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Builder, Stabilizer, Steward: Why Space Needs More Canada

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Key Points

- Canada's dependence on space has deepened rapidly, binding economic activity, environmental monitoring and defence operations to the stability of the orbital environment. As space becomes more congested, commercialized and strategically contested, capability alone is insufficient to sustain security.
- Canada's next phase of space leadership lies in aligning innovation, operational discipline and cooperation so that governance is embedded in capability development, deterrence is reinforced through predictable behaviour and transparency becomes part of routine security practice.
- This policy brief examines Canada's evolving space posture and the systemic pressures reshaping the orbital environment. It argues that Canada can strengthen stability in space by acting simultaneously as *builder* (governing innovation), *stabilizer* (practising operational discipline) and *steward* (institutionalizing cooperation).

Introduction

Since the early years of the Space Age, Canada has relied on space systems to address the challenges of its geography and security environment. Satellite capabilities have supported communications across vast distances, environmental monitoring of the Arctic and surveillance of remote regions. Canada entered orbit not for prestige but for *problem solving*: connecting dispersed communities, supporting national security and advancing scientific knowledge through innovations such as Alouette I in 1962, the RADARSAT series and the Canadarm (Beattie et al. 2002). Over time, space systems became embedded in how Canada governs, monitors and protects its territory.

That dependence has deepened significantly over the past several decades. Satellite systems now underpin a wide range of economic, environmental and security functions, from financial timing and logistics to climate monitoring, Arctic surveillance and emergency response. As these dependencies grow, so too do the risks associated with congestion, competition and instability in orbit. For Canada, the

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As part of her work at Project Ploughshares, Jessica served for seven years as the program manager of the international research consortia responsible for the Space Security Index project, and as managing editor for the 2007–2009 and 2016–2019 publications. She interacts regularly with key UN bodies tasked with space security and sustainability issues, including the UN Committee on the Peaceful Uses of Outer Space, the Conference on Disarmament, the UN First Committee on Disarmament and International Security, and the United Nations Institute for Disarmament Research.

Recently, Jessica concluded a significant research effort to identify and map existing values, principles and norms in outer space and seek opportunities for advancing international security-related norms, with funding from the Canadian Department of National Defence's MINDS program (Mobilizing Insights in Defence and Security). Her current work is focused on grey zone security across outer space, the Arctic and maritime domains, with emphasis on strategic communication, public engagement and dual-use technology governance.

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security of the orbital environment is no longer simply a matter of technological capability but of economic resilience and national security.

From the beginning, Canada has needed space. But space, in turn, has needed Canada. Seven years ago, when Kevin Whale, then director general of space at the Department of National Defence (DND), remarked that “space needs more Canada,” the line sounded audacious for a country with modest budgets and few dedicated military satellites.¹ Yet the phrase resonated because it captured a tension already visible in Canada's space policy: the country had something distinct to offer, but its role in shaping the future of the domain remained uncertain. Today, that tension has sharpened. The phrase now reads less as aspiration than as diagnosis.

What has changed is not the need for but the degree of Canada's reliance on space systems. A significant share of the national economy now relies directly or indirectly on space-enabled services — from financial timing and logistics to climate monitoring and emergency response — which magnifies the consequences of instability in orbit (MacDonald, Khan and Stackhouse 2025). Ottawa's renewed emphasis on sovereign capability reflects this reality.² Satellites and data deliver value only if the systems that sustain them remain predictable. The question of what “more” Canada might contribute has therefore become more pointed: What role should Canada play in space now?

In his January 2026 address to the World Economic Forum in Davos, Prime Minister Mark Carney described the current geopolitical moment as not a gradual transition from, but rather a complete rupture in, the rules-based order. He argued that middle powers must pair renewed strength at home with consistent, values-grounded action abroad (Prime Minister of Canada 2026). Sovereignty and cooperation, in this view, are mutually reinforcing. In space, that insight has practical consequences. As Canada expands its industrial capacity and deepens its role in allied defence architectures, the challenge is not whether but how it should act, to ensure that capability, behaviour and governance evolve together under conditions of heightened strategic rivalry.

1 Kevin Whale, remarks at the Canadian Space Summit, Ottawa, November 2019. See also Gallant (2023).

2 *An Act governing the operation of remote sensing space systems*, SC 2005, c 45 [Remote Sensing Space Systems Act], online: <<https://laws-lois.justice.gc.ca/PDF/R-5.4.pdf>>.

Canada's Shifting Space Posture

Canada's relationship with space has entered a qualitatively different phase. What began as a set of discrete civil, commercial and defence activities is becoming an integrated system on which economic performance, national security and international credibility increasingly depend. This shift reflects converging changes in defence policy, industrial strategy and societal reliance on space-enabled services.

On the defence side, Canada has moved from episodic engagement to a more institutionalized military presence in space. Canada's 2024 defence policy, *Our North, Strong and Free*, formally designates space as an operational domain and commits long-term investment to modernizing continental defence, much of it centred on space-enabled surveillance, communications and command-and-control systems (DND 2024, 2022a). The establishment of 3 Canadian Space Division (3 CSD) within the Royal Canadian Air Force in 2022 consolidates this shift, embedding space permanently within defence planning and doctrine (DND 2022b). Canada is also more deeply integrated into allied space operations than at any point in its history. Through Operation Olympus, Canada organizes its sovereign military space activities, while contributing to initiatives such as the US-led Operation Olympic Defender under the Combined Space Operations framework (Kitterman 2024).

This defence evolution is now embedded within a broader industrial strategy. The 2026 Defence Industrial Strategy (DIS) identifies space — including space launch, space-based intelligence, surveillance and reconnaissance, satellite communications and space domain awareness — as a sovereign capability (Government of Canada 2026, 18). Through its “Build-Partner-Buy” framework and the creation of a Defence Investment Agency, the DIS links industrial policy more directly to national security objectives (ibid., 13). In doing so, it formalizes alignment of domestic industrial growth, alliance interoperability, export ambition and strategic autonomy in space.

Civil and industrial policy has shifted in parallel. The Canadian Space Agency (CSA) has increasingly framed investments around dual-use technologies, sovereignty and resilience, while

deepening strategic partnerships with European counterparts (CSA 2025a, 2025b; Werner 2025). Industry has been explicit in calling for closer integration of innovation funding, procurement and defence demand, framing space infrastructure as critical national infrastructure (Space Canada 2025; Norman 2025). The DIS accelerates this trajectory, reinforcing expectations that innovation, procurement and export pathways will align around strategically significant capabilities.

Yet governance structures have evolved more incrementally. Responsibilities remain distributed across multiple departments, including the CSA, DND, Global Affairs Canada, and Innovation, Science and Economic Development Canada (ISED) (Goody and Shapiro 2022). Coordination mechanisms such as the National Space Council signal a recognition that space policy has become a whole-of-government challenge. But as sovereign capability expands and industrial ambitions grow, institutional integration and governance coherence will become more consequential.

Taken together, these developments elevate the stakes of Canadian decision making. Canada is no longer merely a participant in space activities or a beneficiary of orbital infrastructure built by others. It is now a stakeholder in the stability of the space system itself — one whose industrial decisions, defence posture and governance practices will shape risk, resilience and behaviour in orbit.

Space in Flux: Systemic Risks in a Contested Orbital Environment

The space domain has always reflected the tensions of its time. Today, however, those tensions are magnified by unprecedented scale, speed and density in orbit. Rapid satellite deployment, accelerating technological change and growing civil-military interdependence are placing new strain on the norms, coordination mechanisms and crisis management practices that have historically sustained stability in space.

Orbital congestion is increasing rapidly, with more than 14,000 satellites currently in operation (McDowell 2025). Large commercial constellations plan deployments that could add tens of

thousands of satellites over the coming decade, stretching coordination, traffic management and governance mechanisms (Organisation for Economic Co-operation and Development 2024; World Economic Forum 2022). Although voluntary debris mitigation guidelines are widely endorsed, implementation remains uneven and the overall debris environment continues to deteriorate (United Nations Office for Outer Space Affairs [UNOOSA] 2021; European Space Agency Space Debris Office 2025). There is still no authoritative international regime governing space traffic coordination or proximity operations. Close approaches are often managed through informal communication and voluntary practices, creating ambiguity that can heighten misinterpretation in contested environments (Agachi et al. 2025).

Capabilities to destroy, damage, disrupt or deny use of space systems are expanding and proliferating. To date, four states (China, India, Russia and the United States) have conducted destructive direct-ascent anti-satellite missile tests against objects in orbit. Non-kinetic counterspace capabilities, in particular those using electromagnetic and cyber means, are both widespread and persistently used (Samson and Cesari 2025).

Technological acceleration compounds these pressures. Advances in autonomous manoeuvring, artificial intelligence (AI) and on-orbit servicing compress decision time and complicate intent assessment, raising the likelihood that routine behaviour will be misread.³ At the same time, civil-military entanglement is deepening as commercial systems support military functions and defence institutions rely on civilian infrastructure (Zellner and Potter 2025; Altaf 2025). This integration enhances resilience and capability, but it also tightens interdependencies across economic and security domains.

These dynamics are also heightening escalation risks. What counts as a “weapon” in space has long been politically contested, as technologies capable of inspection, servicing or manoeuvre may also perform counterspace functions. As these capabilities proliferate and operate in closer proximity, however, distinguishing between defensive measures, routine operations

and coercive signalling becomes increasingly difficult (Samson and Cesari 2025). Renewed interest in space-based interceptors underscores how defensive initiatives can carry signalling effects in tightly coupled environments (West and Barrett 2025). As researchers have shown, ambiguity and entanglement can generate escalation dynamics even in the absence of hostile intent, making clear signalling, disciplined behaviour and crisis communication integral to deterrence stability rather than peripheral to it (Acton 2018; Maxwell and Wilson 2021).

Together, these dynamics reveal a domain that is both indispensable and increasingly difficult to manage. Dependence on space has grown faster than the capacity of the institutional mechanisms designed to manage friction within it. For states deeply embedded in these systems — including Canada — stability is no longer simply a background condition. It has become an operational requirement.

Which Canada?

The question for Canada is no longer whether to be active in space, but how to align the different logics shaping its engagement there. As defence modernization accelerates under the DIS, space policy is increasingly tied to questions of security, industrial capacity and alliance integration.

Three distinct policy logics currently shape Canada’s engagement in space. The first, *industrial Canada*, approaches space as an engine of innovation, sovereign capability and economic growth. The second, *strategic Canada*, prioritizes defence integration and allied interoperability. The third, *governance Canada*, emphasizes cooperation, transparency and behavioural predictability through multilateral engagement.

Each orientation reflects a legitimate interest and a well-established policy community. The issue is not their existence, but their coordination. When pursued in isolation, each logic can create its own risk: innovation can outpace oversight, defence integration can create signalling effects that heighten escalation pressures, and governance commitments can lose traction without operational and industrial backing.

3 See Bratu and Azcárate Ortega (2025); UNGAOR, 2nd Sess, UN Doc A/AC.297/2025/NGO/2 (2025), online: <[https://docs-library.unoda.org/Open-ended_Working_Group_on_Prevention_of_an_Arms_Race_in_Outer_Space_\(2025\)/A.AC_297.2025.NGO_2.pdf](https://docs-library.unoda.org/Open-ended_Working_Group_on_Prevention_of_an_Arms_Race_in_Outer_Space_(2025)/A.AC_297.2025.NGO_2.pdf)>.

Space does not require Canada to choose among these roles. It requires Canada to integrate them, ensuring that innovation, defence modernization, export ambition and cooperation reinforce, rather than undermine, one another. As Canada's reliance on space deepens, integration changes from a normative aspiration to a practical necessity for managing risk in a congested, commercialized and strategically contested domain.

Meeting the challenge of integrating these roles requires Canada to act simultaneously as builder, stabilizer and steward: embedding governance within capability development, exercising operational discipline within alliances and institutionalizing transparency as a strategic asset. In an era defined by strategic rivalry and systemic interdependence, predictability is not restraint for its own sake; it is a form of influence.

Canada as Builder: Governing Innovation

Canada's early space achievements were acts of innovation and governance. Programs such as Alouette I and RADARSAT advanced security and technological capability while establishing standards for transparency, licensing and international cooperation (Beattie et al. 2002). As Canada expands sovereign space capabilities under the DIS, and as new generations of autonomous and dual-use technologies reshape how space is used, the ability to govern innovation responsibly has become as strategically important as the ability to develop it.

Capabilities such as autonomous manoeuvring, on-orbit servicing and AI-driven analytics promise efficiency and resilience. As commercial and military uses converge in new ways, however, governance frameworks must evolve in parallel. Without anticipatory oversight, gaps can emerge across accountability, licensing and export control systems (Nikam and Joshi 2025).

Space situational awareness (SSA) illustrates this governance challenge particularly well. Tracking and characterizing objects in orbit is technically demanding and strategically consequential. The same data that prevents collisions and debris-generating incidents also underpins attribution and deterrence, and in some contexts could support targeting. Canada's SSA ecosystem — anchored in defence programs such as Sapphire and the forthcoming Surveillance of Space 2, alongside commercial innovation from firms such as

NorthStar Earth & Space⁴ — demonstrates how industrial and military investments can serve both national and collective security. As SSA becomes a sovereign capability priority, clear standards for data sharing, transparency and oversight become central to safety and to export credibility and alliance trust (West and Azcárate Ortega 2022).

Canada recognized the dual-use challenge earlier than most. The Remote Sensing Space Systems Act of 2005⁵ established one of the first national frameworks to balance commercial freedom with security oversight. Yet the technologies it once helped to regulate have evolved far beyond the scope originally envisaged, often leaving governance as reactive rather than anticipatory.

To ensure that industrial growth and sovereign capability reinforce long-term stability, Canada should modernize how it governs innovation through the following actions:

- **updating the Remote Sensing Space Systems Act** to cover proximity operations, autonomous manoeuvring, AI-enabled processing and SSA analytics, with risk assessment embedded in licensing;
- **creating a standing interdepartmental space-specific dual-use review mechanism** to improve coherence across innovation, industrial, export and security policy and serve as a pilot for broader government approaches to dual-use risk across emerging technologies;
- **integrating governance criteria into public funding and procurement**, making transparency, cybersecurity and sustainability prerequisites for government support and international partnerships; and
- **leading an international partnership on responsible space innovation** through existing UN and allied frameworks, developing voluntary principles for transparency and on-orbit safety in dual-use systems, aligned with Canada's broader commitment to consistent standards in global markets.

Governing innovation does not mean constraining growth. Governance can *strengthen* innovation by reducing systemic risk, clarifying expectations

⁴ See Lindahl (2023); <https://apps.forces.gc.ca/en/defence-capabilities-blueprint/project-details.asp?id=1024>; <https://northstar-data.com/>.

⁵ Remote Sensing Space Systems Act, *supra* note 2.

for industry and reinforcing Canada's reputation as a reliable, standards-based partner in a more competitive space economy.

Canada as Stabilizer: Operational Discipline in Orbit

As Canada expands sovereign space capabilities and deepens its role in allied operations, stability in orbit will depend increasingly on how power is exercised. In space, operational discipline is a strategic asset. It lowers operational risk, preserves decision time and builds the trust on which deterrence depends (Moltz 2019). In a domain where attribution is uncertain and civilian and military systems are tightly intertwined, deterrence depends less on visible threat than on consistent behaviour, clear communication and confidence that escalation will be managed under stress.

Canada's evolving defence posture reflects this reality. With the establishment of 3 CSD in 2022 under the Royal Canadian Air Force, Canada is now an operational actor responsible for delivering and coordinating military space effects in support of Canadian Armed Forces operations.⁶ That role enhances Canada's influence and heightens its responsibility. The way Canada conducts proximity operations, signals new capabilities and communicates intent within alliances will be as important in forming perceptions of stability as the capabilities themselves.

Operational discipline in space is not primarily about limiting capability. It is about shaping how capability is exercised and signalled. In space, increasingly described as an operational or warfighting domain, routine activities — proximity manoeuvres, testing practices, reversible interference and dual-use capabilities — can carry amplified signalling effects. Without shared behavioural reference points, defensive or experimental measures risk being misread as coercive, particularly in environments characterized by ambiguity and entanglement.

For Canada, stabilization therefore requires moving beyond general commitments to broad principles toward clearer behavioural expectations within allied operations. Through NATO (the North Atlantic Treaty Organization), consultations related to the North American Aerospace Defense Command,

⁶ See www.canada.ca/en/air-force/corporate/who-we-are/organizational-structure/3-canadian-space-division.html.

and the Combined Space Operations framework,⁷ Canada can advocate for practical behaviours and standards that reduce ambiguity, including:

- **agreed practices** for proximity operations and use of other dual-purpose capabilities;
- **shared thresholds** for what constitutes escalatory interference;
- **standardized notification** and anomaly-reporting procedures for close approaches, unexpected manoeuvres and suspected interference, drawing on coordinated disclosure practices developed in cyber governance; and
- **commitments** to non-debris-creating actions and disciplined deterrence signalling.

Such measures do not constrain defence modernization. They align allied practices, reduce uncertainty during routine operations and lower the probability that misinterpretation will drive escalation.

Canada's record provides a foundation for this approach. It has advanced transparency and confidence-building measures in multilateral fora, supported the moratorium on destructive anti-satellite missile testing and consistently emphasized predictability as a stabilizing principle.⁸ This tradition reflects a recognition that deterrence credibility in space rests on clarity as well as capability.

At the same time, behavioural discipline cannot be fully separated from choices about capability development. Proposals associated with the United States' Golden Dome missile defence initiative, including possible space-based interceptors, illustrate how even defensive systems can carry broader strategic implications in a tightly coupled security environment (West and Barrett 2025). Although framed as protective, placing dedicated intercept systems in orbit would mark the introduction of a persistent weapons

⁷ See www.canada.ca/en/air-force/corporate/space/combined-space-operations/vision-2031.html.

⁸ Conference on Disarmament, *On the Merits of Certain Draft Transparency and Confidence-Building Measures and Treaty Proposals for Space Security*, UN Doc CD/1865 (2009), online: <<https://digitallibrary.un.org/record/662457>>; Open-ended working group on reducing space threats, *Canadian Statement*, UNODAOR, 1st Sess (2022), online: <<https://documents.unoda.org/wp-content/uploads/2022/05/Canada-General-Statement-for-Translators-OEWG-Space-Threats-Session-bilingual.pdf>>.

function in the space domain, with likely effects including the expansion of offensive capabilities and increased incentives for pre-emption.

For Canada, security in space means ensuring that sovereignty, alliance integration and deterrence are reinforced by disciplined behaviour and capability development that supports stability rather than accelerates competition. This includes maintaining a clear distinction between space-enabled defence and the deployment of dedicated destructive capabilities in space itself. It also requires embedding behavioural expectations in doctrine, exercising transparency within alliances, and communicating intent consistently. Through these measures, Canada can strengthen deterrence while preserving the stability of the domain on which its security and economy depend.

Canada as Steward: Institutionalizing Cooperation

Canada's influence in space has never rested on scale or arsenal, but on its ability to make cooperation operational and credible. It has long translated broad principles into practical mechanisms, from arms control verification to peacekeeping to space sustainability. That tradition remains essential as governance frameworks adapt to rapid technological change, commercial expansion and renewed strategic rivalry.

The international architecture remains intact but under strain. The 1967 Outer Space Treaty continues to provide the legal foundation for peaceful use, including the obligation to exercise "due regard" for the interests of other states.⁹ Yet implementation depends heavily on voluntary reporting, political trust and consistent national practice. Transparency mechanisms developed through the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and related confidence-building processes have generated useful guidance, but their effectiveness ultimately rests on consistent implementation (UNOOSA 2021).

Canada has long sought to translate cooperative intent into technical capability. Its proposal in the early 1980s for PAXSAT — a UN-operated satellite to support arms-control verification — reflected

an effort to embed confidence-building in shared infrastructure.¹⁰ Today, modern Earth-observation and SSA systems provide the technical foundation that earlier initiatives only envisioned.

Data gathered for collision avoidance and situational awareness can serve as the backbone of contemporary transparency. By sharing select orbital information, supporting cooperative information exchanges and piloting verification initiatives through the United Nations and allied frameworks, Canada can contribute to making visibility a form of governance — rebuilding confidence through evidence rather than assertion. In an era of expanded sovereign capability, such practices reinforce Canada's credibility as a predictable and standards-based partner.

Stewardship today means embedding cooperation into routine operations rather than treating it as episodic diplomacy. To advance that goal, Canada should:

- **translate transparency** into regular practice by advancing standardized notifications for launches, manoeuvres and proximity operations through COPUOS and related UN processes;
- **leverage Canadian civil, commercial and defence SSA and Earth-observation capabilities** to pilot open-source approaches to verifying orbital behaviour, in coordination with emerging multilateral SSA initiatives, demonstrating how shared data can support accountability without reliance on classified systems;
- **support multilateral SSA data-sharing arrangements** focused on collision avoidance, anomaly resolution and shared interpretation of on-orbit activity;
- **institutionalize crisis communication** by convening a Track 1.5 Space Governance Forum in Canada to test incident-response protocols, coordinated disclosure practices for on-orbit anomalies and escalation-management procedures involving governments, industry and civil society; and
- **lead by example in reporting and disclosure**, ensuring timely and comprehensive

⁹ *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, 27 January 1967, 610 UNTS 205 art 9 (entered into force 10 October 1967).

¹⁰ *Prevention of an arms race in outer space*, UNGAOR, 48th Sess, Agenda Item 70, UN Doc A/48/305 (1993), online: <<https://docs.un.org/en/A/48/305>>.

Canadian submissions to COPUOS and the UN Register of Space Objects.

Stewardship in this sense is not passive maintenance but active implementation. By embedding due regard, transparency, verification and communication into daily practice, Canada can reinforce the connective tissue of space governance at a moment when credibility is demonstrated operationally. In doing so, it strengthens both cooperation and sovereignty, ensuring that expanded capability is matched by sustained trust.

Conclusion

Canada needs space. That reality has shaped its presence in orbit for more than six decades, from early communications capabilities to all-weather monitoring of the Arctic. What has changed is not the need, but the degree of dependence, and with it, the responsibility to help keep the system itself stable. Space now underpins economic activity, environmental monitoring and defence operations at a scale that leaves little margin for disruption.

In this environment, capability alone is insufficient. As congestion increases, technologies accelerate and civilian and military systems intertwine, stability depends on governance that shapes behaviour before crisis takes hold. This is where space still needs Canada: not because Canada can dominate the domain, but because it has demonstrated an ability to integrate innovation, operational discipline and cooperation into practice.

Acting as builder, Canada can ensure that innovation is governed in ways that reduce risk rather than amplify it, by modernizing oversight of dual-use technologies and embedding accountability into growth. Acting as stabilizer, Canada can exercise operational discipline as a strategic asset, strengthening deterrence through predictability, transparency and clear signalling rather than escalation. Acting as steward, Canada can institutionalize cooperation by turning transparency, verification and crisis communication into durable features of daily operations in orbit.

These roles are mutually reinforcing. Innovation without governance erodes trust. Deterrence without discipline invites miscalculation. Cooperation without capability lacks credibility. Canada's strategic advantage lies not in scale or coercive power, but in linking capability,

behaviour and governance to reinforce stability in a domain on which it increasingly relies.

Leadership in space is measured less by the scale of power a country wields than by the consistency with which it exercises it. Space needs more Canada, not as a slogan, but as practice. Canada has the experience, institutional foundations and alliance relationships to act as builder, stabilizer and steward simultaneously. The task ahead is to align innovation, defence and governance so that expanded capability is matched by durable stability.

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