





CONTAINERIZATION OF THE CANADIAN ARMY ECHELON: A NEED FOR UPDATED DOCTRINE

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Service Paper

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CONTAINERIZATION OF THE CANADIAN ARMY ECHELON: A NEED FOR UPDATED DOCTRINE

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CONTAINERIZATION OF THE CANADIAN ARMY ECHELON : A NEED FOR UPDATED DOCTRINE

AIM

1. On 20 October 2000, the Canadian Armed Forces (CAF) began the process of replacing its medium lift vehicle capability, the Medium Logistics Vehicle Wheeled (MLVW).¹ The selection, purchase and fielding of the Mack Defence LLC Medium Support Vehicle System (MSVS) for the Standard Military Pattern (SMP) variant marked a tremendous increase in capability over its predecessor however, the application of the MSVS SMP to existing Canadian Army (CA) sustainment echelon systems has been difficult. In an eagerness to employ the new capability, and in the absence of revised doctrine, early trials of the MSVS SMP have met varying degrees of success. With the pending Logistics Vehicle Modernization (LVM) project offering a similar capability increase, the CA needs to understand how to adapt its echelon accordingly. This paper will define the problem, examine approaches taken by allied militaries and offer a way how the CA might use the MSVS SMP to introduce the concept of, "containerization," to its sustainment echelons.

INTRODUCTION

2. While much has been made about the physical size advantage the MSVS SMP enjoys over the MLVW (Figure 1-1), a critical change in capability remains to be discussed, understood and resolved by the CA. Of the 2,887 MLVWs that were replaced, 24% (713) were configured to accept containers (of any sort) and none were of the

¹ Department of National Defence, "Medium Support Vehicle System Project," last accessed 16 Jan 21, https://www.canada.ca/en/department-national-defence/services/procurement/medium-support-vehiclesystem-project.html

variant that could self-load / un-load containers.²³ The vast majority of the MLVW fleet (76%) was general-purpose cargo, while the replacement MSVS SMP fleet is only 40% cargo (including cargo with crane), and 44% (705) Load Handling System (LHS) variant.⁴



Figure 1-1 – MLVW compared to the Up-Armoured MSVS SMP⁵

3. The majority of the MSVS SMP LHS are designated to carry shelters of various sorts (28 configurations), however their arrival firmly introduces the age of, "Containerization," to the CA echelon. The paucity of previous container handling vehicles within the CA echelons (109 x Heavy Logistics Vehicle Wheeled (HLVW)

² Department of National Defence. *Succeeding in the Canadian Army Equipment Program*. LCol Sean Ward (Powerpoint Presentation). January 2021. Slide 56.

³ Department of National Defence. *Army Equipment Working Group: Main Presentation*. G34 / G4 Ops (Powerpoint Presentation). 17-18 February 2016. Slide 22.

⁴ Department of National Defence. *Logistics Vehicle Modernization and Containerization*. Maj Bob McLeod DLR 6-6 (Powerpoint Presentation). 17-18 February 2016. Slide 6.

⁵ Department of National Defence. *Succeeding in the Canadian Army Equipment Program*. LCol Sean Ward (Powerpoint Presentation). January 2021. Slide 9.

Pallet Loading System (PLS) vehicles across the entire CAF)⁶, coupled with the dramatic capability differential between the MLVW and it's replacement have seemingly caught the CA off-guard. While some of our allies have studied the effects of containerization on their echelons for 50 or more years, this issue has been (relatively) quickly foisted upon the CA. With LVM Light and Heavy Projects both projecting container variants, the time to resolve this issue is now.⁷⁸

4. With the MSVS SMP project having only completed the last delivery February 13th, 2020, the true effects of the impact of this platform on the CA echelon are far from known. This paper will seek to describe the CA echelon system and the theory of, "containerization," before examining the lessons learned from the studies of containerization by the United States (US) Army and Marine Corps (USMC). Comparison of the theory and previous studies against recent CA attempts to utilize the MSVS SMP will yield useful insights on how future CA Divisions (Divs) and Brigades (Bdes) might best utilize the MSVS SMP and how containerization theory could be applied to the CA echelon.

DISCUSSION

5. CA echelons at the Bde level and below consist of the B, A2, A1 and F and are introduced in B-GL-300-004/FP-001 *Sustainment of Land Operations* and described in

⁶ Treasury Board of Canada Secretariat, *Business Case: Logistics Vehicle Modernization (LVM) Project – Canadian Armed* Forces (Ottawa, ON: Canada Communications Group, 24 October 2018), Annex C Page 4.

⁷ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), ii.

⁸ Department of National Defence, "Logistics Vehicle Modernization and Containerization," Maj Bob McLeod (Powerpoint presentation), 26 February 2016, slides 13-14.

B-GL-345/FP-001 *CSS Units in Operations*. While Figures 1-2 and 1-3 from *CSS Units in Operations* display the battlefield locations of the echelons, the basic premise of the echelon system is that as supplies move forward into the battlefield, they are packaged in smaller and smaller increments. As all of the CA Bde echelons have to contend with operating within direct and indirect fire ranges of the enemy, the reduction in size and quantity of supplies as they move forward is done to improve survivability. Lighter loads offer greater manoeuverability, flexibility and are easier to camouflage in tactical scenarios, and smaller loads allow for supplies to be tailored to the exact needs of the supported elements.⁹



Figure 1-2 and 1-3 – The Canadian Army Echelon System¹⁰¹¹

⁹ Department of National Defence, B-GL-300-004/FP-001, *Sustainment of Land Operations*, (Ottawa: DND Canada, 2010) 3-7.

¹⁰ Department of National Defence, B-GL-345-000/FP-001, *Combat Service Support Units in Operations*, (Ottawa: DND Canada, 2013), 1-2-3.

¹¹ Department of National Defence, B-GL-345-001/FP-001, *Combat Service Support Units in Operations*, (Ottawa: DND Canada, 2013), 3-8.

6. The MLVW was fielded by the CAF in 1982 as a medium lift capability and was employed by the CA down to the A1 echelon.¹² At 3.25m tall and 8.32m long with a cargo capacity of 5 Tonnes, it was well suited to fit the need of cargo and troop carrying demanded by the forward echelons.¹³ Offering a good balance between survivability, size, mobility and manoeuverability, the 6x6 wheel drive MLVW could be quickly camouflaged with 1 x large camouflage net while still offering enough cargo capacity to support a mechanized infantry sub-unit or sub-sub unit.

7. In contrast to the MLVW, the MSVS SMP is 3.54m tall and 11m long and boasts a cargo capacity of up to 23 Tonnes.¹⁴ The MSVS SMP (LHS variant or not) requires up to 6 x large camouflage nets to cover it in a tactical setting and it's wiring is susceptible to damage if backed into shrubs or trees during hide occupation operations.¹⁵ The LHS's requirement to be on nearly level terrain to operate further reduces its utility forward as replenishment operations at the Bde level most favourably occur in undulating and tight terrain.¹⁶¹⁷ Accordingly, despite the increase in capacity, the limitations of the MSVS SMP in close, tactical settings have raised concern as to its utility forward.¹⁸

¹² Department of National Defence, "Medium Support Vehicle System Project," Last accessed 5 February 2021. https://www.canada.ca/en/department-national-defence/services/procurement/medium-support-vehicle-system-project.html.

¹³ Military-Today, "MLVW Light Utility Truck," Last accessed 5 February 2021. http://www.military-today.com/trucks/mlvw.htm#:~:text=The%20MLVW%20or%20Medium%20Logistics,MLVW%20entered %20service%20in%201982.

¹⁴ Military Today, "Mack 8x8 Heavy Utility Truck," Last accessed 5 February 2021. http://www.military-today.com/trucks/mack_8x8.htm.

¹⁵ Department of National Defence, *Fielding the MSVS SMP in ORNERY RAM 19 – MAPLE RESOLVE 19*, Major Matt Hansen (Powerpoint Presentation). April 2019. Slide 9.

¹⁶ Department of National Defence, *Fielding the MSVS SMP in ORNERY RAM 19 – MAPLE RESOLVE 19*, Major Matt Hansen (Powerpoint Presentation). April 2019.

¹⁷ Department of National Defence, B-GL-340-003/FP-001, *Logistics and Combat Service Support Tactics, Techniques and Procedures* (Ottawa: DND Canada, 2017), 6-1.

¹⁸ Department of National Defence, *CSS Doctrine and the New Generation of Trucks*, LCol SD Baker (email). 26 January 2016.

8. Following the WW2, the international shipping industry underwent a dramatic shift cargo ships configuration. The use of standardized containers offered undeniable profit motives, and were accordingly very rapidly integrated into the international shipping system.¹⁹ This trend did not go unnoticed in Military Logistics circles and, "as early as 1968, the [United States] Army was examining the use of containers for resupply movements."²⁰

9. The redeployment from the Vietnam War offered the US Military a unique opportunity to trial the use of containers, however, "the lack of concepts, doctrine and equipment was felt to limit the integration of containers into the logistics system."²¹To fix this fault, the US Department of Defence (DoD) immediately began formal study of how to integrate containers into their various echelons, with the first published by the US Army in 1974.²² In the proceeding years, the US DoD's various services conducted multiple follow-on studies which culminated in the publication of *FM 55-80 – Army Container Operations* in August of 1997, and *DoD Instruction 4500.57 – Transportation and Traffic Management Section 5 – Intermodal Containers*… in March, 2017.

¹⁹ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), 6.

²⁰ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), 40.

²¹ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), 41.

²² United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), 41.

10. Although all DoD services demonstrated initial hesitancy to adopt containers, the advantages of a containerized echelon were too glaring for any to outright reject.²³ Each of the successive DoD studies proved that containerization offered more rapid deployment through standardization, more security of supplies during transit, covertness of supplies in transit (due to their concealment within a container) and tremendous cost effectiveness due to seamless integration with civilian shipping resources.²⁴²⁵²⁶²⁷ The benefits of containerization forced a rapid adoption by all services, which in turn required a rapid development of new doctrine.

11. For the USMC, the 1985 containerization of their Assault Follow-on Echelon (AFOE) required, "new doctrine, concepts of operation, and procedures to be developed to handle the quantum leap form a 200lb pallet to the 44,500lb container."²⁸ Indeed in 1985, across all services in the US DoD complained that, "The words "dimensional standardization" and "containerization" do not appear in FM's."²⁹ While slow to react initially, the US DoD services caught up quickly and each had formal containerization doctrine published by the early 1990s.

²³ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), vii.

²⁴ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), vii,

²⁵ United States Department of Transportation Prepared for United States Department of Defense, Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization, (Cambridge, MA, April 1989.), 44.

²⁶ United States Department of Defence, *DoD Instruction 4500.57: Transportation and Traffic Management*. (Washington, D.C., 23 September 2019), 18.

²⁷ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), 5-1.

²⁸ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), vii,

²⁹ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), x.

12. Between realizing the shift to containerization and publishing formal doctrine, the studies and trials conducted by the US DoD provided concrete and iterative lessons. The most applicable of these lessons to the CA echelon construct is the difficulty in employing containers below the Bde level. Both the US Army and the USMC concluded the requirement of Materiel Handling Equipment (MHE) to efficiently, "stuff,"³⁰ and, "unstuff,"³¹ containers, precluded their deployment forward of their Brigade Support Areas (BSAs) and AFOEs.³²³³ The USMC study poignantly notes that for efficient container handling, rough-terrain forklifts (RTFLs) with a minimum capacity of 20,000 lbs are required and the current equipment held at the forward echelons are woefully insufficient:

The 6,000 pound and 10,000 pound RTFL's have no real mission in containerization. An inventory change is needed. The 4,000 pound RTFL needs considerable help in moving, stuffing, and unstuffing containers³⁴

13. At the BSA and AFOE levels and above however, the US Army and USMC have implemented policies to reach up to, "70 percent containerization of,"³⁵ these echelons. Further, "the DOD relies on commercial sealift to move 85 percent of cargo during

³⁰ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), 46.

³¹ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), 46.

³² United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), 18.

³³ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), 81.

³⁴ United Sates Naval War College, *Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective* (Newport, Rhode Island: Naval War College Press, 1985), 46.

³⁵ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), 81.

contingency operations,"³⁶ Despite the limitations of a containerized forward echelon, at levels at the Bde and above, the US Army and USMC have fully embraced the concept.

CONTAINERIZABILITY, BY SUPPLY CLASS

Class	Description	& Containerizable, 20-Foot Vans
I	Subsistence	100%
II	Indiv. Equipment	100%
III	POL (Pkged)	100%
IV	Construction Materials	75%
v	Ammunition (Conventional) 100%
VI	Personal Demand Items	100%
VII	Major End Items	20%
VIII	Medical	*
IX	Repair Parts (Non-ALOC)	80%

* Not addressed in FM 54-11.

Figure 1-4 Demonstrates the assessed, "containerizability," of the higher echelons of all DoD services: ³⁷

14. For the US DoD, "containerization," is thought of as only applying to the Bde

echelons and above:

Sustainment comes in 20- and 40- foot containers. The goal is to use 20foot containers to support the initial deployment... Delivering a 40-foot container to the division presents challenges. The division has no CHE. Therefore, the container will remain uploaded on the chassis until it is unstuff and ready for retrograde.³⁸

DoD containerization doctrines focus on rapidly deploying divs and supporting

operational-level theatres, and though despite having some experience in moving of

³⁶ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), 1-1.

³⁷ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), 44.

³⁸ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), 2-2.

considerable numbers of containers during the redeployment from Afghanistan and the (more recent) deployment to Latvia, "containerization," is not a concept that has caught on in the CAF.³⁹⁴⁰ It is likely for this reason therefore, that the CA, "didn't know what it didn't know," when the MSVS SMP arrived in the field force in April 2018.⁴¹

15. Despite the MLVW replacement project being identified in 2000, the arrival of the first MSVS SMP in April 2018 came without much fanfare within the CA.⁴² When the MSVS SMP portion of the MLVW replacement was re-tendered in 2006, the project was dealt a serious blow and the revised timeline required the CAF to undertake a major rationalization of its fleet to mitigate the medium lift gap caused by the, "selfdivestment," of the remaining MLVWs. ⁴³⁴⁴⁴⁵ With efforts focused on mitigation, and the delivery of the MSVS SMP occurring at a varied pace over two years, few CA planners were focused on precisely how this platform would be employed. Indeed, with the last MSVS SMP having been delivered February 13th, 2020, the CA has yet to publish corresponding or updated doctrine.

³⁹ United States Department of Transportation Prepared for United States Department of Defense, *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*, (Cambridge, MA, April 1989.), ii.

⁴⁰ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), 1-1.

⁴¹ Department of National Defence, "Medium Support Vehicle System Project," last accessed 16 Jan 21, https://www.canada.ca/en/department-national-defence/services/procurement/medium-support-vehiclesystem-project.html.

⁴² Department of National Defence, "Medium Support Vehicle System Project," last accessed 16 Jan 21, https://www.canada.ca/en/department-national-defence/services/procurement/medium-support-vehiclesystem-project.html.

⁴³ Department of National Defence, "Medium Support Vehicle System Project," last accessed 16 Jan 21, https://www.canada.ca/en/department-national-defence/services/procurement/medium-support-vehiclesystem-project.html.

⁴⁴ Canadian Army Today, "MSVS Logistic Trucks Steer Through First Deployment in Latvia," Last accessed 16 January 2021. https://canadianarmytoday.com/msvs-logistic-trucks-steer-through-first-deployment-in-latvia/.

⁴⁵ Department of National Defence, "Army Equipment Working Group Presentation," (Powerpoint Presentation). 17-18 February 2016. Slides 21-46.

16. Despite arriving without any accompanying doctrine, the relief felt by the arrival of the MSVS SMP led to it being immediately incorporated into the CA Bde echelons. The first CA Bde to fully incorporate the MSVS SMP was 1 Canadian Mechanized Brigade Group (CMBG) during their Fiscal Year 2018-2019 Road to High Readiness (R2HR). As detailed in Table 1-1, the initial plan saw 1 CMBG pushing multiple LHSs to the forward echelons. While final distribution saw the LHSs predominately landing in 1 Service Battalion (1 Svc Bn), 1 Combat Engineer Regiment (1 CER) and the Lord Strathcona's Horse Regiment (Royal Canadians) (LdSH(RC)) received a large number of LHSs to support the R2HR training.

1 CMBG Distribution Plan – MSVS SMP								
	TCV	LHS	MRT (Veh)	MRT (Weld)	MRT (Wpn)	МНС	Trailer	Total (Trucks)
1 PPCL1	1	1	0	0	0	1	0	3
2 PPCLI	0	0	0	0	0	0	0	0
3 PPCLI	3	0	0	0	0	0	2	3
1 CER	1	1	0	0	0	2	2	4
1 RCHA	0	0	0	0	0	0	0	0
LdSH(RC)	0	1	1	0	0	2	0	4
1 Svc Bn	0	7	2	0	0	0	6	9
1 HQ & Sigs	0	0	0	0	0	0	0	0
Total	5	10	3	0	0	5	10	23

Table 1-1 – Planned 1 CMBG Distribution of MSVS SMP FY 18/19⁴⁶

17. During the 1 CMBG R2HR exercises LHSs were employed in both unit echelons and the BSA to carry shelters, workspaces and cargo containers. Lessons learned about the employment of the MSVS SMP during these exercises point to serious flaws with

⁴⁶ Department of National Defence, "Draft MSVS SMP Distribution to 10 Sept 18," (excel document), 12 July 2018.

employing the LHS at the unit-level.⁴⁷⁴⁸ Operationally, the risk associated with having soldiers attempt to camouflage LHS while 3.5 meters in the air, wearing full fighting order led to orders precluding the requirement for full camouflage.⁴⁹ Further, the wiring of the vehicle made it unsuitable for camouflage within tree lines, and the requirement for flat terrain made container swaps unsuitable during tactical replenishment operations.⁵⁰ While initially used a great deal by their units, the aforementioned struggles quickly regulated the LHSs to static roles, and nearly all shelters remained loaded on their prime movers for the duration of the exercises.

CONCLUSION

18. The MSVS SMP is an order of magnitude more capable than the vehicle it replaced. This increase in capability comes with a cost in camouflage and manoeuverability which preclude the MSVS SMP to be treated as a one-for-one swap of the MLVW. With the relief and excitement of receiving a replacement medium lift platform having worn off, and with LVM pending, the CA should now focus attention on how best to integrate containerization into its echelons. The CA cannot afford to take the US DoD's initial cautious-study and test approach, as the platform is here and the need is now. Instead, the CA should build on the 50 years of containerization lessons learned,

⁴⁷ Department of National Defence, "3350-1 (Comd) 1 Canadian Mechanized Brigade Group Synopsis of Tactical Capability Deficiencies," Col R.R. Ritchie (PDF File), 10 June 2019, Page 3.

 ⁴⁸ Department of National Defence, *Fielding the MSVS SMP in ORNERY RAM 19 – MAPLE RESOLVE 19*, Major Matt Hansen (Powerpoint Presentation). April 2019. Slide 9.

⁴⁹ Department of National Defence, *Fielding the MSVS SMP in ORNERY RAM 19 – MAPLE RESOLVE 19*, Major Matt Hansen (Powerpoint Presentation). April 2019. Slide 9.

⁵⁰ Department of National Defence, *Fielding the MSVS SMP in ORNERY RAM 19 – MAPLE RESOLVE 19*, Major Matt Hansen (Powerpoint Presentation). April 2019. Slide 9.

apply recent CA lessons learned, and through the lens of CA doctrine, develop a way forward that would best see the MSVS SMP and LVM incorporated into the echelon.

RECOMMENDATION

All units have equipment that can move in containers, but not all units can move all their equipment in containers.

FM 55-80 Army Container Operations

19. US Army, USMC and recent CA lessons learned all make the assertion that

containers should not be used forward of the Bde-level echelons.

Forty-foot sustainment containers will generally be moved to GS [Division] supply echelons. DS [Brigade] supply echelons either do not have adequate CHE and MHE to unload 40-foot containers or they do not require the volume of material at one time that 40-foot containers provide.⁵¹

Bde to Div and Div to Corps (or Industry) sustainment operations can benefit

tremendously from containerization of the echelon, and indeed containerization has been

used to great effect at these levels in recent CAF operations. Recent CAF Materiel

Management Working Groups and Director Land Requirements Briefings indicate that

the CAF is approaching the concept of containerization with a view of implementing

containers in the operational-level sustainment echelons, thereby seemingly leaving the

door open for the CA to develop tactical-level doctrine.⁵²⁵³

⁵¹ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), 2-4.

 ⁵² Department of National Defence, "Convening Order – Materiel Management & Distribution Working Group (WG) Two – 24-26 November 2020," LCol D. Beyer (Word Document), 4 November 2020, Page 1.
⁵³ Department of National Defence, "Succeeding in the Canadian Army Equipment Program," LCol Sean Ward (Powerpoint Presentation), January 2021, Slide 12.

20. Leaning on the experience of the US Army and USMC, the CA should formally recognize that while containers can be tremendously effective in the echelon system, their employment forward of the BSA is unwise. The systems proposed in Figures 1-5 and 1-6 should be adopted by CA Bdes whereby containers are used to quickly and securely delivery supplies as far forward as the BSA before they are broken down into component parts to be delivered forward.





Figure 2-6. Overview of Theater Container Distribution

Figure 1-5, Figure 1-6 – US Army Container Distribution along the Echelon⁵⁴⁵⁵

21. Regulation of containers to the BSA and higher echelons would understandably effect the employability and therefore distribution of the MSVS SMP LHS and any future LVM container variants. In the CA Bde context, any LHSs forward would be limited to shelter prime movers and any containers would rest with the Bde Svc Bn (for replenishment operations higher). Offsets could see unit echelons augmented with additional MSVS SMP Cargo variants and arguments could be made that Armoured

⁵⁴ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), Figure 2-4. UE Container Distribution.

⁵⁵ United States Army, *FM 55-80 Army Container Operations*, (Washington, D.C.: Department of the Army Headquarters, 13 Aug 1997), Figure 2-6. Overview of Theater Container Distribution.

Units such as 1 CER and the LdSH(RC) be permitted to retain a small number of LHS cargo for Spare Parts holdings.

22. Balancing the MSVS SMP fleet in this manner would seemingly offer the greatest benefit of containerization, while avoiding the limitations and constraints of trying to conduct container operations in forward echelons. Adopting this proposed balance however, will signal a significant shift from the current practices of having containers dot unit-level hides and Bde Svc Bns swapping containers with units during tactical replenishment operations. These practices however, are seemingly quickly abandoned by Bdes and Units early on in real-time training scenarios and therefore it is unlikely the proposed re-balance will face serious rebuke.

23. The real test of adopting this disciplined approach to containerization of the echelon will be with the delivery of the LVM and whether or not containers again make their way back into the forward echelons. The approach of LVM therefore presses the need to use the employment of the MSVS SMP to coalesce the CA into recognizing and adopting common doctrine regarding containerization. With LVM still in the Bid Evaluation Phase, there remains precious time for the CA to get the containerization balance right.⁵⁶

⁵⁶ Department of National Defence, "Logistics Vehicle Modernization Project," last accessed 6 February 2021. https://www.canada.ca/en/department-national-defence/services/procurement/logistics-vehicle-modernization-project.html.

24. Building on the lessons learned from allied militaries and our own lessons observed during recent tactical-level training, it would seem foolish to continue to push containers as far forward as possible into the battlespace. With all available tests and studies indicating containers need not move further forward than the BSA, the CA should adopt this lesson as hard doctrine. Doing so now would allow the CA Divs and Bdes to build the correct sustainment architecture along the echelon, test and train the system, and be ready for whatever containerization challenges the future may present.

BIBLIOGRAPHY

- Canada. Department of National Defence. "2018-2019 Department of National Defence and the Canadian Armed Forces departmental progress report for Canada's National Action Plan on Women, Peace and Security." Last accessed 6 February 2021. https://www.international.gc.ca/gac-amc/publications/cnappnac/progress reports-rapports etapes-2018-2019-dnd.aspx?lang=eng.
- Canada. Department of National Defence. "3350-1 (Comd) 1 Canadian Mechanized Brigade Group Synopsis of Tactical Capability Deficiencies." Col R.R. Ritchie (PDF File), 10 June 2019.
- Canada. Department of National Defence. A-LM-158-005/AG-001. *Transport Manual*. Ottawa: DND Canada, 2017.
- Canada. Department of National Defence. "Army Equipment Working Group: Main Presentation." G34 / G4 Ops (Powerpoint Presentation). 17-18 February 2016.
- Canada. Department of National Defence. B-GL-300-004/FP-001. Sustainment of Land Operations. Ottawa: DND Canada, 2010.
- Canada. Department of National Defence. B-GL-340-003/FP-001. Logistics and Combat Service Support Tactics, Techniques and Procedures. Ottawa: DND Canada, 2017.
- Canada. Department of National Defence. B-GL-341-001/FP-001. *Land Replenishment System*. Ottawa: DND Canada, 2000.
- Canada. Department of National Defence. B-GL-342-001/FP-000. Land Equipment Replenishment System. Ottawa: DND Canada, 2001.
- Canada. Department of National Defence. B-GL-345-001/FP-001. Combat Service Support Units in Operations. Ottawa: DND Canada, 2013.
- Canada. Department of National Defence. B-GL-345-002/FP-001. *The Service Battalion in Operations*. Ottawa: DND Canada, 2017.
- Canada. Department of National Defence. "Canadian Army Land Warfare Centre: Sustain." LCol A.N. Noonan (Powerpoint Presentation). 8 March 2016.
- Canada. Department of National Defence. "Canadian Army Support Vehicles." MGen Poulter (Powerpoint Presentation). 6 February 2012.
- Canada. Department of National Defence. "Convening Order Materiel Management & Distribution Working Group (WG) Two 24-26 November 2020." LCol D. Beyer (Word Document). 4 November 2020.

- Canada. Department of National Defence. "CSS Doctrine and the New Generation of Trucks." LCol SD Baker (email). 26 January 2016.
- Canada. Department of National Defence. "Draft MSVS SMP Distribution to 10 Sept 18." (excel document). 12 July 2018.
- Canada. Department of National Defence. "Fielding the MSVS SMP in ORNERY RAM 19 – MAPLE RESOLVE 19." Major Matt Hansen (Powerpoint Presentation). April 2019. Slide 9.
- Canada. Department of National Defence. "Logistic Vehicle Modernization and Containerization." Maj Bob McLeod DLR 6-6 (Powerpoint Presentation). 26 February 2016.
- Canada. Department of National Defence. "Logistics Vehicle Modernization Project." Last accessed 6 February 2021. https://www.canada.ca/en/department-nationaldefence/services/procurement/logistics-vehicle-modernization-project.html.
- Canada. Department of National Defence. "Medium Support Vehicle System Project." Last accessed 5 February 2021. https://www.canada.ca/en/department-nationaldefence/services/procurement/medium-support-vehicle-system-project.html
- Canada. Department of National Defence. "Succeeding in the Canadian Army Equipment Program." LCol Sean Ward (Powerpoint Presentation). January 2021.
- Canadian Army Today. "MSVS Logistic Trucks Steer Through First Deployment in Latvia." Last accessed 16 January 2021. https://canadianarmytoday.com/msvslogistic-trucks-steer-through-first-deployment-in-latvia/.
- Mack Defense. "Mack Defence Builds Final Truck for Canadian Medium Support Vehicle System (MSVS) Program." Last accessed 16 January 2021. https://www.mackdefense.com/mack-defense-builds-final-truck-for-canadianmedium-support-vehicle-system-msvs-program/.
- Military Today. "Mack 8x8." Last accessed 16 January 2021. http://www.militarytoday.com/trucks/mack_8x8.htm.
- Military-Today. "MLVW Light Utility Truck." Last accessed 5 February 2021. http://www.militarytoday.com/trucks/mlvw.htm#:~:text=The%20MLVW%20or%20Medium%20Log istics,MLVW%20entered%20service%20in%201982.
- The Canadian Encyclopedia. "Canada and the War in Afghanistan." Last accessed 6 February 2021. https://www.thecanadianencyclopedia.ca/en/article/internationalcampaign-against-terrorism-in-afghanistan.

- Treasury Board of Canada Secretariat. Business Case: Logistics Vehicle Modernization (LVM) Project – Canadian Armed Forces. Ottawa, ON: Canada Communications Group, 24 October 2018.
- United States Army. ADP 4-0 (FM 4-0) Sustainment. Washington, DC: Department of the Army Headquarters, 31 July 2012.
- United States Army. *FM 3-21.20 (FM 7-20) The Infantry Battalion*. Washington, D.C: Department of the Army Headquarters, December 2006.
- United States Army. *FM 55-80 Army Container Operations*. Washington, D.C.: Department of the Army Headquarters, 13 August 1997.
- United States Department of Defence. *DoD Instruction 4500.57: Transportation and Traffic Management*. Washington, D.C., 23 September 2019.
- United States Department of Transportation Prepared for United States Department of Defense. *Optimizing Wartime Materiel Delivery: An Overview of DOD Containerization*. Cambridge, MA, April 1989.
- United States Naval War College. Containerization in the Assault Follow-on Echelon (AFOE) – Post J-Lots II Perspective. Newport, Rhode Island: Naval War College Press, 5 June 1985.
- United States Office of the Inspector General. Audit Report: DOD's Use and Procurement of Tactical Shelters. Arlington, Virginia: Office of the Inspector General, 31 August 1994.