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Reinvigorating the Relevance of North American Defense

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Exercise Solo Flight

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Reinvigorating the Relevance of North American Defense

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REINVIGORATING THE RELEVANCE OF NORTH AMERICAN DEFENSE

For nearly sixty-five years, the North American Aerospace Defense Command (NORAD) has proven itself a mostly effective and adaptable defensive alliance that largely has prevented any attack on the United States of America or Canada. More importantly, it has bound the two English speaking nations of the North America in a tight, and interoperable defense relationship that has contributed to one of the world's closest bilateral military alliances^{1,2}. Unfortunately, NORAD today only serves to defend against a small sliver of the threats these two nations face with a rapidly obsolescing infrastructure, a restrictive mission and unequal burden sharing combining to threaten NORAD's *raison d'être*. A new era of threats against these allies provides a fleeting opportunity to arrest NORAD's descent to obsolescence and provide for pan-spectrum defenses that will secure the whole of North American, and more tightly bind these allies to each other in a mutually beneficial political and military alliance. This essay will argue that by reimagining and then equitably investing in North America's defense needs, specifically by expanding NORAD's mission to include the cyber and maritime domains, kinetic capabilities and threat vectors beyond the traditional northern approaches, NORAD can again become the standard for bilateral defense alliances and secure the future for these two allies.

¹ Government of Canada. "March 2020 - North American Aerospace Defense Command (NORAD)." Canada.ca. Government of Canada/ Gouvernement du Canada - Department of National Defence, September 30, 2021. <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/transition-materials/caf-operations-activities/2020/03/caf-ops-activities/norad.html>.

² Government of Canada, and United States of America. "Agreement between the United States of America and Canada." state.gov. United States Department of State, April 28, 2006. <https://www.state.gov/wp-content/uploads/2019/02/06-512-Canada-Defense.pdf>.

Chartered in 1957, NORAD has existed and even thrived in its mission to defend Canada and the United States of America in the Cold War era when the threat of global nuclear war largely required defending polar focused attack routes for bomber or land based nuclear missiles³. This known attack vector between the USA and the United Soviet Socialist Republic gave rise to the first early warning systems, the Distant Early Warning (DEW) line of radars, followed by North Warning System (NWS)⁴. Even though the attacks on the United States on September 11th, 2001 (9/11) necessitated a new mission to secure North America's airspace from sub-national airborne threats, NORAD has found its fundamental purpose continually degraded with growing obsolescence and newly emergent threats⁵.

9/11 represented a painfully visible example of one of the new post-Cold War threats against the North American continent. NORAD's herculean efforts to help safely land the thousands of aircraft in US airspace in the hours after the attacks does not compensate for its failure in imagination to prepare for and prevent such a creative attack against a NORAD partner⁶. Closer examination of 9/11 has even partially condemned NORAD for an inability to generate sufficient airborne power in the hours after 9/11 to defend against follow-on attacks

³ North American Aerospace Defense Command, Office of History. "A Brief History of NORAD." A Brief History of NORAD. North American Aerospace Defense Command, December 3, 2013. https://www.norad.mil/Portals/29/Documents/History/A%20Brief%20History%20of%20NORAD_May2016.pdf?ver=2016-07-07-114925-133.

⁴ Gilmour, Jeff. "NORAD: Renewal of the North Warning System ... - Navalassoc.ca." NORAD: Renewal of the North Warning System by Canada – or Not? Naval Association of Canada/ Association navale du Canada, 2021. <https://www.navalassoc.ca/wp-content/uploads/2021/08/Gilmour-NORAD.pdf>.

⁵ Fergusson, James. "Modernizing Continental Defence." Canadian Global Affairs Institute, January 29, 2021. https://www.cgai.ca/modernizing_continental_defence.

⁶ Wood, Andrew. "Canada, the Freeloader, Rather Than Vested Defence Partner in NORAD and the Defence of North America." Canadian Military Journal | Revue militaire Canadienne. Canadian Armed Forces, 2021. <http://www.journal.forces.gc.ca/vol21/no2/PDF/CMJ212Ep5.pdf>. Page 7

which thankfully never occurred⁷. Today, in NORAD's primary domains of defense (air and space) new threats continue to grow at alarming rates that challenge NORAD's outdated technology, posture and force structure and ultimately calls into question the future relevance of this unique partnership. NORAD has largely seen its success in defending the air and space domains of the United States and Canada supplanted by adversarial technological developments and the obsolescing of its current warning systems and technology⁸.

More than any other developments, the threats presented by new capabilities from adversaries like the Russian Federation (Russia), the People's Republic of China (China) and even a rapidly developing Democratic People's Republic of Korea (North Korea) have challenged the continued efficacy of NORAD. Russia, China, and North Korea continue to develop technologies like new Intercontinental Ballistic Missiles (ICBM), missile decoys, maneuverable hypersonic and stealthy cruise missile systems that can more easily evade NORAD's current warning infrastructure⁹. Russia specifically has made monumental strides in technologies that can render the current NWS (or even any replacement) little more than a modern day *Arctic Maginot Line*. The Russian Air Force can now launch hypersonic missiles and glide vehicles from its own territory from 'archer' aircraft that can strike anywhere in the

⁷ Sokolsky, Joel. "U.S. Ballistic Missile Defense, NORAD and the Canada Conundrum." Virtual Commons - Bridgewater State University, May 2014. https://vc.bridgew.edu/br_rev/vol33/iss1/5/. Page 10.

⁸ Vanherck, Glen. "Statement Of General Glen Vanherck, United States Air Force Commander United States Northern Command And North American Aerospace Defense Command." United States Northern Command. Senate Armed Services Committee, March 16, 2021. <https://www.northcom.mil/Portals/28/USNORTHCOM%20and%20NORAD%20Posture%20Statement%2016%20Mar%2021.pdf>. Page 1-4.

⁹ Lackenbauer, P. Whitney, and Ryan Dean. "We Cannot Deter What We Cannot Detect - NAADSN." Quick Impact. North American and Arctic Defence and Security Network, May 25, 2020. <https://www.naadsn.ca/wp-content/uploads/2020/05/20-may-25-PWL-RD-We-Cannot-Deter-What-We-Cannot-Detect-final.pdf>.

world in a matter of minutes^{10,11}. These highly maneuverable vehicles can attack North America from nearly any direction and, even if detected, can continue to maneuver to evade defense, all at fantastically high Mach speeds¹². Whether because attacks will follow along new vectors that ‘outflank’ the DEW/NWS polar facing radar pickets, or use fantastic hypersonic speeds, the USA and Canada are potentially now as vulnerable as they have ever been to an attack as at any point since NORAD’s creation. Canada’s unique geographic position no longer provides an inimitable asset to North American defense¹³, and arraying the bulk of NORAD’s aerospace warning and defense infrastructure against obsolete bomber and missile approaches risks investing limited resources into an ineffective solution. Instead, NORAD must now look beyond the air and space domains, and brace itself for contests, competition and even combat across all domains with a specific and immediate focus on expanding its maritime and cyber forces and capabilities.

Canada and the United States of America have taken tentative steps since the end of the Cold War to expand NORAD’s mission to provide for a more total North American defense. On April 26, 2006 NORAD expanded on its charter missions to include an Arctic Ocean and polar

¹⁰ Henderson, M. (2019, August 29). *Hypersonics: The new 'Sputnik' moment?* War Room - U.S. Army War College. Retrieved May 11, 2022, from <https://warroom.armywarcollege.edu/articles/hypersonics-new-sputnik-moment/?msclkid=3ee02447d15511ec9ce8c920dc0e8475>

¹¹ Vanherck, Glen. “Statement Of General Glen Vanherck, Armed Services Committee. Page 5-7.

¹² RAND Corporation. “Hypersonic Missile Nonproliferation.” RAND Corporation. Accessed May 18, 2022. <https://www.rand.org/multimedia/video/2017/09/27/hypersonic-missile-nonproliferation.html>.

¹³ McDonough, David S. “Canada, NORAD, and the Evolution of Strategic Defence.” *International Journal* 67, no. 3 (2012): 797–811.

maritime monitoring mission.^{14,15,16} This mission has become increasingly more important as climate change has enabled longer open ice navigation for commercial and military sea traffic, and enabled easier mineral extraction from previously unreachable locations. Unfortunately, this new NORAD mission has not received sufficient resources to deter adversarial aggression and posturing in the Arctic Ocean. In a 2021 article for Macleans, senior fellow at the MacDonald-Laurier Institute and Conference on Defense Associates Institute, Marcus Kolga highlighted that the Royal Canadian Navy's new, 'limited capability' Arctic Defence station in Alert, Baffin Island, Nunavut will only support six Arctic and Offshore Patrol Vessel with limitation to operating in only first year ice¹⁷. This limited Canadian investment has unfortunately been met with equally moribund United States Naval and Coast Guard resourcing^{18,19} that underscore NORAD's lack of focus on this new maritime mission.

¹⁴ Government of Canada, and United States of America. "Agreement between the United States of America and Canada." Article 1.

¹⁵ North American Aerospace Defense Command. "A Brief History of NORAD." page 30.

¹⁶ North American Aerospace Defense Command. "NORAD Agreement." North American Aerospace Defense Command > About NORAD > NORAD Agreement. Accessed April 29, 2022. <https://www.norad.mil/About-NORAD/NORAD-Agreement/>.

¹⁷ Kolga May 26, Marcus. "Winter Is Coming to Canada's North. Vladimir Putin Will Make Sure of It." Macleans.ca, May 26, 2021. <https://www.macleans.ca/opinion/winter-is-coming-to-canadas-north-vladimir-putin-will-make-sure-of-it/>.

¹⁸ Office of the Under Secretary of Defense for Policy. "Report to Congress Department of Defense Arctic Strategy." Defense.gov. United States Department of Defense, June 2019. <https://media.defense.gov/2019/Jun/06/2002141657/-1/-1/1/2019-DOD-ARCTIC-STRATEGY.PDF>.

¹⁹ Department of the Navy. "A Blue Arctic: A Strategic Blueprint for the Arctic." Defense.gov. United States Department of Defense, January 5, 2021. <https://media.defense.gov/2021/Jan/05/2002560338/-1/-1/0/ARCTIC%20BLUEPRINT%202021%20FINAL.PDF/ARCTIC%20BLUEPRINT%202021%20FINAL.PDF>.

When compared to Russia's expansion of dozens of Arctic facing bases and the establishment of its new Russian Arctic Command, the NORAD partner's investment looks particularly paltry and opens an invitation to heightened adversarial activities in this increasingly important geography²⁰. Beyond military investments, as recently as October 2020, Russian President Vladimir Putin signed an arctic strategy intended to signal Russia's intent to gain primacy (if not hegemony) in a range of Arctic economic activities from shipping to mineral extraction^{21,22}. Even China, a self-declared 'Near Arctic State,' has dramatically increased its arctic focused maritime investments^{23,24}. Specifically, China's two newly commissioned Xuelong class icebreakers can provide a nearly year-round arctic presence and signal an intent to influence arctic governance despite no legitimate territorial claims in or near the Arctic waters^{25,26}. The noted potential of Chinese Jin-Class ballistic missile submarines to operate in

²⁰ Gramer, Robbie. "Here's What Russia's Military Build-up in the Arctic Looks Like." Foreign Policy. Foreign Policy, January 25, 2017. <https://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/>.

²¹ President of Russia. "Strategy for the Development of the Arctic Zone of Russia and Ensuring National Security until 2035 Has Been Approved." Kremlin.ru, October 26, 2020. <http://www.kremlin.ru/acts/news/64274>.

²² Stallesen, Atle. "Behind Putin's New Arctic Strategy Lies a Rude Quest for Natural Resources." The Independent Barents Observer, October 30, 2020. <https://thebarentsobserver.com/en/climate-crisis/2020/10/behind-putins-new-arctic-strategy-lies-rude-quest-natural-resources>.

²³ Lajeunesse, Adam, and Timothy Choi. "Here There Be Dragons? Chinese Submarine Options in the Arctic." *Journal of Strategic Studies*, 2021, 1–27. <https://doi.org/10.1080/01402390.2021.1940147>.

²⁴ Lajeunesse, Adam, and Timothy Choi. "Chinese Submarines under Ice?" U.S. Naval Institute, May 19, 2022. <https://www.usni.org/magazines/proceedings/2022/may/chinese-submarines-under-ice>.

²⁵ Office of the Under Secretary of Defense for Policy. "Report to Congress Department of Defense Arctic Strategy." Page 4.

²⁶ Department of the Navy. "A Blue Arctic: A Strategic Blueprint for the Arctic."

Arctic waters only further highlights their investment in maintaining a maritime military presence capable of threatening North America^{27,28}.

If the growing presence and influence of these two adversarial states in the Arctic region alone is unable to spur a recommitment to NORAD's newer maritime mission, the ability of these states to deliver nuclear weapons to the North American continent via arctic maritime vectors should underscore the urgent necessity of seriously incorporating a more robust Arctic maritime presence and defense into NORAD's larger plans for the North American continental security. Russia has continued to develop maritime based nuclear primary and second-strike weapons like the Poseidon 2M39 torpedo which could, in theory, stealthily navigate under polar ice and autonomously strike coastal targets in either Canada or the United States of America in the event of a general nuclear war²⁹. Although an opening Arctic Ocean will serve as a new geography for NORAD to more actively monitor, it must also expand its mission to deter and if necessary, fight to protect the United States and Canada. Beyond the maritime domain both NORAD nations must also find the political will and resources to actively (and collectively) contest the clear, present and perhaps more dangerous malicious activities taking place today in the cyber domain.

²⁷ Congressional Research Service. "China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress." congress.gov. United States Government, May 21, 2020. <https://crsreports.congress.gov/product/pdf/RL/RL33153>.

²⁸ Gilmour, Jeff. "NORAD: Renewal of the North Warning System ... - Navalassoc.ca." NORAD: Renewal of the North Warning System by Canada – or Not? Naval Association of Canada/ Association navale du Canada, 2021. <https://www.navalassoc.ca/wp-content/uploads/2021/08/Gilmour-NORAD.pdf>. page 3-4.

²⁹ Sutton, H I. "New Satellite Images Hint How Russian Navy Could Use Massive Nuclear Torpedoes." USNI News, August 31, 2021. <https://news.usni.org/2021/08/31/new-satellite-images-hint-how-russian-navy-could-use-massive-nuclear-torpedos>.

Using the precedence of the 2006 maritime mission expansion NORAD must explicitly declare the cyber domain as an actively contested domain viewed by both constituent nations as under the aegis of NORAD's bilateral collective defense. Unlike the Arctic maritime domain, where initial 'scientific,' and 'commercial' forays by adversaries are only beginning with the increasingly open Arctic sea ice, the cyber domain is today a domain of active and present hostilities against both nations³⁰. These attacks, ranging from relatively minor commercial and intellectual property theft to large-scale government & election altering influence operations have become ubiquitous. In the US Secretary of Defense's 2018 Summary of the National Defense Strategy of the United States, Secretary James Mattis places a fine point on this by declaring, "[the] homeland is no longer a sanctuary."³¹ He identifies (along with political and information subversion) cyber activities as a prime threat against United States (and Canadian) personal, commercial and government infrastructure. The intervening years since Secretary Mattis' dire assertion have only seen the tempo and breadth of cyber-attacks against the United States increase³². In a June 2021 article for the Modern War Institute at West Point, *America the Undefended: The Flawed Assumption At The Heart Of Us Homeland Defense*, Lieutenant Colonel M.L. Cavanaugh highlights that 2021 saw, 'the worst' cyber-attack against critical infrastructure with East coast fuel and oil supplies taken offline for days³³. The close integration

³⁰ Center for Strategic and International Studies. Significant Cyber Incidents. Accessed May 11, 2022. <https://www.csis.org/programs/strategic-technologies-program/significant-cyber-incidents>.

³¹ Mattis, James. "Summary of the 2018 National Defense Strategy." dod.defense.gov. United States Department of Defense, 2018. Page 3.

³² Center for Strategic and International Studies. Significant Cyber Incidents.

³³ Cavanaugh, ML. "America the Undefended: The Flawed Assumption at the Heart of Us Homeland Defense." Modern War Institute, October 27, 2021. <https://mwi.usma.edu/america-the-undefended-the-flawed-assumption-at-the-heart-of-us-homeland-defense/>.

between United States and Canadian economies, road, rail and energy infrastructure^{34,35,36} inherently make the United States and Canada a ‘backdoor’ to cyber attacking the other and oblige both nations to resource and implement integrated command structures that can effectively secure this domain. Not only do the North American allies experience infrastructure and economic impacts from malicious cyber activity, but cyber attacks will likely occur as part of a more conventional conflict underscoring the need for NORAD to lead in the defense of this vulnerable domain.

More worryingly for the United States and Canada, cyber-attacks have proven capable of inducing strategic or kinetic-like military effects in the lead up to or in conduct of hostilities³⁷. These attacks can easily commence and propagate from non-state entities, or third-party territories making attribution difficult³⁸. Unlike the maritime and air/space domains the complexity of positively identifying an adversary in the cyber domain can make a retaliatory action difficult to justify. While ‘combat’ in the cyber domain may be difficult to initiate, there is clearly a requirement for monitoring that could detect, confirm, mitigate and then respond to

³⁴ Office of the United States Trade Representative. “U.S.-Canada Trade Facts.” Countries & Regions - Western Hemisphere - Canada. Executive Office of the President. Accessed May 13, 2022. <https://ustr.gov/countries-regions/americas/canada>.

³⁵ Csenkey, Kristin, and Dominique Phillippe Genest. “An Opportunity for NORAD Modernization in a Joint CA-US Cyber Component.” Strategic Perspectives. North American and Arctic Defense Council, January 21, 2021. <https://www.naadsn.ca/wp-content/uploads/2021/01/Strategic-Perspectives-An-Opportunity-for-NORAD-Modernization-in-a-Joint-CA-US-Cyber-Component-21jan.pdf> Page 6.

³⁶ United States State Department. “U.S. Relations with Canada - United States Department of State.” Bilateral Relations Fact Sheet. Bureau Of Western Hemisphere Affairs, July 8, 2021. <https://www.state.gov/u-s-relations-with-canada/?msclkid=142edc79d16811ecbf6603e8c8af6694>.

³⁷ Jayamaha, Buddhika B., and Jahara Matisek. “Social Media Warriors: Leveraging a New Battlespace.” *The US Army War College Quarterly: Parameters* 48, no. 4 (2018). <https://doi.org/10.55540/0031-1723.3008>.

³⁸ Mazarr, Michael J., Bryan Frederick, Emily Ellinger, and Benjamin Boudreaux, Competition and Restraint in Cyberspace: The Role of International Norms in Promoting U.S. Cybersecurity. Santa Monica, CA: RAND Corporation, 2022. https://www.rand.org/pubs/research_reports/RRA1180-1.html. Also available in print form. Pages x, 4-5.

cyber-attacks. The US Army War College article *The New Battlespace Is Here: The American Homeland Is No Longer Safe* shows the true capabilities a well-resourced cyber power can bring to bear upon an enemy and further stresses the confluence of cyber and kinetic operations that could be used against the United States (or Canada)³⁹. In an article for the North American and Arctic Defense Council, Kristen Csenkey and Master Corporal Dominique Philippe Genest detail the current (hopefully cooperative) but ultimately unintegrated nature of US and Canadian cyber defenses and the seams this disorganization has exposed to enemy actors. Their proposal to establish a Joint Interagency Cyber Component at NORAD (JICC-NORAD) succinctly explores some of the Canadian concerns of over militarizing NORAD⁴⁰ and ultimately highlights that a JICC-NORAD provides a relevant, yet mutually palatable defense capability for both nations⁴¹. Other notable cyber warfare practitioners like Randall Degering have echoed and enhanced the Csenkey/Genest proposal by advocating NORAD quickly adopt a phased cyber warning system, expand NORAD's inadequate cyber staffing and eventually combine with United States Cyber Command for 'All Domain Attack Assessments'⁴². Expanding the NORAD mission and aligning the United States and Canadian cyber forces in line with the recommendations of Csenkey, Degering and their colleagues to monitor and then react to cyber-attacks should seal a vulnerability to the North American alliance and allow NORAD to embrace more relevant mission that can impact every other warfighting domain. Most importantly the credible ability of

³⁹ Matissek, Franky. "The New Battlespace Is Here: The American Homeland Is No Longer." War Room. U.S. Army War College, April 6, 2022. <https://warroom.armywarcollege.edu/articles/new-battlespace/>.

⁴⁰ Csenkey, Kristin, and Dominique Phillipe Genest. "An Opportunity for NORAD Modernization in a Joint CA-US Cyber Component." Page 1-9.

⁴¹ Ibid., Page 7.

⁴² DeGering, Randall, and Kyung Lah and Greg Botelho. "What Is NORAD's Role in Military Cyber Attack Warning?" Homeland Security Affairs, April 28, 2022. <https://www.hsaj.org/articles/10648>.

these nations to leverage their considerable individual capacities in cyber operations should serve as a deterrent to at least give pause to an adversary seeking to gain a kinetic advantage through cyber means.

While reframing NORAD's missions in new domains to provide for the holistic defense of North America will go a long way to ensuring NORAD's long-term viability, the means devoted must match these new ends. Most importantly, the Canadian government must take seriously the legitimate defense requirements of the whole continent and realize that its primary contribution to NORAD can no longer just be its unique geographic location⁴³ and it must increase its defense budget allocations to address the actual threats against North America. Even in NORAD's current domains (air and space) Canada's long drawn out and ineffectual decision making in obtaining a replacement fighter aircraft has served as a potential point of contention in an otherwise largely stable alliance^{44,45,46}. Canada's 2022 Defense Budget and the latest developments in the *Future Fighter Capability Project* do go some way towards promising a

⁴³ Jockel, Joseph T., and Joel J. Sokolsky. "Dandurand Revisited: Rethinking Canada's Defence Policy in an Unstable World." *International Journal* 48, no. 2 (1993): 380. <https://doi.org/10.2307/40202886>.

⁴⁴ Government of Canada Canada. Public Works and Government Services Canada. Summary Report: Evaluation of Options for the Replacement of the CF-18 Fighter Fleet. Ottawa: Canada Communications Group, December 2014. <https://www-deslibris-ca.cfc.idm.oclc.org/ID/245644>.

⁴⁵ Clark, Campbell, and Steven Chase. "Canada's \$9-Billion Jet Fighter Deal Raises Questions." *The Globe and Mail*. The Globe and Mail, July 17, 2010. <https://www.theglobeandmail.com/news/politics/canadas-9-billion-jet-fighter-deal-raises-questions/article1212443/>.

⁴⁶ Government of Canada. "Future Fighter Capability Project." Canada.ca. Government of Canada/ Gouvernement du Canada, April 1, 2022. <https://www.canada.ca/en/departement-national-defence/services/procurement/fighter-jets/future-fighter-capability-project.html>.

solution to this capability gap^{47,48}. A new fighter plane fleet alone; however, does not adequately address investments in other proposed areas for NORAD expansion (maritime and cyber) nor even sufficiently address threats in the air and space domains as proposals to invest in modernizing the NWS (with a balance of investment actually coming from the United States^{49,50}) may ultimately prove to be at best redundant (at worst useless) with United States ballistic missiles detection capabilities located in Greenland, the United Kingdom, Alaska and California more than capable of detecting nuclear launches against North America.^{51,52,53} In addition to counter the arguments of Canada ‘freeloading’ its defense⁵⁴, one benefit to a Canadian reinvestment in expanded NORAD capabilities is that many assets would likely enhance Canada’s ability to fulfill its North Atlantic Treaty Organization (NATO) defense obligations

⁴⁷ Government of Canada, Department of Finance. “Chapter 5: Canada's Leadership in the World: Budget 2022.” Chapter 5: Canada's Leadership in the World | Budget 2022. / Gouvernement du Canada, April 7, 2022. <https://budget.gc.ca/2022/report-rapport/chap5-en.html#wb-cont>.

⁴⁸ Government of Canada. “Future Fighter Capability Project.” Canada.ca. Government of Canada/ Gouvernement du Canada, April 1, 2022. <https://www.canada.ca/en/departement-national-defence/services/procurement/fighter-jets/future-fighter-capability-project.html>.

⁴⁹ Charron, Andrea “Responding to the Hardening the SHIELD: A Credible Deterrent and Capable Defense for North America,” Quick Impact, NAADSN, 11 September 2020.

⁵⁰ Sherman, Jason. “U.S., Canada Set New Framework For NORAD Modernization.” Inside the Pentagon's Inside Missile Defense 27, no. 17 (Aug 25, 2021).

⁵¹ United States Government. “Missile Defense Agency - The System - Elements - Sensors.” Missile Defense Agency. U.S. Department of Defense . Accessed May 11, 2022. <https://mda.mil/system/sensors.html?msclkid=d80250e1d16811ecb42771e378b8ce5b>.

⁵² Sokolsky, Joel. “U.S. Ballistic Missile Defense, NORAD and the Canada Conundrum.” Virtual Commons - Bridgewater State University, May 2014. https://vc.bridgew.edu/br_rev/vol33/iss1/5/. Page 9.

⁵³ Lackenbauer, P. Whitney, and Ryan Dean. “We Cannot Deter What We Cannot Detect - NAADSN.” Quick Impact. North American and Arctic Defence and Security Network, May 25, 2020. <https://www.naadsn.ca/wp-content/uploads/2020/05/20-may-25-PWL-RD-We-Cannot-Deter-What-We-Cannot-Detect-final.pdf>.

⁵⁴ Wood, Andrew. “Canada, the Freeloader, Rather Than Vested Defence Partner in NORAD and the Defence of North America.”

and spending goals and enable it to come closer to meeting its 2% of GDP NATO defense spending commitment⁵⁵. If, and when, investments are made commensurate with a NORAD defense plan actually capable of securing the continent tough decisions will have to be made to properly align how NORAD is structured and operates.

If NORAD's constituent nations can collectively gather the means to embrace a new, and more expansive, but more effective, mission that provides for the collective defense in the air, space, maritime and cyber domains they will also have to embrace new ways to succeed. First and foremost, the NORAD nations must acknowledge that effective collective security must include the option for kinetic operations in all domains. This transition from traditional air and space (and now maritime) monitoring to a more active defense posture has historically served as a point of tension between the NORAD allies. The Canadian government in particular has resisted efforts to expand NORAD's mission to kinetic defenses⁵⁶. With new threats against North America propagating in multiple domains NORAD has a closing window to adopt a more flexible and effective force structure or face obsolescence and a potential United States withdrawal in favor of a more responsive unilateral defense strategy.

One immediate and concrete step NORAD can take is to integrate Canada into the United States' ballistic missile defense (BMD) plans and operational capabilities. Joel Solkosky, writing for Bridgewater Review, highlights the logical inconsistency of developing a North American BMD capability, but carving out any Canadian involvement. Though he advocates for

⁵⁵ North Atlantic Treaty Organization (NATO). "Defence Expenditure of NATO Countries (2014-2021)." *NATO Public Diplomacy Division Communique*, 094, PR/CP, no. (2021) (June 11, 2021): 3–8. https://doi.org/https://www.nato.int/nato_static_fl2014/assets/pdf/2021/6/pdf/210611-pr-2021-094-en.pdf.

⁵⁶ McDonough, David S. "Canada, NORAD, and the Evolution of Strategic Defence."

Canadian participation in BMD his article highlights the past Canadian resistance rooted in defense policy conflicts often unrelated to continental defense.⁵⁷ This recommendation is echoed by General Terrence J. O'Shaughnessy and Brigadier General Peter Fesler (Former NORAD Commander and Director of Operations, respectively) in their call to *Harden the Shield* of North American Defense. In their article for the Canada Institute at the Wilson Center the generals advocate for a purposefully built, layered system of defenses that integrates NORAD with US Northern Command to anticipate, deter, detect, and, if necessary, blunt (or ideally defeat) an aggressor's actions against the North American continent^{58,59}. While Canadian entry to BMD would bring a welcome set of capabilities it is essential that Canada embrace and participate in developing the next generation of missile defense. With ballistic missiles likely becoming less of a strategic threat in favor of hypersonic cruise and glide vehicles the defense in depth General O'Shaughnessy described can only be achieved by purposeful and adequate research and investment^{60,61}. By adding teeth to an increasingly moribund North American defense construct and providing a deterrence capability equal to the threats of today and

⁵⁷ Sokolsky, Joel. "U.S. Ballistic Missile Defense, NORAD and the Canada Conundrum." Page 10-11.

⁵⁸ O'Shaughnessy, Terrence J, and Peter Fesler. "Hardening the Shield: A Credible Deterrent & Capable Defense for North America." Canada Institute. Wilson Center, September 2020. <https://www.wilsoncenter.org/publication/hardening-shield-credible-deterrent-capable-defense-north-america?msclkid=397ce18dd15611ecbf3e9d41e6ffef38>. Pages

⁵⁹ Hitchens, Theresa. "The Key to All-Domain Warfare Is 'Predictive Analysis:' Gen. O'Shaughnessy." *Breaking Defense*, January 16, 2021. <https://breakingdefense.com/2020/05/the-key-to-all-domain-warfare-is-predictive-analysis-gen-oshaughnessy/>.

⁶⁰ RAND Corporation. "Hypersonic Missile Nonproliferation."

⁶¹ Speier, Richard H., George Nacouzi, Carrie Lee, and Richard M. Moore. "Hypersonic Missile Nonproliferation." RAND Corporation, September 27, 2017. https://www.rand.org/pubs/research_reports/RR2137.html.

tomorrow, concepts like ‘hardening the shield’ can ensure a truly secure continent for both nations, but only if combined with appropriate resourcing and an expanded mission.

While a ‘new NORAD’ with new all-domain *sense* and *defeat* capabilities can more effectively secure North America, several credible counterpoints have been made, notably among Canadian defense strategists. Andrea Charon (The University of Manitoba’s Director for the Centre for Defence and Security Studies) takes on General O’Shaughnessy directly in her essay, *Responding to the Hardening the SHIELD: A Credible Deterrent and Capable Defense for North America*. Her argument raises several points that generally revolve around Canada’s unwillingness to cede elements of sovereign defense policy and decision making to an, at times, mercurial U.S. ally. She pointedly asks, if Canada (and NORAD) joined BMD, could Canada help decide when and which targets the system engaged?⁶² Successful examples of the United States operating strategic weapons bilaterally in the past should serve as a model to address this concern. Specifically, the expansion of BMD with a Canadian ‘Dual-Key’ (similar to the Cold War era proposals for ground launched cruise missiles in the United Kingdom^{63,64} and nuclear

⁶² Charron, Andrea “Responding to the Hardening the SHIELD.” Page 4.

⁶³ McDowall, Julie. “1983: Cruise Missiles in Britain: Atomic Hobo - Nuclear War Podcast.” Atomic Hobo - Nuclear War Podcast, October 19, 2020. <https://shows.acast.com/atomichobo/episodes/1983-cruise-missiles-in-britain>.

⁶⁴ Donald, Colin James, "Who Controlled Cruise?: The 1983 Deployment of Cruise Missiles in the United Kingdom and the Post-1945 Anglo-American Special Relationship in Defense" (1989). Dissertations, Theses, and Masters Projects. Paper 1539625488

armed BOMARC missiles in Canada^{65,66}) could enable both an expansion of the capability with the preservation of some meaningful Canadian sovereignty in the system's use.

In a stark examination NORAD's necessity for Canadian defense, Doctor Michael Dawson writes for the University of Calgary's School of Public Policy that NORAD helps level the imbalance between US and Canadian militaries and itself secures Canada's defense sovereignty. He provides the clearest argument against critics who assert the 'Canadian Sovereignty' argument like Andrea Charron in resisting NORAD expansion. He argues that without an equitable Canadian investment in relevant NORAD infrastructure (beyond just a new NWS) and the inculcation of an effective defense mission (to include a combat capable NORAD) the United States could, in a crisis, withdraw from NORAD and unilaterally assert a defense policy "for Canada, ON Canada."⁶⁷ Ultimately, Canada may have to choose between yielding a marginal portion of defense and sovereign autonomy (which it often, it should be pointed out, has currently felt comfortable enough to partially cede to other organizations like NATO or the USMCA trade association^{68,69}) to continue access to the enormous benefits of NORAD membership. Charron herself highlights that these benefits include; enhanced training,

⁶⁵ McDonough, David S. "Canada, NORAD, and the Evolution of Strategic Defence." Page. 801.

⁶⁶ Adams, Sharon. "BOMARC Missiles Come to Canada." Legion Magazine, September 25, 2019. <https://legionmagazine.com/en/2019/09/bomarc-missiles-come-to-canada/>.

⁶⁷ Dawson, Michael. "NORAD: Remaining Relevant." Canadian Global Affairs Institute. University of Calgary - The School of Public Policy, November 2019. https://www.cgai.ca/norad_remaining_relevant. page

⁶⁸ Office of the United States Trade Representative. "USMCA." United States - Mexico - Canada Agreement. Executive Office of the President. Accessed May 13, 2022. <https://ustr.gov/usmca>.

⁶⁹ United States Mexico Canada Agreement. "Exceptions and General Provisions - USMCA Chapter 32 - USMCA: United States-Mexico-Canada Agreement." USMCA, March 18, 2020. <https://usmca.com/exceptions-and-general-provisions-usmca-chapter-32/>.

integration with & US support for forward deployments, command positions⁷⁰ and a unique entry to US defense decision making.⁷¹ These benefits should only expand with an increase in capabilities and mission of NORAD and further help ameliorate Canadian concerns.

The threats against the United States and Canada will continue to grow. NORAD does not now but could (and should) serve as the foundational pillar of a truly united and effective defense enterprise for both nations. With an appropriately resourced approach that enables these allies to effectively monitor and contest adversaries in the traditional air and space domain and the newer maritime and cyber domains, both nations will be able to better ensure their security against all adversaries for the foreseeable future.

⁷⁰ Charron, Andrea “Responding to the Hardening the SHIELD.” Page 2.

⁷¹ Dawson, Michael. “NORAD: Remaining Relevant.” Page 11.

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