

Canada's Submission on its implementation of the report of the Group of Governmental Experts on Transparency and Confidence Building Measures in Outer Space Activities

Canada strongly supports the implementation of the recommendations contained in the 2013 report of the Group of Governmental Experts (GGE) on Transparency and Confidence Building in Outer Space Activities. Building on [Canada's response to resolution 70/53](#) and in accordance with operative paragraph 11 of resolution 77/251, Canada would like to submit the present report detailing Canada's updated implementation of the GGE's recommendations.

Value of TCBMs

As Canada highlighted in our submissions to UN resolutions [75/36](#) and [76/230](#), the rising challenges to outer space security and sustainability can be most effectively addressed through norms of responsible behaviours, which include TCBMs. The latter offer pragmatic and near term steps to increase information shared between states, to reduce miscalculations based on the misperception of other states' actions, and build overall confidence amongst all states in the peaceful use of outer space. It is important to note that non-binding instruments do not rule out the adoption of legally binding measures in the future. Robust TCBMs can serve as important instruments in their own right, as well as provide the basic elements and create the conditions necessary for an eventual treaty. This is a proven approach, as demonstrated by the establishment of the 1967 Outer Space Treaty, whereby a global consensus on norms and TCBMs was eventually codified into law.

Canada's Implementation of Space TCBMs

Since the GGE report on TCBMs was unanimously endorsed in 2013, Canada has worked to apply and promote the adoption of its recommendations. While Canada's detailed implementation of space TCBMs can be found in the annex, we would like to highlight a few significant steps taken in the interim years.

- Canada sees information exchange as a key measure that can pave the way to the establishment of many other forms of TCBMs. As such, Canada made publically available the 2019 [Canadian Space Strategy: Exploration, Imagination, Innovation](#) and 2017 [Strong Secure and Engaged: Canada's Defence Policy](#). Given the dual-use nature of many space assets, communicating the general purpose of space programs clarifies intent, which can alleviate misperceptions regarding how capabilities are being used.
- Canada is proud to be an Artemis Accords signatory, which now include 23 nations. The Artemis Accords established a practical set of principles to ensure safe and sustainable space exploration activities consistent with the legal obligations contained in the core outer space treaties. Coordination of space policies among States enables common understandings in the exploration and use of space, which enhances predictability and reduces potential for conflicts.
- Canada is one of 11 states who made the commitment not to conduct destructive direct-ascent anti-satellite missile testing. A clearly defined, verifiable commitment can be an effective confidence building measure to create the momentum needed for more ambitious steps.

Further, growing agreement on one norm of responsible behavior can create a climate of confidence to develop other norms and common understanding of responsible and irresponsible behaviours across all outer space activities.

Importantly, these TCBMs fulfil the criteria set by the 2013 GGE on TCBMs (Section III C. in the report). Canada will continue to welcome and join initiatives that are clearly defined and verifiable as we work towards a more secure and sustainable outer space environment. Canada looks forward to further engagement with states on implementation of these TCBMs.

Next Steps

Canada believes work could be undertaken to generate ideas around possible protocols and mechanisms to enhance communication. In this regard there are some positive developments. In response to UN General Assembly resolution 76/231, an Open Ended Working Group on reducing space threats through norms, rules and principles of responsible behaviours was established. Through this mechanism states have actively been exchanging views. Canada regards dialogue amongst all states and non-governmental entities as a pragmatic way to advance space security issues. The challenges to treaty-making efforts is the lack of understanding amongst states about what conduct leads to the misunderstanding that could fuel an arms race or conflict. Once that is established, translating this understanding into a treaty will be greatly facilitated.

Annex: Detailed summary of Canada's implementation of TCBMs

Information exchange on space policies

Paragraph 37: Canada implements this transparency measure by publishing goals and strategies for its national space activities, such as the 2014 [Canada's Space Policy Framework](#) and the 2019 [Canadian Space Strategy: Exploration, Imagination, Innovation](#). Canada also submits an annual report to the UN COPUOS Scientific and Technical Subcommittee (STSC) detailing its main space activities on its implementation of the 21 Guidelines for the Long-term Sustainability of Outer Space Activities.

Canada has also published its space security policies, as was most recently captured in [Strong Secure and Engaged: Canada's Defence Policy](#). On February 22, 2022, Canada and its Combined Space Operations (CSpO) Allies and partners released [CSpO Vision 2031](#). Details on future space capability investments are also made publicly available online, including for military capabilities.

Information exchange and notifications related to outer space activities

Paragraph 39: Canada currently implements these measures by sharing information on space object and orbital events with the National Defence-led Centre of Operations, as well as regularly updating orbital data on its operational missions (with propulsion) by uploading it multiple times per day on the US-led free service www.space-track.org. In addition, Canada has two space-based Space Situational Awareness (SSA) assets that collect observational data that is shared with international partners. Canada will continue to operate available Canadian sensors to contribute to improving the accuracy of orbital data on space objects. The Canadian Space Agency-led Conjunction Risk Assessment and Mitigation System (CRAMS) continues to provide invaluable analysis services to help satellite operators, in Canada and internationally, to quickly make the best decision in response to on-orbit close approaches identified by the Space Surveillance Network (SSN). CRAMS supports almost 100 satellites worldwide in providing risk assessment and mitigation (avoidance maneuver calculations).

In support of Canada's commitment to implement the 21 Guidelines for the Long-term Sustainability of Outer Space Activities we have also provided UN Office of Outer Space Affairs (UNOOSA) with points of contact to share information on space objects and orbital events. In addition, Canada adheres to the *Convention on Registrations of Objects Launched into Outer Space*, submitting its information to UNOOSA. Canada also maintains a national registry of space objects and makes a concerted effort to update it as soon as practicable. Once an object has been registered in our national register, we provide registration information to the UN in compliance with the *Convention on Registration of Objects Launched into Outer Space* and in accordance with the recommendations of General Assembly resolution 62/101.

Paragraph 40: Canada operates the Canadian Space Weather Forecast Centre (CSWFC), a Regional Warning Centre (RWC) of the International Space Environment Service (ISES) that contributes to the World Meteorological Organization (WMO). In addition, civilian experts work with their security counterparts to distribute daily Space Weather forecasts and weather forecast data for potential impact on space operations (<https://spaceweather.gc.ca/index-en.php>). Canada's Dominion Radio Astrophysical

Observatory also manages the Solar Radio Flux Monitor, which plays a key role in space weather forecasting and is being used by telecommunication operators (satellite and terrestrial), hydroelectric companies, the space weather community as well as for communications prediction and ionospheric modelling, terrestrial environmental studies, and research into global climate change. The data is distributed free of charge.

Paragraph 41: Canada subscribes to The Hague Code of Conduct. While Canada is not currently a launching state, in January 2023 Canada announced its intention to support commercial space launch. Canada will provide notification of space launches, consistent with obligations under the Code, once commercial space launch is enabled.

Risk reduction notifications

Paragraph 42: Canada's space debris management system performs manoeuvre coordination with affected states when needed. The space debris management system refines avoidance manoeuvres and shares the analysis with cooperating spacecraft operators. Canada also contributes its Sapphire satellite to the US Space Surveillance Network, providing precise and timely measurement information, improving the overall fidelity of the US's Spacetrack catalogue. Canada regulates operation of space objects in alignment with the legal framework established by international law.

Paragraph 43: By request, Canada offers a free subscription to its Collision Risk Assessment and Mitigation system, equipping national and international organisations with the information necessary to make informed decisions. Re-entry information is also shared, as required and when necessary, with national organisations. Canada is a member of the Inter-Agency Space Debris Coordination Committee (IADC), which has procedures for notification and monitoring of annual high-risk re-entry test campaigns.

Canada's domestic remote sensing regulatory framework, the *Remote Sensing Space Systems Act* and the *Radiocommunications Act*, requires all licenced systems to ensure the eventual disposal of satellite systems, according to international norms, thus reducing the likelihood of high-risk re-entry events.

Paragraph 44: Canada, to the extent possible, participates in the annual IADC re-entry test campaigns of uncontrolled re-entries of space objects. Canada, through the Canadian Space Agency, recently applied for membership in the Space Mission Planning Advisory Group (SMPAG) whose mission it is to prepare for an international response to a threat by a near-Earth object through the exchange of information, development of options for collaborative research and mission opportunities, and to conduct Near Earth Object threat mitigation planning activities.

Paragraph 45: Canada's *Remote Sensing Space Systems Act* (RSSSA) and *Radiocommunications Act* (RA) contain provisions to mitigate the risk of orbital debris creation and for satellite disposal demonstrating Canada's commitment to the Space Debris Mitigation Guidelines of the UN. Canadian licensing requirements under the RA for the allocation of radio spectrums also include a demonstration of compliance with the ITU Recommendation ITU-R S.1003-2, Environmental Protection of the

Geostationary Satellite Orbit or for Non Geostationary Orbits networks as well as compliance with the IADC Space Debris Mitigation Guidelines.

In 2022, Canada made the non-binding commitment not to conduct destructive direct-ascent anti-satellite missile testing and co-sponsored the related UN General Assembly resolution 77/41 which called for a halt to these tests.

Contact and visits to space launch sites and facilities

Paragraph 46: Canada regularly welcomes international delegations to the Canadian Space Agency for briefings, meetings and tours, including to the space robotics centre. In addition, visits to the science laboratories are also available, depending on the interest of visitors.

Paragraph 47: Canada welcomes visits to the CSA's Satellite Operations (SATOPS) centre as appropriate.

Paragraph 48: Canada welcomes visits to space-related technologies facilities in accordance with export control and technology transfer regimes.

International cooperation

Paragraph 49 and 51: Canada is currently implementing this measure through several programs designed to enhance international cooperation. For the Canadian Space Agency, international collaboration is critical to meeting its mission mandate. Through bilateral and multilateral consultations, Canada continues to promote the peaceful use of space and provide leadership in coordinating the regulation of remote sensing space activities that support long-term sustainability goals and other international obligations. Canada is sharing its expertise and experience through a variety of international fora in order to advocate the importance of responsible behaviours in space. Canada offers, free of charge, support for space debris risk assessment and mitigation to operators, both national and foreign, upon request.

By engaging at the international level, including through the IADC, support to Committee on Space Research (COSPAR) science goals, and fostering cooperation and information sharing with other space agencies, Canada aims to develop and strengthen capacity. Examples of such collaboration include, inter alia, the Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS).

Paragraph 55: The Committee on Earth Observation Satellites (CEOS), through its Working Group on Capacity Building and Data Democracy, as well as the Group on Earth Observations (GEO), through its regional initiatives, are international bodies through which Canada contributes and benefits from joint capacity-building efforts.

Paragraph 56: Canada, as a member of the Group on Earth Observation (GEO), fully subscribes to the free and open data sharing principles. The GEO and CEOS initiatives on Sustainable Development Goals aim at fostering the use of earth observation data to monitor and reach the goals. The Canadian Space Agency will begin Chairmanship of CEOS in November 2023, for a period of one year. These initiatives partner with organisations such as UNOOSA, the World Bank, the Global Partnership for Sustainable

Development Data, the WMO, to share and foster the use of earth observation data. The Government of Canada is committed to increasing the availability of scientific data and publications as part of its [Open Government](#) initiative. The Canadian Space Agency supports this objective by making scientific data available to researchers, students, industries and the public to encourage innovation and contribute to the advancement of knowledge. The RADARSAT Constellation Mission (RCM) is Canada's new generation of Earth observation satellites. Certain RCM image products are freely and openly available to users outside the Government of Canada, subject to exceptions in terms of security, privacy and confidentiality. Public and vetted users can access RCM image products through the Earth Observation Data Management System

Consultative mechanisms

Paragraph 57 and 58: Canada is engaged in a number of bilateral and multilateral consultative initiatives, such as diplomatic dialogues on space security issues with the G7 and through broader Non-proliferation, Disarmament, and Arms Control consultations as well as targeted exchanges on space issues at the bilateral level. These initiatives serve to clarify national space policies and positions and reinforce the importance of adopting appropriate norms of behaviour in the conduct of outer space activities, in particular transparency and confidence building measures, to increase trust and reduce the risks of misperception and miscalculations. Canada also engages in a number of military-to-military bilateral and multi-party arrangements for research and development.

Canada participates in multilateral forums discussing space issues, including the UNCOPUOS, the Conference on Disarmament, the UN Disarmament Commission and the International Telecommunication Union. On international coordination to avoid harm and the ITU Radio Regulations, we engage in bilateral and multilateral coordination discussions and agreements to prevent harmful radio interference. We also notify the frequency assignment of our satellite networks at the ITU, for inclusion in the ITU Master International Frequency Register (MIFR). Canada actively supports initiatives to increase transparency and confidence-building measures, including the development and implementation of the 21 Long-term Sustainability Guidelines.

Outreach

Paragraph 60: Canada regularly participates in UN-sponsored workshops and conferences, including UNCOPUOS thematic workshops and meetings, and the annual UN Institute for Disarmament Research Space Security Conferences.

Paragraph 61: Canada routinely publishes information on its outer space activities on the Canadian Space Agency website and its annual report to UNCOPUOS as well as presentations at conference and workshops and through public diplomacy.

Paragraph 62: Canada strongly values the contribution of international and non-governmental organizations to support the continued peaceful uses of outer space and collaborates with such organizations to foster research and outreach. Canada has a long-standing collaboration with the Simons Foundation for Disarmament and Non-Proliferation Research at the University of British

Colombia, which provides scholarships to support the development of a new generation of young Canadian scholars dedicated to further expanding their knowledge and expertise on critical Disarmament and Non-Proliferation issues, including space security. Canada has also facilitated attendance to UN COPUOS and UN General Assembly meetings for members of academia and non-governmental organizations, including by welcoming them on Canada's delegations. Canada also actively seeks input from stakeholders, for instance in 2021 Canada conducted a public consultation on a framework for future space exploration activities. The 194 written submissions received from industry, academia, non-governmental organisations and the general public will inform Canada's national and international efforts to develop and strengthen frameworks for space exploration activities. Currently, Canada is conducting a public consultation that is supporting the ongoing space regulatory review process as committed to in the 2019 Space Strategy.

Furthermore, Canada supports various academic institutions in the development of space-related knowledge, including through funding from the Department of National Defence/Canadian Armed Forces Mobilizing Insights in Defence and Security (MINDS) Program for various seminars and engagements.

Coordination

Paragraph 63: Canada holds a range of bilateral and multilateral space discussions where its space policies and programmes are discussed, in order to enhance the safety and predictability of the uses of space.

Canada is proud to be an Artemis Accords signatory, which established a practical set of principles to ensure safe and sustainable space exploration activities consistent with the legal obligations contained in the core outer space treaties. In the Artemis Accords, the signatories committed to open data, transparency and international cooperation in the exclusively peaceful exploration and use of outer space.

Canada is also a member of the Combined Space Operations (CSpO) initiative, which contributes to the development of norms of responsible behaviors and promotes a secure, stable, safe, peaceful, and operationally sustainable space domain.

Paragraph 65: Canada, through the CSA Satellite Operation (SATOPS) centre, maintains contact information for a number of owner/operators to ensure the swift dissemination of operational information. In addition, the Canadian Space Agency's policy office maintains a list of national and international points of contact for coordination and discussions on a wide-range of space activities.

Paragraph 67: Canada actively participates in UN space-related activities, including the UNCOPUOS, the Conference on Disarmament, the ITU, and the WMO. Canada also actively participates and submitted three working papers to the United Nations Open Ended Working Group on reducing space threats through norms, rules and principles of responsible behaviours (2022-2023). In addition, Canada actively

participates in the Long-Term Sustainability Working Group at the UN COPUOS Scientific and Technical Subcommittee and submitted three Conference Room Papers during the 60th session.

Conclusions and recommendations

Paragraph 68: Canada strongly supports the implementation of the recommendations contained in this report and has consistently voted in favor of the related United Nations General Assembly resolution “Transparency and CBMs in Outer Space Activities”

Paragraph 69: Canada believes that the international community must adopt new rules of behaviour in outer space, such as transparency and confidence-building initiatives, which would help solidify international norms and establish the climate of confidence necessary to develop additional legally-binding measures governing outer space. As a pragmatic first step, in 2022 Canada was proud to join the U.S. in committing not to conduct destructive direct-ascent anti-satellite missile testing. This non-binding commitment addresses one of the biggest issues facing space security– the deliberate destruction of space objects creating long-lived debris.

Paragraph 70: Canada is currently reviewing its domestic legal and regulatory framework given the rapid evolution of activity in the outer space domain, as committed to in Canada’s 2019 Space Strategy. This will support efforts to ensure we are meeting all of our TCBM objectives.

Paragraph 71: Canada has signed, ratified, and implemented the four core space treaties, namely the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies; the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space; the Convention on International Liability for Damage Caused by Space Objects; and the Convention on Registration of Objects Launched into Outer Space. Canada has also signed the Constitution and the Convention of the International Telecommunication Union and its Radio Regulations; the Convention of the World Meteorological Organization; the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water; and the Comprehensive Nuclear-Test-Ban Treaty. Canada actively participates in UN COPUOS Legal Subcommittee (LSC) as a way to contribute development of international legal framework of space activities.

Paragraph 72: While Canada supports the discussion of space threats at the United Nations Conference on Disarmament and the discussion of space hazards at the UN COPUOS, Canada values a more sustained dialogue between the two space communities. Accordingly, Canada was pleased to participate in joint meetings of the First and Fourth Committees of the UN General Assembly to address possible challenges to space security and sustainability in 2015, 2019, and in 2022.

Paragraph 73: Canada implements the Space Debris Mitigation Guidelines through the *Remote Sensing Space Systems Act* as well as through its licensing requirements for the allocation of radio spectrums, which includes a demonstration of compliance with the ITU Recommendation ITU–R S.1003-2 and Environmental Protection of the Geostationary Satellite Orbit or for Non Geostationary Orbits networks.

Additionally, Canada was a strong proponent of the 21 Guidelines for the Long-term Sustainability of Outer Space Activities and is actively working to implement the Guidelines, as well as share information on the status of our implementation of the Guidelines to advance transparency and capacity-building. Canada actively participates in both the UN COPUOS Legal Subcommittee and Scientific and Technical Subcommittee to advance principles and guidelines. This includes the drafting of non-legally binding principles and guidelines such as the Principle Relating to the Remote Sensing of the Earth, Principles Relevant to the Use of Nuclear Power Sources in Outer Space, and the UN Debris Mitigation Guidelines.