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BUILDING NORMENTUM: A FRAMEWORK FOR SPACE NORM DEVELOPMENT

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Summary

There appears to be a rising consensus among U.S. policymakers and space experts that norms of some kind are necessary to protect the safety, stability, security, and sustainability of the space domain. Since it is a U.S. national policy aim to lead the development of international space norms, what would a strategy to achieve that aim look like? This paper proposes a framework for the development of international norms of behavior for space. It emphasizes four strategic decision points involved in developing norms: (1) establishing domestic buy-in through interagency coordination; (2) selecting initial international negotiating partners; (3) choosing diplomatic mechanisms for generating international commitment; and (4) setting a target for which and how many states need to support the proposal for it to be considered a norm, referred to in this paper as the *critical mass*. After describing the strengths, weaknesses, and tradeoffs of different types of options at each decision point, this paper applies the framework in analysis of three case studies of space norm development. These include the 1963 development of a treaty banning the testing of nuclear weapons in space, the 2007 adoption of the UN Space Debris Mitigation Guidelines, and the responses to China's 2007 anti-satellite (ASAT) weapon test. This framework and analysis show that there is no 'one-size-fits-all' solution to norm development, especially not for space activities. Different international norms of behavior for space can be paired with the approaches that have the best suited strengths and weaknesses. The framework proposed in this paper can help analyze and compare these tradeoffs while demonstrating how different decisions in norm development will interact with each other.

Introduction

Space diplomacy is in the midst of a wave of greater attention, new ideas, and renewed debates. In March 2021, the Biden administration's *Interim National Security Strategic Guidance* declared that the United States "will lead in promoting shared norms and forge new agreements on emerging technologies, space," and a range of other issues.[1] This mirrors policy statements from previous administrations going back over a decade, but the public profile of the issue has risen in recent years. Policymakers and senior leaders across the U.S. government from NASA to the State Department to the U.S. Space Force and U.S. Space Command have been remarkably vocal regarding norms of behavior for space and calling for U.S. leadership in their development. There are many possible

purposes for norms of behavior in space,[*] but there appears to be a rising consensus that norms of some kind are necessary to protect the safety, stability, security, and sustainability of the space domain.

Since it is a U.S. national policy aim to lead the development of international space norms, what would a strategy to achieve that aim look like? Although there is general agreement that norms for space are desirable, there is much less agreement on what kinds of commitments are involved in developing norms, which actors must be involved in the development process, and at what point a possible standard of behavior turns from a proposal to an accepted norm.

This paper proposes a framework for the development of international norms of behavior for space. The framework comprises four strategic decision points that will need to be considered for each norm effort, and the exploration of tradeoffs across each decision point shows that there is no "one-size-fits-all" solution to norm development, especially not for space activities. Different international norms of behavior for space can be paired with the different approaches that have the best suited strengths and weaknesses. The framework proposed in this paper can help analyze and compare these tradeoffs while demonstrating how different decisions in norm development will interact with each other.

Separate work in this series of papers will address potential content of future norms of behavior in space and identify technical opportunities to support policy goals.

Definitions and Framework Overview

Evidence for this analysis was collected using a combination of expert interviews; reviews of academic literature on norm development; research on U.S. policies and senior leader statements; and examples from past and current norm efforts, both for space and for other domains. Because international norms of behavior are such a complex and, at times, contentious field of policy, the actual definition of the term *international norm* will play a key role in scoping this discussion.

This analysis uses a definition for international norms of behavior with several elements common to norms discussions: *generally accepted standards of appropriate behavior for states*. The first element, "generally accepted," is typically not quantified or specified but will be a key point of debate later in the paper. "Standards of behavior" indicates that the term "norms" means *normative*, not *normal*, because it implies some judgement on what kinds of behaviors are acceptable or unacceptable. For example, there may be a social norm for drivers to slow down when they see small children playing near a road; even if not every driver (or even a majority of drivers) actually complies with that norm, it is seen as the "right thing to do." Finally, the "for states" element represents the scoping of this paper to focus on norms developed and adhered to (or not) by states, emphasizing diplomatic processes and interstate dynamics. Although commercial and non-state actors frequently develop their own norms, non-state norms are outside the scope of this paper except for a discussion on the

[*] Military leaders indicate that norms are needed so that they can better interpret and judge appropriate responses to potentially hostile acts in space. Private space companies hope that norms can promote more predictable behaviors and make space a less risky investment. Diplomats and space sustainability experts call for norms to lower the chances of misunderstanding, escalation, or crises in space that could result in hazardous orbital debris and disrupt the vital services provided to Earth through space.

tradeoffs of including commercial and non-state actors in state-led discussions.

This definition also indicates that norms are not solely "non-legally binding" measures. Since norms are simply standards of behavior, these standards can be developed or established through various mechanisms, including treaties or other legally binding agreements. One way to achieve the international commitment needed for a norm may be through writing and ratifying a treaty that includes that norm.[2] Not all norms appear in treaties, and not all treaties succeed in establishing norms (especially if the content of a treaty is violated without significant outcry), but sometimes the two go hand-in-hand.

Figure 1 portrays the framework for evaluating alternatives and decision points in a strategic approach to norm development that comprises most of this paper's discussion. It emphasizes four strategic decision points involved in developing norms:

1. Establishing domestic buy-in through interagency coordination
2. Selecting initial international negotiating partners
3. Choosing diplomatic mechanisms for generating international commitment
4. Setting a target for which and how many states need to support the proposal for it to be considered a norm, referred to in this paper as the *critical mass*

These are not the only decisions that must be made to develop international norms of behavior, but each point features unique challenges and opportunities in the context of norms related to space activities.

Although there is a logical sequence for when each point may be most significant in the development process, these decisions all affect and are affected by each other throughout the process. So,

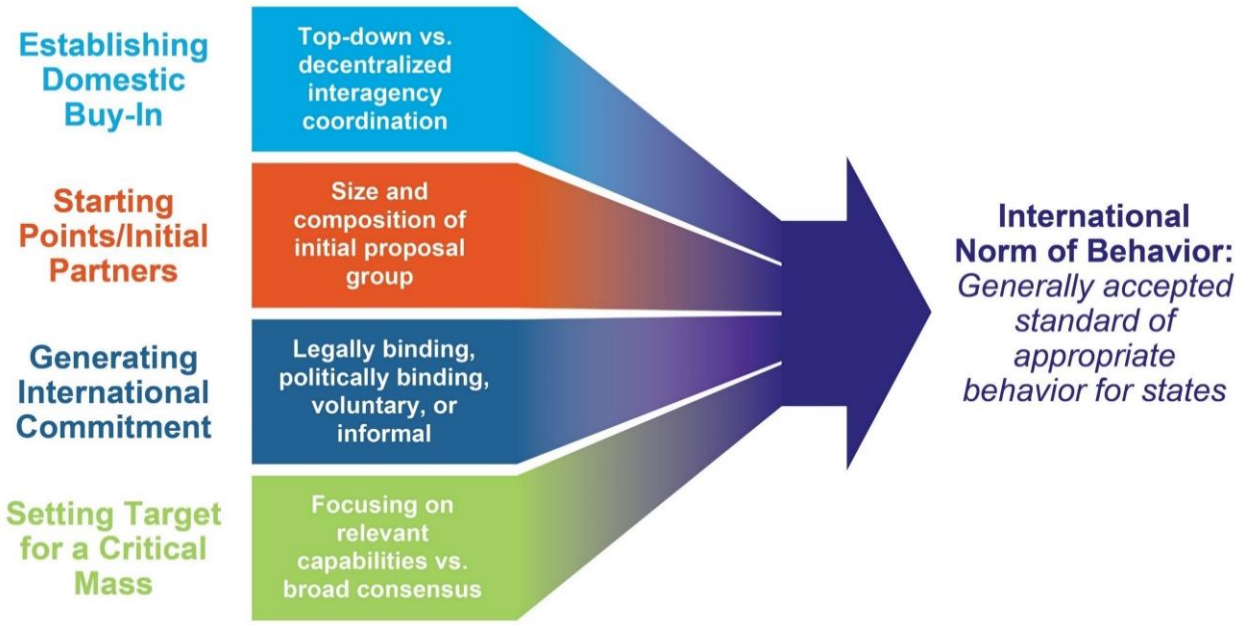

Figure 1: Norm development decision-point framework

policymakers may approach these decisions in different sequences or all at once and no decision should be taken without considering the effects on the others. An analysis of the four decision points provides a norm development structure, including the major tradeoffs involved in choosing between the alternatives at each point, how each point interacts with the others, and what the significant issues and challenges are when applying each point to outer space norms and activities. Furthermore, a review of case studies of past and current space norm efforts through the lens of the four-point framework demonstrates how the framework can be used to compare the decisions and outcomes of norm efforts going forward.

Strategic Decision Point 1: Establishing Domestic Buy-In

Norm leadership requires domestic buy-in. Any government trying to lead international norm development first needs to establish some level of agreement among key domestic actors; namely, those who must authorize commitment to a norm, those who will be affected or constrained by the norm, and those who must publicize the norm and the actions that uphold it. This will affect and be affected by the recognition and support (or lack thereof) of the public. Therefore, policymakers will have to decide early on how they want to navigate intragovernmental coordination as the foundation for establishing domestic buy-in.

The opportunities and tradeoffs in this decision point vary dramatically from country to country because each state has its own unique set of processes, entities, and authorities that will have to be considered. So, although this decision point and the framework as a whole could be applied to any state, this paper focuses on the U.S. perspective on domestic buy-in for the sake of brevity and (relative) simplicity.

The United States faces unique challenges in interagency coordination on space norms because there are so many actors with complementary, competing, or even, at times, contradictory roles and views regarding space activities. These include a civil space agency and a military service dedicated to space as well as a geographic combatant command, two different offices in different bureaus within the Department of State (DOS) with diplomatic responsibilities for space, and multiple agencies regulating everything from launch to remote sensing to spectrum management.[3] As one Government Accountability Office report demonstrated, in 2016 there were over 60 organizations with military space interests or responsibilities within the Department of Defense (DOD).[4] In Congress, there are nine different committees with some sort of direct responsibility over space activities across civil, commercial, and national security issues, plus the foreign relations committees.[5] There are also the countless nongovernmental entities and industry partners, such as commercial satellite operators or companies developing space systems for government contracts, that could affect and would be affected by norms of behavior for space. This means that for any given space norm, the entity negotiating agreements to support the norm, the entity that has to comply with the norm in its space activities, and the entity that incorporates the norm into regulations for other U.S. actors to follow could all belong to different departments or agencies.

Tradeoffs Between Major Alternatives

Three possible models of interagency coordination for developing space norms were commonly discussed across expert interviews and academic literature: top-down national leadership, a designated single-agency lead, or decentralized bottom-up development. The general tradeoff is that leadership from higher levels of authority or

national visibility can bring about a perceived stronger nationwide commitment to a proposed norm and increase international credibility but can add procedural hurdles and layers of debate that stall the effort.

Proponents of a top-down method argued that coordination should come from the Executive Office of the President (EOP) through a body like the National Security Council (NSC) or National Space Council (NSpC), or even with direct presidential involvement. The two main benefits of relying on national leadership are that it can raise attention leading to policy momentum, and it can provide a high-level outlet for coordinating among diverse agencies. The development of a treaty-based norm against testing nuclear weapons in space, which is included as the first of the three case studies discussed later in this paper, demonstrates how President Kennedy's public statements and engagement contributed to strong domestic and international buy-in. The National Space Council can balance across different agencies and stakeholders because, typically, the cabinet-level secretaries of each agency participate or have representation on the council and can present their varying perspectives for discussion.[6] The resulting national space policies, which often reference the goal of developing international norms of behavior, can therefore direct a whole-of-government approach with wide domestic buy-in. However, the generalist perspective inherent in national-level organizations can make it difficult to develop consensus on specific norms, especially those that rely on technical and operational expertise to be feasible. Even the 2020 National Space Policy, compiled by NSpC, does not go into specifics on what norms of behavior for space might look like or what should be prioritized. The policy also does not direct the White House, NSC, or NSpC to lead in space norm development.[7]

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Another option is for a single agency or department, typically the DOS, to act as the designated lead for a whole-of-government norms effort. Senior leaders in the Space Force and U.S. Space Command (USSPACECOM) have publicly stated that "[t]he State Department is lead on all things when we talk about rules and norms of behavior."[8] The deference to DOS has been particularly strong in the national response to United Nations (UN) Resolution 75/36, calling on states to submit opinions on responsible, irresponsible, and threatening behavior in space. Policymakers may be able to develop norm efforts more frequently when focusing on diplomatic leadership instead of national policy bodies. For example, USSPACECOM and NASA both work with DOS to conclude bilateral cooperation and data-sharing agreements. Through this approach USSPACECOM has numerous active government-level SSA data-sharing agreements, and NASA currently has over 700 active agreements around the world.[9] However, relying on one agency or department among many can lead to ambiguous chains of command and lines of authority. Several experts raised the concern that, although other agencies might defer to DOS when it comes to negotiating international agreements, it might be more difficult for DOS to ensure coordination on public statements from senior leaders in other agencies.

Also proposed was the bottom-up approach in which relevant agencies work independently to

develop a plan or set a norm concept and then expand on their proposition within the rest of the government in a more ad hoc manner. This approach raises different challenges in the context of space policy. Space policy issues are often seen as too complex and interrelated across agencies for any one agency to be able to establish a cohesive and successful norm approach on its own. The bottom-up approach is further limited by the fact that no agency except DOS can make binding international agreements without direct interagency coordination. However, the first steps in conceptualizing and developing a norm might be more efficient and suited to unique challenges in space if they are led by experts within a specific agency. Individual agencies already act to promote norms through senior leader statements praising best practices (or criticizing bad behavior) and through public demonstration of updates to rulemaking and licensing processes on activities like remote sensing.[10] Therefore, a bottom-up, individual agency approach might be more appropriate for early conceptualization of norms but then lead to more coordinated effort to garner national acceptance or deconflict with other agencies.

Impacts on Other Decision Points

Building strong, clear domestic buy-in can add crucial credibility when it comes time for policymakers to propose a norm to the rest of the world. For space activities in particular, norms can affect and be affected by so many entities that contradictions or ambiguity on a domestic level can create or exacerbate obstacles on the international level. The type of domestic approach can also affect which mechanisms for developing international agreement or commitment are the most feasible, such as treaties requiring Senate approval versus UN resolutions primarily negotiated by State Department representatives. Therefore, policymakers must consider which approaches for developing domestic buy-in fit best with which types of space norms: some norms may need to go through more agencies or higher levels of authority and coordination than others depending on who they affect, how much they constrain behavior, and how closely they are tied to national security interests.

This decision point is also essential for working through the other points in the framework because it addresses a crucial decisionmaking question: Who decides? By designating leadership and processes for interagency coordination, policymakers can establish clearer lines of responsibility for decisionmaking across all stages of norm development. This is necessary to move from an abstract framework and series of tradeoffs to concrete progress and planning. In the first strategic decision point, the "who decides" question could be answered through a national policy decision, such as a formal designation of a leading agency in a national space policy or a presidential directive. Stakeholders or leaders in different agencies could

Public Support and Congressional Efforts for Domestic Buy-In

Many discussions of space norms have not garnered widespread public attention outside of the space community since the effects of different behaviors in space are often difficult for the public to directly observe. In future efforts, however, strong positive public views toward certain space norms could help build attention and urgency, or strong negative views could pressure policymakers to stall the development of norms. Between these extremes, it will be much more difficult to anticipate or measure the effects of public opinion on norm development, so a more direct proxy for examining public opinion may be to observe debates on the subject in Congress, where members are directly elected and highly public-facing. Both congressional efforts and publicly presented activities by executive branch agencies help to span the gap between intragovernmental efforts and broader domestic buy-in.

also indicate which bodies or authorities they are looking to for leadership, as has been done in USSPACECOM's public backing of DOS norm efforts. If no organization steps up or is designated to lead, the decentralized approach might be "chosen" by default. The more clarity that comes out of this first decision point, the more efficiently decisionmaking responsibilities can be assigned for the other strategic decision points.

Strategic Decision Point 2: Selecting Initial International Partners

The second decision point taps into a widespread debate among experts and policymakers interested in international norms of behavior for space: Where and with whom should initial international discussions on norm development begin? As norm developers get their own house in order, they will also have to consider the best ways to start socializing the norm proposal with other states.

The challenge inherent in this decision point is the question of what it actually means to be the "best" starting point for international negotiations. Is it the point that most quickly generates attention and support? Is it the point that makes it easier in the long-term to bring on more reluctant states? Is it the point where the original text or specifications of the proposed norm are likely to survive negotiations or disputes? Adjectives like *quick*, *easy*, *efficient*, and *enduring* could all be applied, and different approaches will result in different strengths and weaknesses.

International norms of behavior for space are discussed in a wide range of venues. The UN divides space discussions topically, with the Conference on Disarmament (CD) focusing on space security and weaponization issues, while the Committee on the Peaceful Uses of Outer Space (COPUOS) focuses on promoting civil and commercial space activities. These committees are relatively large, with 65 and 95 member states, respectively.[11] There are also slightly smaller and non-UN groups like the Inter-Agency Space Debris Coordination Committee (IADC), which currently comprises 13 different civil space agencies.[12] Many space discussions, however, occur outside of these multilateral fora. Of the 446 space-related agreements in the UN Treaty Registry, 412 (92 percent) are bilateral.[13] So there is precedent for a number of different types, venues, and partners for space-related discussions, and the effectiveness of different "starting point" options for norm development can vary across the type of space issues, level of technicality, and degree of controversy involved in each norm.

Tradeoffs Between Major Alternatives

Policymakers could choose to introduce proposed space norms through unilateral presentations, bi- or plurilateral (small group) discussions, or multilateral negotiations. When it comes to selecting initial partners and venues for introducing international norms of behavior for space, the easiest starting points can lead to obstacles later on if other states feel excluded or feel they do not have a stake in the norm's development.

Unilateral efforts have the benefits of ease and speed. A state can unilaterally express its interests and promote best practices without the political limitations that come through working with partners. A senior leader from a space-focused agency or a national leader like the president could simply announce a list of best practices or describe space behavior considered unacceptable. The downside of starting with this approach is the lack of guarantee that other states will listen to or engage with unilateral declarations. A norm cannot be established without some level of support or buy-in from other states. When discussing international norms of behavior for space in 2020, the assistant secretary of state for International Security and Nonproliferation at the time, Dr. Christopher Ford, stated that the United States did not want to impose a "take-it-or-leave-it" approach and that "You don't

just *declare* norms; you *grow* them."[14] That said, most of the interviewed experts argued that unilateral public statements can supplement other norm efforts at all stages of development, demonstrating U.S. interests and intention to follow specific norms.

Many experts viewed bilateral and plurilateral partnerships as some of the easiest mechanisms for starting international outreach on norms of behavior. One possible advantage is that a small group of like-minded states could collectively strategize and work out the strengths and weaknesses of an approach before it is tested by states with less-established relationships.[15] It can be easier to reach an agreement on the initial concepts or even the text of a proposed norm among a pair or small group of like-minded nations than within multilateral forums, which are often based in consensus-driven organizations. Victoria Samson of the Secure World Foundation, for example, contends that it can be slow and difficult to sit down and negotiate from scratch at the multilateral level if consensus is required because each participant can "veto" the specific wording of an agreement.[16] History has shown the stalling effect that consensus can have on initiatives to develop space norms and agreements. It took almost a decade for UN COPUOS to reach consensus on the "Guidelines for the Long-Term Sustainability of Outer Space Activities" (commonly known as the LTS Guidelines), even though the guidelines are fully voluntary and nonbinding.[17] The UN Conference on Disarmament, another consensus-based body, has spent four decades debating the prevention of an arms race in space with little to show for it.[18]

On the other hand, several experts and officials have expressed concerns that starting with the "easiest" partners can lead to a perception of exclusivity that causes a proposed norm to stall when attempting to expand to broader negotiations. As John Logsdon, George Washington University, argued, "If some space-active countries view themselves as being excluded from the discussion and being presented with a fait accompli, they might oppose norms development."[19] A 2013 UN group of governmental experts on transparency and confidence-building measures for space—including representatives from the U.S., Russia, and China—stated in consensus in the final report that, "measures developed in a multilateral framework are more likely to be adopted by the wider international community."[20]

When it comes to selecting initial partners and venues for introducing international norms of behavior for space, the easiest starting points can lead to obstacles later on if other states feel excluded or feel they do not have a stake in the norm's development.

As the stalled European Union-proposed "Draft International Code of Conduct for Outer Space Activities" demonstrates, the perception of exclusivity can make it extremely difficult to move forward with norm concepts developed among a specific group. Daniel Porras, who served as an in-house expert at the UN for development of norms during debates on the proposed code, described how many states outside the European Union refused to support the code because they saw it as "a regional effort sprung on everyone else."[21] This juxtaposes against the approach to the 2007 UN Debris Mitigation Guidelines—the second case study presented later in the paper—where early negotiations in the multilateral IADC led to broad acceptance of guidelines that are highly reflective of U.S. domestic standards. What starts out as the path of least resistance may create obstacles further down the line if there is not enough sensitivity to the perception of exclusivity.

Including Commercial and Non-State Actors in Norm Development

Although norm development is typically the product of state negotiation, other actors often play a vital role. This dynamic has become increasingly important in the space domain. States must, according to the Outer Space Treaty (OST), provide authorization and continuing supervision for space activities for all entities located in the state, so state decisions involving international norms can have a significant effect on the regulations imposed on commercial and other non-state actors. Commercial actors have significant vested equities in space activities and therefore their actions are increasingly impactful on the space environment. As a result, including input from non-state and commercial actors in norms development can help build greater buy-in and understanding among all the relevant entities. Norms involving issues like space traffic management or after-mission disposal might be practically ineffective if commercial actors do not participate. Regulation can help to domestically enforce norms, but the process will likely be more efficient, equitable, and transparent if commercial actors understand from the beginning the benefits of norm compliance and costs of violation. One example of direct engagement is the Joint Spaceflight Safety Agreement signed between NASA and SpaceX, which included the provision that SpaceX will maneuver its Starlink satellites out of the path of NASA satellites whenever necessary to avoid collision.[22]

As with other norm development cases, widening the participant tent to engage with commercial and non-state entities adds complexity that comes with including actors with different sets of values and interests. Companies are motivated by profits and the potential for market expansion, which influences how they conduct space activities. In most countries, however, commercial entities do not have the same level of sovereign authority or formal representation in intergovernmental organizations, and so it is rarer for them to be able to "veto" an international agreement. Governments can impose requirements or laws on commercial space but will have to balance regulatory and norm compliance with a strong national imperative for a business-friendly environment to allow companies to innovate and compete globally.

Policymakers' decisions in the second strategic point will determine when, during norm development, policymakers will face the challenge of persuading a larger group of less closely aligned states to support the norm. Relatively clear and simple norms might be able to face multilateral, consensus-based forums earlier in the process because they do not necessarily need extensive up-front negotiation on language or technical parameters. Additionally, the more ambiguously a norm is expressed, the easier it may be to get buy-in because stakeholders will not feel overly constrained due to the loopholes implicit in interpretations of ambiguous language. If policymakers are aiming for highly distinct or technically driven norms, they may need to clarify the norms in small group discussions before introducing them for broader debate.

Effects on Other Decision Points

The interagency coordination methods selected in the first decision point can affect which partners are the most feasible or favorable in the second decision point. Individual agencies may have particularly well-established partners, such as DOD's long-term cooperation with security partners like the United Kingdom, Canada, and Australia. While DOS is always participating in various international fora as part of its permanent mission to the UN, the prioritization of different specific committees and entities could be affected by DOS leadership or by priorities passed down by national leaders when they choose to get involved. Finally, some partners may be limited by laws or processes that require decisions on whom to cooperate with to be assigned to Congress or specific executive branch authorities.

For example, if NASA wanted China as a bilateral partner for a norm development endeavor, Congress would first have to revise or waive the Wolf Amendment, which prohibits civil space program cooperation with China.

The "starting point" decision will have particularly significant effects on the fourth decision point: where to put the "finish line" of sufficient international support for a norm. Negotiations started among small, close-knit groups of allies might not be the perfect match for a norm that policymakers hope to be universally observed by allies, adversaries, and unaligned states alike. On the other hand, in parallel to the need to establish domestic buy-in before sharing internationally, international credibility might be damaged if policymakers do not secure buy-in from allies and partners before pushing a norm proposal to other states.

Strategic Decision Point 3: Employing Mechanisms to Establish International Commitment

Policymakers must also decide what mechanisms they will use to establish commitments among international partners and supporters of a norm. Policymakers can have different preferences or beliefs for what constitutes a credible commitment to a norm, which will in turn affect which diplomatic mechanisms are deemed necessary or sufficient. Because norms can impose constraints on behavior, policymakers will need to balance concerns about constraining their own countries' behavior with confidence that other states will reciprocate those constraints.

From the UN to the U.S. Congress, leaders and policymakers disagree over whether space norms should be developed through legally binding treaties, voluntary guidelines, or informal acceptance by individual states. This has been reflected in debates and votes over diplomatic mechanisms such as Russia and China's proposed draft treaty Prevention of Placement of Weapons and Threats in Outer Space (PPWT) or the United Kingdom's UN resolution on developing voluntary measures for identifying threats and irresponsible behavior in space. Treaty opponents argue that legally binding mechanisms are not necessary to ensure appropriate behavior in outer space (or are counterproductive or take too long to negotiate), while treaty proponents argue that voluntary measures are not sufficient.

This debate is particularly challenging due to ambiguities and contradictions over the definitions of key terms like *legally binding* and *treaty*. The 1969 Vienna Convention on the Law of Treaties provides the definition of treaties typically used by bodies like the UN: "an international agreement concluded between States in written form and governed by international law."[23] The United States, on the other hand, constitutionally reserves the term *treaty* for international agreements that have been signed by the president and have received the advice and consent of two-thirds of the Senate (ratification).[24] Some policymakers also distinguish some agreements as *politically binding*; that is, agreements that lack the force of law but still represent a political commitment that could trigger a response if broken.[25] In this decision point, navigating and clarifying terms can be just as challenging as negotiating the agreements themselves.

Tradeoffs Between Major Alternatives

There are significant tradeoffs between the possible approaches to this decision point. More legally binding mechanisms can increase the international credibility of norm commitments, but concerns about constraints, weaknesses, and loopholes can result in major obstacles to forming legally binding agreements relative to politically binding, voluntary, or informal options.

Proponents of legally binding international measures tend to focus on the heightened credibility and longevity of treaties relative to nonbinding agreements. Some international legal scholars claim that agreements including "mechanisms for arbitration, prosecution, or dispute settlement" can help make treaty commitments more credible by increasing the cost of violation.[26] Some experts, observing how much U.S. policy and interest in norms can vary from administration to administration, argue that treaties may help to convince allies and potential partners that adherence to a norm will not be tossed out in the next political cycle.[27] The 1967 Outer Space Treaty (OST) demonstrates this longevity, standing for over 50 years as the foundation for international space law and supporting a number of norms and standards on space activities.

The downsides of treaties are significant, however. Legally binding agreements can be extremely difficult to negotiate because they require such a high threshold of commitment. One pair of scholars indicated that "[e]ssential parties may be unwilling to accept or impose stringent regulations if the prospects for compliance are doubtful."[28] And prospects for compliance can seem particularly doubtful when it comes to space. Due to current limits on space situational awareness and the difficulty of identifying threats from dual-use technologies, it can be challenging to even prove that a norm enshrined in a treaty has been violated. American diplomats and officials often highlight verification challenges to criticize space arms control treaty proposals.[29] Furthermore, experts like Frank Rose, former assistant secretary of state for Arms Control, Verification, and Compliance, indicated a common risk of treaties and binding agreements is that they can quickly become obsolete in the face of rapidly changing space technologies.[30] These obstacles to treaty negotiation indicate that a downside of treaty longevity and credibility can be the risk of rapid treaty obsolescence and infeasibility. There has never been a successful initiative to update, amend, or replace the OST even though key technologies, activities, and actors involved in space have changed significantly. Only four major space treaties were negotiated after OST at the UN level. The most recent treaty, the 1979 Moon Treaty, only has 18 ratifying or accepting states.[31] This decades-long stall in space treaty negotiation drives a common belief that legally binding mechanisms are not feasible for developing norms of behavior for space.

More legally binding mechanisms can increase the international credibility of norm commitments, but concerns about constraints, weaknesses, and loopholes can result in major obstacles to forming legally binding agreements relative to politically binding, voluntary, or informal options.

Alternatively, numerous policymakers and experts support nonbinding, voluntary agreements and guidelines. In a hearing in the U.S. House of Representatives on May 7, 2021, lawmakers and senior leaders from DOS and DOD indicated that nonbinding measures are the primary U.S. approach to developing space norms.[32] Experts and officials discussing this approach explained that their expectations regarding norms were that not all states will obey the norms, but that there would be sufficient consensus on a standard of behavior that violators could be identified and face consequences.[33] Norms scholar Ann Florini contended that, "norms are obeyed not because they are enforced, but because they are seen as legitimate."[34] Decisionmakers leaning toward nonbinding or voluntary agreements could then distinguish between different mechanisms such as UN General Assembly resolutions or COPUOS guidelines by how widely these mechanisms would be accepted as "legitimate."

Although these types of agreements may be easier to negotiate than treaties because they do not require such high commitment, there is in turn less incentive to actually implement the guidelines. This has been demonstrated by the lackluster follow-through on voluntary norm development efforts such as the Space Debris Mitigation Guidelines, the LTS Guidelines, and the 2013 Group of Governmental Experts (GGE) on transparency and confidence-building measures for outer space.[35] The fact that UN General Assembly or First Committee[†] resolutions are not particularly binding and are considered and agreed to by the hundreds every year may result in these resolutions having relatively diluted political effects.[36] The typical lack of formal enforcement mechanisms could also mean that the cost of bad behavior is not high enough to deter states opposed to a norm. Several lawmakers in the May 7, 2021, House of Representatives hearing raised concerns that norms would be useless without enforcement mechanisms.[37]

Legally binding treaties and nonbinding guidelines are not the only options to develop commitment to norms. One option is to focus on specific partnership and program cooperation agreements like the NASA-led Artemis Accords for cooperation on civil space and moon exploration, the intergovernmental agreement regulating cooperation on the International Space Station, and DOD's space situational awareness (SSA) data-sharing agreements. Each of these agreements provides positive incentives for behaving responsibly, such as receiving valuable data on the location of hazards in orbit or the prestige of participating in an international program to send humans back to the moon. The tradeoff and potential downside to this approach is that, because the incentives in partnership agreements are often so specific and tailored in terms of scope, participating states, and timing, there may be a number of norms that are too disconnected from feasible incentives to be established in this manner.

Finally, norms of behavior could develop without any formal codification or agreements. The responses of individual states to threatening or irresponsible behavior could be a measure of support for an uncodified norm. If many actors protest an action—as occurred in the third case study of this paper, the public condemnation of a debris-producing anti-satellite (ASAT) test conducted by China in 2007—there might be an unwritten general agreement that such behavior is unacceptable. Lieutenant General Chance Saltzman, U.S. Space Force deputy chief of Space Operations for Operations, Cyber, and Nuclear, argued that public ad hoc responses can increase compliance because "all of a sudden the rotten apple sticks out."[38] Of course, this kind of hands-off approach to norm development makes it difficult to tell what the exact norm is and how well it is being followed.

Many possible tools could be used to codify or establish commitment to a norm of behavior for space, and many policymakers have already taken a stance on which approaches are best. It may be worth considering, however, that different types of space norms may pair best with different diplomatic mechanisms. There has been much more success in reaching voluntary, nonbinding agreements on space safety and sustainability issues than there has been for space security issues, which may relate to a higher demand for enforcement mechanisms if states are to commit to high-stakes security agreements. Highly specific norms, such as best

[†] In addition to UN organizations like COPUOS and CD, there are six main committees of the UN General Assembly. The First Committee deals with disarmament and international security, so space security debates tend to fall under this committee. Other space issues typically fall under the Fourth Committee, which is titled "Special Political and Decolonization," but includes international cooperation in the peaceful uses of outer space as a main topic.

practices for space system interoperability, may be more easily established through program and partnership agreements highlighting subject-matter expertise. Norms that can be generalized or easily observed, like a norm against destroying satellites on orbit, might be feasibly developed simply by ad hoc responses and outcry anytime a state conducts or threatens to conduct this behavior. The various tradeoffs between these mechanisms indicate that there is no "one-size-fits-all" solution for establishing commitment to a norm.

Effects on Other Decision Points

As negotiations raise or lower the level of commitment that would be established in a norm-developing agreement, domestic buy-in may need to be adjusted or reestablished to fit the mechanism and fulfill legal or political requirements. This refers back to the "Who decides?" question discussed in the first strategic point. Different levels of commitment require different domestic authorities, so a decentralized agency-led approach selected in the first point may make it more difficult to bring in Congress, the president, and other national leadership if the treaty approach is selected in the third point.

Furthermore, some types of agreements are naturally more inclusive than others or are more significantly affected by the addition of more parties to a negotiation. Partnership and program cooperation agreements lend themselves more to bi- or plurilateral negotiations because they are so contextual and specific, whereas UN resolutions naturally involve a wide range of states due to the universal scope of UN membership. So, just as decision points 2 and 4 focus on the "who" of norm development—that is, which countries to start negotiating with and which are needed to cross the "finish-line" of norm adoption—the "how" emphasized in point 3 will play out differently with different negotiating partners and vice versa. This decision point also speaks directly to the end goal of norm development: Are policymakers aiming to establish a firm, unbreakable commitment to follow a norm, or are they simply looking for everyone to recognize that the norm exists?

Strategic Decision Point 4: Setting a Target for a Critical Mass of Support

The final crucial point for strategic tradeoffs in this analysis is setting a target at which a proposal would be considered a generally accepted norm. Although this decision point may not come up explicitly in many discussions on norm development, policymakers cannot take a strategic approach if they do not have a sense of end goals. At what level of international support can we call a proposed standard of behavior a norm? Which specific states, groups of states, or overall number of supporters should policymakers consider necessary to constitute a "general agreement" that will keep a norm going into the future? This decision point does not constitute the end of the story in norm development—norms develop, shift, and change over time, even after they are created, and "general agreement" might not always translate to implementation. However, setting a target for support is necessary to measure progress and adjust approaches along the way.

Definitions of norms, including the one used for this analysis, tend to be vague on what constitutes the level of agreement needed to consider a standard of behavior as a norm. One useful concept is the notion of a "critical mass" of states described in Martha Finnemore and Kathryn Sikkink's "International Norm Dynamics and Political Change." Finnemore and Sikkink describe the critical mass of states supporting a norm as producing a "tipping point" where other states begin supporting or adhering to norm without significant effort by norm entrepreneurs who have been actively promoting it.[39] Experts and policymakers have not come to a consensus on what level of buy-in constitutes a critical mass, both because it is difficult to study

quantitatively and because each norm may be different. Finnemore and Sikkink noted that empirical studies indicate norm tipping "rarely occurs before one-third of the total states in the system adopt the norm," but reflected that buy-in from different states can have different effects on overall norm support.[40]

Tradeoffs Between Major Alternatives

Experts and officials interviewed for this paper fit into two schools of thought on what would constitute a critical mass for space norms: those who believe norms of behavior need to be established through consensus among nearly all states, and those who believe norms can be sufficiently established through agreement by the actors with the capabilities relevant to the norm. Varying approaches tend to have the following tradeoffs: A smaller target number of states to buy in to the norm can help avoid short-term diplomatic obstacles but may weaken international support in the long run.

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Nearly all states make some use of space services like navigation, communications, and weather monitoring even if those services are bought from other states or commercial actors. Additionally, the behavior of one actor in space can affect all others through orbital debris. Therefore, all states could feel as though they have a stake in space norms and may act to support or oppose norms based on their effects on state interests. Daniel Porras argued that "eventually everyone will have space capabilities and interests, so for some things, like space traffic management, you need buy-in from everyone and can't isolate to the few most capable actors."[41]

However, the current state of space activities could also be used to support the argument for a more selective critical mass because of the large variance in state space capabilities. While over 70 states own or operate at least one satellite, only 9 countries and the European Space Agency possess their own space launch capabilities, and just a handful of countries have demonstrated kinetic ASAT capabilities.[42] If the states with relevant capabilities buy in, other states may be more likely to follow suit or at least not actively oppose the norm. Some experts even indicated that only support from Russia and China may be needed to establish a critical mass for norms involving some of the most advanced capabilities.[43]

The downside of using a small critical mass to establish norms on selective capabilities is that the proliferation of those capabilities beyond the critical mass can outpace or undermine the process of encouraging the rest of the world to follow along. The exclusion of states that later develop relevant capabilities could lead to those states not accepting a stake in the norm or to establishing their own set of behaviors to compete with the existing norm.

A more universal critical mass may add obstacles to the path of developing a norm by pushing the "finish line" farther away. This is because it would require agreement not only from allies, partners, and like-minded nations, but also from non-aligned states, states with limited active space capabilities, or even potential adversaries or competitors. Each state brings its own capabilities, subject matter expertise, and concerns about constraints on behavior into norms negotiations, so even states that are currently less active in space can add complexity and substance to the debate. On the other hand, highly inclusive critical mass groups could aid in the longevity of the norm as states gain new capabilities that make their support and compliance more significant. Even though only three states had

developed successful space launch capabilities before the OST was established, 90 states signed the treaty in 1967, setting up an inclusive foundation so that well over a hundred states have signed, ratified, or acceded to the treaty today.[44]

Effects on Other Decision Points

Although the fourth strategic decision point focuses on the "end" of initial norm development, the questions and alternatives raised must be considered from the very beginning. If policymakers decide which supporters they need for a norm in order to consider it "generally accepted," they can have a better sense of who to start with and which mechanisms to use to get there. If all that matters in the end is swaying Russia and China, it might not make sense to start in a large, consensus-based international forum. If a majority of actors with interests or activities in space need to indicate support, policymakers may need to consider which actors at the domestic level can present the norm with an appeal to the widest audience. Even if the bulk of the effects of each strategic decision point can be observed in a roughly chronological order, they are actually interwoven together and effects can cycle across all four interchangeably, so all must be considered up front.

Applying the Norm Development Framework to Case Studies

Now that the proposed decisionmaking framework has been described, it can be applied across past and present cases of space norm development. Applying the norm development framework to case studies demonstrates some of the complex dynamics and tradeoffs as they occurred and can provide insight into some of the major norm efforts today, such as the Artemis Accords and responses to the UK-proposed UN Resolution 75/36. The three cases used here and the decisions made at each of the four points are listed in Table 1.

No Placement or Testing of Nuclear Weapons in Space

The first example of space norm development that can be examined through the lens of the decision point framework is one of the oldest: the norm against deploying or testing nuclear weapons in space. Discussions between the United States and the Soviet Union on some form of nuclear testing restrictions began in the 1950s without significant progress. The push for a norm against testing in space gained momentum after the Cuban Missile Crisis and the Starfish Prime nuclear test in low

Table 1: Decision Points for Three Space Norm Case Studies

Example	Domestic Buy-In	Initial Partners	Commitment Mechanism	Critical Mass
No nuclear testing/ placement in space	National-level interest and involvement	Bi-/Trilateral negotiations	Treaties (legally binding)	Focus on states with the relevant capabilities
Orbital debris mitigation guidelines	Agency-led, nationally adopted	Unilateral proposal, multilateral forum	Voluntary, non-legally binding	General consensus
Norm against debris-producing ASAT tests	Largely decentralized	Unilateral statements/ responses	Informal, ad hoc, uncodified	Extra scrutiny on states with the capability

Earth orbit (LEO), which damaged or destroyed a third of satellites on orbit.

The choices made at the four decision points were:

1. **Domestic Buy-In:** Development of this norm featured high-level interest and involvement from the president and Congress. President Kennedy himself announced the new round of arms control negotiations with the Soviet Union at his commencement address at American University on June 10, 1963, and a month later announced that the negotiations would result in a treaty.[45]

2. **Initial Partners:** Negotiations commenced between the United States and only two other states: the United Kingdom and the Soviet Union.

3. **Commitment Mechanism:** The targeted product of these trilateral negotiations was the legally binding Limited Test Ban Treaty of 1963.[46] The treaty prohibited nuclear weapons tests in the atmosphere, outer space, or under water.[47] Although there had been years of stalemated prior discussions, the final agreement on the ban only took 12 days to negotiate.[48]

4. **Critical Mass:** Due to the limited proliferation of nuclear and missile technologies at the time (only the United States and the Soviet Union had launched objects into orbit and Britain and France were the only states beside the Cold War superpowers to have tested nuclear weapons), the norm established in the treaty effectively worked on a global level with a very small critical mass.[49]

Current Status, Strengths, and Weaknesses: The norm against testing nuclear weapons in space has held for nearly 60 years, even with states beyond the initial critical mass gaining relevant capabilities.[50] The weight of Soviet and American support for the norm allowed it to expand relatively easily through the 1967 Outer Space Treaty, which further prohibited the placement of nuclear weapons and other weapons of mass destruction in outer space.[51]

The third strategic decision point, selecting a mechanism for generating international commitment, was not taken for granted at the time. One declassified memorandum to President Kennedy from his Adviser on Disarmament, John McCloy, highlighted numerous arguments being made over the strategic decision to pursue an arms control treaty. McCloy expressed concerns about "an inhibiting effect which the agreement might have on some areas of weapons development which may be more important to the U.S. than to the U.S.S.R.," but argued that it would "provide an opportunity for joint U.S.–U.S.S.R. cooperation in the exploration of outer space" and help reduce the possibility of a nuclear catastrophe.[52] The president and secretary of state met frequently with the Joint Chiefs of Staff (JCS) before, during, and after negotiation of the treaty in order to respond to JCS concerns about using a legally binding commitment, so clear support and engagement by national leadership played a significant role in establishing domestic and international buy-in to the norm.[53]

Although some of the longevity of this norm may be attributed to the legally binding treaties, it also benefits from being particularly easy to verify—at least in LEO it would be hard to "hide" a nuclear detonation in space. There is also wide recognition that the effects of violation of this norm would be catastrophic and indiscriminate, as demonstrated by the Starfish Prime Test, which provided high-stakes motivation for national leaders to get involved and act quickly. This case shows the entanglement between the subject matter of a norm and the strategic decision points regarding domestic buy-in and mechanisms of commitment. The high public pressure to reduce the nuclear threat and ease of verification made it relatively easy and urgent to

negotiate a legally binding treaty, which in turn necessitated the Senate's approval and the president's signature.

So, in 1963 the conditions were particularly apt for establishing a norm against testing nuclear weapons in space through a legally binding treaty, conditions which may not exist for space norms in today's political environment. The United States and Russia are still among the most significant space actors, but agreement between the two states alone would likely not be enough to reach a critical mass for most space norms. Although certain space issues have raised some level of public concern—the uncontrolled deorbiting of a Chinese rocket stage in May 2021 was featured in national news for a week—nothing has generated as much attention and fear regarding irresponsible behavior in outer space the way the Cuban Missile Crisis heightened fear of nuclear weapons. Also, many of the systems or behaviors considered for possible restriction under a norm would be more difficult to verify than a prohibition on nuclear detonations in space. This indicates that the norm approach from this case study may be extremely difficult to replicate today.

Orbital Debris Mitigation Guidelines

The development process of the "Space Debris Mitigation Guidelines of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)" provides an example of agency leadership in multilateral forums building toward widely accepted voluntary, non-legally binding best practices. Throughout the 1990s, spacefaring nations and space-focused multilateral organizations paid increasing attention to the possible hazards involved in the proliferation of orbital debris. The United States developed its own set of best practices "to limit the generation of new, long-lived debris by the control of debris released during normal operations, minimizing debris generated by accidental explosions, the selection of safe flight profile and operational configuration to minimize accidental collisions, and postmission disposal of space structures."[54]

The U.S. approach to turning these domestic practices into international norms on debris mitigation fits into the four-point framework as such:

1. **Domestic Buy-In:** NASA and DOD collaborated in the late 1990s to develop guidelines for orbital debris mitigation, which were then adopted by the NSC as the "U.S. Government Orbital Debris Mitigation Standard Practices" (USG ODMSP) in 2000.[55] NASA then took the lead on introducing and socializing the guidelines internationally.

2. **Initial Partners:** NASA proposed the unilaterally developed guidelines for consideration in the multilateral Inter-Agency Space Debris Coordination Committee (IADC), which consists of 13 national space agencies from around the world.[56] Several opportunities arose for interested states to be involved in the negotiating process as the proposal moved from the IADC to the larger COPUOS.[57]

3. **Commitment Mechanism:** Both IADC and COPUOS negotiations aimed at creating voluntary, nonbinding guidelines to serve as best practices that states and other space actors could choose to follow. The text of the guidelines states: "Member States and international organizations should voluntarily take measures, through national mechanisms or through their own applicable mechanisms, to ensure that these guidelines are implemented, to the greatest extent feasible, through space debris mitigation practices and procedures."[58]

4. **Critical Mass:** COPUOS and then the UN General Assembly both endorsed the guidelines in 2007, indicating broad support among the majority of UN member states.[59]

Current Status, Strengths, and Weaknesses: The six-year international development of the guidelines was certainly not rapid, but it does present a successful example of expanding from a unilaterally developed standard to an internationally accepted set of voluntary guidelines. This approach demonstrates the coordination of the strategic decision points for domestic buy-in and initial international partners. Although DOD and NASA worked together on the original U.S. guidelines, NASA served as the public- and international-facing promoter, using a multilateral forum specifically designated for civil space agencies. This civil space multilateral approach may have helped ease perceptions of the United States unilaterally imposing guidelines on other states. The United States, following a similar process of NASA–DOD collaboration followed by NSC adoption, updated the USG ODMSP in 2019, but the changes have not yet been incorporated into the international guidelines.

However, the broad agreement to the guidelines on paper has not translated to full implementation or compliance with the relevant norms, perhaps due to the low level of commitment involved in setting the guidelines. Compliance rates have been particularly poor for the recommendation in the guidelines to deorbit LEO satellites after the end of their mission to limit long-term presence.[60] Although the percentage of payloads left in LEO more than 25 years after the end of their missions declined from around 60 percent to just over 20 percent from 2000 to 2018, the overall mass of payloads left in orbit longer than 25 years has consistently hovered around 40percent.[61] There is a natural lag in implementing this guideline because of the long lead times for developing, deploying, and operating satellites. However, some experts and operators argue that there still are insufficient incentives to accept the costs involved in voluntarily complying with the norm for new satellites.

This shows that the multilateral starting point and voluntary nature of the guidelines helped establish broad international support relatively quickly but did not pair with strong commitments to comply with the norm. One telling metric for the future of this norm will be the degree to which other states incorporate the guidelines into their domestic laws, policies, and best practices.

Debris-Producing ASAT Tests

The international reaction to the 2007 Chinese ASAT test demonstrates how uncodified, informal norms might be developed through ad hoc responses to behavior perceived as unacceptable. During this test, China destroyed its own defunct weather satellite using a ground-based missile and created over 3,000 pieces of long-lived orbital debris. Whereas the numerous ASAT tests during the Cold War did not generate significant public outcry or opposition, the slew of condemnations and criticisms of China's behavior in 2007 indicates there may be an emerging norm against destructive ASAT tests that produce long-lived orbital debris.

While some decisions are less explicit in the development of this potential norm than with the other examples due to the ad hoc appearance of many responses, many elements can still be analyzed through the lens of the four-point framework:

1. **Domestic Buy-In:** In the United States, officials from the White House, NSC, DOS, and DOD were all publicly involved in monitoring, reporting on, or condemning the test.[62] This shows both interest from national leadership and some bottom-up technical efforts to demonstrate why the behavior was irresponsible.

2. **Initial Partners:** National leaders from many countries officially condemned the test in unilateral statements, including the United

States, Japan, Canada, Australia, South Korea, India, and even Russia.[63] The test is still referenced often in reports and public debates on irresponsible behavior in space.

3. **Commitment Mechanism:** Because states responded mostly through ad hoc unilateral statements, the potential norm tied to the impression that the 2007 test was irresponsible has not been codified in a written agreement. However, some observers are calling for negotiations to begin on a more explicit agreement or a binding destructive ASAT test ban.[64]

4. **Critical Mass:** Although there has not been much discussion on what would constitute a "critical mass" for this norm, only a few states possess demonstrated or presumptive kinetic ASAT capabilities, so those states have received the most scrutiny. However, a wider range of states without capabilities have voiced support for a norm against debris-producing tests.

Current Status, Strengths, and Weaknesses: Neither China nor any other state has tested a kinetic-kill ASAT weapon without efforts to mitigate debris since China's 2007 test.[65] Although the United States and India have both used kinetic systems to destroy one of their own satellites, both events occurred at much lower altitudes and therefore did not produce long-lived orbital debris since debris quickly reentered the atmosphere. The relative lack of strong international condemnation of these two events helps to show that the norm may only apply to tests that produce long-lived debris, but the overall ambiguity continues to be a concern. China and Russia have both tested kinetic ASAT weapons but avoided testing them directly against satellites.[66] In 2016, Mallory Stewart, then-deputy assistant secretary of state for emerging security challenges and defense policy, discussed this debris-generation avoidance and said, "At the State Department, we like to attribute that to the huge international outcry" to the 2007 test.[67]

However, it is difficult to say whether this emerging norm will prevent destructive high-altitude ASAT tests in the future, or whether the change in behavior is driven by the norm itself or China's recognition of the debris threat posed to its own satellites by testing. This ambiguity is a common challenge for evaluating any activity aimed to deter certain behaviors but particularly potent in the absence of any formal agreements or coordination.

Another challenge involved in the lack of codification and formal agreement of this potential norm is that many experts and leaders do not yet consider it to be an established norm. In response to the UN Resolution 75/36, over 75 percent of the state submissions referenced kinetic destruction of satellites or ASAT tests producing long-lived debris as irresponsible or threatening behavior.[68] This may indicate significant interest in a future written agreement establishing a norm against debris-producing ASAT tests, though disagreement continues over whether the norm should be a legal prohibition or a voluntary guideline.

Conclusion

These three case studies demonstrate that even a small sample of space norm development efforts can feature a wide range of approaches across the four strategic decision points. Further research would be needed to do a deeper examination of how debates among policymakers over these decision points have played out across different norm efforts. Even when debate over the four decision points is not visible to the public, or even if there are cases where the decision is not explicitly debated at all, the diversity in approaches for different elements of norm development shows that there are choices to be made. And often the choices made in one decision point have a strong effect on choices made in another.

This framework and the tradeoffs it presents can make a significant contribution to the ongoing discussion on U.S. leadership in developing international norms of behavior for outer space, especially for specific ongoing efforts like the Artemis Accords and the response to UN resolution 75/36. It is not enough to argue whether we need norms for space or what those norms should be; any state pursuing a goal of establishing a broadly accepted standard of behavior for space will need to dig deeper to clarify both the long-term aims and the short- and medium-term steps necessary to achieve those aims. Policymakers will need to ask questions such as:

- How do we demonstrate our own conceptualization and commitment to a norm?
- Who should we work with first in international norm development, and who should we aim to include before we can consider our effort a success?
- What level and credibility of commitment do we need from other states in order to feel confident that our own commitment will be worthwhile?

Space may be a vacuum, but space diplomacy is not. If the United States does not lead in developing international norms of behavior for space, someone else will. Although many experts and policymakers argue that the existing norms for space are not comprehensive or robust enough to ensure a safe, stable, secure, and sustainable domain in the future, the myriad past and present efforts to develop space norms provide crucial context for forward-looking strategy. Policymakers will need to combine an understanding of the existing space norms environment with this new framework for analyzing critical decisions during the norm development journey. Only by navigating the diverse strengths, weaknesses, and tradeoffs that vary for any space norm can policymakers tailor strategies to achieve national policy goals.

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