

CENTER FOR SPACE POLICY AND STRATEGY

SEPTEMBER 2020

The Rise and Fall of Space Sanctuary in U.S. Policy

ROBIN DICKEY
THE AEROSPACE CORPORATION

ROBIN DICKEY

Robin Dickey is a space policy and strategy analyst at The Aerospace Corporation's Center for Space Policy and Strategy, focusing on national security space. Her prior experience includes risk analysis, legislative affairs, and international development. She earned her bachelor's and master's degrees in international studies at Johns Hopkins University.

ABOUT THE CENTER FOR SPACE POLICY AND STRATEGY

The Center for Space Policy and Strategy is dedicated to shaping the future by providing nonpartisan research and strategic analysis to decisionmakers. The center is part of The Aerospace Corporation, a nonprofit organization that advises the government on complex space enterprise and systems engineering problems.

The views expressed in this publication are solely those of the author(s), and do not necessarily reflect those of The Aerospace Corporation, its management, or its customers.

Contact us at www.aerospace.org/policy or policy@aero.org

Summary

In the U.S. national security space policy debate, there has been a dichotomy between a “sanctuary” space policy and a “contested” space policy, where policymakers have chosen between preventing conflict in space by delegitimizing attacks on satellites on the one hand and preparing for conflict through warfighting doctrines and weapons systems on the other. The history of this dichotomy is nuanced and often difficult to decipher. Some administrations pursued a sanctuary policy but also developed anti-satellite (ASAT) weapons. Others supplemented a contested space policy with some pursuit of space arms control. However, when looking at the balance of priorities and tradeoffs at the highest levels of national policy, it becomes clear that, since 1976, a policy of treating space as a sanctuary has been consistently rejected. This paper discusses how sanctuary policy developed in the early Space Age and how it was replaced by a contested space policy, providing historical context for today’s space policy debates.

Introduction

In recent years, a consensus has risen that the space domain is congested, contested, and competitive. From national security strategy documents to congressional testimony to academic papers and think tank reports, discussion of the threats to vulnerable space assets has increasingly become a central facet of space policy thinking. Some observers argue that contested space is a relatively new phenomenon, that space was until recently viewed as a “sanctuary” from the violent conflicts seen in other domains, and that this perception overly influenced how we approached space for military purposes. The rhetoric that space is no longer a sanctuary permeates space policy and strategy discussions all the way to the civilian and military leadership of the U.S. national security space enterprise. But this rhetoric understates how

long official U.S. policy has been concerned with contested space.

Ever since the Space Age began in the 1950s, U.S. policymakers have debated policy options on how to approach the space domain. Treating space as a sanctuary was one of those policy options, and the concept played a central role in national space policy from 1957 to 1976. In 1976, however, U.S. policy turned to treatment of space as a contested domain. Although there have been highs and lows in how far each administration has gone in promoting a contested space policy, every major space policy since 1976 has reaffirmed the decision not to treat space as a sanctuary.

This paper explores the history of sanctuary as a policy, its proponents and opponents, and how the

policy rose in the early Space Age only to fall much earlier than commonly understood to a policy calling for a contested approach to space. Since the 1970s, decisionmakers at the highest levels of national security space policy have consistently called for the United States to deter and defend against attacks on space assets and improve satellite survivability. This insight does not judge the state of today's space architectures, but it does demonstrate a greater national policy consistency of rejecting sanctuary than is often recognized today.

Understanding the decisions that the United States faces today requires understanding the decisions of the past. This analysis provides context for today's debates on threats and vulnerability in the space domain by tracing the historical trends and continuities in these debates back to their origins.

Methodology and Terms

This paper examines U.S. policy for whether it sought to treat space as a sanctuary or as contested by looking at four distinct eras from both a senior- and a service-level perspective.

The term *sanctuary* as it applies to space has meant many things. It has been referred to as a characteristic of the space domain, a historical perception, an assumption, a doctrine, a myth, a strategy, and a "school of thought." Although definitions commonly stress the relative peace and safety of space, there is no consensus on *who* is safe from *what*. Sanctuary to some has implied that all actors in space have guaranteed freedom of movement for any peaceful activities, while others use sanctuary purely in the context of freedom of movement for the United States as the dominant space power. Sanctuary is often tied up in the terminology of "militarization" (placing or operating military systems in space or using space assets for military purposes) versus "weaponization" (developing or deploying weapons that operate in, from, to, or through space) with sanctuary requiring the absence of the former, the

latter, or both depending on how stringent the definition is. Does space sanctuary mean "weapons-free," "conflict-free," or simply "strategically stable"? The answer can be all or none of the above, depending on who is asked. *There is no consensus or dominant definition for space sanctuary today.*

One definition played a significant role in shaping the debate. Robert Lupton published his book, *On Space Warfare*, in 1988, highlighting sanctuary as one of four "doctrines" for national security space, namely as "the official doctrine since the Eisenhower administration."¹ As the most thorough discussion of space sanctuary in circulation at the time, Lupton described the doctrine in terms of space surveillance systems making nuclear wars less likely due to their central functions in deterrence and as national technical means of treaty verification.² Although, as this paper shows, Lupton mischaracterized the timing and nature of the formal policy shift by placing it in the mid-1980s, partially because the many classified elements of space policy obscured his ability to discuss it publicly. Lupton's framework of approaching sanctuary in terms of decisions and efforts instead of assumptions or characteristics makes it a valuable tool for studying the history of space sanctuary as a policy.

This paper largely follows Lupton's use of the term. It uses *sanctuary* to refer to whether U.S. efforts sought to make space a sanctuary by protecting space assets through political, diplomatic, and strategic methods of preventing or avoiding conflict. A policy of space sanctuary includes the pursuit of bans on developing and testing "space weapons"—weapons based in space or weapons that can be used against space assets—but focuses primarily on efforts to delegitimize past or future use of such weapons. These efforts involve techniques such as developing terminology that drives legal and normative acceptance of nonaggressive space activities, hiding the existence of space weapons programs from public notice, and establishing laws and treaties banning interference with key satellites.

Space sanctuary policy will be juxtaposed throughout this paper against “contested space” policy. Contested space policy rejects the notion that space can be kept free from conflict and focuses on deterring, denying, and defending against attacks in space. Contested policy proponents also consider attacks against adversary space assets to be legitimate.

Space policy has more complexity and nuance than the dichotomy shown here; presidents have pursued arms control efforts while subscribing to contested space policy, and some administrations dedicated to treating space as a sanctuary also worried over satellite vulnerability and supported or allowed anti-satellite (ASAT) weapons programs to continue. However, the relative balance between preparing for conflict versus delegitimizing conflict in space can demonstrate the goals, assumptions, and priorities of national security space decisionmakers.

This paper explores this debate between *sanctuary* and *contested* space policies during four eras of the U.S. space program, shown below in Figure 1. These eras encompass numerous administrations and are marked by events that featured strongly in the following space policy debates. The key events are the Soviet Sputnik launch in 1957, the Soviet ASAT tests in 1975 and 1976, the collapse of the Soviet Union and onset of the Gulf War in 1991, and the Chinese ASAT test in 2007. These eras provide the backdrop for exploring the evolution of debates on sanctuary versus contested space policies, as

each administration asked the question of how to protect U.S. activities in the space domain. Although each era comes with several unique characteristics, fundamental continuities persist in the debates, particularly after 1976.

Capturing U.S. policy as a single concept is difficult not least because the U.S. government is made of many actors who rarely have a single approach to problems. To address this difficulty, this paper relies on declassified primary documents from each era for key evidence but also acknowledges these primary documents come from different actors with different roles in the U.S. government. Memoranda from presidents, the National Security Council (NSC), and top civilians and joint staff at the Department of Defense (DOD) comprise a “senior level” for analysis. The second group examined is the “service level,” the civilian and military leadership of the military services, primarily the Air Force. This level partially overlaps with the operational leaders, such as commanders of U.S. Space Command (USSPACECOM), both representing the leaders with a more direct connection to space operations and with direct organizational responsibility for space compared to the national political and broader security scope of senior leadership. Leading stances on space from within the U.S. Congress are also considered as legislators occasionally weighed in on space sanctuary debates through authorizations, appropriations, or bans on certain activities. These primary perspectives, combined with secondary

LAUNCH OF SPUTNIK	SOVIET ASAT TESTING SPREE	USSR COLLAPSE, GULF WAR	CHINESE ASAT TEST
1957	1976	1991	2007
SANCTUARY • Protect NTMs through strategic deterrence and arms control • Develop but de-prioritize ASATs • Service level promotes contested approach	CONTESTED • Space control at service and senior level • Prevent Soviet ASAT monopoly • Pursue operational ASATs and space-based weapons	CONTESTED • Space control remains • No immediate threat perceived • Space excluded from arms control • Emphasis on reversible, flexible ASATs	CONTESTED • “Contested, congested, competitive” consensus • Re-organize military space for warfighting domain

Figure 1: Overview of four eras of space policy.

documents from historians, scholars, and academics, demonstrate the content and context of U.S. government space sanctuary debates, how they have changed, and how they have stayed the same.

Era 1 (1957 to 1976): ‘Open Skies’ and ‘Peaceful Purposes’ in the Top-Down Development of Sanctuary Policy

As the United States rose beyond Earth’s atmosphere for the first time, so too rose a policy of treating space as a sanctuary. This policy was not based on the assumption that space was a peaceful domain and, in fact, the term *sanctuary* was not used though it fits this paper’s definition of a sanctuary policy. Senior-level civilian policymakers chose a sanctuary policy to protect strategic reconnaissance satellites despite the expressed intention of service-level leadership to treat space as a contested domain. The era opens in 1957 with the Soviet Union’s Sputnik launch, runs from the Eisenhower administration through the early years of the Ford administration, and ends in 1976 with the Soviet Union’s successful ASAT tests.

On October 4, 1957, the Soviet Union launched the first manmade satellite to orbit Earth, Sputnik. This event signaled to the Eisenhower administration that the United States had a significant rival in space with capabilities exceeding those of the United States in some areas. This event loomed large in

policy discussions on how to approach the space domain and how to protect U.S. space assets. Also prominent in the policy discussions were the Soviet actions demonstrating threats to reconnaissance in general and satellites in particular, including the May 1960 Soviet shootdown of the U-2 reconnaissance aircraft and public threats issued by Soviet leaders about targeting satellites.³ Figure 2 shows some of the key events of this era.

The Origins of Sanctuary Under Eisenhower

Under the administration of President Dwight D. Eisenhower, sanctuary policy gradually developed as a means of protecting strategic reconnaissance satellites. While leaders at the service level advocated for a contested space policy, Eisenhower and his advisors at the senior level prioritized legal, diplomatic, and normative means of protecting space assets over the development of technical offensive or defensive space capabilities.

Sanctuary policy at the senior level developed in tandem with increasing reliance on strategic reconnaissance in space and concerns about the Soviet threat to reconnaissance satellites. In 1958, an NSC document that was one of, if not the very first, U.S. space policy, argued that Soviet “superiority” in the exploitation of space threatened U.S. security, declaring strategic reconnaissance satellites critical to U.S. national security for their

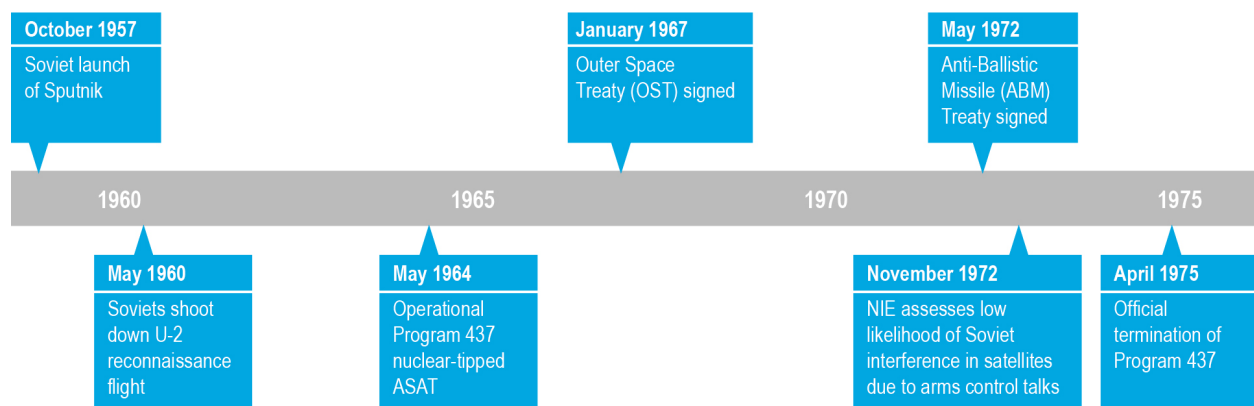


Figure 2: Key events timeline in Era 1.

potential in “policing a system of international armaments control.”⁴ Eisenhower’s emphasis on space-based reconnaissance began years before the launch of Sputnik, tying into the government-wide effort to improve strategic intelligence collection and prevent catastrophic surprise attacks in the aftermath of Pearl Harbor. In November 1954, he secretly prioritized peacetime strategic reconnaissance in national policy, approving construction of the high-altitude U-2 reconnaissance airplane and, upon recommendations of a secret study by MIT president James Killian completed in 1955, expanded considerations of reconnaissance overflight to outer space.⁵ This culminated in the U.S. National Committee for the International Geophysical Year (IGY) formally requesting a scientific satellite project that Eisenhower hoped would set a precedent for peaceful overflight in space.⁶ As the vulnerability of reconnaissance aircraft such as U-2 became clear with the shootdown of Gary Powers in 1960, Eisenhower

increasingly relied on satellites for reconnaissance on the Soviet Union. This dependence led to policy debates on how best to protect these increasingly important assets.

In this first era, Eisenhower and his successors developed a sanctuary policy in pursuit of explicit strategic goals and not because they assumed space was safe from conflict. Documents from the Eisenhower administration indicate that the president and the senior policymakers saw a policy of sanctuary, though not called that at the time, as the best means to protect reconnaissance satellites. In 1955, Eisenhower approved a policy proposed in tandem with the IGY satellite emphasizing the “peaceful purposes” of activities in space with the

intent to establish norms and international law guaranteeing “freedom of space” and “the right of unimpeded overflight.”⁷ This served as an extension of Eisenhower’s “Open Skies” reconnaissance overflight proposal, and the concepts continued even after the Soviets rejected the proposed agreement.⁸ Because reconnaissance satellites observed Soviet territory and watched for indications and warnings of a potential nuclear attack, they played a central role in U.S. estimates of Soviet nuclear capabilities and intentions. This significance was expressed in the original comprehensive space policy memorandum from 1958, NSC 5814/1, where Eisenhower called for the development of an international political framework to place U.S. reconnaissance satellites in both a

political and psychological context favorable to protecting them from interference.⁹

Despite Eisenhower’s dedication to developing a space sanctuary policy, this policy was only one side of a debate on how to treat the space domain. Operational-level and service-level

leadership in the military, particularly in the U.S. Air Force, promoted concepts that would later feature in contested space policy. Unlike Eisenhower, many Air Force leaders considered space as a potential arena for direct warfighting. In 1958, General Thomas Power, commander in chief of Strategic Air Command, argued in favor of developing offensive space weapons as part of the evolutionary pattern of military development, and Air Force Under Secretary MacIntyre claimed that other agencies were wrongly refusing to adopt Air Force beliefs that “control and use of space were closer to reality and, indeed a necessity to achieve.”¹⁰ Although Eisenhower allowed dissenting voices on space policy to continue, he

***Eisenhower and his successors
developed a sanctuary policy in
pursuit of explicit strategic goals
and not because they assumed
space was safe from conflict.***

implemented his preferred policy by taking some space responsibilities from the Air Force and vesting them in new civilian and intelligence agencies. In October 1958, the director of the Advanced Research Projects Agency in the Department of Defense (DOD) requested the Air Force stop using the designation “weapons system” for military satellites in order to “reduce the effectiveness of possible diplomatic protest against peacetime employment” of such satellites.¹¹ The services still looked for paths to contest space within sanctuary constraints placed by Eisenhower. The Air Force’s Air Research and Development Command initiated numerous programs to develop ASAT capabilities starting in 1958; although some were canceled—reportedly due to cost, schedule, or technical issues—this eventually led to the early 1960s operationalization of Program 505, a ground-based ASAT modification of the nuclear-armed Nike Zeus antiballistic missile.¹²

These internal debates indicate that space sanctuary was never the guaranteed or default choice for space policy, even at a time it was being advanced at the highest levels of the U.S. government. Eisenhower and his senior leaders, in pursuit of national-level strategic intelligence goals, effectively sidelined service-level claims that space should be treated as a contested and competitive domain. Sanctuary policy was one option among several, and, when it was chosen over the Air Force’s contested space approach, it remained influential for over a decade after Eisenhower’s term ended.

International Law Versus ASATs: Sanctuary Significance Through Nixon

The next few presidential administrations continued to explore efforts that might have formed a contested space policy but, in the end, formalized a policy of sanctuary to protect reconnaissance satellites as part of a theory of stability in nuclear deterrence.

The administration of President John F. Kennedy, weathering Cold War crises in Berlin and Cuba and observing the Soviet ASAT programs, considered that American ASATs might be needed to ensure U.S. freedom of movement in space and reduce satellite vulnerability.¹³ This contributed to the development and May 1964 operationalization of the Program 437 ASAT, another nuclear-tipped interceptor on a modified Thor missile, followed by the phase-out of Program 505 in 1966.¹⁴ Although President Kennedy and Secretary of Defense McNamara initially supported Program 437, it lost funding priority among DOD programs over time and faced operational limitations such as limited coverage of radar detection systems and an inflexible targeting system.¹⁵

Even while these programs were developed, the Kennedy administration also emphasized cooperative space negotiations and international law for outer space, key aspects of a policy of sanctuary. In July 1962, the Kennedy NSC produced a report devising both legal and technical means for protecting strategic reconnaissance satellite programs.¹⁶ Despite considering technical means, Kennedy administration NSC memoranda on the subject indicate that preserving the legitimacy of satellite reconnaissance remained the central focus.¹⁷ Proposals by the United States to the United Nations (UN) Outer Space Committee’s Legal Subcommittee in Geneva “were carefully framed so as not to affect the U.S. reconnaissance satellite program,” sometimes in direct opposition to Soviet proposals to ban reconnaissance satellites.¹⁸ While not using the term *sanctuary*, the Kennedy administration aimed to set “peaceful” as the opposite of “aggressive” instead of the opposite of “military” so that reconnaissance satellites would be protected by international norms and laws. The Kennedy administration officials claimed that “there was no division between peaceful and nonpeaceful objectives in American policy, since

American military space programs were nonaggressive and were just as peaceful as civilian programs.”¹⁹

These proposals and other negotiations aimed at raising the political price of interfering with reconnaissance satellites and creating a “climate of acceptance” of freedom in space. In contrast, the U.S. ASAT program was deliberately kept as quiet as possible because senior decisionmakers believed it could undermine the main diplomatic efforts to establish space sanctuary.²⁰ As a result, a sanctuary space policy dominated in the Kennedy administration despite both service- and senior-level considerations of ASATs.

The administrations of President Lyndon B. Johnson and President Richard M. Nixon continued to promote peaceful uses of outer space and marginalize ASAT programs. The Johnson administration completed the negotiations on the 1967 Outer Space Treaty, the culmination of nearly a decade of efforts to preserve space for “peaceful activities” while ensuring that “peaceful” included surveillance and other military satellites.²¹ The Nixon administration followed up with the 1972 Anti-Ballistic Missile (ABM) Treaty with the Soviet Union, which included the provision that, “Each Party undertakes not to interfere with the national technical means of verification of the other Party.”²² Although neither the ABM Treaty nor the Strategic Arms Limitation Talks (SALT) that helped develop it explicitly defined National Technical Means (NTM), Director of Central Intelligence Richard Helms claimed that both the United States and the USSR recognized that the term primarily referred to satellite reconnaissance and that the vague terminology was a product of Soviet resistance to explicitly agreeing to anything that could appear as violation of Soviet sovereignty, including satellite overflight.²³ The lasting, widespread recognition of satellites as NTM indicates that, despite this textual ambiguity, it is largely accepted that these agreements provided legal protection for strategic

reconnaissance satellites and codified the connection between interference with reconnaissance satellites and prevention of nuclear war.

The ban on interfering with NTM formed a significant legal protection for strategic reconnaissance satellites as the primary tools to observe Soviet compliance with arms control treaties. An attack on a reconnaissance satellite could therefore be seen as highly destabilizing: interference with a system of strategic observation could be interpreted as the precursor to a nuclear attack and would also represent a serious violation of a marquee treaty. This relationship between reconnaissance satellites and nuclear stability became a key element of sanctuary policy throughout the Cold War and formed the cornerstone of Lupton’s definition of sanctuary doctrine when more public debates about sanctuary began in 1988.²⁴

Although the Nixon administration recognized the potential threat of ongoing Soviet ASAT programs in the late 1960s and early 1970s, the overall atmosphere of détente, the temporary lull in open Soviet ASAT testing, and the progress made in the ABM Treaty and Strategic Arms Limitation Talks pushed concerns over contested space to the background.²⁵ A National Intelligence Estimate (NIE) from November 1972 acknowledged that the Soviets had been conducting a satellite intercept program and were likely capable of non-nuclear attacks on satellites in low Earth orbit but concluded that, “Considering the importance of space reconnaissance to the viability of the Strategic Arms Limitation Talks agreements, we continue to believe it highly unlikely that the Soviets would actively interfere with US satellites.”²⁶ The same combination of awareness of Soviet capabilities with skepticism over an active threat can be seen in a memorandum from Deputy Secretary of State Kenneth Rush to the Acting Secretary of Defense Bill Clements. In the memorandum, Rush refers to

a study of U.S. responses to Soviet anti-satellite activities and agreed that the issue should be studied carefully but argued that actively pursuing an ASAT program could undermine treaties and agreements with the USSR and that a new ASAT program might not be needed on “strictly military grounds.”²⁷ John McLucas, Secretary of the Air Force from 1973 to 1975, professed later to believe in the policy of “maintaining space as a sanctuary from weapons” and claimed to have terminated Program 437 during his tenure because he “did not see a good match between the likelihood of its eventual use and the cost of maintaining it.”²⁸ As a whole, the Nixon administration therefore featured increasing concern over satellite vulnerability but concluded a policy of sanctuary better served U.S. interests than a policy of contested space.

Sanctuary policy guided U.S. space activities from 1957 to 1976, stemming from deliberations on how best to protect U.S. strategic reconnaissance satellites and debates between senior- and service-level perspectives. Most decisionmakers did not assume assets in space were safe from attack, and many agonized over whether negotiations to ensure “peaceful uses” of outer space would be effective at keeping space assets safe. For nearly 20 years, concern about preventing a nuclear surprise attack and desire for legal and normative protection of reconnaissance satellites largely won out over interest in preparing for combat in space and fears of Soviet aggression in the domain. This era of support for a policy of sanctuary only survived while strategic reconnaissance and its role in nuclear stability dominated other potential uses of space, however, and Soviet ASAT development and testing eventually solidified what turned out to be a permanent shift away from a policy of sanctuary.

Era 2 (1976 to 1991): Contested Space Becomes Policy

Policy of space as a sanctuary came to an end in 1976 when a wave of Soviet ASAT threats triggered

a reconsideration of national security space policy. From 1976 to 1991, both senior- and service-level leadership questioned, undermined, and rejected sanctuary policy, often in direct reference to the Soviet threat. Focus shifted to the development of ASATs and other space weapons not only as a modified deterrence strategy to protect satellites, but also in pursuit of offensive capabilities against Soviet space assets.

Between 1976 and 1978, the Soviet Union conducted nine intercept tests in space of the co-orbital, kinetic, *Istrebitel Sputnikov* program: four were considered successful and one demonstrated in 1976 a Soviet capability for a single-orbit intercept of a satellite, allowing for much faster attacks than previously possible.²⁹ The tests therefore showed significant progress toward operationalizing a Soviet ASAT. The pace of testing indicated Soviet interest in developing and using ASATs may be higher than during the Nixon administration, and this event became a touchpoint for arguments that the U.S. must pursue a contested space policy. Figure 3 shows some of the key events of this era.

Transition to a Contested Space Policy

Considering the Soviet threat demonstrated by the ASAT tests, U.S. policy explicitly switched to treating space as a contested domain rather than seeking to preserve it as a sanctuary. A series of memorandums from Brent Scowcroft in 1976 and 1977 triggered by new analyses of Soviet ASAT capabilities demonstrates the rejection of a sanctuary policy. In April 1976, Scowcroft wrote in a memorandum on the Soviet anti-satellite capability that the U.S. needed to “reexamine our posture in space and the vulnerability of our space assets.”³⁰ In a July 1976 National Security Decision Memorandum 333, Scowcroft indicated that, although President Gerald R. Ford still emphasized the use of international treaty obligations to foster the free use of space for U.S. satellites, concerns on the vulnerability of those satellites necessitated new

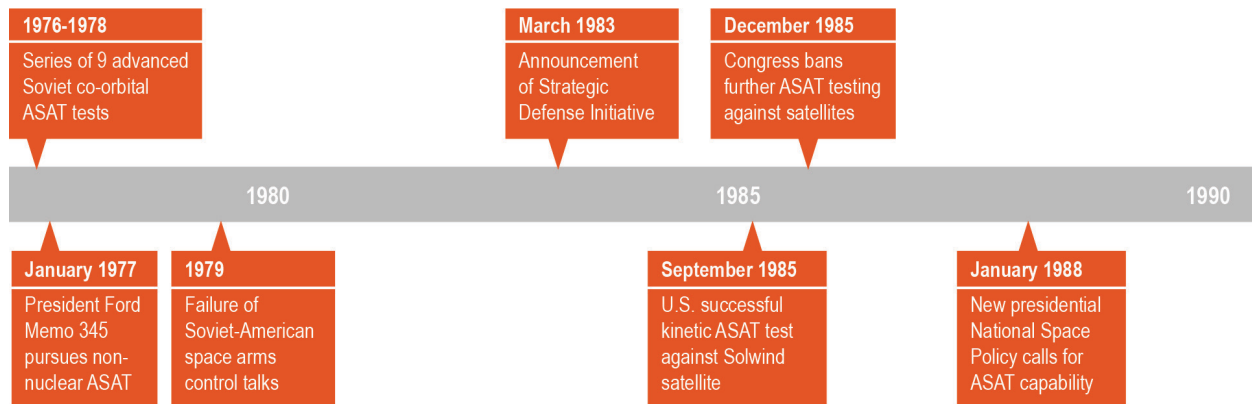


Figure 3: Key events timeline in Era 2.

measures for protection and survivability.³¹ In a follow-up memorandum to President Ford, Scowcroft argued that previous neglect of U.S. ASAT programs stemmed from a lack of national policy to develop an anti-satellite capability, and he attributed this policy gap to past perceptions that the Soviets were not aggressively pursuing ASAT systems and concerns that a U.S. ASAT program would contradict the spirit of SALT (and ABM Treaty) protection of NTM.³²

In November 1976, the NSC released the final report of the Ad Hoc Space Panel, concluding that “there is an urgent need for the U.S. to have the capability to destroy a few militarily important Soviet space systems in crisis situations or war.”³³ Upon laying out several options for the U.S. military posture in space, the report rejected the option of “treat[ing] space as a sanctuary” as “neither enforceable nor verifiable.”³⁴ This is the earliest document this study identified in which the term *sanctuary* is used. In his recently declassified January 1977 National Security Decision Memorandum 345, President Ford officially decided that the United States should acquire a nonnuclear anti-satellite capability.³⁵ This string of documents indicates that sanctuary policy was identified, examined, and rejected in 1976 and 1977, instead establishing a policy of contested space.

The administration of President James (“Jimmy”) Carter sought to leverage the new ASAT programs into arms control gains and potentially a new policy of sanctuary but, when negotiations broke down, accepted the policy of contested space. Following up on Ford’s decision to begin an ASAT program, Carter’s 1978 NSC-37 memorandum ordered the Department of Defense to “vigorously pursue development of an anti-satellite capability,” but Carter paired the program with the first ever Soviet-American ASAT arms control negotiations.³⁶ The Carter administration saw the ASAT program not as a usable weapon but as leverage in the arms control talks to ensure a more balanced negotiating position with the Soviet Union. The talks broke down in 1979 with the Soviet invasion of Afghanistan, and U.S. ASAT development continued.³⁷ The simultaneous pursuit of ASAT arms control and ASAT capabilities shows that senior leadership of

Sanctuary policy was identified, examined, and rejected in 1976 and 1977, instead establishing a policy of contested space.

the Carter administration attempted several aspects of the sanctuary policy but also continued a policy of contested space by emphasizing the physical survivability of space systems, calling for distributed system architectures, reliable emergency systems, and flexible backups.³⁸

'Space Control' Takes the Lead

The administration of President Ronald Reagan embraced a policy of contested space. Reagan, like every president of the Space Age before and after him, included in his national space policy the basic principle that "the United States is committed to the exploration and use of outer space by all nations for peaceful purposes and to the benefit of all mankind."³⁹ However, the Reagan administration favored actions to defend and deny in space rather than to delegitimize attacks in, to, and from space. This public embrace of a contested space policy sparked a backlash in Congress for a policy of sanctuary but one that never successfully changed U.S. policy.

Several elements of the Reagan administration's contested space policy were highly visible to the public. Air Force Space Command was established on September 1, 1982, and the first U.S. Space Command was established in 1985, indicating greater integration of military space capabilities to the "joint warfighting team."⁴⁰ In an address to the nation later known as the "Star Wars" speech on March 23, 1983, President Reagan announced a ballistic missile defense program to counter the Soviets using highly advanced technology. Although the word "space" does not appear once in this speech, the Strategic Defense Initiative (SDI) that it described kicked off a global debate not only on ballistic missile defense but also on the question of weapons in space because SDI included research and development toward space-based missile interceptors.⁴¹ The pursuit of space-based active defenses to ballistic missiles under SDI publicly reframed the approach to conflict in space because the possibility of space conflict was no longer

limited to "unthinkable" attacks on strategic reconnaissance satellites.

The 1980s also featured more consistent alignment between the senior- and service-level leadership in opposition to a policy of space sanctuary. The first identified criticism of a past policy of space sanctuary came in a 1981 Air Force Headquarters report from the Deputy Chief of Staff for Operations, Plans, and Readiness, Lt. Gen. Jerome O'Malley: "Space has traditionally been viewed as a sanctuary in which warfare is prohibited. This study concludes that there are compelling reasons for a closer look at space as a warfighting medium."⁴² Demonstrating the dominance of contested space policy at the service level, the 1982 Air Force manual included for the first time the basic responsibility of the Air Force to negate enemy attacks "to, from, in, or through space."⁴³

Reagan administration senior- and service-level officials pursued a contested space policy because they considered the space domain not only as an area to deter or defend against Soviet aggression but also as a potentially advantageous battlespace for the United States to go on the offensive. Concerns that the *Soviets* had a sanctuary in space due to their asymmetric ASAT capabilities led to discussions on how to counter Soviet threats. One product of these discussions was widespread emphasis on "space control," a policy of protecting freedom of action for U.S. space assets and denying that freedom of action to adversaries, namely the Soviet Union. For example, the authors of a 1983 Air Force Headquarters memo described force application from space as offering "significant potential for eliminating major national security deficiencies and, ultimately, altering the current military balance."⁴⁴ Secretary of the Air Force Edward Aldridge argued in a 1988 space policy memorandum that space control necessitated the integration of ASAT and surveillance capabilities for operations in space as well as the operation of space-based ASATs as soon as technology permitted cost-effective

deployment.⁴⁵ Space control was even included in work on the Strategic Defense Initiative, with a 1987 document on the program stating that it would “contribute to space control during peace, crisis, and conflict” by protecting space-based assets and denying freedom of action to the enemy.⁴⁶ These space control plans under a contested space policy indicate a fundamental difference compared to the ASAT programs of the 1960s, with the newer programs receiving much more strategic and operational attention for how an ASAT could be used in combat against the Soviet Union.

The Reagan emphasis on a policy of contested space sparked a congressional embrace of a policy on sanctuary. Clashes over ASATs occurred throughout the decade with Congress searching for ways to induce Soviet ASAT restraint and prevent an arms race in space.⁴⁷ Members of Congress from both houses and parties introduced resolutions calling for ASAT arms control talks and bills restricting funding for ASAT development and testing as early as 1981.⁴⁸ None of these proposals gained any momentum until the fiscal year 1984 defense authorization and appropriation bills, passed in the months after Reagan’s SDI speech, which prohibited use of funds for ASAT testing until the President met congressional requirements for reporting and certification.⁴⁹ The new ASAT developed under the Reagan administration, a non-nuclear, air-launched Miniature Homing Vehicle, achieved a successful test intercept of the American Solwind satellite in 1985, and then Congress effectively banned further testing.⁵⁰ This demonstrates the increasing pressure Congress applied to the Reagan administration to halt ASAT tests and negotiate with the Soviet Union as arms race concerns rose among legislators.

Although Congress could push against the implementation of contested space policy through its power over budgets and program authorizations,

it was not able to change the policy itself. Documents produced by the Reagan administration continued to declare a policy of contested space. In 1988, several years into the congressional ban on ASAT testing, the Presidential Directive on National Space Policy reiterates the goal of an operationally deployed “robust and comprehensive” ASAT capability.⁵¹ The repeated emphasis on operational deployment, a goal that does not feature strongly in previous administrations, pairs with the Reagan administration’s argument that without such a system the Soviets would continue to hold an ASAT monopoly threatening U.S. space assets.⁵² Thus the Reagan administration persisted in following a policy of contested space despite congressional restrictions on translating the policy into budgets and programs.

Under the George H.W. Bush administration, the intent remained to “maintain assured access to space and negate, if necessary, hostile space systems,” as presented in the 1990 National Security Strategy.⁵³ This strategy openly emphasized anti-satellite systems as necessary to counter threats from adversaries, continuing a contested space policy.⁵⁴

In this second era, decisionmakers explicitly considered and set aside a policy of sanctuary and embraced a policy of contested space. The looming specter of the Soviet ASAT program and several administrations’ interests in the potential military advantages provided by counter-space capabilities ensured a heightened emphasis on developing operations and technologies for space control. For some senior- and service-level decisionmakers, conflict in space appeared not only unavoidable but also potentially advantageous for the United States, and material steps were taken to implement these ideas until they lost congressional support. The contested space policy of the late 1970s and 1980s set the stage for the continuation of such an approach to the present.

Era 3 (1991 to 2007): Sanctuary Fails to Make a Comeback

Although the 1990s featured significant geopolitical changes affecting human activities in space, the collapse of the rival used to justify the development of a contested space policy did not result in a revival of sanctuary policy. Both Bush administrations and the Clinton administration continued to advance contested space policy and promote space control.

The Soviet Union's collapse ended the great Cold War space rivalry and left the United States dominant in space, with no real challengers. The co-orbital ASAT system and other Soviet space programs were gradually dismantled as budgets decreased and priorities were reassessed.⁵⁵ The Russian Federation and the United States also embarked on new efforts for cooperation in space, such as the International Space Station.⁵⁶ Throughout the 1990s and early 2000s, no new major space threat presented itself. Although analysts recognized increases in Chinese space capabilities, some disregarded China as a possible ASAT developer due to its technological limitations and the publicly cooperative focus of Chinese space programs.⁵⁷

While the Soviet collapse changed threat perceptions, another event at the time drew the attention of the space policy community. The First Gulf War (Operation Desert Storm) demonstrated a

wide range of space asset applications in combat, continuing a trend away from the early Cold War focus solely on pre-war space-based strategic reconnaissance and early warning satellites. Military space assets served as force multipliers for the U.S. coalition by providing weather information, rapid warning of Iraqi Scud missile launches, broad area images of the region for tactical maps, validation of strike successes, and the first use of Global Positioning System (GPS) for combat as coalition forces navigated the desert.⁵⁸ By the time Operation Desert Storm ended, American airmen had begun to describe it as “the first space war.”⁵⁹ Although, as this description reflects, the Gulf War was often referred to as a transformational event for U.S. space activities, its role in justifying contested space policy resulted more in a continuation of a policy pattern than a revolution in space policy. The timeline in Figure 4 represents some of these critical events.

A Quiet Continuation of Contested Space in the 1990s

Although forced to reconsider the strategic situation across all domains, including space, in the aftermath of the collapse of the USSR, the George H.W. Bush administration and those following in the 1990s and early 2000s continued to reject a space sanctuary policy.

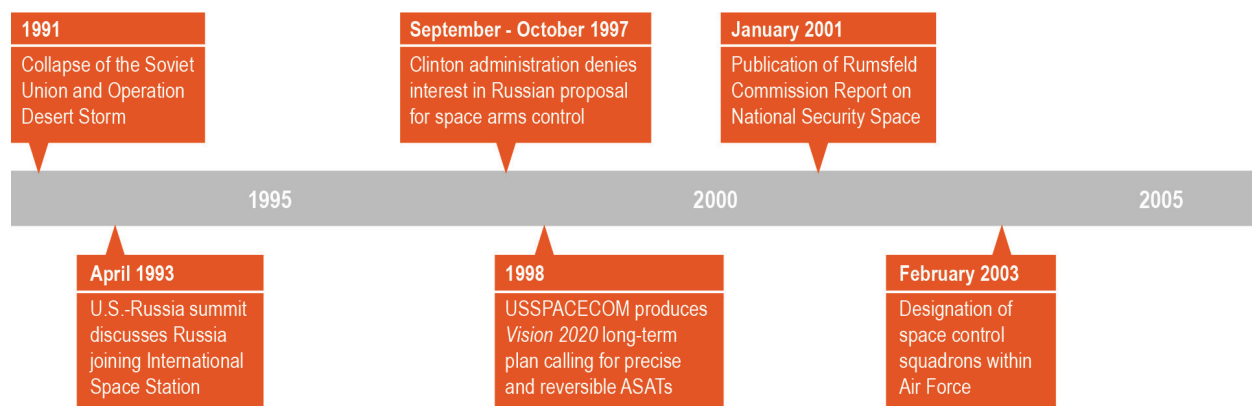


Figure 4: Key events timeline in Era 3.

The demonstration of the role space systems can play in supporting active combat in the Gulf War became a major justification for contested space policy in the 1990s just as the Soviet ASAT tests helped justify a contested space policy in the previous era. The final report on the U.S. space program in the George H.W. Bush administration argued that “control of space was essential to our ability to prosecute the war quickly, successfully, and with minimum loss of American personnel.”⁶⁰ The National Space Council stated in this report that “the proliferation of space systems has changed profoundly the space control equation, and the

‘space sanctuary’ concept has been overtaken by events.”⁶¹

The report called for emphasis on such space control capabilities as space surveillance, satellite protection from interference, and a “comprehensive antisatellite capability” to deny future adversaries military uses of space.⁶² The conclusions drawn from the Gulf War therefore

parallel those drawn from the 1970s Soviet ASAT tests 15 years previously, specifically those that claimed the event had made space sanctuary untenable as a policy and that technical capabilities must be developed to protect friendly assets and target adversary assets.

The Clinton administration pulled several policies back from the competitive Cold War heights of Reagan, including scaling back contested space policy. With smaller defense budgets and the absence of the Soviet threat, the Strategic Defense Initiative Organization established under the Reagan administration was renamed the Ballistic Missile Defense Organization and refocused to deal

with more limited missile strikes.⁶³ The Clinton administration also scaled back several programs associated with space control, such as when the DOD budget proposal left out funding for the kinetic energy antisatellite (KE-ASAT) from fiscal year 1995 to fiscal year 2000 and the Army spent millions of dollars less on the program than was appropriated by Congress.⁶⁴ This, combined with the Clinton administration’s public efforts to increase cooperation on space issues, made it appear as though sanctuary policy was poised to make a comeback.

Although the Clinton administration may have receded on certain elements of contested space policy, it continued to treat space as a contested domain up to the highest levels of national policy.

The return to sanctuary never came. Although the Clinton administration may have receded on certain elements of contested space policy, it continued to treat space as a contested domain up to the highest levels of national policy. The National Science and Technology Council’s National Space Policy in 1996 highlighted key national security space

activities, such as ensuring access to space; deterring, warning, and defending against attack; and countering hostile space systems and services.⁶⁵ The 1999 Department of Defense Directive Number 3100.10, the first major re-examination of national space policy since 1987, included similar objectives suiting a contested space emphasis and provided an expansive definition of space control with mission areas comprising space surveillance, protecting friendly space systems, preventing an adversary’s hostile use of space systems, and negating systems used for purposes hostile to U.S. national security interests.⁶⁶

Another demonstration of the continuity of contested space policy came from the Clinton administration's skepticism for space arms control in sharp contrast to the broader series of arms control efforts conducted by the administration. The Clinton administration pursued a slew of arms control agreements to prevent nuclear proliferation or accidents among the former Soviet states, ban chemical and biological weapons, and secure a legal path for limited U.S. ballistic missile defense capabilities.⁶⁷ But, besides adjacencies to nuclear weapons technologies such as ballistic missiles and continued legal protections for NTM, space-specific technologies did not feature in any of the Clinton administration's major arms control efforts. Marc Berkowitz, Assistant Deputy Under Secretary of Defense for Space Policy from 1992 to 2003, argued that the Clinton administration "determined that additional space arms control measures would not be verifiable, equitable, effective, or compatible with the nation's security interests."⁶⁸

When Russian President Yeltsin made a request for a formal ASAT ban in 1997 that raised vocal concerns by Congress and former military officers who criticized the potential softening of contested space policy, the administration vehemently denied involvement or interest in negotiations.⁶⁹ Robert Bell, NSC Senior Director for Defense Policy and Arms Control, referred to the Gulf War reliance on space capabilities while arguing, "We don't have the option of turning the clock back and going off and negotiating some arms control treaty with Russia that prohibits the development, testing, or deployment of space control capabilities... We've got to have them."⁷⁰ Whereas policymakers in the first era deprioritized programs to contest space out of concern that they would undermine arms control efforts central to a sanctuary policy, the opposite trend had developed by the time of the Clinton administration: space arms control was now deprioritized out of concern that it would interfere with contested space programs.

The service and operational levels rejected sanctuary even more explicitly. Space control proved to be a key approach for the Air Force and the combatant command for space to protect the space support capabilities demonstrated during the Gulf War.⁷¹ While calling for the avoidance of the "seductive" notion of space as a sanctuary, U.S. Space Command's (USSPACECOM) 1998 *Long Range Plan: Implementing USSPACECOM Vision for 2020* promoted key capabilities for space asset protection and hostile activity negation.⁷² Air Force Secretary F. Whitten Peters and Chief of Staff General Michael Ryan produced a memorandum on aerospace integration in May 2000 directly tying the end of "the status of [space] as a sanctuary" to the rise of military competition in space.⁷³ These arguments indicate that the Clinton administration service-level leaders dismissed sanctuary policy even while acknowledging the appeal of viewing space as a conflict-free domain.

Within this dichotomy of a scaled-back approach to some elements of contested space policy but a continued rejection of sanctuary, documents and comments within the Clinton administration indicate aims to apply contested space policy to more temporary and reversible counter-space capabilities than had been previously emphasized. The growing recognition that physical destruction of satellites generated debris that could threaten other U.S. space systems as well as the desire for greater flexibility in potential conflicts involving space led senior officials such as Deputy Secretary of Defense John Hamre to state, "The philosophy underlying the Department's plan for negation technologies is that physical destruction of satellites [is] not the preferred approach... DOD's goal is tactical denial of an adversary's space-based capabilities."⁷⁴ Service- and operational-level leaders also expressed this approach. The reorientation towards temporary and reversible capabilities formed the basis of the Army's justification for restructuring and defunding the KE-ASAT program according

to a Government Accountability Office report.⁷⁵ In 1998, USSPACECOM emphasized precision and flexible effects as two of the most important characteristics for capabilities to negate adversary space systems.⁷⁶ The transition to temporary and reversible counter-space systems endured beyond the Clinton administration and eventually led to an operational electronic jamming anti-satellite capability, the Counter Communication System, indicating a genuine interest in contested space policy but with a different set of programs and operational concepts.

Although space control became one of several points of contention between the Democratic Clinton administration and the Republican-controlled Congress of the late 1990s, these debates differed from the Reagan administration's congressional challenges because the disagreement was over the degree of funding and type of programs for space control while both branches expressed firm support for space control and contested space policy as a whole. Congress repeatedly attempted to elevate the KE-ASAT program by authorizing appropriations, criticizing the administration for not requesting funds for the program, and in some cases attempting to limit funding for other space control programs until previously appropriated funds had been spent on KE-ASAT.⁷⁷ Despite these critiques and expressed concerns that the Clinton administration had not allocated enough resources to space control, conference and committee reports on the National Defense Authorization Act show recognition that national space policy took a contested space approach and that the Department of Defense was working to further develop contested space policy.⁷⁸ For example, in the Fiscal Year 2000 Senate Armed Service Committee Report senators praised DOD's Space Control Technology Program by stating, "The committee believes that the Department has taken an important step in developing a space control policy and architecture."⁷⁹ Therefore, although debates continued over the specifics of programs and

budgets, the *policy* of contested space continued through the Clinton administration with acceptance by both the executive and legislative branches.

Early 2000s Concern Over Vulnerabilities as Space Controllers Oppose Sanctuary

The George W. Bush administration continued emphasizing space control and rejecting sanctuary policy. A contested space policy had a major senior-level advocate in Secretary of Defense Donald Rumsfeld. Rumsfeld chaired the Commission to Assess United States National Security, more commonly known as the Rumsfeld Commission, which was tasked by Congress to evaluate U.S. national security space management and organization. The Commission's report called attention to U.S. vulnerabilities in space and pushed for increased preparations and operations and new organizations to counter this vulnerability. It argued that, "An attack on elements of U.S. space systems during a crisis or conflict should not be considered an improbable act. If the U.S. is to avoid a 'Space Pearl Harbor' it needs to take seriously the possibility of an attack on U.S. space systems."⁸⁰

As Secretary of Defense, Rumsfeld followed up on this concern by ordering the realignment of headquarters and field commands to improve the effectiveness of preparations for "prompt and sustained offensive and defensive space operations."⁸¹ This approach was also reflected in the 2001 Quadrennial Defense Review (QDR), with a foreword written by Rumsfeld. The QDR referenced the likelihood of future adversaries seeking to deny U.S. access to space and the need for capabilities to both protect U.S. military space capabilities and deny hostile military activities.⁸²

The service-level stance on a contested space policy appears to have been in line with the senior-level policy under the George W. Bush administration. Multiple space operations units in the Air Force for space surveillance and electronic security were redesignated as "space control squadrons" in February

2003.⁸³ The Air Force followed up on the pivot to temporary and reversible counter-space capabilities begun under the Clinton administration by fielding the Counter Communications System for space electronic warfare under the 4th Space Control Squadron in 2004, which recently became the first and only acknowledged offensive weapon of the U.S. Space Force.⁸⁴ More explicitly, in a series of articles in the winter 2005 issue of *High Frontier: The Journal for Space & Missile Professionals*, five officers from Air Force Space Command described and opposed a sanctuary policy. General Lance W. Lord, Commander of Air Force Space Command, argued that, “Space is no different [from other domains where military competition occurs] and we cannot continue to think of it as a benign sanctuary.”⁸⁵ In addition, the combat-support role of space indicated by the Gulf War as well as the increasing asymmetry involved in U.S. space capabilities continued to bolster arguments that, whatever may have been the plausibility of space sanctuary in the past, such an approach was no longer feasible.⁸⁶ These programmatic, organizational, and rhetorical supports for space control indicate a general concurrence on the rejection of a sanctuary space policy across the Bush administration.

Strategy and policy memoranda and statements by senior civilian and service leaders indicate the continued rejection of a sanctuary policy throughout the third era. A contested space policy was not always pursued as aggressively as in the 1980s, but the disinterest and in space arms control efforts as well as the continued reference to the need to deter and deny hostile activities in space shows that there was more continuity in space policy over time than first appears. By the time the 2007 Chinese ASAT test revived public concern over threats to U.S. space assets, the Clinton and Bush administrations had already affirmed that a contested space policy was in the U.S. interest.

Era 4 (2007 to 2020): A New Wave of Competition and the Declaration of the End of Sanctuary

In the fourth and final era of the space policy evolution, adversary actions, U.S. government statements and strategies, and the wider scholarly literature converged on an understanding that space is a contested domain and must be treated as such. This was not so much a transformation that changed the direction away from past space policy as it was a culmination of decades of policy aimed at treating space as a contested domain.

The January 2007 destruction of a defunct Chinese weather satellite by a direct-ascent ASAT (DA-ASAT) operated by China’s People’s Liberation Army (PLA) brought public attention to discussions on space security. Even though the PLA had begun considering the idea of attacks on U.S. space systems as early as the mid-1990s and developed systems throughout the 2000s, it was the 2007 test that triggered a wider strategic discussion on the threat China could pose in space.⁸⁷ Furthermore, a year after the Chinese test, the United States used a modified SM-3 missile to destroy a de-orbiting American satellite in an operation that, although not officially acknowledged as an ASAT test, demonstrated the capability. However, the Chinese test, like the Gulf War and Soviet ASAT tests before it, played a familiar role in the recurring pattern of contested space policy. Although the 2007 ASAT test as well as other emerging counter-space capabilities from Russia, China, India, and other state and non-state actors have been frequently referenced as signs of a major shift in the space environment, the conclusions drawn from a policy perspective were once again used to justify contested space policy.⁸⁸ Figure 5 demonstrates some of the key events in this fourth era.

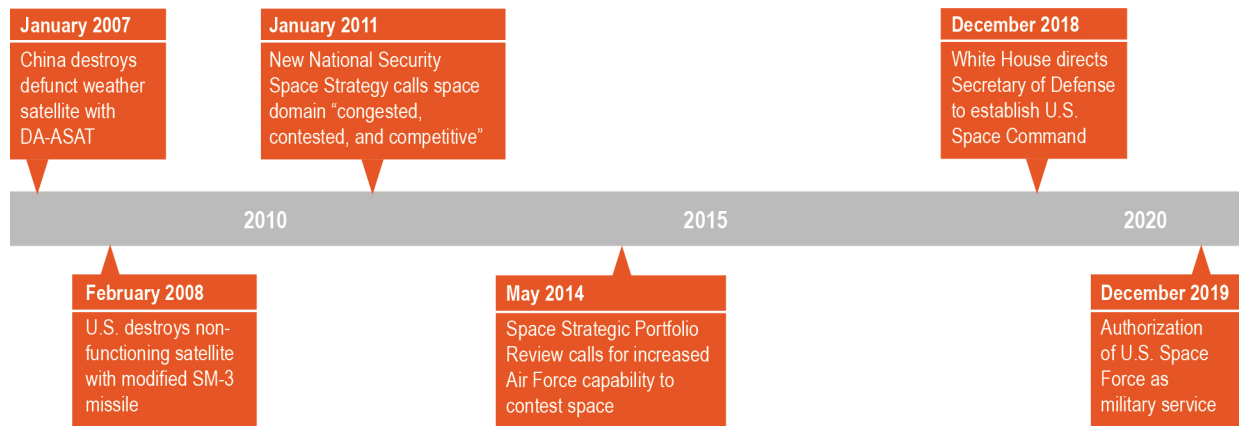


Figure 5: Key events timeline in Era 4.

The Post-2007 Rising Public Dominance of Contested Space Concerns

In the aftermath of the 2007 Chinese ASAT test, space came more to the forefront among national security issues. The subsequent administrations indicated concern about new threats to space and, as had the previous seven administrations, pursued a policy of contested space in response to these threats.

References to the Chinese ASAT test to support contested space policy have abounded for over a decade since the test occurred. In the last years of the President George W. Bush administration, both the Secretary and Chief of Staff of the Air Force argued in February 2007 that the test was a “wake-up call” to reject sanctuary and discuss facets of a contested space policy.⁸⁹ General Kevin Chilton, commander of U.S. Strategic Command, used the ASAT test to justify a request for congressional support “in the development and finding of a credible deterrent capability to deter and if necessary defeat any and all threats to our space systems.”⁹⁰ As with the Soviet ASAT tests and the Gulf War, contested space proponents used the Chinese ASAT test to raise concerns about dangerous asymmetry in space and reject approaches that would treat space as a sanctuary. Therefore, whether the test marked a shift in technology, geopolitics, or the space environment, it

did not mark a pivot in U.S. space policy. The test became new evidence for a decades-old policy argument.

The President Barack Obama administration pursued opportunities for cooperation on space issues but ultimately settled on a contested space policy. Obama administration strategy documents tended to omit specific mentions of ASAT weapons and instead emphasized collective international action to counter threats to space and promote responsible peaceful use of space.⁹¹ The 2010 National Security Strategy, however, emphasized the need to leverage and grow space capabilities due to asymmetric threats, and the 2010 National Space Policy directed the Secretary of Defense to

Whether the 2007 Chinese ASAT test marked a shift in technology, geopolitics, or the space environment, it did not mark a pivot in U.S. space policy. The test became new evidence for a decades-old policy argument.

“Develop capabilities, plans, and options to deter, defend against, and, if necessary, defeat efforts to interfere with or attack U.S. or allied space systems.”⁹² In the 2011 National Security Space Strategy, the Obama administration made public the assessment that “space is becoming increasingly congested, contested, and competitive.”⁹³ The strategy encouraged “denial” and “defeat” of hostile activities in space and listed the specific requirement that military and intelligence capabilities prepare to “fight through” a degraded environment and be able to defeat attacks targeted at space systems.⁹⁴ These documents signaled the role of contested space policy at the senior levels of the Obama administration, which Deputy Secretary of Defense Robert Work publicly highlighted in a speech at the Space Symposium in 2016 on “thinking about space as a war fighting mission” and improving capabilities in response to threats in space.⁹⁵

The service-level also backed a contested space policy under the Obama administration. In 2010, General C. Robert Kehler, Commander of Air Force Space Command, stated that, in response to the Chinese ASAT test and “concern about space not being a sanctuary,” he was collaborating with other agencies in a joint effort called the Space Protection Program to help integrate space system protection for military, intelligence, civil, commercial, and allied space programs.⁹⁶ In 2014, General Roger Teague, Director of Space Programs in the Office of the Secretary of the Air Force for Acquisitions, summarized the NSC-led “Space Strategic Portfolio Review” as arguing for increased Air Force abilities to identify threats in space, assure that U.S. space capabilities can withstand counterspace attacks, and counter the space capabilities of adversaries that target U.S. forces.⁹⁷ These public expressions of support for contested space policy therefore continued rejection of sanctuary at the service level throughout the Obama administration.

Treating Space as a Contested, Warfighting Domain

Carrying on from the declaration of “congested, contested, and competitive” space from the Obama administration, the President Donald J. Trump administration fully embraced a contested space policy.

The senior level of the Trump administration has been publicly vocal in support of contested space policy. The 2018 National Space Strategy stated that “the United States will seek to deter, counter, and defeat threats in the space domain,” and listed “strengthen deterrence and warfighting options” as one of the four essential pillars of the strategy.⁹⁸ The discussion of space not just as a contested domain, but as a warfighting domain, culminated in the Trump administration’s most public expression of contested space policy: the establishment of the U.S. Space Force as an independent military service under the Department of the Air Force. As described in Space Policy Directive-4 (SPD-4), officially calling for establishment of the Space Force, President Trump emphasized the core contested space policy concepts of deterring aggression and defending against hostile acts in space while projecting military power in, from, and to space.⁹⁹ Beyond the Space Force proposal itself, vocal senior-level support for a contested space policy also included Secretary of Defense James Mattis and Assistant Secretary of Defense for Homeland Defense and Global Security Kenneth Rapuano, both of whom discussed the end of “space sanctuary” in congressional hearings while supporting strategies and programs befitting a contested space policy. Rapuano specifically argued that, “Our strategy recognizes that—due to actions by our competitors and potential adversaries—the space domain is not a sanctuary.”¹⁰⁰ Congress did not act to oppose this contested space policy, as shown by the passage of the National Defense

Authorization Act authorizing the Space Force in December 2019.

Overall service-level support for contested space policy remained high under the Trump administration as well. A 2017 joint statement before the U.S. Senate by Air Force leaders such as Secretary Heather Wilson, Chief of Staff General David L. Goldfein, General John Raymond, and General Samuel Greaves emphasized the end of space sanctuary, the vulnerability of on-orbit capabilities, and the competitive, congested, and contested nature of the space domain as justification for contested space policy.¹⁰¹ In December 2019, Secretary of the Air Force Barbara Barrett argued that “we have got to be able to deter derogatory action in space, and if deterrence doesn’t work, we need to be prepared to be something other than a victim with our space assets.”¹⁰² As the structure of the service and operational levels changed with the reestablishment of U.S. Space Command and creation of the U.S. Space Force, General John Raymond, tasked with commanding both organizations as they stand up, summarized the four features of the approach to space as a contested, warfighting domain: deterrence, defense against attacks on space assets, delivering space combat effects, and developing joint warfighters to operate in the space domain.¹⁰³

Since 2007, a consensus has developed within and around the U.S. government that space is currently a congested, contested, and competitive domain. The momentum to pursue contested space policy paired with doctrinal and organizational shifts that placed national security space in a new public spotlight. The creation of the Space Force, the return of USSPACECOM, and the numerous testimonies, initiatives, and directives aimed at pursuing contested space policy represent efforts by a wide range of actors to improve U.S. strategy and preparedness for the potential outbreak of conflict in space.

Conclusion

The history of U.S. space policy includes more continuity than it does change, especially over the last four decades. Sanctuary policy only experienced 20 years of prominence at the outset of the Space Age. The Eisenhower administration that started the push for a sanctuary policy simultaneously included the origins of contested space policy that persisted and eventually dominated. Since 1975 the sanctuary-versus-contested debate within the U.S. government has ended in victory for the contested camp. Different administrations may have pursued contested space to different degrees, and some tried to resurrect specific elements of sanctuary policy, but each administration since Ford has eventually accepted the need to develop passive and active capabilities to defend U.S. assets in space and to deny or defeat hostile activities in a bid to improve the survivability of the U.S. space architecture.

This analysis provides new insight into what has changed and what remains the same in U.S. policy and activities in the space domain. The last 10 years have witnessed unprecedented changes in the space domain. Old competitors have developed new capabilities, new competitors have risen, and the commercial space industry has been transformed by new companies, new technologies, and new ways of conceiving behavior in space. Despite all this change, core elements of national security space policy remain what they were over 40 years ago. The Carter administration, even while attempting to negotiate away ASAT weapons, mandated that the national intelligence program in space be configured to operate “in a hostile environment,” the same call many are making for space assets today.¹⁰⁴ Therefore, while changes in the space domain and threat environment are discussed widely, the current space policy is more of a cumulation or crescendo of past space policies than it is a pivot away from them.

Questions about resiliency, survivability, and deterrence and denial of counter-space systems began far earlier at the highest levels of U.S. policy than has often been acknowledged. In fact, concerns about whether U.S. space systems can survive the threats directed against them have been a common theme of space policy debates since the 1950s. Today, just as in 1957, 1976, 1991, and 2007, policymakers are looking at the value that space can provide U.S. national security and asking how we can assure space mission success in the face of threats and challenges. Although the dominant policy answers to those questions changed in the 1970s, history shows that, at the policy level, space security was not taken for granted.

What does this conclusion, drawn from the past 60 years of space policy debates, mean for the space policy debates of today? Although space asset vulnerability has not been truly put to the test by a conflict in space, concerns about the survivability of U.S. satellites and architectures are clearly a lasting challenge confronted in national security space policies. A past U.S. policy of treating space as a sanctuary cannot be used to justify the impression of vulnerability today because this policy has not existed for decades. To understand the root causes of current space vulnerability and the fear that the

United States has not yet done enough to secure its assets in space, one must go beyond national security space policy and look at other factors. Whether these factors include belief in nuclear deterrence stability, challenges in bureaucratic and organizational politics, obstacles in budgeting and acquisitions, all of the above, or none of the above, this kind of investigation is not possible unless it rests on a solid foundation of context and evidence.

For all the consideration of how new technologies and behaviors are changing the space domain, we must recognize which debates we have had before, what decisions we have made to lead up to this point, and what patterns and predispositions we have followed in our past policies before we can decide how to move forward.

Acknowledgments

The author would like to thank Aaron Bateman, Gerald Epstein, Marc Berkowitz, and Thomas Mahnken for their insight and comments. The author also appreciates the helpful review and contributions from Aerospace colleagues Russell Rumbaugh, Dr. Michael Gleason, Steven Jordan Tomaszewski, and Dr. Jamie Morin.

References

- ¹ Robert Lupton, *On Space Warfare*, (Maxwell AFB, AL: Air University Press, 1998) 29.
- ² Ibid., 29-30.
- ³ Asif Siddiqi, "The Soviet Co-Orbital Anti-satellite System: A Synopsis," *Journal of the British Interplanetary Society* 50 (1997): 226-227, https://aerospace.csis.org/wp-content/uploads/2018/09/Soviet-Co-Orbital-Anti-Satellite-System_A.-Siddiqi.pdf
- ⁴ "442. National Security Council Report: Statement of Preliminary U.S. Policy on Outer Space," *Department of State Office of the Historian*, Foreign Relations of the United States, 1958-1960, United Nations and General International Matters, Volume II, NSC 5814/1 (Washington, D.C.: August 18, 1958), <https://history.state.gov/historicaldocuments/frus1958-60v02/d442>
- ⁵ Louis N. Ridenour, "Civil-Military Relations," in R. Cargill Hall and Jacob Neufeld, *The U.S. Air Force in Space: 1945 to the 21st Century*, USAF History and Museums Program (Washington, D.C.: 1998): 23, <https://media.defense.gov/2010/Oct/01/2001329745/-1/-1/0/AFD-101001-060.pdf>.
- ⁶ Ibid., 24.
- ⁷ Ibid., 25.
- ⁸ The "Open Skies" concept bears the same name as a 1992 treaty created to establish a regime of unarmed observation flights of the territory of states party to the treaty. On May 21, 2020, Secretary of State Mike Pompeo announced that the U.S. would be withdrawing from the Open Skies Treaty due to Russian violations. See "On the Treaty on Open Skies," *U.S. Department of State* (May 21, 2020), <https://www.state.gov/on-the-treaty-on-open-skies/>
- ⁹ "442. National Security Council Report: Statement of Preliminary U.S. Policy on Outer Space," *Department of State Office of the Historian*, NSC 5814/1.
- ¹⁰ Thomas S. Power, "Document I-3: General Thomas S. Power, Commander in Chief, Strategic Air Command, to General Thomas D. White, Chief of Staff, United States Air Force, 'Strategic Air Command Space Policy,' 13 August 1958," in David N. Spires, *Orbital Futures: Selected Documents in Air Force Space History* (Peterson AFB, CO: Air Force Space Command, 2004): 27, <https://catalog.hathitrust.org/Record/005257023#> Malcolm A. MacIntyre, "Document IV-5: Malcolm A. MacIntyre, Under Secretary of the Air Force, to Neil McElroy, Secretary of Defense, 'Space Programs,' 17 September 1958," in Spires, *Orbital Futures*, 763.
- ¹¹ Curtis Peebles, *High Frontier: The U.S. Air Force and the Military Space Program*, Air Force History and Museums Program (1997): 11, <https://media.defense.gov/2010/Dec/02/2001329901/-1/-1/0/AFD-101202-013.pdf>
- ¹² Clayton K.S. Chun, "Shooting Down a 'Star': Program 437, the US Nuclear ASAT System, and Present-Day Copycat Killers," *CADRE Paper No. 6, College of Aerospace Doctrine Research and Education* (Maxwell AFB, AL: Air University Press, 2000): 2,8 https://media.defense.gov/2017/Nov/21/2001847039/-1/-1/0/CP_0006_CHUN_SHOOTING_DOWN_STAR.PDF.
- ¹³ "National Security Policy Planning Paper: Implications of Outer Space in the 1970's (June 1963)" *Papers of John F. Kennedy: Presidential Papers*, John F. Kennedy Library, (1963) iii, <https://www.jfklibrary.org/asset-viewer/archives/JFKNSF/308/JFKNSF-308-001>
- ¹⁴ Chun, "Shooting Down a 'Star'," 8-9.
- ¹⁵ Ibid., 8-9, 17, 19-20.
- ¹⁶ Paul H. Nitze, Joseph Charyk, Herbert Scoville, Jr., Robert C. Seamans, Jr., Adrian S. Fisher, Carl Kaysen, Jerome Wiesner, U. Alexis Johnson, "Report by the Committee on Satellite Reconnaissance Policy," *Foreign Relations of the United States: Volume xxv, Number 421* (2 July 1962), <https://history.state.gov/historicaldocuments/frus1961-63v25/d421>
- ¹⁷ John F. Kennedy, "National Security Action Memorandum 156: Negotiations on Disarmament and Peaceful Uses of Outer Space" *The Aerospace Corporation Space Policy Archive*, <https://aerospace.csis.org/wp-content/uploads/2019/02/NSAM-156-Negotiations-on-Disarmament-and-Peaceful-Uses-of-Outer-Space.pdf>
- ¹⁸ Nitze et al., "Report by the Committee on Satellite Reconnaissance Policy."
- ¹⁹ Robert H. Puckett, "American Space Policy: Civilian/Military Dichotomy," *Air University Review* (March-April 1965): 49, <https://babel.hathitrust.org/cgi/pt?id=osu.32435020844809&view=lup&seq=253>

- ²⁰ Nitze et al., "Report by the Committee on Satellite Reconnaissance Policy."
- ²¹ "Report Excerpt E: The Outer Space Treaty (Lyndon Johnson Administration)," *The Aerospace Corporation Space Policy Archive*, 5, https://aerospace.org/sites/default/files/policy_archives/Outer%20Space%20Treaty%20rpt%20excerpt.pdf
- ²² Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty), U.S. Department of State (May 26, 1972) <https://2009-2017.state.gov/t/avc/trty/101888.htm#text>
- ²³ "Richard Helms, "17-32-1: Strategic Arms Limitation Talks and Intelligence," *National Archives Catalog* (Spring 1973): 3, <https://catalog.archives.gov/id/7283848>
- ²⁴ Lupton, *On Space Warfare*, 29-30.
- ²⁵ Barry D. Watts, *The Military Use of Space: A Diagnostic Assessment*, Center for Strategic and Budgetary Assessments (2001): 96, <https://csbaonline.org/research/publications/the-military-use-of-space-a-diagnostic-assessment/publication/1>
- ²⁶ "226. National Intelligence Estimate (NIE 11-3-72): Soviet Strategic Defenses," Department of State Office of the Historian, Foreign Relations of the United States, 1969-1976, Volume XXXIV, National Security Policy, 1969-1972 (November 2, 1972), <https://history.state.gov/historicaldocuments/frus1969-76v34/d226>
- ²⁷ "80. Memorandum from the Deputy Secretary of State (Rush) to the Acting Secretary of Defense (Clements): U.S. Responses to Soviet Anti-Satellite Activities," , " *Department of State Office of the Historian, Foreign Relations of the United States, 1969-1976, Volume E-3, Documents on Global Issues, 1973-1976* (June 18, 1973), <https://history.state.gov/historicaldocuments/frus1969-76ve03/d80>
- ²⁸ John L. McLucas, "The U.S. Space Program Since 1961: A Personal Assessment," in Hall and Neufeld, *The U.S. Air Force in Space*, 95.
- ²⁹ Saddiqi, "The Soviet Co-Orbital Anti-satellite System," 234.
- ³⁰ Brent Scowcroft, "Soviet Anti-Satellite Capability," *The Aerospace Corporation Space Policy Archive* (April 26, 1976), <https://aerospace.org/sites/default/files/2019-02/Scowcroft%20memo%20ASAT%20Apr76.pdf>
- ³¹ Brent Scowcroft, "National Security Memorandum 333: Enhanced Survivability of Critical U.S. Military and Intelligence Space Systems," *The Aerospace Corporation Space Policy Archive* (July 7, 1976): 1, <https://aerospace.org/sites/default/files/2019-02/NSDM%20333%20-%20Enhanced%20Survivability%20of%20Critical%20Space%20Systems.pdf>
- ³² "96. Memorandum From the President's Assistant for National Security Affairs (Scowcroft) to President Ford: U.S. Anti-Satellite Capability," *Department of State Office of the Historian: Foreign Relations of the United States, 1969-1976, Volume XXXV, National Security Policy, 1973-1976* (Washington: July 24, 1976), <https://history.state.gov/historicaldocuments/frus1969-76v35/d96>
- ³³ Robert L. Smith, "Final Report of the Ad Hoc NSC Space Panel—Part II: U.S. Anti-Satellite Capabilities," *The Aerospace Corporation Space Policy Archive* (November 3, 1976): 1, <https://aerospace.org/sites/default/files/2019-02/Smith%20memo%20NSC%20space%20panel%20Nov76.pdf>
- ³⁴ Ibid., 5.
- ³⁵ Brent Scowcroft, "National Security Decision Memorandum 345: U.S. Anti-Satellite Capabilities," *The Aerospace Corporation Space Policy Archives* (January 18, 1977), https://aerospace.org/sites/default/files/policy_archives/NSDM-345%20ASAT%20Jan77.pdf
- ³⁶ Jimmy Carter, "Presidential Directive/ NSC-37: National Space Policy," *The Aerospace Corporation Space Policy Archive* (May 11, 1978): 4, <https://aerospace.org/sites/default/files/2019-02/PD-37%20National%20Space%20Policy%2011May78.pdf>
- ³⁷ Carl Q. Christol, "Arms Control and Disarmament in Space: The Rough Road to Vienna 1984," *Space Policy* (February 1985): 30, Accessed from <https://pdf.sciencedirectassets.com/>.
- ³⁸ Carter, "Presidential Directive/ NSC-37: National Space Policy," 3-4.
- ³⁹ "Fact sheet: National Space Policy," *The Aerospace Corporation Space Policy Archive* (July 4, 1982), https://aerospace.org/sites/default/files/policy_archives/National%20Space%20Policy%20Jul82.pdf
- ⁴⁰ "Air Force Space Command Facts," *Air Force Space Command*, <https://www.afspc.af.mil/About-Us/>.

- ⁴¹ Ronald Reagan, "Address to the Nation on Defense and National Security," *Ronald Reagan Presidential Library* (March 3, 1983), <https://www.reaganlibrary.gov/research/speeches/32383d>.
"Strategic Defense Initiative (SDI), 1983," *U.S. Department of State Archive*, <https://2001-2009.state.gov/r/pa/ho/time/rd/104253.htm>
- ⁴² "Document III-23: Headquarters United States Air Force, Deputy Chief of Staff for Operations, Plans, and Readiness: Space Policy and Requirements Study, 1 May 1981," in Spires, *Orbital Futures*, 637.
- ⁴³ "Document I-18: Department of the Air Force, Air Force Manual (AFM) 1-6, 'Military Space Doctrine,' 15 October 1982," in Spires, *Orbital Futures*, 68.
- ⁴⁴ "Document II-24: United States Air Force Space Plan, March 1983," in Spires, *Orbital Futures*, 377.
- ⁴⁵ E.C. Aldridge, Jr., "Document I-22: E.C. Aldridge, Jr., Secretary of the Air Force, to the Secretary of Defense, 'The Air Force Role in Space – Information Memorandum,' 7 December 1988," in Spires, *Orbital Futures*, 92.
- ⁴⁶ "Report to Congress on The Strategic Defense System Architecture," *Strategic Defense Initiative Organization* (December 17, 1987).
- ⁴⁷ Christol, "Arms Control and Disarmament in Space," 34.
- ⁴⁸ "Chapter 5: ASAT Arms Control: History," in U.S. Congress, Office of Technology Assessment, *Anti-Satellite Weapons, Countermeasures, and Arms Control* (Washington, DC: U.S. Government Publishing Office, September 1985): 99-100, <https://www.princeton.edu/~ota/disk2/1985/8502/850207.PDF>.
- ⁴⁹ Ibid.
- ⁵⁰ Watts, *The Military Use of Space: A Diagnostic Assessment*, 19.
- ⁵¹ "Fact Sheet: Presidential Directive on National Space Policy," *The Aerospace Corporation Space Policy Archive* (February 11, 1988), https://aerospace.org/sites/default/files/policy_archives/National%20Space%20Policy%20Feb88.pdf
- ⁵² *National Security Strategy of the United States*, Office of the Secretary of Defense Historical Office (January 1987): 31, <https://history.defense.gov/Portals/70/Documents/nss/nss1987.pdf?ver=2014-06-25-121104-753>
- ⁵³ *National Security Strategy of the United States*, Office of the Secretary of Defense Historical Office (March 1990): 27, <https://history.defense.gov/Portals/70/Documents/nss/nss1990.pdf?ver=2014-06-25-121138-080>.
- ⁵⁴ Ibid., 23.
- ⁵⁵ Saddiqi, "The Soviet Co-Orbital Anti-satellite System," 236-238.
- ⁵⁶ John M. Logsdon and James R. Millar, *U.S.-Russian Cooperation in Human Space Flight: Assessing the Impacts*, Elliott School of International Affairs, George Washington University (Washington, DC: February 2001): 5, https://www.nasa.gov/sites/default/files/atoms/files/partners_us_russian_cooperation_in_human_space_flight.pdf
- ⁵⁷ David W. Ziegler, "Safe Heavens: Military Strategy and Space Sanctuary," in Bruce M. DeBlois, Ed., *Beyond the Paths of Heaven* (Maxwell AFB, AL: Air University Press, 1999): 222.
https://www.airuniversity.af.edu/Portals/10/AUPress/Books/B_0070_DEBLOIS_BEYOND_PATHS_HEAVEN.pdf
Bruce M. DeBlois, "Space Sanctuary. A Viable National Strategy," *Airpower Journal* (1998): 48.
- ⁵⁸ *Final Report to the President on the National Space Program*, National Space Council (January 1993): 8, https://aerospace.org/sites/default/files/policy_archives/Final%20Report%20on%20U.S.%20Space%20Program%20Jan93.pdf.
- ⁵⁹ Watts, *The Military Use of Space: A Diagnostic Assessment*, 45.
- ⁶⁰ *Final Report to the President on the National Space Program*, 8.
- ⁶¹ Ibid., 10.
- ⁶² Ibid.
- ⁶³ "History Resources: Missile Defense after the Cold War," *Missile Defense Agency*, accessed June 23, 2020, https://www.mda.mil/news/history_resources.html
- ⁶⁴ "GAO-01-228R KE-ASAT Program Status," *Government Accountability Office* (December 5, 2000): 9, <https://www.gao.gov/new.items/d01228r.pdf>.
- ⁶⁵ "Fact Sheet: National Space Policy," *The White House National Science and Technology Council* (September 19, 1996): 5, https://aerospace.org/sites/default/files/policy_archives/National%20Space%20Policy%20Sep96.pdf.
- ⁶⁶ William Cohen, "Memorandum: Department of Defense Space Policy," *Massachusetts Institute of Technology Open Courseware*, (July 9, 1999): 23, <https://ocw.mit.edu/courses/aeronautics-and->

- astronautics/16-891j-space-policy-seminar-spring-2003/readings/dodspacepol.pdf.
- ⁶⁷ “Balancing the Global Arms Control Agenda,” *Clinton White House*, <https://clintonwhitehouse5.archives.gov/textonly/WH/EOP/NSC/html/nsc-15.html>
- ⁶⁸ Marc J. Berkowitz, “Protecting America’s Freedom of Action in Space,” *Air Force Space Command: High Frontier* 3, no. 2 (March 2007): 14, <https://www.afspc.af.mil/Portals/3/documents/HF/AFD-070322-103.pdf>.
- ⁶⁹ Stewart M. Powell, “Bell at the White House,” *Air Magazine* 82, no. 2 (February 1999, Published online July 13, 2008), <https://www.airforcemag.com/article/0299bell/>.
- ⁷⁰ Ibid.
- ⁷¹ William S. Cohen, “Report of the Quadrennial Defense Review,” *Department of Defense* (May 1997): viii, <https://history.defense.gov/Portals/70/Documents/quadrennial/QDR1997.pdf?ver=2014-06-25-110930-527>.
- ⁷² *Long Range Plan: Implementing USSPACECOM Vision 2020*, U.S. Space Command (1998): 33, 46 https://books.google.com/books/about/Long_Range_Plan.html?id=Et9XZFae8yMC.
- ⁷³ Michael E. Ryan, “Document I-26: Gen Michael E. Ryan, Chief of Staff, and F. Whitten Peters, Secretary of the Air Force, Aerospace Integration Task Force, ‘The Aerospace Force: Defending America in the 21st Century,’ 9 May 2000,” in Spires, *Orbital Futures*, 114.
- ⁷⁴ John Hamre “Department of Defense Authorization for Appropriations for Fiscal Year 2000 and the Future Years Defense Program,” *Armed Services Committee, United States Senate* (March 22, 1999): 296, <https://play.google.com/store/books/details?id=q4lKa7W56bAC&rdid=book-q4lKa7W56bAC&rdot=1>
- ⁷⁵ “GAO-01-228R KE-ASAT Program Status,” 2.
- ⁷⁶ Long Range Plan: Implementing USSPACECOM Vision 2020, 42.
- ⁷⁷ *National Defense Authorization Act for Fiscal Year 1997: Conference Report 104-724*, United States House of Representatives, 104th Congress, 2nd Session (July 30, 1996): 687, <https://www.govinfo.gov/content/pkg/CRPT-104hrpt724/pdf/CRPT-104hrpt724.pdf>.
National Defense Authorization Act for Fiscal Year 1998: Conference Report 105-340, United States House of Representatives, 105th Congress, 1st Session (October 23, 1997): 669, <https://www.govinfo.gov/content/pkg/CRPT-105hrpt340/pdf/CRPT-105hrpt340.pdf>
Strom Thurmond National Defense Authorization Act for Fiscal Year 1999: Conference Report 105-736, United States House of Representatives, 105th Congress, 2nd Session (September 22, 1998): 547, <https://www.govinfo.gov/content/pkg/CRPT-105hrpt736/pdf/CRPT-105hrpt736.pdf>
- ⁷⁸ *National Defense Authorization Act for Fiscal Year 1998: Conference Report 105-340*, 669.
National Defense Authorization Act for Fiscal Year 2000: Committee on Armed Services Report 106-50, United States Senate, 106th Congress, 1st Session (May 17, 1999): 144, <https://www.govinfo.gov/content/pkg/CRPT-106srpt50/pdf/CRPT-106srpt50.pdf>
Strom Thurmond National Defense Authorization Act for Fiscal Year 1999: Conference Report 105-736, 547.
- ⁷⁹ *National Defense Authorization Act for Fiscal Year 2000: Committee on Armed Services Report 106-50*, 144.
- ⁸⁰ “Report of the Commission to Assess the United States National Security Space Management and Organization,” *The Aerospace Corporation Space Policy Archive* (January 11, 2001): viii-ix, <https://aerospace.csis.org/wp-content/uploads/2018/09/RumsfeldCommission.pdf>
- ⁸¹ Donald Rumsfeld, “Document VII-3: Donald Rumsfeld, Secretary of Defense, Memorandum for Secretaries of the Military Departments, et al, ‘National Security Space Management and Organization, 18 October 2001,” in Spires, *Orbital Futures*, 1253.
- ⁸² Donald Rumsfeld, *Quadrennial Defense Review Report*, Department of Defense (September 30, 2001): 31, <https://archive.defense.gov/pubs/qdr2001.pdf>
- ⁸³ “4th Space Control Squadron,” *Peterson Air Force Base* (June 29, 2016), <https://www.peterson.af.mil/About/Fact-Sheets/Display/Article/326219/4th-space-control-squadron/>
“20th Space Control Squadron,” *Peterson Air Force Base* (January 25, 2017), <https://www.peterson.af.mil/About/Fact-Sheets/Display/Article/1060309/20th-space-control-squadron/>
“18th Space Control Squadron,” *Peterson Air Force Base* (August 6, 2018), <https://www.peterson.af.mil/About/Fact-Sheets/Display/Article/1060346/18th-space-control-squadron/>

- ⁸⁴ “Counter Communications System Block 10.2 Achieves IOC, Ready for the Warfighter,” *Space and Missile Systems Center Public Affairs, Los Angeles Air Force Base* (March 13, 2020), <https://www.losangeles.af.mil/News/Article-Display/Article/2111775/counter-communications-system-block-102-achieves-ioc-ready-for-the-warfighter/#:~:text=The%20first%20offensive%20weapon%20system%20in%20the%20United%20States%20Space,operational%20support%20to%20the%20warfighter.>
- ⁸⁵ Lance W. Lord, “Space Superiority,” *Air Force Space Command: High Frontier* 1, no. 3 (Winter 2005): 3, <https://www.afspc.af.mil/Portals/3/documents/HF/AFD-070622-057.pdf>.
- ⁸⁶ John E. Shaw, “On Cossacks, Subs, and SAMs: Defeating Challenges to US Space Superiority,” *Air Force Space Command: High Frontier* 1, no. 3 (Winter 2005): 23, <https://www.afspc.af.mil/Portals/3/documents/HF/AFD-070622-057.pdf>.
- ⁸⁷ James Andrew Lewis, “Chapter 14: Neither Mahan nor Mitchell: National Security Space and Spacepower, 1945-2000,” in Charles D. Lutes and Peter L. Hays, Eds., *Toward a Theory of Spacepower: Selected Essays* (National Defense University Press, 2011): 292, <https://ndupress.ndu.edu/Portals/68/Documents/Books/spacepower.pdf>
- ⁸⁸ *Challenges to Security in Space*, Defense Intelligence Agency (2019): 20-21, 28-29, https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Space_Threat_V14_020119_sm.pdf
- ⁸⁹ Michael W. Wynne and T. Michael Mosely, “Fiscal Year 2008 National Defense Authorization Act—Budget Request from the Department of the Air Force,” *Armed Services Committee, United States House of Representatives* (February 28, 2007): 30-31, <https://www.govinfo.gov/content/pkg/CHRG-110hhrg38264/pdf/CHRG-110hhrg38264.pdf>
- ⁹⁰ Kevin Chilton, “Fiscal Year 2009 National Defense Authorization Act—Budget Request on U.S. Strategic Posture and Budget Request for Strategic Programs,” *Armed Services Committee, United States House of Representatives* (February 27, 2008): 79, <https://www.govinfo.gov/content/pkg/CHRG-110hhrg43250/pdf/CHRG-110hhrg43250.pdf>.
- ⁹¹ *National Security Strategy*, Obama White House Archives (May 2010): 31, https://obamawhitehouse.archives.gov/sites/default/files/rss_viewer/national_security_strategy.pdf.
- National Security Strategy*, Obama White House Archives (February 2015): 13, https://obamawhitehouse.archives.gov/sites/default/files/docs/2015_national_security_strategy_2.pdf.
- ⁹² *National Security Strategy* (2010), 31. *National Space Policy of the United States of America* (June 28, 2010): 14, https://aerospace.org/sites/default/files/policy_archives/National%20Space%20Policy%2028Jun10.pdf
- ⁹³ *National Security Space Strategy: Unclassified Summary*, Director of National Intelligence (January 2011): 1, https://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/2011_nationalsecurityspacestrategy.pdf
- ⁹⁴ *Ibid.*, 5 & 11.
- ⁹⁵ Robert Work, “Remarks at the Space Symposium,” *U.S. Department of Defense* (April 12, 2016), <https://www.defense.gov/Newsroom/Speeches/Speech/Article/723498/remarks-at-the-space-symposium/>
- ⁹⁶ C. Robert Kehler, “Space Posture Review and the Fiscal Year 2011 National Defense Authorizations Budget Request for National Security Space Activities,” *Armed Services Committee, United States House of Representatives* (April 21, 2010): 11-12, 29-30, <https://www.govinfo.gov/content/pkg/CHRG-111hhrg58024/pdf/CHRG-111hhrg58024.pdf>
- ⁹⁷ Mike Gruss, “U.S. Spending on Space Protection Could Hit \$8 Billion through 2020,” *Space News* (July 2, 2015), <https://spacenews.com/u-s-spending-on-space-protection-could-hit-8-billion-through-2020/>
- ⁹⁸ “White House Fact Sheet: Press Release on National Space Strategy,” *The White House* (March 23, 2018): <https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-unveiling-america-first-national-space-strategy/>
- ⁹⁹ “Text of Space Policy Directive-4: Establishment of the United States Space Force,” *The White House* (February 19, 2019), <https://www.whitehouse.gov/presidential-actions/text-space-policy-directive-4-establishment-united-states-space-force/>
- ¹⁰⁰ Kenneth Rapuano, “Fiscal Year 2020 Priorities for National Security Space Programs: Statement of the Honorable Kenneth Rapuano, Assistant Secretary of Defense for Homeland Defense & Global Security,” *Armed Services Committee, United States House of Representatives* (April 3,

2019): 34,
<https://www.govinfo.gov/content/pkg/CHRG-116hhrg36900/pdf/CHRG-116hhrg36900.pdf>

- ¹⁰¹ “Joint Prepared Statement of the Honorable Heather A. Wilson, General David L. Goldfein, General John W. Raymond, and Lieutenant General Samuel A. Greaves,” *Armed Services Committee, United States Senate* (May 17, 2017): 6,9, <https://www.govinfo.gov/content/pkg/CHRG-115shrg35942/pdf/CHRG-115shrg35942.pdf>
- ¹⁰² C. Todd Lopez, “Time to Move Forward with Space Force, Air Force Secretary Says,” *U.S. Department of Defense News*, (December 8, 2019), [https://www.defense.gov/Explore/News/Article/Art](https://www.defense.gov/Explore/News/Article/Article/2034790/time-to-move-forward-with-space-force-air-force-secretary-says/)

[icle/2034790/time-to-move-forward-with-space-force-air-force-secretary-says/](https://www.defense.gov/Explore/News/Article/Article/2034790/time-to-move-forward-with-space-force-air-force-secretary-says/)

- ¹⁰³ John Raymond, “Media Roundtable with U.S. Space Command Commander Gen. John Raymond,” *U.S. Department of Defense* (August 29, 2019), <https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1949346/media-roundtable-with-us-space-command-commander-gen-john-raymond/>
- ¹⁰⁴ Jimmy Carter, “Presidential Directive/ NSC-37: National Space Policy,” 6.

