THE
PLOUGHSHARES MONITOR
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A WORLD IN FLUX

AS TECHNOLOGY, CONFLICT, AND CLIMATE PRESSURES CONVERGE, CANADA MUST ADAPT ITS APPROACH TO A RAPIDLY EVOLVING SECURITY LANDSCAPE

CANADA STRONG?
ANALYZING CANADA'S DEFENCE SURGE

NUCLEAR WEAPONS
HYPERSONICS PRIORITIZE SPEED OVER STABILITY

EMERGING TECH
IT'S TIME TO REIN IN AUTONMOUS WEAPONS

STRATEGIC FUTURES
STANDING ON THE EDGE OF CATASTROPHE

"and they shall beat their swords into ploughshares, and spears into pruning hooks; nation shall not lift up sword against nation; neither shall they learn war any more." Isaiah 2:4

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Dispatch from Brussels

Written by Branka Marijan and Jessica West

In an age of geopolitical headwinds, Europe and Canada are facing similar dilemmas: How to sustain disarmament and diplomacy in a world shaped by fractious rivalry, technology, and mistrust. This is not yesterday's Cold War: Power is diffuse, technology moves faster than treaties, and the lines between civilian and military domains are blurring. At this year's EU Non-Proliferation and Disarmament Consortium meetings, Dr. Jessica West and Dr. Branka Marijan joined policymakers, researchers, and diplomats to take stock. The mood was sober but urgent: cooperation feels fragile, yet the need for it has never been greater.

1 Rethinking Disarmament in a Turbulent World

Across panels, the question was how to keep disarmament alive amid deepening geopolitical divisions and innovations in weapons technology. With multilateralism under strain, participants emphasized working-level trust and cross-regional coalitions as tools of resilience. Creativity, not nostalgia, is needed to encourage new partnerships that rebuild the connective tissue of diplomacy, one conversation at a time.

2 Nuclear Anxieties Return

Nuclear risks are top of mind. The collapse of long-standing bilateral restraints, from the INF Treaty to the limits of New START, has left few guardrails in place. New delivery systems including hypersonic missiles, long-range precision weapons, and dual-capable platforms, are shortening decision times and complicating deterrence. Regional flashpoints such as South Asia remain tense, while the fear of nuclear weapons in orbit underscores how quickly restraint is eroding across domains. The shared concern was clear: Nuclear order is weakening faster than institutions can adapt.

> This is not yesterday's Cold War: Power is diffuse, technology moves faster than treaties, and the lines between civilian and military domains are blurring.

3 The Technological Tinderbox

New missile technologies, dual-use space systems, and AI-driven decision-making are redrawing the boundaries of conflict. Without agreed rules or reliable communication channels, miscalculation could come easily and catastrophically. Confidence-building, data transparency, and crisis hotlines are once again at the centre of strategic stability.

4 The Reinvention of Diplomacy

From the Middle East to Eastern Europe, the limits of military logic are on display. As rivalries deepen, diplomacy must once again carry the burden of stability. The challenge is to craft regional architectures that deter aggression while leaving space for dialogue; a task easier to describe than to deliver. For both Europe and Canada, this means investing in diplomatic capacity as deliberately as in defence: rebuilding relationships, re-engaging institutions, and finding room for negotiation even when trust is thin.

5 New Role of Networked Powers

If the old superpowers can no longer lead, networked powers must step in to stabilize the system, less through hard power than through institutional competence. Europe and Canada can operate as a collective centre of gravity: agenda entrepreneurs advancing workable rules, driving transparency, and restoring diplomatic credibility. In a fragmented order, this kind of networked leadership is the only leadership still available.

Brussels reminded us that even in turbulent times, diplomacy endures, not because it is easy, but because every alternative is worse. □

Why Civil Society Still Matters in Disarmament

Written by Kianna Low-A-Chee

Each October, Member States of the United Nations gather in New York to attend the First Committee on Disarmament and International Security, and participate in speeches and procedural skirmishes, and, occasionally, to determine matters of substance. On the final day of this year's session, the eightieth in the history of the UN, civil society – academics, campaigners, and representatives of civil society organizations (CSOs) – took to the floor to remind member states of what is at stake. I was honoured to deliver the statement on outer space security, on behalf of Project Ploughshares and 16 CSOs.

Even securing this and other opportunities to engage has become contentious. Several member states question or seek to curtail civil society's participation in arms-control debates. But civil society's voice remains one of the few that can still cut through the diplomatic routine. Calls for trust and cooperation dominated the morning's proceedings. By afternoon, after civil society had spoken, the mood had shifted. When the CSO, the Conflict and Environment Observatory, referred to Israel's "genocide in Gaza," only Israel objected, albeit strongly. The Israeli delegate's indignation underlined another enduring truth: the purpose of civil society is not to comfort the powerful, but to confront them.

The fraught reality in which arms control and disarmament discussions take place today requires an engaged, active civil society. As the International Committee of the Red Cross noted, "over 130 conflicts are raging today, twice as many as 15 years ago." Today's conflicts, which are more complex and prolonged, have a devastating impact on civilians. CSOs give those most at risk a voice.

CSOs Delivering Democracy

Civil society contributes to multilateralism by adding diverse voices to discussions, helping to shape debates, influence the language used in resolutions, and inspire more effective resolutions. In this way, civil society helps to legitimize global governance by representing some of the multitude of opinions held by some of the world's citizens.

This diversity of perspectives reflects the broader reality of international politics, which is far from monolithic. The international community is made up of a "rich tapestry of competing social and political discourses." Without civil society, only official member state perspectives would be heard, with the most powerful states likely dominating discussions. These views tend to prioritize the security of the state over human security. Often this desire for security is expressed in spending on the military. In 2024, global mili-

tary spending surpassed $2.7 trillion USD. Civil society speaks for all the world's citizens who need secure access to food, housing, and education. And we are not screaming into the void; when we speak in international forums today, more and more states are listening to us.

> In an age of increasing militarization, civil society plays a vital role in multilateralism. Norms and treaties are not formed overnight; both require sustained attention and effort which civil society offers.

In an age of increasing militarization, civil society plays a vital role in multilateralism. Norms and treaties are not formed overnight; both require sustained attention and effort which civil society offers. The success of the Mine Ban Treaty and Convention on Cluster Munitions reminds us of the importance of civil society and these organizations' perseverance. Despite the wide use of anti-personnel landmines and cluster munitions, civil society was able to campaign against the two technologies by appealing to humanitarian consequences and International Humanitarian Law. Civil society empowered like-minded states to engage in negotiations of the treaties rather than efforts being stopped by the need for consensus.

Sustained Efforts in Disarmament

Long term interest and consistency in messaging creates a pressure that states cannot avoid. Through accountability and the creation of moral and political pressure, states are likely to align behaviour with the norms being advocated for.

Civil society offers sustained attention to topics through monitoring, expertise, and campaigns making civil society a key part of the information eco system. States are concerned with a variety of issues; we concentrate on specific topics and maintain longer-term interest in disarmament. By sharing knowledge with states through monitoring and public engagement, well informed decisions can be made.

As representatives rotate out, civil society maintains its presence allowing for a continuity of efforts rather than starting over each time a new delegate enters the scene. This allows for more efficient governance as CSOs can inform discussions and debates using experience and expertise to shape debates and resolution language. Equally important, they help ensure that humanitarian concerns are not lost amid political or technical discussions.

The need for reminders of impacts on civilians is great. In 2023, civilian casualties reached record highs not seen in decades; with the current pace of technological innovation with the potential for military applications, communication and expertise offered by CSOs are needed to prevent an arms race.

Fostering Cooperation

The bedrock of multilateralism and disarmament is cooperation and trust. Both Libya and Colombia reminded us of this at the First Committee meeting, respectively offering messages of peace by consolidating trust and not amassing weapons, and of security through cooperation, not force. The Maldives noted the importance of renewing cooperation and working as a collective for greater security, stating "disarmament is not a choice; it is a responsibility. We must restore trust, renew dialogue, and redirect resources from weapons to development." Yet, building and sustaining this trust often requires dialogue that extends beyond states themselves.

In cases where states are at odds, CSOs act as a communication bridge between parties creating space for neutral dialogue. When official channels cannot be accessed, CSOs are able to connect states, advocacy groups, humanitarian organizations, and disarmament experts in informal settings. Workshops and conferences can offer a space for neutral dialogue and foster cooperation by reducing the mistrust that can

Project Ploughshares Research Assistant Kianna Low-A-Chee delivers the statement on outer space security at the United Nations First Committee on Disarmament and International Security in New York this October. *Erin Hunt*

arise in more formal discussions. These spaces allow states to come together and find common ground.

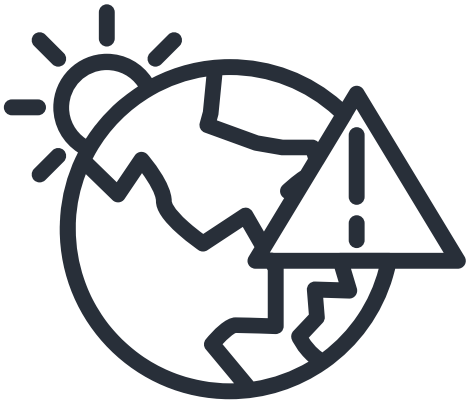
CSOs not only foster dialogue by convening meetings – we come prepared with facts. The transparency of facts is vital in an age of disinformation and misinformation. By presenting actors with verified reports from experts regarding impacts and risks associated with weapons, trust is built. Offering consistent and reliable information rather than augmented facts that support specific interests builds the confidence of states that we are providing the whole picture and can be reliable partners in the moment and in future scenarios. As King's College London has emphasized, "strengthening information integrity should become an integral element of our collective efforts to uphold and advance the disarmament regime. By defending truth, we defend trust—and trust remains the foundation of disarmament and international security." In this way, the work of CSOs reinforces the very principles that sustain effective multilateralism: truth, trust, and transparency.

Civil Society Still Matters

While the "golden age" of civil society may appear to be over as civic spaces shrink, CSOs face politicization, and funding is shrinking; our work still matters. When states do not abide by norms or international law, civil society will be there to hold the state accountable. We will prioritize a multi-perspectival approach to global governance to add democratic legitimacy to global governance. Effort will be sustained as governments rotate, creating consistency and contributing expertise to discussions. Cooperation will remain a priority for CSOs as the issues facing society today cannot be tackled alone, disarmament cannot be achieved by one state alone; it requires global trust and restraint. Sustaining this work depends on a broader community that values dialogue, evidence, and the quiet persistence needed to keep peace efforts moving forward. □

Kianna Low-A-Chee is a Balsillie School Research Fellow at Project Ploughshares.

Standing on the Edge of Catastrophe



To face systemic risks, defence investments must build stability, not just strength

Written by Jessica West

In early October, I attended the Montreal Climate Security Summit, co-hosted by NATO's Climate Change and Security Centre of Excellence and the Conference of Defence Associations Institute. Panel after panel, military and civilian experts mapped a widening spectrum of dangers, from climate disruption and Arctic instability to disinformation and the fragility of space-based systems. What struck me most was not the list of risks but the shared assumption that they can be managed; that instability itself can be contained through foresight, capability, and control. Across every domain, the reflex is the same: prepare, harden, arm, deter. Yet the systems we depend on—from the climate to orbit to nuclear deterrence—are complex, interconnected, and fragile.

As Canada undertakes "generational investments" in defence, equal investment is needed in the conditions of stability, including climate resilience, orbital safety, and crisis prevention, that make lasting security possible.

The Illusion of Control

Climate change has forced governments and alliances to confront the limits of security as we know it. NATO's own assessments describe accelerating impacts as "complex, non-linear, and co-evolving," touching every domain from land and sea to cyber and space. Yet its strategy still frames climate change as a "threat multiplier:" something to adapt to rather than a crisis to prevent. The focus remains on protecting military capability instead of addressing the causes of instability.

This logic extends far beyond climate. Across emerging technologies and security domains, uncertainty has become something to engineer away. Governments and industries alike are betting on automation, data, and predictive analytics to outpace instability. Much of this innovation is dual-use: technologies first developed for civilian efficiency or commercial profit being repurposed for military control. The promise is seductive: that with enough sensors and algorithms, disorder can be mastered.

Tech and defence firms have built empires around that belief. Palantir markets "decision dominance" as a service, fusing military, intelligence, and disaster-response data into predictive dashboards. Anduril Industries sells autonomous towers and drones designed to "see,

Ploughshares Senior Researcher Jessica West attended the Montreal Climate Security Summit, co-hosted by NATO's Climate Change and Security Centre of Excellence and the Conference of Defence Associations Institute, in October. *Rohan Jain*

decide, and act" faster, replacing human interpretation with algorithmic reflex. But complexity does not yield to control: it multiplies under it. Each new layer of automation tightens the feedback loop between perception and response, raising the risk of error and escalation. A misread signal in orbit or a misclassified threat in cyberspace can cascade across systems too tightly coupled to pause.

Across domains, the governing idea is the same: that survival lies in anticipation, speed, and precision. Yet the more tightly we try to manage uncertainty, the more brittle our systems become. Even Canada's renewed investments in Arctic surveillance and infrastructure show the same tension: necessary for safety yet combatting symptoms rather than transforming the sources of insecurity.

Control from Orbit

Nowhere is the ambition of control more literal than in outer space, the proverbial high ground, long imagined as the vantage point from which Earth could be observed, defended, or commanded. That ambition is being rebuilt in real time.

The United States' proposed Golden Dome system, mandated in 2025, envisions a vast network of satellites, sensors, and interceptors designed to detect and destroy missiles in flight from the vantage point of space. China's announced "planet-wide defence system" follows a similar logic, aiming by 2030 to link orbital sensors, ground radar, and AI-driven command networks into a seamless layer of predictive awareness; control through orbit rather than merely from it. Europe's planned Space Shield, part of its Re-Arm Europe roadmap, would extend deterrence above

the atmosphere space-based early-warning data with ground-based missile-defence systems.

But orbit itself resists command. Collisions, malfunctions, and natural forces routinely undo even the most sophisticated designs. The 2009 crash between a defunct Russian satellite and a commercial Iridium spacecraft created more than 1,700 fragments still circling the planet. A 2022 geomagnetic storm destroyed 40 newly launched Starlink satellites. Every destructive anti-satellite test, from the United States in 1985 to Russia's in 2021, has scattered long-lived debris that endangers all nations. Each new attempt to impose order multiplies complexity and risk. The pursuit of mastery in space, like on Earth, breeds its own instability.

The more we try to use orbit as a platform of control, the more it exposes our lack of it. What was once imagined as the ultimate high ground has become a shared field of mutual vulnerability.

> "Deterrence's old paradox that stability comes through the promise of annihilation is collapsing, exposing a deeper, more frightening vulnerability.

Nuclear Shadows

If space reveals the limits of control, nuclear weapons expose its oldest illusion. Deterrence was built on the belief that existential danger could be managed through balance and calculation; that fear itself could be engineered into stability. For decades that equilibrium held, but it was never true control. It depended on judgment, restraint, and trust. These are human qualities that cannot be automated.

Those guardrails are now eroding. In October 2025, Russia conducted new flight tests of its Burevestnik nuclear-powered cruise missile and renewed trials of the Poseidon underwater drone, both designed to evade interception and outlast defence. Moscow had already withdrawn its ratification of the Comprehensive Nuclear-Test-Ban Treaty, signalling that even symbolic restraint no longer applies. In the United States, calls by the President to resume nuclear testing follow the same logic, rooted in displays of strength through the rejection of limits. Strategic surprise, once the danger to avoid, is now cultivated as a strategy of deterrence.

The technologies driving this new instability, which include AI, quantum sensing, rapid launch, real-time data fusion, are fuelling an arms race between systems, not just states. Missile-defence architectures such as Golden Dome and Europe's Space Shield draw on the same sensor and data networks that underpin nuclear early warning. Each promises invulnerability through speed: to detect faster, decide faster, act faster than an adversary. But this quest to eliminate uncertainty only accelerates it as the space for human judgment shrinks. Crisis management becomes a contest of speed; one that machines will always win, and humans will ultimately lose.

What began as a pursuit of control has become a contest of chaos. Weapons once meant to enforce restraint now defy it. Deterrence's old paradox that stability comes through the promise of annihilation is collapsing, exposing a deeper, more frightening vulnerability.

Beyond Control

Today's most urgent security challenges including climate disruption, orbital instability, and nuclear risk, do not fit the traditional logic of defence. They are systemic, interconnected, and non-linear. Weapons and deterrence may still be necessary to guard against aggression, but systemic threats cannot be contained by strength alone. Security now depends as much on the stability of shared systems as on the capabilities of armed forces.

That means broadening what "defence investment" entails. Stability is built through early-warning networks that fuse climate, cyber, and space data; through accessible verification tools that make restraint credible; and through crisis-prevention and mediation mechanisms that stop escalation before it begins. It depends on inter-

Outer Space: Holding Ground on Peace

This fall, Senior Researcher Dr. Jessica West reported on outer space diplomacy at the United Nations for Reaching Critical Will, where this year's debates reveal how fragile the idea of peace in space has become, and how hard governments are working to hold it together.

A screenshot of the voting results on the resolution "Prevention of an Arms Race in Outer Space (L.3)" at the UN First Committee, November 2025.

For the first time in five years, states failed to reach consensus on the annual resolution calling for the prevention of an arms race in outer space. The measure still passed overwhelmingly, but the United States and Israel voted against it, objecting to references to a Russia–China draft treaty to ban weapons in space that they argued is unverifiable and politically insincere. The United States instead leaned on deterrence and "peace through strength," reflecting a broader shift toward viewing space as a domain of competition rather than restraint. The debate exposed a widening fault line between those pressing for new legal limits on weapons in orbit and those preferring voluntary norms of behaviour.

Beneath this divide ran a deeper anxiety. Delegations raised concerns about nuclear weapons in orbit, missile-defence systems that could include interceptors in space such as the proposed Golden Dome, and the indiscriminate damage of anti-satellite missile tests, all of which threaten the civilian infrastructure that keeps societies safe and connected.

Yet amid these divisions, a quieter effort endures. Many states and civil society groups continue to work across political lines to build restraint and cooperation, keeping alive the vision of outer space as a realm of peace rather than conflict. Their persistence is a reminder that even in orbit, peace is a choice, and that it must be made and remade every year.

national coordination to monitor orbital debris and greenhouse emissions with the same urgency we track military launches, and on resilient infrastructure that can withstand cascading disruption.

Technology can serve that purpose. The same satellites that track missile launches can map permafrost collapse and sea-ice drift. Algorithms that fuse early-warning data can also predict food shortages and disease outbreaks. The ingenuity that builds weapons can build resilience, but it requires re-balancing what "dual-use" means. Today, innovation investments are channeling civilian creativity to military application. It is time to turn that current back, using defence investment to strengthen the public goods that make all forms of security possible.

We are all standing on the edge of catastrophe together. The challenge now is not to command uncertainty, but to build cooperation strong enough to live with it. □

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The Machines Aren't Waiting

Why efforts to rein in autonomous weapons have stalled – and why 2026 is the time to act

Written by Branka Marijan

On 1 June this year, 117 Ukrainian drones swarmed deep into Russian territory, striking airbases that house the Kremlin's nuclear-capable long-range bombers. The audacious attack, dubbed Operation Spiderweb, captured global attention, not only for its ingenuity but for what it revealed about the changing character of modern warfare.

Amid the headlines, one detail deserved far more notice: the drones' "terminal guidance," the autonomous last-mile solution that allows a system to finish the job even if its human operator cannot. Humans still chose the targets. But once a drone locked on, it could keep tracking and strike independently, even if communications were jammed or severed. In other words, autonomy is no longer speculative, it is already shaping the battlefield.

Diplomacy, however, has not kept pace.

The Missing Political Will

For more than a decade, governments, experts, and campaigners have met in Geneva to debate how machines capable of selecting and engaging targets without human intervention should be governed. Yet after countless working papers and earnest interventions, there is still no treaty, no ban, and only a fragile semblance of consensus on even the most basic definitions.

The failure is not for lack of foresight or even nuanced understandings of issues at hand. Governments and civil-society groups have long recognised that AI-enabled weapons pose profound ethical and strategic challenges. Leading technologists, including Stuart Russell, Yoshua Bengio and even Elon Musk have warned about the dangers of these systems.

What has been missing is not insight but the political will, and perhaps the imagination, to turn it into rules. As technology races ahead and the mandate of the UN's Convention on Certain Conventional Weapons (CCW) nears its end, 2026 is shaping up to be a decisive year. Governments will have to decide whether to persist with a forum that has likely exhausted its usefulness, shift the debate to a new institutional home inside or outside the UN, or fall back on a patchwork of voluntary pledges. None of these routes offers much certainty. The only certainty is that technological innovation, and the battlefield, will not pause for diplomacy.

This June 2025 photo shows drones being loaded onto trucks for transport to launch points inside Russian territory as part of an audacious strike known as Operation Spiderweb. *"Drone Attack (Drones in containers)" by Ssu.gov.ua is licensed under CC BY 4.0.*

The Stalled Diplomacy

The first serious discussions began in 2014 under the CCW, the same forum that includes the landmine and cluster-munitions protocols. At the time, the notion of "killer robots" felt speculative, closer to science fiction than to an imminent military reality. Delegates debated definitions, with some states pledging not to pursue more autonomous systems and many still uncertain about the utility of AI in military applications. Large language models, the technologies now shaping global debates, were still years away. The level of autonomy achievable in the near future also remained highly uncertain.

A decade later, the reality is far less theoretical: loitering munitions capable of identifying and striking targets autonomously have already appeared in battle. AI decision support systems assist in targeting decisions and military leaders even use familiar AI tools for decision-making. U.S. Major General William "Hank" Taylor has revealed that he has a close relationship with "Chat," likely a closed but comparable system to ChatGPT, OpenAI's conversational AI chatbot.

Yet progress at the CCW has been glacial. Its consensus rule has, in effect, handed every delegation a veto—one that major military powers such as Russia have used enthusiastically, while others have quietly welcomed the cover. The result is well-intentioned paralysis: reports are drafted, chairs are praised, and diplomats thank one another for their constructive spirit.

Outside the formal chamber, side events brim with substantive debate, as experts and governments grapple with the technology's complexity and its limits. But little of that candour ever reaches the official proceedings. To be fair, the CCW has served a useful purpose: as an incubator, it has helped shape a shared understanding among states that a two-tier approach is needed—one tier for clear prohibitions, and another for systems that require varying levels of regulation. But it has not built consensus to ensure a negotiating pathway.

Civil society, led by the Campaign to Stop Kill-

er Robots, has filled some of the void, pressing for a legally binding ban. The Campaign, which Ploughshares joined in 2015, built on previous successful civil society efforts, such as the 1990s landmine campaign that produced the Ottawa Treaty. But the audience, and the issues, are far more challenging this time. The technology is no longer confined to a handful of weapon systems; it now permeates everything from sensors and drones to decision-support tools and command networks. Few states are prepared to prohibit capabilities they increasingly regard as the future of warfare. Civil society, too, will need to think creatively about how to advance new proposals.

The CCW's inability to deliver concrete results has spurred a search for alternatives. Regional forums, from Latin America to Africa, have begun issuing joint statements calling for regulation. The United Nations General Assembly, which operates with greater flexibility than the CCW, provides an additional venue for moral and political pressure and has adopted several resolutions encouraging further dialogue on autonomous weapons.

The Shifting Battlefield

The urgency of the issue is being shaped not by negotiators but by soldiers, coders, and private companies. As noted at the outset, the war in Ukraine has become a grim laboratory for increasingly autonomous systems. Both sides have employed AI-assisted drones for surveillance, targeting, and even attack. Speaking to *The Guardian*, Mykhailo Fedorov, the 34-year-old deputy prime minister of Ukraine and minister of digital transformation, put it plainly: "We strive for full autonomy."

And this is only part of the story. The United States and China are widely acknowledged to possess far more advanced capabilities and the capacity to develop autonomous systems of greater sophistication and at far greater scale. Consider the U.S. Replicator Program, launched in 2023, which aims to field thousands of uncrewed systems to offset China's advantage in mass, whether in personnel or equipment.

Questions remain about the effectiveness of Replicator's initial targets, by August of this year, the Pentagon was expected to have deployed thousands of systems, yet reports suggest the number delivered is in the hundreds. Still, the programme is increasingly seen within the U.S. military as a prototype: a test bed for rapid development, deployment, and operational integration of autonomous systems at scale.

For its part, China has worked on Jiu Tian or Nine Heavens, a mothership drone that has a range of 6,400 kilometres and that can carry six tonnes of ammunition and 100 autonomous drones. China has also tested multiple swarm systems and unveiled new uncrewed platforms during its military parade marking the Second World War victory on 3 September. It has even experimented with "drone swarms and robot wolves" in simulated urban-warfare exercises, using human-machine teams working together.

This diffusion is not limited to states. Cheap sensors, open-source software, and off-the-shelf drones have drastically lowered the barrier to entry. As small, and even military-grade, drones become more accessible, non-state armed groups are acquiring capabilities once reserved for national militaries. At least nine African countries have already seen such groups deploy drones in conflict.

The Road to 2026

If 2025 was a year of muddling through, 2026 will be a year of decisions. It will also reveal what remains of the patchwork of governance initiatives built over the past decade. The United States and several allies are now ambivalent about the Political Declaration on Responsible Military AI, a non-binding document outlining principles of human oversight, reliability, and accountability. More than 60 countries have endorsed it, but there is no sign that the current U.S. administration intends to support it.

Recent resolutions at the UN General Assembly on autonomous weapons and responsible military AI were noticeably more muted in 2025 than in the previous year. These issues are also being raised in other UN forums, including human rights bodies, but those venues are likely to have limited impact given that defence ministries "own" the agenda. The REAIM discussion was not held in 2025; it has been rescheduled for Feb-

AI-RELATED MILITARY SPENDING & TRENDS

1

Autonomy Is Already Here

» Autonomous “terminal guidance” was used in Ukraine during Operation Spiderweb.
» Loitering munitions now select and strike targets autonomously.

2

Major Powers Are Increasing Investment

UNITED STATES

» **Replicator Program:** Aims for thousands of autonomous systems to offset China’s mass.
» Despite delays (hundreds delivered, not thousands), it’s a prototype for scaled procurement.

CHINA

» **Jiu Tian / Nine Heavens:** Long-range mothership drone carrying 100 autonomous drones.
» Regular testing of swarm systems and human–machine teaming.

3

Diplomacy Is Falling Behind

A decade of talks under the CCW but no treaty, no ban, and stalled by consensus rules.

» UN resolutions in 2025 were more muted than previous years.
» U.S. not backing the Political Declaration on Responsible Military AI despite 60+ endorsements.

4

There’s a Dual-Use Startup Boom

» Across NATO states, 17,619 startups developing dual-use tech that could feed into military AI.
» This is the most dramatic driver of future AI-enabled weapons – private-sector, not government.

5

Strategic Competition Is Accelerating the Trend

U.S. vs China competition is driving rapid investment, prototyping, and deployment pressure.

» Militaries want advantage, tech sector wants innovation freedom, society wants safeguards.

ruary 2026 and will be hosted by Spain. With the expectation that the dialogue will shift into a more informal format in Geneva after the Summit, diplomats are now grappling with a larger question: what comes next, and what is the most effective pathway forward?

At the same time, strategic competition between the United States and China continues, and the current U.S. administration remains unpredictable in its approach. China, for its part, has oscillated between supporting certain regulatory measures and withholding its endorsement of the 2024 non-binding "blueprint for action" adopted at the REAIM Summit in Seoul. China's stance at the 2026 REAIM Summit will be an important indicator of how it views the future of this process.

> "The technology is no longer confined to a handful of weapon systems; it now permeates everything from sensors and drones to decision-support tools and command networks. Few states are prepared to prohibit capabilities they increasingly regard as the future of warfare.

Meanwhile, countries from the Global South are pushing for a legally binding framework, something closer to an arms-control treaty than a declaration of intent. Their argument is straightforward: voluntary principles rarely constrain powerful states. As one diplomat observed years ago during CCW discussions, these technologies will most likely be tested and deployed in countries of the Global South. This divide between voluntary principles and binding rules will shape the diplomatic agenda in the year ahead.

Outside formal negotiations, a new ecosystem of norms is taking shape. Financial firms committed to responsible investment are adopting guidelines for investment in defence technology. AI researchers are calling for "fail-safe" mechanisms and testing standards. The International Committee of the Red Cross is developing guidance on how existing humanitarian law applies to autonomous systems. These may not amount to treaties, but they are building the scaffolding of governance.

Still, time is short. The diffusion of AI in warfare is not waiting for diplomats to agree on commas. Algorithms are already embedded in target-recognition systems, logistics planning, and threat assessment. And the next leap in autonomous technologies is likely to come from the roughly 17,619 startups across NATO countries working on dual-use technologies—innovations with both civilian and military applications.

The political challenge lies in reconciling three competing imperatives. Militaries want operational advantage; technologists want freedom to innovate and some with clearer guidelines than others; and societies want assurance that machines will not decide questions of life and death. None will get exactly what they want. The best that 2026 might deliver is a framework that keeps humans legally and ethically responsible, even as their control grows thinner.

For Canada and other middle powers, the coming year offers a chance to shape that conversation. With fewer vested interests in AI-enabled warfare and a history of bridging divides, such countries can help translate broad principles into practical commitments. It is a narrow but vital diplomatic space, the sort where moral leadership, not military might, carries weight.

Whether that opportunity is seized will depend on how policymakers read the moment. The world has stumbled into every major arms race assuming there was still time to negotiate. It would be a tragic irony if, in the age of intelligent machines, humanity's problem were not ignorance, but delay. □

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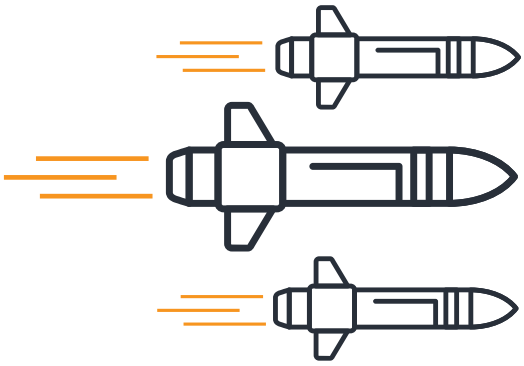
Speed Over Certainty

How hypersonics are collapsing the window for informed decision-making



Written by Ishmael Philip Carrey

A radar screen suddenly flashes, revealing an incoming missile of unknown origin. *In House of Dynamite*, a new Netflix thriller, commanders have only minutes to decide whether to retaliate. The film depicts a traditional intercontinental ballistic missile (ICBM), the type that defined Cold War fears. However, its tension reflects a reality that is becoming even more dangerous. As nations develop hypersonic weapons that can travel five times the speed of sound and manoeuvre unpredictably through the atmosphere, the time for rational decision-making is shrinking. What once took about half an hour—the warning time of a Cold War ICBM—could soon be less than ten minutes. When speed replaces certainty, the foundation of nuclear stability begins to come apart.

For seventy years, deterrence depended on time: the period needed to verify, understand, and respond. Now, that window is closing. With New START, the last major arms control treaty between the United States and Russia, set to expire in 2026 without a successor, the world faces an age where weapons develop faster than diplomacy can adapt. New technologies like AI and automation further shorten decision-making cycles and diminish the role of human judgment, key ingredients needed to prevent nuclear catastrophe.

Hypersonics: When Speed Destroys Stability

Speed and manoeuvrability are the hallmarks of hypersonic weapons. Unlike traditional ICBMs, which travel along high, predictable arcs in space, hypersonic weapons fly lower, faster, and with more maneuverability. Two main types are in development: hypersonic glide vehicles (HGVs), which detach from rockets and glide toward targets, and hypersonic cruise missiles (HCMs), which employ air-breathing scramjet engines to sustain Mach 5 speeds within the atmosphere. This combination makes them hard to detect, track, or intercept, allowing them to evade radar and missile-defence systems and significantly reduce response times.

All nine nuclear-armed states now have some form of hypersonic program. Russia has deployed the Avangard and Kinzhal systems, China operates the DF-ZF, and the US, India, and others are testing and developing prototypes. Each nation

claims its efforts are for defensive modernization, but together they follow a common pattern: an arms race that provides no genuine security.

> For seventy years, deterrence depended on time: the period needed to verify, understand, and respond. Now, that window is closing.

Recent tests show that hypersonic weapons have moved from research to real-world use. Russia has used the Kinzhal and Zircon missiles in Ukraine. China's 2021 test of a system that combined a fractional orbital bombardment path with a hypersonic glide vehicle surprised U.S. officials. In response, the United States has sped up its own programs. These developments mark a bigger shift: the pursuit of technological dominance is replacing the principles of stability that once guided nuclear deterrence. When advantage is measured in seconds, it becomes hard to justify restraint.

The threat is not just about high speed but also about deliberate ambiguity. Many hypersonic weapons systems are built to carry either conventional or nuclear warheads, making it difficult to identify the type until impact. An attacker may leave the defending nation only minutes to choose a response. As automation and AI become part of these systems, the time for human decision-making shrinks even more. This shortened decision window transforms deterrence from a strategic stance into a reflex action.

The Illusion of Control

During the Cold War, early-warning systems such as the Distant Early Warning (DEW) Line in northern Canada provided governments time to verify and discuss before responding. Now, that window is narrowing. A false alarm from a cyber-attack, sensor error, or misread trajectory could prompt irreversible actions.

Initiatives like the proposed Golden Dome missile-defence network seek to regain control via automation. This system would link lasers, space-based interceptors, and ground missile fields, utilizing real-time data and predictive analytics. It aims to defend against emerging threats like hypersonics. However, if one country thinks it can intercept any missile, others will create faster or stealthier systems to bypass defenses. This leads not to stability but to an accelerating cycle of innovation and countermeasures, which consumes resources and fosters mistrust.

For Canada, whose security is closely linked to U.S. early-warning and missile-defence systems via the North American Aerospace Defence Command (NORAD), its anticipated participation in this setup ties it to the ongoing push for faster defence responses. Canada must consider whether contributing to these increasingly rapid defences actually enhances collective security or merely perpetuates instability.

Multilateral paralysis

While weapons development accelerates, diplomacy remains sluggish. The Conference on Disarmament has been paralyzed for four decades, and the Treaty on the Prohibition of Nuclear Weapons (TPNW), which bans nuclear development, testing, possession, and use, has created divisions among Canada's allies in the North Atlantic Treaty Organization (NATO). Many of whom consider it to be conflicting with deterrence policy. Verification systems for arms control are weakening due to declining funding and political support. Recent UN First Committee votes show increasing mistrust, with countries divided over resolutions that once passed easily by consensus. This paralysis is not only procedural but also psychological, reflecting a loss of confidence that cooperation can keep pace with technological progress.

From Observer to Leader

Civil society groups persist in advocating for disarmament and holding parties accountable. During recent Ottawa events, officials, diplomats,

Exploring the Environmental Grey Zone

This photograph shows the Thunderhill Lake Complex Fire in Flin Flon, Manitoba, June 2025. *Public Domain Photo*

How do environmental change and security intersect in ways that challenge traditional defence policies and practices? This question is at the heart of a new collaboration between Senior Researcher Dr. Jessica West, Project Ploughshares Fellow Dr. Pauline Pic, and Dr. Jennifer Silver at the University of Guelph, which examines what they call the "environmental grey zone."

As climate change accelerates, Canadians are increasingly affected by security risks that emerge not from distant conflicts but from shifting environmental conditions such as wildfires, floods, coastal erosion, and even the cascading effects of space and ocean disruptions. These forces blur the line between environmental stress and deliberate harm, raising new questions about responsibility, communication, and collective resilience.

Funded by the Department of National Defence MINDS (Mobilizing Insights in Defence and Security) program, the project explores how Canada can better understand and respond to these overlapping risks and how government, researchers, and communities, can communicate more effectively about them. Security today cannot be defined only by borders or militaries; it also depends on how well societies adapt, share information, and cooperate in the face of a changing planet.

Stay tuned next year as this work continues to develop through research, dialogues, and new opportunities for engagement.

and civil society leaders concurred on an essential point: Canada must move beyond being a passive observer. The decline of arms control treaties and the emergence of destabilizing technologies demand renewed leadership from nations that profess commitment to disarmament.

Canada, as a trusted partner in NATO and NORAD, and a non-nuclear nation with a strong disarmament record, has both influence and responsibility. It can leverage this position to challenge the assumptions behind the new arms race and promote transparency. Within these alliances, Canada can push for limits on nuclear modernization, clearer policies on emerging technologies, and enhanced verification methods. Additionally, it can motivate partners to pair technological upgrades with renewed strategic stability discussions with Russia and China to lower escalation risks. Ultimately, Canada can also act as a mediator between the NPT and the TPNW, helping to restore dialogue between nuclear and non-nuclear states.

Restoring Balance

The rise of hypersonic and orbital weapons leads governments to believe that faster missiles mean better safety. However, true security depends less on speed and more on patience and diplomacy. Every new weapon that promises protection diminishes the chance for open discussion. Canada should focus on rebuilding this space by fostering transparency, restraint, and dialogue, especially when these qualities are most vulnerable. □

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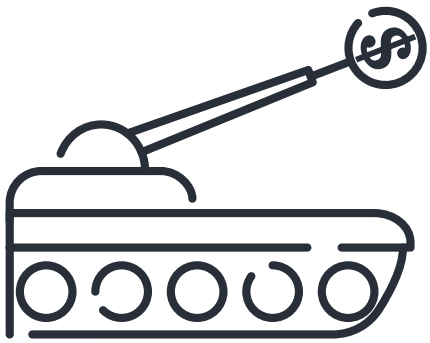
Canada Strong? Analyzing Canada's Defence Surge



Written by Kelsey Gallagher

In June 2025, under the new government of Prime Minister Mark Carney, Canada fast-tracked an increase in defence spending to match NATO's 2% of GDP target. Mere days after this announcement — and likely to the consternation of Canadian officials who had just reached the prior benchmark — NATO countries agreed to increase annual defence expenditures for each member to an eye-watering 5% of GDP.

On November 4, the federal government published Canada's 2025 federal budget, *Canada Strong*. The budget provides some details of this surge in defence spending, including roughly $81.8 billion to be spent on rearming the Canadian Armed Forces (CAF) over the next five years.

The context for this budget is an unparalleled fracture in relations between the United States and Canada, which is leading Canada to pursue defence-related spending that promotes both industrial autonomy and a diversification of suppliers. But while increases in military expenditures may currently be popular with Canada's allies and the Canadian public, some new policy prescriptions outlined in *Canada Strong*, as well as the professed benefits of those policies, should be approached with caution.

Guns *and* Butter?

Along with many other major projects, *Canada Strong* marks the launch of the Defence Industrial Strategy, a $6.6 billion cash injection into Canada's military industry. So far, only the outlines of this strategy are available as part of the recent budget.

A major element of *Canada Strong* is the revamping and expansion of the CAF; the Defence Industrial Strategy is premised on the idea that a larger military will require an expanded industrial base that will need subsidies from the federal government. As well, *Canada Strong* links investments in Canada's defence production to job creation, noting that the "defence sector in Canada accounts for over 81,200 direct and indirect jobs" and that "[further] investment in defence…will create good, high-paying careers for Canadians."

However, the extent of the impact of military spending and defence production on job growth remains contested.

Military production has been shown to be an inefficient driver of job creation because it is so capital, rather than labour, intensive. For example, a 2009 study found that for each US$1 billion spent on defence, 8,555 jobs were directly

Members of the Canadian Special Operations Regiment during a freefall jump in Hurlburt Field, Florida, in 2013. *Public Domain Photo*

created. When the same amount is spent on more labour-intensive industries, the results go much farther: home weatherization and infrastructure (12,804 jobs), health care (12,883 jobs), education (17,687 jobs), and public transit (19,795) all produce many more jobs per public dollar spent.

The economics of arms manufacturing is also inherently precarious. Because the arms trade is highly specialized, and almost all major potential customers are national governments, defence production is vulnerable to boom-and-bust cycles. These cycles result in short-term surges in local workforces that quickly dissipate once major orders are filled and military needs change for some customers.

The reality is that Canadian defence firms (with six of the top ten American-owned) require outsized support from the federal government to weather the down periods. For example, in 2019, the federal government made an advance $3 billion purchase of 360 light armoured vehicles (LAVs) from General Dynamics Land Systems-Canada (GDLS-C). Experts pointed to this deal as a means to sustain the company during financing interruptions following a diplomatic spat with Saudi Arabia, which was under a contract to procure LAVs valued at more than $14 billion.

While major contracts awarded to Canadian arms manufacturers will almost certainly produce some localized short-term job growth, the long-term economic prosperity promised from armament production in *Canada Strong* remains far from certain.

The Export Reliance Trap

Over five years, *Canada Strong* is designed to provide $17.9 billion to expand Canada's military capabilities, with expenditures earmarked for, amongst other things, light utility and armoured vehicles, long-range precision strike capabilities, and domestic ammunition production. And while procurement by the CAF is seen as central to increased defence spending, as noted, domestic orders rarely provide long-term, stable demand.

This naturally leads domestic firms to seek foreign clients, many of which have mixed or poor human-rights records. Project Ploughshares has previously noted this tendency towards export reliance, particularly regarding large contracts with Saudi Arabia for GDLS-C LAVs, with the Saudi Kingdom now typically being the second-largest annual importer of Canadian weapons systems, behind only the United States.

> Canada and the United States share a deeply integrated North American defence industrial base, with most Canadian-made weapons exported to its southern neighbour, and many of Canada's military imports coming from American manufacturers. On its face, a wholesale move away from U.S.-made military systems does not appear to be realistic.

GDLS-C originally secured its first (and at that time, largest) contract for LAVs with Saudi Arabia in 1993 to fill a gap in orders following the culmination of contracts with both the CAF and the U.S. Department of Defense. This relationship has now persisted for more than three decades, with GDLS-C exporting thousands of individual LAVs to different branches of the Saudi military since the early 1990s. Saudi Arabia, a state with one of the world's worst human-rights records, both deployed and diverted Canadian-made LAVs to the war in Yemen, a conflict that resulted in the deaths of nearly 400,000 people.

The forthcoming financial surge into Canada's defence industrial base may later translate into increases in Canadian arms exports, also considering that the value of international arms transfers continues to soar, global conflicts are on the rise, and the global arms trade has become increasingly transnational.

Diversifying Export Partners

Canada Strong also aims to diversify Canada's trade partners. Export Development Canada (EDC), a Crown corporation that provides export financing to Canadian suppliers, is being allocated $5 billion under the Trade Impact Program, an initiative originally announced in March 2025.

The two-year Trade Impact Program aims to increase total business facilitated by EDC by $25 billion over five years. And, according to the new budget, this program explicitly includes exports related to defence.

This marks a departure for EDC, which, according to its 2023 Human Rights Report, prohibited business relationships involving the transfer of fully assembled weapons systems to any country or end-user, due to the human-rights risks involved. Such a strong and principled position has not been shared by other Canadian crown corporations. But the current federal government has now pushed EDC to again finance arms production and export.

Before 2023, EDC provided significant support to Canadian-owned arms manufacturers seeking to expand abroad. Between 2003 and 2015, for instance, EDC loans to the Streit Group helped facilitate the export of armoured combat vehicles to multiple destinations, including the UAE. Since then, the company has shifted much of its production to the UAE, from where it has supplied armed groups with armoured vehicles in the ongoing humanitarian catastrophe in Sudan. The EDC's return to supporting arms producers could similarly expose Canadian public financing to future cases where weapons exports raise serious human-rights concerns.

Reducing Dependence on American Arms Producers

In a time in which many allies are experiencing strained relations with the United States, numerous NATO members are seeking to reduce dependence on American military suppliers by building a more independent defence industry. For example, the EU's Readiness 2030 initiative includes a major €800 billion investment to expand Europe's capacity to produce armaments; Canada has pledged to join as the only non-European partner.

Yet, despite huge public funds being funneled towards national arms production across NATO

states, the feasibility of reducing reliance on American-made weapons remains uncertain. The United States is, by far, the world's largest arms exporter; between 2020 and 2024, it supplied 53% of Europe's arms imports (up from 41% between 2015 and 2019). And in July, even after the announcement of Readiness 2030, US President Trump stated that a deal between the United States and the European Union would have Europe procuring "hundreds of billions of dollars worth" of American military equipment, although details were not provided.

Even with significant government support for Canadian military suppliers, Canada faces a more complex challenge to achieve any degree of autonomy. Canada and the United States share a deeply integrated North American defence industrial base, with most Canadian-made weapons exported to its southern neighbour, and many of Canada's military imports coming from American manufacturers. On its face, a wholesale move away from U.S.-made military systems does not appear to be realistic. U.S. suppliers will almost certainly continue to win bids for major procurement, even as domestic arms manufacturers benefit from seldom-seen levels of federal investment. European manufacturers may add some diversity to the pool, but they're unlikely to replace the United States as a main source of Canadian weaponry.

Caution Needed

Canada Strong includes some welcome provisions related to defence acquisition and the CAF more broadly — for example, an overhaul of Canada's inefficient and costly approach toward procurement and improved salaries and living conditions for CAF members. But while the budget's approach toward bolstering Canada's defence industrial base may bring short-term gains, its long-term impact is far from guaranteed. □

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