Duality in Space

Remarks Presented to the United Nations Open-ended Working Group on (2025) Prevention of an Arms Race in Outer Space



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July 9, 2026

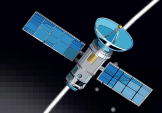
RAND

Overview

RAND *Duality in Space* Project Background, Objectives, and Timeline

Phase 1:
Baseline Understanding of Dual-Use Space Activities

Phase 2:
Understanding Escalatory Activities & Potential Responses









The challenge:

Duality of space systems

Space system duality poses potential challenges to maintaining peace and stability in space.



- Space offers limited visibility
- Countries might struggle to discern identity or intent
- Ambiguities could lead to misperceptions
- Countries could conduct activities perceived as escalatory – **increasing the risk of conflict**

RAND *Duality in Space* project objectives



Explore current & future landscape of dual-use systems



Offer realistic yet ambitious **policy options**



Build a **community of interest** around this issue

Why focus on mitigating duality-related risks?



Prevent conflict and build trust



Shape responsible norms or governance



Preserve national sovereignty and space access for all

Duality in Space Project Timeline

Phase 1
July 2024-July 2025

Baseline review & virtual workshops

with 47 stakeholders from 23 countries/orgs

Phase 2
July 2025-July 2026

In-person workshops

with 28 stakeholders from 17 countries/orgs

Phase 3
July 2026-June 2027

Online survey, in-person workshops & final report with recommendations



Phase 1 Activities

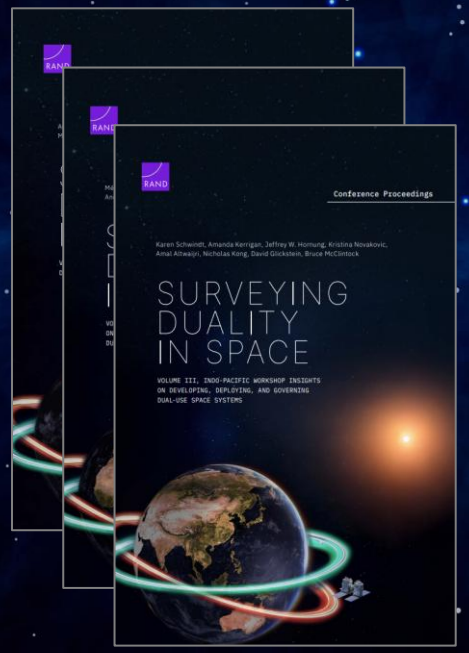
20+ Project Team Engagements



Baseline Report



Workshop Proceedings



Phase 1 Report

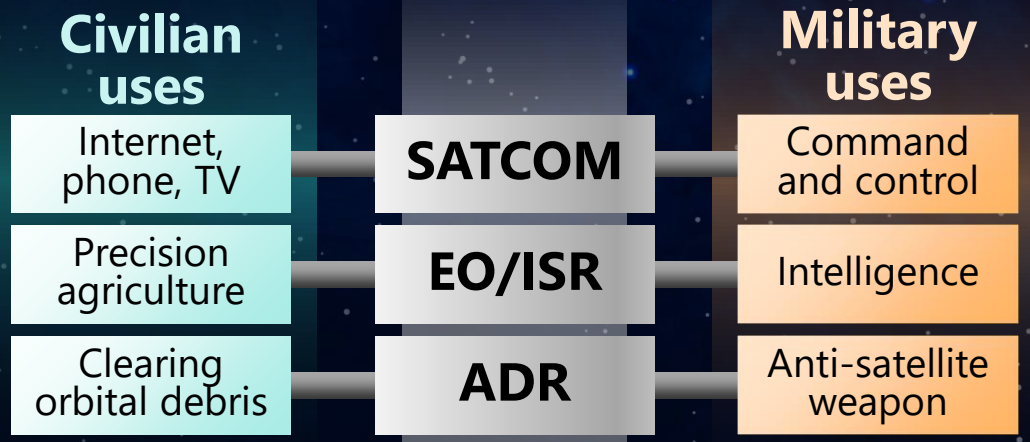


Phase 1 Findings & Recommendations

Finding 1

Stakeholders broadly perceive space systems as dual use, and no universally accepted definition of dual use exists for space systems.

Measures that apply rules to "dual-use systems" might fail because *virtually all space systems* are dual-use.



Recommendations 1a/b

a Stakeholders should assume the dual-use nature of space systems and avoid attempts to distinguish dual-use from non-dual-use systems.

b Stakeholders should pursue a **behavior- and effect-based framework** based on concrete activities to mitigate risks of escalation or conflict. Stakeholders could incorporate factors that are often difficult to discern, such as intent, user identity, and technical design, when they can be definitively established.

Phase 1 Findings & Recommendations

"A behavior- and effect-based framework"

Behaviors

Observable maneuvers or activities in space



- Maneuvering a space system
- Servicing or refueling a space system
- Assembling or manufacturing in space

Effects

Use of space system-collected data to inform Earth-based activities



- Providing communications or navigation services
- Collecting imagery and monitoring Earth-based activities
- Collecting data on space environment

Phase 1 Findings & Recommendations

Finding 2

Power asymmetries among stakeholders complicate governance design and adoption. Nations with nascent or emerging space capabilities may lack representation; commercial actors may face unclear regulations and guidance.

The diverse global space system ecosystem

- Countries with robust space tech & access: *USA*, *China*, *Russia*, *Canada*, *India*, *Japan*
- Private industry: MDA, Airbus, Astroscale, Starlink, Skyroot, Perigee
- International partnerships: Artemis, CSpO, BRICS, ALCE, APSCO, Five Eyes
- Countries with nascent, or niche capabilities: Luxem., Norway, UAE
- International and multilateral bodies: NATO, UN, ESA

Recommendation 2

The process of developing a behavior- and effect-based framework should include inputs from governments, industry, and academic and research communities and **prioritize progress over complete consensus**.



Phase 1 Findings & Recommendations

Finding 3

Space technologies continue to advance and evolve…

On-orbit refueling	Planetary defense
Active debris removal	Space traffic management

… but governance tied to specific technologies or capabilities could become quickly outdated.

Canada's Remote Sensing Space Systems Act

Renewed every 5 years

Recommendation 3

Stakeholders should incorporate timely mechanisms into a behavior- and effect-based framework that address short-term risks while allowing for long-term, ongoing reassessment as technologies evolve.



Phase 2 Activities

Three in-person workshops

Geneva, Switzerland — *March 2026*

Tokyo, Japan — *April 2026*

Washington, D.C. — *May 2026*



Continued project team engagements



Workshop participants worked through two scenarios:



Behavior-based

A satellite of unknown origin appears to conduct a mysterious RPO maneuver



Effect-based

A commercial satellite is suspected of providing intelligence data to an adversary

What sorts of activities in space increase risk of escalation?



Behaviors

- Close-proximity maneuvers
- Undisclosed or opaque space system operations
- Physically destructive on-orbit actions



Effects

- Actions with broad or indiscriminate impact beyond initial parties
- Activities occurring outside established norms or governance guidelines, or with unclear liability
- Actions occurring within geopolitically strained environments

Findings are preliminary and have not yet received peer review. Please do not cite.

Phase 2 Preliminary Findings

Escalatory Activities | Escalatory Thresholds | Governance Gaps | Potential Policy Options

When does risk escalate to unacceptable levels, such that they warrant a response?

Recommended **structured questions** for decision-makers on evaluating risk

Does the activity….

…compound uncertainty?

… risk loss of life directly?
i.e., by enabling attacks on civilians

… extend harm beyond the directly involved parties?
i.e., economic disruption

… risk loss of life indirectly?
i.e., through destruction of life-supporting space systems

… exacerbate geopolitical tensions?

Findings are preliminary and have not yet received peer review. Please do not cite.

In what ways are existing norms or governance efforts insufficient for managing risk?

Gaps in enforcement

Even when some rules exist, no dependable mechanisms ensure adherence

Legal gray zones

Stakeholders lack a shared understanding of what is clearly lawful or who is liable

Communication breakdowns

Stakeholders lack sufficient transparency, communication, or deconfliction mechanisms

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What are potential policy options for mitigating risks stemming from the duality of space systems?

Improved communication & transparency mechanisms	Operational norms & "rules of the road"	Improved application of existing norms/legal instruments	New, more targeted governance instruments	Clearer governance expectations for commercial space providers

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Duality in Space Next Steps: July 2026-June 2027

Online survey
Sep 2026



Collecting data from stakeholders worldwide across government, industry, research, and academia

In-person workshops:
Oct 2026-Feb 2027



Convening key stakeholders to determine feasible approach to developing norms & governance

Contact Us

Write to **space@rand.org** with inquiries about RAND's space work or to participate in the survey

Visit the RAND Space Enterprise Initiative here:

Read our June 2026 report here: