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What Got Us Here, Won't Get Us There: Why U.S. Commercial Space Policy Must Lie in an Independent Regulatory Agency

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Notes

What Got Us Here, Won't Get Us There: Why U.S. Commercial Space Policy Must Lie in an Independent Regulatory Agency

GERARDO INZUNZA HIGUERA[†]

This Note addresses the need for a comprehensive, centralized independent agency designated solely for the management of commercial space activities. The current commercial “space rush” promises unimaginable possibilities and profits for a burgeoning sector, yet no single federal agency has been entrusted with the regulation of this nascent industry. Currently, the United States has settled into an inefficient, fragmented regulatory approach that unduly burdens commercial players and frustrates its national objective of fostering a robust commercial low-Earth orbit economy. This Note analyzes proposals by Congress for such a new regulatory agency and concludes by proposing a new framework that encourages expert-driven commercial space regulations void of political adulteration, while also establishing a regulatory system that can be exported to other spacefaring nations.

[†] J.D. Candidate 2022, University of California, Hastings College of the Law. I would like to thank Professor Dorit Rubinstein Reiss for not only introducing me to the fascinating world of administrative law, but more importantly for being an incredible mentor. I would also like to thank the *Hastings Law Journal* staff for their hard work and insightful feedback. Finally, I would like to thank Joaquin Benavente and Samar Lightfoot for their unconditional support. This Note is dedicated to my mother, who taught me that there are no limits in this world for those with an abundance of imagination.

TABLE OF CONTENTS

INTRODUCTION	107
I. THE THREE SECTORS OF SPACE REGULATIONS: NATIONAL SECURITY, CIVIL, AND COMMERCIAL	108
A. NATIONAL SECURITY—DEPARTMENT OF DEFENSE AND THE U.S. SPACE FORCE.....	108
B. CIVIL—NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)	109
C. COMMERCIAL—THE AMERICAN SPACE COMMERCE FREE ENTERPRISE ACT OF 2019.....	111
II. THE INEFFICIENCIES OF A FRAGMENTED ADMINISTRATIVE APPROACH: LESSONS FROM FEMA	112
III. THE UNITED STATES' CURRENT FRAGMENTED APPROACH TO COMMERCIAL SPACE POLICY.....	114
IV. WHY COMMERCIAL SPACE REGULATIONS MUST BE PROMULGATED BY AN INDEPENDENT EXECUTIVE AGENCY	117
A. ADDITIONAL CONCERNS EMANATING FROM THE PROPOSED ASCFEA FRAMEWORK	119
V. THE IDEAL COMMERCIAL SPACE AGENCY—A BETTER APPROACH	121
CONCLUSION	127

INTRODUCTION

The passage of the U.S. Commercial Space Launch Competitive Act of 2015¹ (CSLCA) signaled to the world that the United States was not only ready for, but actively engaging in, its manifest destiny of the “final frontier.”² However, as the first country to adopt national legislation aimed at establishing a regulatory framework for commercial space activities—including the appropriation of space resources—it is in the United States’ best interest to set forth a cohesive and comprehensive standard.³ This standard must ensure that democratic values of justice and cooperation are also exported to, and at the forefront of, any future global commercial space policies. Since the enactment of the CSLCA, the United States’ efforts to further its national space policies continue to increase without any signs of slowing down. The Trump administration, over the course of four years, implemented a slew of executive orders aimed at “encouraging and facilitating the continued growth of a domestic commercial space sector.”⁴ However, the orders lacked cohesion and simply amounted to an amalgamation of somewhat unconnected directives to various executive agencies and political entities. The absence of any substantive guidance and the infusion of political rhetoric throughout the executive orders highlight another problem with these directives; namely, the politicization of what *should* be expert-driven decisions. Additionally, current statutes and directives relating to commercial space activities continue to disregard the pressing need to establish a framework for an integrated global space ecosystem that is necessary for sharing vital in-orbit data among spacefaring nations.

As the self-appointed global leader in commercial space policy, this patchwork approach is not only unsustainable, but incompatible with the United States’ obligation to establish a cohesive standard for the rest of the world to emulate. Creating a model regulatory framework that incorporates western democratic values into commercial space activities is a necessary step if the United States is to continue exerting its power and leadership in space throughout the rest of the twenty-first century and beyond. This Note argues the need for establishing a domestic independent regulatory agency with comprehensive powers to regulate commercial space activities, with the intention of serving as a model system for other nations to emulate, given that

1. Pub. L. No. 114–90, 129 Stat. 705 (2015) (codified as amended in scattered sections of 42 U.S.C. and 51 U.S.C.).

2. The colloquial reference to the famous description of space in the opening narration of the science fiction TV series, *Star Trek: The Original Series: The Man Trap* (NBC television broadcast Sept. 8, 1966).

3. Tanja Masson-Zwaan & Neta Palkovitz, *Regulation of Space Resource Rights: Meeting the Needs of States and Private Parties*, 35 *QUESTIONS OF INT’L L.* 5, 10 (2017) (“The first state to adopt national legislation was the United States. The Commercial Space Launch Competitiveness Act (CSLCA) was passed on 25 November, 2015.”).

4. The National Space Policy, 85 Fed. Reg. 81,755, 81,755 (Dec. 16, 2020) (from 2017 to 2020, the Trump administration implemented eleven executive orders directed at commercial space policy initiatives).

the ultimate goal is to incorporate these various systems into one interdependent global ecosystem.

I. THE THREE SECTORS OF SPACE REGULATIONS: NATIONAL SECURITY, CIVIL, AND COMMERCIAL

The United States' current approach to space regulations is segmented largely based on subject matter and showcases why there is a clear need for a comprehensive, centralized agency dedicated exclusively to *commercial* space activities.⁵ Currently, the United States' space policies and regulatory schemes are divided into three sectors: (1) national security; (2) civil; and (3) commercial.⁶

A. NATIONAL SECURITY—DEPARTMENT OF DEFENSE AND THE U.S. SPACE FORCE

The Department of Defense (“DOD”) is the governmental body designated to oversee the national security of the United States, including deterring and countering threats from space.⁷ The Trump administration and Congress furthered the United States' intent of exercising political and physical dominion over the use of space by establishing a new military branch—the United States Space Force (“Space Force”)—to enable offensive and defensive space operations.⁸ Given the national security threats implicated by orbital debris, the DOD also operates the Space Surveillance Network, which monitors and tracks orbital debris larger than ten centimeters in diameter⁹ in what is commonly referred to as Space Situational Awareness (“SSA”).¹⁰

In 2019, the DOD reestablished the U.S. Space Command (“USSPACECOM”), a unit specifically devoted to deterring aggressions and conflicts from other countries in space,¹¹ in response to the changing reality that eleven nations now also have the industrial capability to develop, manufacture,

5. *See id.* at 81,765 (describing how space regulations concerning national security and space exploration are primarily overseen by a single agency—DOD and NASA respectively—while space regulations concerning commercial activities are currently overseen by multiple agencies).

6. *See id.* (“The United States conducts space activities in three distinct but interdependent sectors: commercial, civil, and national security.”).

7. Memorandum from Donald J. Trump, President of the United States, on Space Policy Directive-4: Establishment of the United States Space Force (Feb. 19, 2019) [hereinafter Space Policy Directive-4], <https://media.defense.gov/2019/Mar/01/2002095015/-1/-1/1/SPACE-POLICY-DIRECTIVE-4-FINAL.PDF>; *see also* STEPHEN M. MCCALL, CONG. RSCH. SERV., IF10337, CHALLENGES TO THE UNITED STATES IN SPACE (2020), <https://sgp.fas.org/crs/natsec/IF10337.pdf> (explaining that the Space Force was established after the enactment of the National Defense Authorization Act for FY2020).

8. Space Policy Directive-4, *supra* note 7; The National Space Policy, 85 Fed. Reg. at 81,770–71.

9. DANIEL MORGAN, CONG. RSCH. SERV., R45416, COMMERCIAL SPACE: FEDERAL REGULATION, OVERSIGHT, AND UTILIZATION 15 (2018), <https://crsreports.congress.gov/product/pdf/R/R45416/2>.

10. *Id.* at 16; *see also* 10 U.S.C. § 2274 (authorizing DOD to provide SSA services and information to non-U.S. government entities, including U.S. and foreign commercial entities).

11. Space Policy Directive-4, *supra* note 7; The National Space Policy, 85 Fed. Reg. at 81,770–71.

launch, and operate their own space systems.¹² The need for reestablishing such an entity became apparent after China conducted tests in 2007 and 2013 of a ground-based, direct-ascent anti-satellite (“ASAT”) system that was used to destroy aging Chinese weather satellites, showcasing China’s capability of destroying American satellites as well.¹³

As commercial space activities grow, analysts and observers increasingly find it inappropriate for the DOD to bear the responsibility of providing safety services for commercial operations.¹⁴ In the 2018 Space Policy Directive-3 (“SPD-3”), the Trump administration acknowledged that as the number of space objects increase, the DOD’s limited space traffic management (“STM”) and then-architecture were becoming increasingly inadequate.¹⁵ Additionally, *SPD-3* also instructs federal agencies to develop new policies and regulations for future U.S. orbital operations aimed at creating a framework designed to operate in increasingly congested space traffic,¹⁶ and identifies the Department of Commerce as the civil agency in charge of publicly releasing DOD SSA data.¹⁷ However, *SPD-3* runs counter to Section 110 of the CSCLA, in which Congress specifically directed the Department of Transportation, acting through the Federal Aviation Administration’s (“FAA”) Office of Commercial Space Transportation—not the Department of Commerce—to study the feasibility of taking on the responsibility of processing and releasing SSA data to commercial actors.¹⁸ The urgent need for designating a federal department or agency—other than the DOD—to provide SSA services is further underscored by Congress’s mandate that the President submit such a plan to Congress.¹⁹ The contradictions between *SPD-3* and the CSCLA exemplify the inefficiencies of the current fragmented regulatory approach to commercial space policies and show the need for a comprehensive, centralized federal agency dedicated exclusively to regulating and overseeing commercial space endeavors.

B. CIVIL—NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

The National Aeronautics and Space Administration (“NASA”) is the governmental body in charge of overseeing the civil division of the United States’ space program.²⁰ NASA was originally established in 1958 for the

12. CONG. RSCH. SERV., *supra* note 7.

13. JAMES A. VEDDA & PETER L. HAYS, MAJOR POLICY ISSUES IN EVOLVING GLOBAL SPACE OPERATIONS 49 (2018) (China conducted another similar test in May 2013, again showcasing these capabilities).

14. CONG. RSCH. SERV., *supra* note 9, at 16; *see also* VEDDA & HAYS, *supra* note 13, at 7.

15. Memorandum from Donald J. Trump, President of the United States, on Space Policy Directive-3: National Space Traffic Management Policy (June 18, 2018) [hereinafter Space Policy Directive-3], <https://trumpwhitehouse.archives.gov/presidential-actions/space-policy-directive-3-national-space-traffic-management-policy>.

16. *Id.*

17. CONG. RSCH. SERV., *supra* note 9, at 16.

18. *Id.*

19. *Id.* at 17.

20. National Aeronautics and Space Act of 1958, 51 U.S.C. § 20102.

purpose of securing and advancing U.S. leadership in aeronautics, communications satellites, and Earth remote sensing.²¹ Since then, and particularly as a result of the Trump administration's focused efforts through its National Space Policy Memorandum from December 9, 2020²² ("National Space Policy Memo"), the agency has restructured and repositioned its efforts towards space exploration with four strategic goals: (1) encouraging scientific discovery; (2) expanding human presence in space and long-term exploration to the Moon, Mars, and beyond; (3) developing and promoting revolutionary technologies and promoting these to catalyze economic growth; and (4) enabling NASA's capabilities and operations in furtherance of its missions.²³ These evolving agency directives are *dependent* on a robust governmental partnership and commercialization strategy with the U.S. private sector in order to develop a competitive low-Earth orbit (LEO²⁴) economy.²⁵ NASA intends to shift its operations in space from relying solely on the International Space Station ("ISS") to relying on new commercial orbital platforms, as it becomes a *consumer* in the private sector rather than a primary supplier of these capabilities following the expected cessation of direct U.S. federal funding for the ISS in 2025.²⁶ However, given the current fragmentation of commercial space regulations, there are currently no federal rules relating to the operation of privately-owned commercial orbital platforms or private vehicles in space, further frustrating the agency's enumerated objectives.²⁷

In the coming years, NASA sees itself as being one of many customers of privately-owned platforms and cargo transportation services that will enable a variety of activities in LEO.²⁸ Given this new vision, having a centralized federal

21. NAT'L AERONAUTICS & SPACE ADMIN., NASA STRATEGIC PLAN 2018 22, 55 (2018), https://www.nasa.gov/sites/default/files/atoms/files/nasa_2018_strategic_plan.pdf.

22. The National Space Policy, 85 Fed. Reg. at 81,756.

23. NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 21, at 7–8; *see also* Memorandum from Donald J. Trump, President of the United States, on Space Policy Directive-1: Reinvigorating America's Human Space Exploration Program (Dec. 11, 2017) [hereinafter Space Policy Directive-1], <https://irp.fas.org/offdocs/nspm/spd-1.pdf>.

24. *See* BILL CANIS, CONG. RSCH. SERV., IF10415, CHANGES IN THE U.S. COMMERCIAL SPACE INDUSTRY (2016), <https://crsreports.congress.gov/product/pdf/IF/IF10415> (explaining how satellites are placed in different orbits depending on their planned use: (1) low-Earth orbit (LEO) is reserved for the ISS, other orbital platforms, or satellites that provide higher-resolution images because they are close to Earth and revolve around the planet every 90 minutes; (2) medium-Earth orbit (MEO) is typically reserved for Global Positioning System (GPS) satellites; (3) geosynchronous-Earth orbit (GEO) is traditionally reserved for television or weather satellites, as these match the Earth's rotational speed and thus remain in the same place above Earth enabling them to monitor the same location for changes in weather or to facilitate telecommunications; and (4) high-Earth orbit (HEO)).

25. NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 21, at 1; *see also* NAT'L AERONAUTICS & SPACE ADMIN., NASA PLAN FOR COMMERCIAL LEO DEVELOPMENT 1 (2019), https://www.nasa.gov/sites/default/files/atoms/files/commleodevt_plan_6-7-19_final1.pdf.

26. NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 21, at 1; NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 25, at 1–2.

27. ALYSSA K. KING, CONG. RSCH. SERV., R46500, THE FUTURE OF SPACE TOURISM 4–5 (2020), <https://sgp.fas.org/crs/space/R46500.pdf> ("There are currently no federal rules related to suborbital operations or to the operation of privately owned space stations and private vehicles in space.")

28. NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 25, at 2.

agency dedicated exclusively to regulating and overseeing these commercial space activities is of paramount and pressing importance. NASA itself recognizes that to further its policy directives, there must be a regulatory environment in LEO that enables U.S. commercial space activities to thrive, with the aim of eventually leading our international partners to adopt what will hopefully be a successful American regulatory system.²⁹

C. COMMERCIAL—THE AMERICAN SPACE COMMERCE FREE ENTERPRISE ACT OF 2019

Unlike the national security and civil sectors, the commercial sector is neither governed nor regulated by a particular governmental body, mostly because of a lack of a pressing need for it; that is, until now. Although Congress attempted to address this problem with the American Space Commerce Free Enterprise Act of 2019 (“ASCFEA”),³⁰ the Act failed to adequately address the current commercial space sector’s regulatory system’s inefficiencies, administrative burdens, and lack of transparency.³¹ This failure is a problem, not only because certain portions of both the civil and national security sectors *expect* to rely on commercial services and capabilities to supplant their own,³² but also because this approach undermines the United States’ stated efforts of establishing a centralized federal agency for commercial space activities that should serve as an international model for other countries.³³

The ASCFEA entrusts the Secretary of Commerce (the “Secretary”), acting through the Office of Space Commerce (“OSC”), with the role of being the sole administrator authorized to implement and oversee the provisions of the ASCFEA.³⁴ The Act enumerates specific responsibilities for the OSC to oversee: (1) ensuring that nongovernmental (commercial) space activities are carried out in conformity with international obligations; (2) authorizing and overseeing the certification process for commercial space activities; (3) overseeing the mitigation of space debris; (4) evaluating the development of commercial space activities through a newly established entity, the Private Space Activity Advisory Committee (created to identify the challenges facing the private sector, avoiding adverse environmental changes to the Earth from space activities, and to provide recommendations to the Secretary and Congress); and (5) ensuring

29. *Id.* at 4.

30. American Space Commerce Free Enterprise Act, H.R. 3610, 116th Cong. § 2(c)(1) (2019).

31. *Id.*

32. The National Space Policy, 85 Fed. Reg. at 81,762–65 (seeking to transfer “routine operational space functions to the commercial space sector” such as SSA data and basic space traffic coordination); *see also* NAT’L AERONAUTICS & SPACE ADMIN., *supra* note 25, at 11 (explaining NASA’s framework for commercial development of LEO involves turning over LEO operations to the private sector and simply becoming one of many customers).

33. The National Space Policy, 85 Fed. Reg. at 81,755.

34. H.R. 3610 § 80101(8) (defining “Secretary”), § 80103(c)(5) (explaining the nondelegable nature of the Secretary’s responsibilities for certifications applications and requirements, including to the OSC).

the United States remains the world leader in commercial space activities.³⁵ The ASCFEA also elevated the head of the OSC from a Senior Executive (appointed by the Secretary) to the Assistant Secretary of Commerce (acting as the Director of the OSC), thus requiring appointment by the President and confirmation by the Senate.³⁶ This seemingly innocuous change highlights another central problem of the ASCFEA's approach; the politicization of a new federal agency charged with promulgating commercial space regulations that must be based on expertise rather than political preference.

II. THE INEFFICIENCIES OF A FRAGMENTED ADMINISTRATIVE APPROACH: LESSONS FROM FEMA³⁷

The creation of the Federal Emergency Management Agency ("FEMA") in 1978 was largely in response to the lack of a comprehensive, coordinated national emergency management system, which resulted in decades of inefficient and fragmented responses to national disasters.³⁸ From 1803 to 1950, more than 128 laws relating to disaster relief were passed by Congress as a consequence of not having a centralized authority.³⁹ As a result of this fragmentation, by 1978, more than 100 federal agencies claimed jurisdiction over different aspects of emergency management, often resulting in a slow government response to major catastrophes.⁴⁰ However, it was not until the partial meltdown of the Three Mile Island Nuclear Generation Station in Harrisburg, Pennsylvania, that the need for a centralized management agency became overwhelmingly apparent.⁴¹

During the partial meltdown on March 28, 1979, Pennsylvania Governor Richard Thornburgh was given conflicting recommendations by the Nuclear Regulatory Commission ("NRC") that resulted in public confusion and hysteria.⁴² While the emergency Executive Management Team recommended a ten-mile evacuation based on the readings it was provided by the plant, the NRC's regional inspectors *at the reactor* were informing Governor Thornburgh that no evacuation was needed.⁴³ Unable to provide the public with a conclusive answer as to whether an evacuation was necessary, President Jimmy Carter

35. H.R. 3610 § 2(a)(1) (international obligations), § 2(a)(4) (certification process), § 80104(a)(1) (mitigation of space debris), §§ 80109(a), (e)(1–8) (continual evaluation of commercial space activities), § 2(c)(2) (remains global leader in commercial space activities).

36. H.R. 3610 § 7(2).

37. Federal Emergency Management Agency ("FEMA").

38. FED. EMERGENCY MGMT. AGENCY, WE ARE FEMA HELPING PEOPLE BEFORE, DURING, AND AFTER DISASTERS 16–17 (2019), https://www.fema.gov/sites/default/files/2020-03/publication-one_english_2019.pdf.

39. *Id.* at 16.

40. *Id.* at 17.

41. *Id.*

42. WILLIAM W. CHENAULT, GARY D. HILBERT & SETH D. REICHLIN, FED. EMERGENCY MGMT. AGENCY, RS 2-8-34, EVACUATION PLANNING IN THE TMI ACCIDENT 6 (1980), <https://apps.dtic.mil/dtic/tr/fulltext/u2/a080104.pdf>.

43. *Id.*

called an emergency meeting to understand the source of the conflict and found the problem to be the diffusion of responsibility between the agencies involved.⁴⁴ Specifically, the NRC was designated as the lead technical agency, the Federal Disaster Assistance Administration (“FDAA”) was the lead federal agency responsible for the organization and coordination of a federal response to support potential evacuations, and the Defense Civil Preparedness Agency (“DCPA”) was in charge of evaluating the State’s evacuation plan.⁴⁵ Additionally, the Bureau of Radiation Protection (“BRP”) and the Environmental Protection Agency (“EPA”), alongside the Pennsylvania Department of Environmental Resources (“DER”), *all* were responsible for assessing any potential radiation exposure to the surrounding populations.⁴⁶ The fragmentation and incoordination between the agencies resulted in the conflicting reports that both Governor Thornburgh and President Carter were expected to use to provide the public with the important directive of either evacuating the surrounding areas or staying put—an impossible task when no clear answer could be deduced from the reports.⁴⁷ Therefore, given the inefficient and vexed fragmented response, the Three Mile Island disaster cemented the need for a centralized agency for emergency management.⁴⁸

In response to the disaster, President Carter established FEMA on April 1, 1979, and shortly thereafter gave the agency the dual mission of emergency management and civil defense.⁴⁹ By concentrating the management of emergency responses in *one* central agency, FEMA allowed for the conglomeration of many dispersed executive agencies that claimed jurisdiction, such as the DCPA (from the DOD), the FDAA (from the Department of Housing and Urban Development), and the Federal Preparedness Agency (from the independent General Services Administration).⁵⁰ This centralization increased the efficiency and effectiveness of the Federal Government’s response to national disasters.⁵¹ The importance of having such a comprehensive, centralized emergency management entity was later reaffirmed by President William (“Bill”) J. Clinton’s decision to elevate the FEMA Director to a cabinet-level position, following the 1995 Oklahoma City bombing.⁵²

The United States must apply what it learned from the pre-FEMA framework to the commercial space sector, given that its inefficiencies and fragmentation serve as a cautionary tale. Although the United States’ national space policy infrastructure is still in its infancy, it is bound to result in a

44. *Id.*

45. *Id.* at 6, 26.

46. *Id.* at 26.

47. *Id.*

48. FED. EMERGENCY MGMT. AGENCY, *supra* note 38, at 17.

49. *Id.*

50. *Id.* at 17–18.

51. *Id.*

52. *Id.* at 21.

fragmented and inefficient regulatory framework if Congress fails to establish an independent, comprehensive, centralized commercial space agency. The Trump administration's *National Space Policy Memo* is showing signs of this problem already, given that six government entities currently hold jurisdiction over commercial space policies under its directives, including: (1) The Office of Commercial Space Transportation⁵³ ("AST") (under the Department of Transportation); (2) the OSC⁵⁴ (under the Department of Commerce); (3) NASA⁵⁵; (4) the National Space Council⁵⁶ (under the Executive Office of the President); (5) the Office of Science and Technology Policy⁵⁷ ("OSTP") (a department under the Executive Office of the President); and (6) the National Science and Technology Council⁵⁸ ("NSTC") (a council under the Executive Office of the President). If the United States is to learn from its mistakes, it must approach the commercialization of space in a proactive manner by actively anticipating and preparing for what is to come, and by avoiding the mistakes highlighted by the pre-FEMA regulatory morass.

III. THE UNITED STATES' CURRENT FRAGMENTED APPROACH TO COMMERCIAL SPACE POLICY

Since before the decommissioning of NASA's space shuttle program in 2011,⁵⁹ the United States has taken a fragmented regulatory approach through the use of multiple federal agencies to regulate the commercial space industry⁶⁰—eerily reminiscent of the pre-FEMA emergency management framework.⁶¹ Like the inefficiencies that plagued the pre-FEMA framework, the current commercial space regulatory scheme is showing signs of fragmentation that are leading to inefficient responses as a result of this patchwork approach—currently only addressing commercial space developments through the oversight of agency programs and budgets, rather than by passing comprehensive legislation.⁶² For example, the administration of export licenses for spacecraft and other commodities related to launch vehicles, missiles, and rockets, is currently managed by *both* the Department of Commerce and the Department of State.⁶³ Therefore, a commercial actor who wishes to acquire an export license for any space-related commodity would need to either spend the resources to

53. *About the Office of Commercial Space Transportation*, FED. AVIATION ADMIN.: OFF. OF COM. SPACE TRANSP., https://www.faa.gov/about/office_org/headquarters_offices/ast (last visited Jan. 3, 2022).

54. OFF. OF SPACE COM., <https://www.space.commerce.gov> (last visited Jan. 3, 2022).

55. NAT'L AERONAUTICS & SPACE ADMIN., <https://www.nasa.gov> (last visited Jan. 3, 2022).

56. NAT'L SPACE COUNCIL, <https://www.space.commerce.gov/category/national-space-council> (last visited Jan. 3, 2022).

57. OFF. OF SCI. & SPACE POL'Y, <https://www.whitehouse.gov/ostp> (last visited Jan. 3, 2022).

58. NAT'L SCI. & TECH. COUNCIL, <https://www.whitehouse.gov/ostp/nstc> (last visited Jan. 3, 2022).

59. CONG. RSCH. SERV., *supra* note 24.

60. CONG. RSCH. SERV., *supra* note 9, at 1.

61. FED. EMERGENCY MGMT. AGENCY, *supra* note 38, at 16.

62. CONG. RSCH. SERV., *supra* note 9, at 1.

63. *Id.* at 10.

obtain duplicative licenses from both departments, or spend the resources to decipher which department has jurisdiction over their particular transaction. Both instances expose the inefficiencies and wastefulness in which the current approach burdens commercial space actors.

The current regulation of in-orbit activities is an incomplete patchwork that requires commercial actors to consult with a slew of federal agencies for the launching of commercial satellites.⁶⁴ For example, the Federal Communications Commission (“FCC”) oversees radio frequency use for satellite communications and geostationary Earth orbit (“GEO”) orbital slot assignments.⁶⁵ Additionally, a commercial entity must also consult with the National Oceanic and Atmospheric Administration (“NOAA”) and the Commercial Remote Sensing Regulatory Affairs Office⁶⁶ (under the Department of Commerce)—which both regulate commercial remote sensing—to obtain a remote sensing license for a satellite.⁶⁷ Besides the FCC and NOAA, a commercial entity wishing to launch a satellite into space must also consult with the FAA (which regulates commercial launches and reentries) to obtain a license for launching that same satellite.⁶⁸ Although consulting with multiple agencies to partake in regulated activities is not unusual, the problem with the current approach is the overlapping nature of many of these burdensome requirements. However, these burdens could be significantly lessened by the creation of a coordinated, comprehensive independent agency dedicated specifically to minimizing these administrative burdens, which often come at great financial cost to commercial actors. Therefore, the regulatory patchwork for commercial space activities highlights the current inefficiencies and burdensome bureaucratic hurdles commercial space actors must overcome—largely because of the absence of a centralized agency designated specifically to address commercial space activities.

The U.S. Government Accountability Office (“GAO”) has also determined that the current fragmentation and overlap in national security space acquisition management has contributed to program delays and cancellations, cost increases, and inefficient operations.⁶⁹ In 2012, the GAO identified sixty national security space stakeholder organizations across the Federal Government that shared oversight and acquisition management responsibilities, leading the GAO to conclude that this fragmented leadership contributed to poor coordination and lengthy decisionmaking, such that space technologies

64. VEDDA & HAYS, *supra* note 13, at 16.

65. *Id.*

66. CONG. RSCH. SERV., *supra* note 9, at 8.

67. VEDDA & HAYS, *supra* note 13, at 16–17.

68. *Id.* at 17.

69. KATHLEEN J. MCINNIS & STEPHEN M. MCCALL, CONG. RSCH. SERV., IF11172, “SPACE FORCE” AND RELATED DOD PROPOSALS: ISSUES FOR CONGRESS (2019), <https://crsreports.congress.gov/product/pdf/IF/IF11172>.

frequently became obsolete by the time these systems were deployed.⁷⁰ Since the passage of the CSLCA, Congress has repeatedly been made aware of the fragmented structure of federal regulations and the management of the commercial space industry by the OSC.⁷¹ In particular, Congress is well aware of the need to restructure the regulatory and management framework as the commercial space industry grows and incorporates activities such as space tourism, asteroid and moon mining operations, and the exploration of Mars and beyond.⁷²

Federal recognition of the inefficiencies stemming from the current fragmented regulatory approach to commercial space activities has led to the creation of numerous oversight and management entities, such as the National Space Council⁷³ and the OSC.⁷⁴ However, these entities do not (and cannot) go far enough because they lack central regulatory functions,⁷⁵ as a result of the current moratorium on the regulation of commercial space activities established by the CSLCA—as a way to allow the commercial space sector to develop without costly and burdensome regulations in an unexplored area.⁷⁶ For example, the National Space Council’s function is merely to provide advice on civil, commercial, and military space issues and to coordinate the implementation of the President’s space policies.⁷⁷ However, it is unclear how such an entity would go about implementing these policies without possessing some regulatory power. Both the National Space Council and the OSC have provided recommendations to Congress to improve the current regulatory framework for commercial space activities, yet these have all gone nowhere due to Congress’s current gridlock, which siphons Congress’s attention away from these administrative matters towards other politically expedient and controversial legislations.⁷⁸ Although the creation of a new administrative agency requires congressional action, the current regulatory inefficiencies will continue to worsen without a dedicated agency with the authority to promulgate the aforementioned recommended changes.

However, unless otherwise extended by Congress, the current moratorium on the regulation of commercial space activities (or “learning period”) will

70. *Id.*

71. CONG. RSCH. SERV., *supra* note 24.

72. *Id.*

73. CONG. RSCH. SERV., *supra* note 9, at 14 (“[T]he National Space Council was established in 1989 ‘to provide a coordinated process for developing a national space policy and strategy and for monitoring its implementation.’”).

74. *Id.* at 9 (“Under the authority of 51 U.S. § 50702, the Commerce Department’s Office of Space Commerce is the department’s ‘principal unit for the coordination of space-related issues, programs, and initiatives.’”).

75. *Id.*

76. *Id.* at 6.

77. CONG. RSCH. SERV., *supra* note 27, at 12.

78. KING, *supra* note 27, at 12–13 (describing legislative proposals sent to Congress to establish an entity for administering regulations of commercial spaceflight activities not overseen by the FAA, such as asteroid mining, on-orbit satellite servicing, and other commercial endeavors).

expire in October 2023.⁷⁹ Given the expected exponential growth of the domestic commercial space industry,⁸⁰ it is imperative that Congress tackle the current fragmented regulatory framework proactively rather than continue its current “hands off” approach.⁸¹ The commercial space industry’s relatively nascent regulatory framework has allowed agency roles to not yet fully settle. This provides an opportunity for Congress to methodologically incorporate the different parts of the current fragmented framework into a holistic regulatory scheme that can avoid the pre-FEMA-type deficiencies and convolutions that plagued U.S. emergency disaster management in the past.⁸²

IV. WHY COMMERCIAL SPACE REGULATIONS MUST BE PROMULGATED BY AN INDEPENDENT EXECUTIVE AGENCY

Given the global implications inherent in any commercial space activities, regardless of the activities’ origin, regulations aimed at these activities must use an effective approach in order to truly serve as a “model” for other countries to emulate. An agency entrusted with promulgating regulations for commercial space activities must be governed by expertise, not only in the subject matter, but also in the global dynamics implicated in any regulatory scheme it expounds. The principal avenue by which Congress can guarantee that experts, not politicians, would be the driving force behind commercial space policies is through the establishment of an *independent* agency.

The principal distinction between an independent and traditional regulatory agency is that independent agencies are more likely to be free from the President’s political influence.⁸³ This relative independence stems from several characteristics generally shared by independent agencies, such as having multimember boards (as opposed to a single director) that reach decisions by a majority vote, with members serving for a term of years on a staggered basis as a way to ensure that a President is unable, in a single term, to replace the entire governing body.⁸⁴ Additionally, an independent agency normally requires that no more than a simple majority of its board come from a single political party, thereby ensuring, or at least making it more likely, that agency decisions would

79. CONG. RSCH. SERV., *supra* note 9, at 6 (explaining that the moratorium, or learning period, was initially enacted in 2004 for an eight-year period but has been subsequently extended several times—most recently in 2015 as part of the CSCLA).

80. See ALYSSA K. KING, CONG. RSCH. SERV., IFF11351, IMPACT OF COMMERCIAL LAUNCH ACTIVITIES ON AVIATION (2020), <https://sgp.fas.org/crs/space/IF11351.pdf> (highlighting that the FAA predicts commercial space launches will increase from an average of 21 launches from 2013–2018 per year to up to 56 by 2021).

81. 51 U.S.C. § 50905(c)(3) (“The Secretary [of Commerce] shall continue to work with the commercial space sector . . . to facilitate the development of voluntary industry consensus standards based on recommended best practices . . . as the commercial space sector continues to mature.”)

82. CONG. RSCH. SERV., *supra* note 9, at 2.

83. See WILLIAM F. FUNK, SIDNEY A. SHAPIRO & RUSSELL L. WEAVER, ADMINISTRATIVE PROCEDURE & PRACTICE: A CONTEMPORARY APPROACH 15 (6th ed., 2018).

84. *Id.*

be based on expertise rather than simply furthering a particular political party's preferences.⁸⁵

Another typical feature of independent agencies that safeguards agency actions from operating as purely political decisions is that, unlike executive agencies whose heads generally serve "at the pleasure" of the President, members of independent agencies normally can only be removed "for cause."⁸⁶ Protecting agency administrators from dismissal unless the President can provide proper cause is important because without these protections, the President can always fire an administrator simply for disagreeing with White House demands regarding the content or outcome of particular rulemaking decisions.⁸⁷ The importance of ensuring that any designated agency for commercial space regulations be independent was also endorsed by the Department of Commerce in 2018, when it proposed making the OSC an *independent* bureau that, among other functions, would oversee commercial space traffic management.⁸⁸

Currently, under the proposed agency structure contained in the ASCFEA, the responsibility for promulgating regulations for commercial space activities is delegated *solely* to the Secretary of Commerce, who invariably serves at the pleasure of the President.⁸⁹ As such, the proposed agency structure does not protect expertise from direct political pressure, facilitating the potential for presidential abuse, which could lead to disastrous and counterproductive consequences. That being said, even independent agencies can still face political reproach from Congress through budget cuts or by being called to testify at hearings.

Placing politics above expertise was at the heart of the United States' decision to withdraw from the Joint Comprehensive Plan of Action ("JCPOA")⁹⁰—commonly referred to as the Iran Nuclear Deal—in May of 2018.⁹¹ This ideologically-based decision has led to lasting and counterproductive repercussions that the United States is still attempting to resolve.⁹² After then-President Trump directed the Secretary of the Treasury to reinstate all U.S. sanctions—which had been waived as part of the JCPOA—and

85. *Id.* ("[I]n a commission of five members, no more than three could be from one party.").

86. *Id.* at 15, 606 ("Almost all the principal officers whose removal can only be for cause are members of independent boards or commissions.").

87. *Id.* at 616.

88. CONG. RSCH. SERV., *supra* note 27, at 12.

89. American Space Commerce Free Enterprise Act § 80103(c)(5), § 80202(c)(6) (establishing that responsibilities for applications and certifications thereof may not be delegated by the Secretary, including to the OSC).

90. Reza Sayah & Nick Schiffrin, *Iran's Top Nuclear Scientist Discusses the Potential for a Nuclear Deal with the U.S.*, PBS NEWSHOUR (Mar. 9, 2021, 6:45 PM), <https://www.pbs.org/newshour/show/irans-top-nuclear-scientist-discusses-the-potential-for-a-nuclear-deal-with-the-u-s>.

91. Mark Landler, *Trump Abandons Iran Nuclear Deal He Long Scorned*, N.Y. TIMES (May 8, 2018), <https://www.nytimes.com/2018/05/08/world/middleeast/trump-iran-nuclear-deal.html>.

92. Sayah & Schiffrin, *supra* note 90 (detailing how Iran began exceeding some of the deal's nuclear limits and restricting required inspections following the U.S. withdrawal from the deal by the Trump administration).

impose additional economic penalties⁹³ on Iran without having a proper reason (Iran was in compliance with the JCPOA), the Iranian government began ignoring its JCPOA obligations and exceeding its nuclear limits, while restricting nuclear inspections in protest.⁹⁴

The withdrawal of the United States from the JCPOA because of the political whims of a president, exemplifies the problems that arise from allowing politics, rather than expertise, to be the primary driver in consequential global decisionmaking. Commercial space regulations, which invariably have global ramifications, must be structurally safeguarded against such political caprice and the best regulatory framework that can accomplish this goal is through an independent executive agency.

A. ADDITIONAL CONCERNS EMANATING FROM THE PROPOSED ASCFEA FRAMEWORK

Apart from failing to shield important expert-dependent regulatory decisions from undue political influence, the proposed ASCFEA framework also fails the United States' *National Space Policy Memo*'s goals of "[e]ncourag[ing] other nations to adopt United States space regulatory approaches and commercial space sector practices" in several ways.⁹⁵

First, the current version of the ASCFEA handicaps the Secretary of Commerce's ability to improve and refine the process for issuing certifications and permits for commercial space activities, unless those improvements are specifically delineated in the ASCFEA.⁹⁶ Given the novel and evolving nature of commercial space policymaking, such arbitrary restrictions on the designated administrative body run afoul of the stated objectives expressed in the *National Space Policy Memo*, which directs agency heads to "[e]nhance operational efficiency, increase capacity, and reduce launch costs by investing in the modernization of space launch infrastructure."⁹⁷ By prohibiting the Secretary from deviating from the congressionally prescribed certification and permit process, the ASCFEA frustrates the United States' national policy goals of creating an efficient commercial space regulatory framework that can "sustain future reliable, resilient, and efficient access to space."⁹⁸ An inflexible regulatory framework in a constantly evolving policy area is not the type of structure the United States should adopt itself, nor encourage other nations to adopt.⁹⁹

93. Landler, *supra* note 91.

94. Sayah & Schifrin, *supra* note 90.

95. The National Space Policy, 85 Fed. Reg. at 81,761.

96. American Space Commerce Free Enterprise Act § 80301(d).

97. The National Space Policy, 85 Fed. Reg. at 81,758.

98. *Id.*

99. The National Space Policy, 85 Fed. Reg. at 81,761 (explaining that restructuring the current commercial space regulatory framework should also seek to "[e]ncourage other nations to adopt United States space regulatory approaches and commercial space sector practices").

Second, the ASCFEA establishes a mechanism for unconditional automatic approvals of commercial launch applications if the Secretary has not approved or denied them within ninety days from submission.¹⁰⁰ However, this mechanism is flawed because commercial space launch applications should *always* be thoroughly reviewed, regardless of any bottleneck issues the approving administrative body suffers from. Having this automatic mechanism could inadvertently harm the development of commercial space enterprises because the ninety-day window might not allow enough time for the designated agency to make an informed decision given the inherently global, complex, expensive, and hazardous environment in LEO.¹⁰¹

Further, the proposed automatic approval process can create a perverse incentive that rewards applicants for “running the clock” by deliberately avoiding responding to questions from the government or doing so very slowly.¹⁰² Additionally, given the United States’ goal of creating a “model” commercial space regulatory framework,¹⁰³ this type of automatic approval can prove disastrous if another country’s commercial space vehicles or platforms obtain its launch approval this way and then experience in-orbit system failures that result in catastrophic international damages or casualties.

Third, the ASCFEA also establishes certain concerning presumptions that bind the Secretary, absent clear and convincing evidence to the contrary, when making launch application determinations.¹⁰⁴ In particular, the presumption that “reasonably commercially available efforts” by commercial entities are sufficient to conform with the United States’ international obligations fails to sufficiently uphold the spirit of the commitments established under the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Bodies including the Moon and Other Celestial Bodies (the “Outer Space Treaty”).¹⁰⁵ The Outer Space Treaty details the responsibilities of signatory nations in their operation and management of space, including commercial activities by non-governmental actors within their jurisdictions.¹⁰⁶ Article IX of the treaty stipulates that signatories shall conduct all activities in outer space in a manner that avoids harmful contamination of space and celestial bodies, including adverse changes in the Earth’s environment.¹⁰⁷ However,

100. H.R. 3610 § 80103(b)(3).

101. VEDDA & HAYS, *supra* note 13, at 33–34.

102. *Id.* at 34.

103. The National Space Policy, 85 Fed. Reg. at 81,761 (explaining that restructuring the current commercial space regulatory framework should also seek to “[e]ncourage other nations to adopt United States space regulatory approaches and commercial space sector practices”).

104. H.R. 3610 § 80103(e)(3).

105. *Id.*; Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, art. VI, Jan. 27, 1967, 18 U.S.T. 2410, 2415, 610 U.N.T.S. 205, 209 [hereinafter Outer Space Treaty].

106. Outer Space Treaty, *supra* note 105, at 2418.

107. *Id.* at 2416.

simply presuming that “reasonably commercially available efforts”¹⁰⁸ carried out by commercial space entities are *sufficient* to meet the United States’ obligations under the Outer Space Treaty, without a system that can ensure a country’s adherence to their responsibilities under the treaty, is not the type of “model” system the United States should encourage other nations to adopt.

For example, Nuclear Thermal Propulsion (NTP) systems, currently being developed by BWX Technologies,¹⁰⁹ can easily meet the ASCFEA’s “reasonably commercially available efforts” presumption. Whether these systems meet the United States’ obligations under Article IV of the Outer Space Treaty, however, is an open question.¹¹⁰ Article IV prohibits signatories from placing into orbit any objects “carrying nuclear weapons,” yet the feasibility of creating nuclear material from what is primarily a source of rocket fuel is questionable and therefore it is unclear whether this possibly violates Article IV.¹¹¹ With these uncertainties, imbedding a “model” system with these types of presumptions is a mistake.

Finally, although the *National Space Policy Memo* advocates for a commercial space regulatory framework that can be exported to other nations in an effort to “[p]romote the adoption of [United States’] policies and practices internationally,”¹¹² the ASCFEA lacks any language or mechanism aimed at international cooperation in the administration and management of commercial space activities. Given the global implications involved in any commercial space activities, a comprehensive regulatory approach governing these activities must incorporate some mechanism that facilitates international cooperation between commercial space agencies. Any regulatory framework lacking such a mechanism is not worthy of exporting to other nations.

V. THE IDEAL COMMERCIAL SPACE AGENCY—A BETTER APPROACH

Considering the deficiencies in the ASCFEA’s approach to commercial space regulations, an ideal approach would ensure that policymaking decisions are primarily based on expertise rather than politics through the use of an independent agency. Like the appointment structure used by the FCC, a future independent commercial space agency should be headed by five members, each of whom would be appointed for a five-year term on a staggered basis, so that their terms do not expire at the same time.¹¹³ The appointed members should only be removable by the President from their roles “for cause,” such as for

108. H.R. 3610 § 80103(c)(3).

109. *Nuclear Thermal Propulsion*, BTX TECHNOLOGIES, INC., <https://www.bwxt.com/what-we-do/nuclear-thermal-propulsion-ntp> (last visited Jan. 3, 2022).

110. Outer Space Treaty, *supra* note 105, at 2413 (“States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.”).

111. Outer Space Treaty, *supra* note 105, at 2413–14.

112. The National Space Policy, 85 Fed. Reg. at 761.

113. WILLIAM F. FUNK & RICHARD H. SEAMON, *ADMINISTRATIVE LAW* 7 (6th ed., 2020).

malfesance in office or neglect of duties.¹¹⁴ Additionally, by ensuring that no more than a simple majority of its members come from one political party, the five-member board would be protected from undue political pressure.¹¹⁵ Like other independent agencies, all agency policies and changes thereto would be decided through a majority vote, similar to a legislative assembly.¹¹⁶

The promulgation of regulations for commercial space activities should be enacted through notice-and-comment rulemaking (commonly referred to as “informal rulemaking”) because it lacks the two basic requirements of formal rulemaking: (1) that rules be made on the record and (2) after an opportunity for an agency hearing.¹¹⁷ An informal rulemaking procedure would allow the agency to address all interested parties and give them the opportunity to influence commercial space regulations through comments submitted to the agency following publication in the Federal Register.¹¹⁸ Since commercial space regulations adopted through notice-and-comment rulemaking would be based on the administrative record, including comments submitted by interested parties, any challenges to the regulations should be reviewed directly in a court of appeals, rather than a trial court, given that there would be no disputed facts requiring testimony.¹¹⁹

Similar to the language enacted in the statutory mandate of the FCC, an ideal independent commercial space agency would employ language that specifies that the purpose for establishing the agency is to secure a more streamlined execution of commercial space regulations by centralizing the authority that is currently vested among several agencies and granting the new agency additional authority for the effective execution of its statutory mandate.¹²⁰ Although the main impetus for creating a centralized independent agency is to have a comprehensive regulatory body for the coordination and management of commercial space activities, such an agency must nonetheless include interagency protocols for the coordination of in-orbit commercial operations with other agencies, including the FAA, which manages the use of national airspace by traditional aircraft operations and increasingly commercial space launch operations.¹²¹ Once the independent agency is established, the incorporated units from the other agencies would simply supplant their statutory authority with that of the newly-created agency.

114. *Id.* at 9.

115. *Id.* at 7.

116. *Id.* at 8.

117. *Id.* at 177.

118. *Id.* at 180–83.

119. *Id.* at 210–11.

120. 47 U.S.C. § 151 (stating “for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication, there is created a commission to be known as the ‘Federal Communications Commission’”).

121. KING, *supra* note 80.

Although Article II of the Outer Space Treaty mandates that “[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means,”¹²² the CSLCA nonetheless recognizes celestial property rights for any U.S. citizen engaging in “commercial recovery” of asteroids or other space resources.¹²³ Without exploring further whether the “commercial recovery” provision of the CSLCA is in conflict with Article II of the Outer Space Treaty,¹²⁴ any agency regulating commercial space activities must develop a regulatory framework for the management of such “recoveries.”¹²⁵ Taking into account Article I’s language in the Outer Space Treaty, which declares that “[t]he exploration and use of outer space...shall be the province of all mankind,”¹²⁶ any such agency would be entrusted with ensuring that the United States complies with its international treaty obligations. That agency must also consider the possibility of developing a regulatory scheme that considers whether Article I requires an equitable distribution of any profits or other benefits derived from the exploitation of outer space resources.¹²⁷ Although “province of all mankind” connotes notions of equality among signatories, this language was generally considered at the time to represent an expansion of the international legal principle of *res communis*, which traditionally was understood to simply mean a prohibition on appropriating whatever matter it referred to.¹²⁸

However, other signatories to the treaty have since interpreted “province of all mankind” as vesting upon all nations rights in common resources that

122. Outer Space Treaty, *supra* note 105, at 2413.

123. Pub. L. No. 114–90, 129 Stat. 705 (2015) (codified as amended in scattered sections of 42 U.S.C. and 51 U.S.C.); 51 U.S.C. § 51302–03 (“A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.”).

124. Kurt Taylor, *Fictions of the Final Frontier: Why the United States Space Act of 2015 Is Illegal*, 33 EMORY INT’L L. REV. 653, 656–57 (2019), <https://scholarlycommons.law.emory.edu/eilr/vol33/iss4/6> (arguing that the CSLCA’s “commercial recovery” provision violates the non-appropriation doctrine in Article II of the Outer Space Treaty because it bars states from claiming territorial ownership of celestial bodies and resources); *see also* Masson-Zwaan & Palkovitz, *supra* note 3, at 8–9 (maintaining that the CSLCA violates Article II of the Outer Space Treaty and Article 11 of the Moon Agreement of 1979 for failure to reach an international agreement before engaging in commercial mining activities).

125. *See* The National Space Policy, 85 Fed. Reg. at 81,761 (directing the Secretary of State in coordination with the heads of federal agencies to “[e]ncourage international support for the recovery and use of outer space resources”).

126. Outer Space Treaty, *supra* note 105, at 2412.

127. Sarah Coffey, *Establishing A Legal Framework for Property Rights to Natural Resources in Outer Space*, 41 CASE W. RES. J. INT’L L. 119, 133–34 (2009) (arguing that the Outer Space Treaty and Moon Agreement of 1979 requires an equitable distribution of any exclusive rights to the exploration and exploitation of space resources).

128. J.I. Gabrynowicz, *The “Province” and “Heritage” of Mankind Reconsidered: A New Beginning*, in THE SECOND CONFERENCE ON LUNAR BASES AND SPACE ACTIVITIES OF THE 21ST CENTURY 691, 692 (W. W. Mendell ed., 1992), <https://space.nss.org/the-second-conference-on-lunar-bases-and-space-activities-of-the-21st-century>.

should be shared among all nations.¹²⁹ Understanding if the CSLCA's "commercial recovery" provision takes into account the former rather than the latter interpretation of "province of all mankind" is not critical for crafting a comprehensive statutory mandate for an agency regulating commercial space activities, as long as the agency has the flexibility to incorporate the equitable interpretation of the treaty, if necessary. Given the altruistic nature of such a directive, any domestic regulatory agency entrusted with its adherence must operate as freely as possible from political and self-interested motivations, further underscoring the necessity of making such an agency independent. Some might argue, however, that because these regulatory decisions about commercial space activities involve national resources and the rights of U.S. citizens, they present political questions and thus require a political response. This perspective fails to understand the fundamental purpose served by administrative agencies: namely, the effective and efficient implementation of expert-driven policies in areas that require expertise. If Congress is concerned that regulatory decisions will have a negative impact on the country's national interests, these concerns are already adequately addressed by the notice-and-comment rulemaking process imbedded in the agency's decision-making process. One of the benefits of the notice-and-comment rulemaking process is the ability of all interested parties to raise concerns regarding a particular rule the agency is considering by submitting comments to the agency. Therefore, even if an agency's regulatory decisions touch on political questions, the notice-and-comment rulemaking framework provides an avenue for political responses to influence the agency's final decision.

Alongside establishing interagency management capabilities, the new agency must also include interoperability protocols for the development of a global space ecosystem that seamlessly shares and communicates in-orbit SSA data.¹³⁰ Global cooperation in the management of commercial space activities is crucial to the development of any "model" regulatory framework the United States hopes to export to other nations, given the global implications involved in in-orbit accidents.¹³¹ To have a flourishing and robust LEO economy, the independent agency must also have the capability of overtaking the DOD's space traffic management system and working in tandem with the DOD to share SSA data with commercial actors, both domestic and foreign, as proposed by *SPD-3*.¹³²

The need for a centralized, well-coordinated regulatory agency for commercial space activities, which includes orbital debris mitigation, is apparent when taking into account the economic concept of the "tragedy of the

129. *Id.*

130. The National Space Policy, 85 Fed. Reg. at 81,761 (enumerating that part of the United States' national policy objectives must include protocols that "[e]ncourage interoperability among United States, allied, and partner space systems, services, and data").

131. *Id.*

132. Space Policy Directive-3, *supra* note 15, at § 4(d).

commons.”¹³³ The “tragedy of the commons” describes circumstances in which individual users have unlimited access to a particular “common” resource, yet as a result of an inadequate regulatory framework, these individuals act independently out of self-interest and exploit the common resource, driving its depletion and ultimately reducing its availability to all.¹³⁴ As described by Garrett Hardin in his influential piece *The Tragedy of the Commons*, the solution to this type of collective action problem is through the regulation of usage established in administrative law.¹³⁵

The limited “common” resource at play in the regulation of commercial space activities is space itself, particularly the allocation of limited LEO space. Currently, there are few limitations, in the United States or abroad, on the number of space objects being launched into LEO due to the prevailing attitude that “in orbit, it seems, there is always room for one more.”¹³⁶ However, after decades of unrestricted use, there has been an ever-increasing buildup of orbital debris,¹³⁷ which now poses a substantial threat not only to current operations in space, but also to the development of a robust LEO economy because of the possibility of the *Kessler syndrome*.¹³⁸ Proposed by Donald Kessler, a retired NASA senior scientist for orbital debris research, the *Kessler syndrome* describes a self-sustaining domino effect that is created when the density of in-orbit objects increases such that collisions between those objects can cause a cascading, self-sustaining, runaway cycle where each collision generates more orbital debris, thereby increasing the likelihood of further collisions until it ultimately renders space activities in LEO impractical and too hazardous.¹³⁹

Since the inception of the space age more than 5,000 launches have resulted in over 43,000 tracked objects of which about 23,000 continue to be monitored and tracked by the DOD.¹⁴⁰ The majority of space debris is created as a result of in-orbit breakups and in-orbit collisions.¹⁴¹ Although in-orbit collisions currently only account for a very small percentage of space debris, the recent introduction of commercial space actors into LEO has increased the likelihood of such collisions exponentially. The first-ever accidental in-orbit collision

133. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1243 (1968) (discussing the problem that arises when individuals utilize resources “common” to all in such a self-interested manner that said limited resources become depleted for all).

134. See *id.* at 1244.

135. *Id.* at 1246.

136. Leonard David, *Space Junk Removal Is Not Going Smoothly*, SCI. AM. (Apr. 14, 2021), <https://www.scientificamerican.com/article/space-junk-removal-is-not-going-smoothly> (“And with few meaningful limitations on further launches into that increasingly congested realm, the prevailing attitude has been persistently permissive: in orbit, it seems, there is always room for one more.”).

137. CONG. RSCH. SERV., *supra* note 7.

138. David, *supra* note 136.

139. Louis de Gouyon Matignon, *The Legal Status of Space Debris*, SPACE LEGAL ISSUES (June 23, 2019), <https://www.spacelegalissues.com/the-legal-status-of-space-debris>.

140. *Id.* (explaining that this large amount of space debris has a total mass of more than 7,500 tons, equivalent to the mass of the Eiffel Tower).

141. *Id.*

between two satellites occurred on February 10, 2009, when a privately owned U.S. satellite, *Iridium 33*, collided with a Russian military satellite, *Kosmos 2251*.¹⁴² As a result of the collision, more than 2,300 trackable fragments were generated and continue to cause problems for current operations in space.¹⁴³ The increased threats to both government and commercial space activities has been further exacerbated by the proliferation of satellite “mega constellations” by companies such as SpaceX (through its Starlink system) and OneWeb, who are using these satellites to create global broadband internet networks.¹⁴⁴ Additional commercial actors, such as Amazon and its Project Kuiper, are expected to add to the number of space objects in LEO, with Amazon projecting to launch up to 3,200 satellites in the near future.¹⁴⁵

Given the growing congestion of space objects and the absence of a comprehensive regulatory framework to curb this congestion, the threats posed by these “mega constellations” and other orbital debris have already impacted activities in LEO. For example, the congestion has forced the ISS to regularly adjust its orbit to avoid potentially hazardous debris, underscoring the need for the development of coordinated, comprehensive regulations for commercial space activities that could contribute to the *Kessler syndrome*.¹⁴⁶ For example, on April 23, 2021, astronauts of SpaceX’s Crew-2 mission for NASA were forced to re-suit as a safety precaution after a piece of space debris passed unexpectedly close to their Crew Dragon capsule.¹⁴⁷ Most recently, on November 16, 2021, astronauts aboard the ISS once again were forced to seek shelter due to fears of an in-orbit collision as the station passed through a freshly created cloud of orbital debris produced when Russia intentionally destroyed a defunct satellite named *Cosmos 1408*.¹⁴⁸ These recent events underscore the very real threats posed by a congested LEO and the *Kessler syndrome*. A new independent agency dedicated to regulating commercial space activities should consider developing end-of-life protocols for the disposal of satellites as a way to proactively minimize the congestion in LEO rather than merely relying on the current norm of natural decay.¹⁴⁹ In doing so, such an agency would establish a proper model framework that other nations can emulate.

The issues emanating from the current “tragedy of the commons” as applied to LEO, and the increasing possibility of the *Kessler syndrome*, cement the need for an agency entrusted with coordinating and regulating commercial

142. *Id.*

143. *Id.*

144. David, *supra* note 136.

145. *Id.*

146. *See id.*

147. Tariq Malik, *A Piece of Space Junk Zipped by SpaceX’s Dragon Capsule on Its Way to the Space Station*, SPACE (Apr. 24, 2021), <https://www.space.com/amp/spacex-crew-2-dragon-capsule-space-junk>.

148. *See* Nadia Drake, *Russia Just Blew Up a Satellite—Here’s Why That Spells Trouble for Spaceflight*, NAT’L GEOGRAPHIC (Nov. 16, 2021), <https://www.nationalgeographic.com/science/article/russia-just-blew-up-a-satellite-heres-why-that-spells-trouble-for-spaceflight>.

149. *See* VEDDA & HAYS, *supra* note 13, at 16.

space activities to establish an unprecedented global ecosystem, free of political influence, that is focused solely on ensuring the safety of space operations and facilitating the development of norms, standards, guidelines, and best practices in accordance with the objectives outlined in the U.S. National Space Policy.¹⁵⁰

CONCLUSION

The exponential growth of the commercial space sector over the last decade underscores the need for an independent, comprehensive, and centralized regulatory body to coordinate and manage the plethora of developing commercial space activities, currently estimated to be a \$424 billion industry.¹⁵¹ In addition to planned private space flight operations by commercial actors such as Virgin Galactic¹⁵² and Blue Origin,¹⁵³ the number of commercial space activities expected in the near future continues to expand. Orbital Assembly, a large space construction company, announced plans to begin construction of the world's first space hotel that will be housed on a commercial space station, "Voyager Station," by 2026.¹⁵⁴ Other commercial actors have redirected their efforts away from providing commercial services and instead have targeted their efforts towards commercial manufacturing of space products, such as 3-D printed rockets and robotics.¹⁵⁵ These nascent and promising industries invariably require establishing comprehensive regulatory schemes that would not only facilitate their widespread adoption through the elimination of bureaucratic hurdles stemming from the current fragmented and decentralized regulatory framework, but would also create a stable system these industries can begin to rely on when making important and costly business decisions.

The commercial space era is no longer a distant, speculative fever dream of science-fiction enthusiasts, it is currently the next phase of the United States' national space policy objectives for "[f]acilitat[ing] new market opportunities for United States commercial space capabilities and services."¹⁵⁶ To "[e]ncourage other nations to adopt United States space regulatory approaches and commercial space sector policies,"¹⁵⁷ the United States must learn from its

150. See The National Space Policy, 85 Fed. Reg. at 81,760–61.

151. Christian Davenport, *As Private Companies Erode Government's Hold on Space Travel, NASA Looks to Open a New Frontier*, WASH. POST (Feb. 25, 2021, 6:00 AM), <https://www.washingtonpost.com/technology/2021/02/25/nasa-space-future-private/>.

152. Natalie B. Compton, *A Vacation That's Out of This World: The First Space Hotel is Set to Start Construction by 2026*, WASH. POST (Mar. 3, 2021, 10:28 AM), <https://www.washingtonpost.com/travel/2021/03/03/space-hotel-orbital-assembly/> ("More than 600 people have placed deposits, topping \$80 million in total, for Virgin Galactic's upcoming space opportunities, and thousands more are on a waitlist.").

153. Davenport, *supra* note 151; see also Sissi Cao, *Jeff Bezos' Rocket Company Is 'Very, Very Close' to Launching Tourists Into Space*, OBSERVER (Apr. 12, 2021, 12:35 PM), <https://observer.com/2021/04/jeff-bezos-blue-origin-new-shepard-ns14-test-faa/>.

154. Compton, *supra* note 152.

155. Davenport, *supra* note 151 (describing the efforts of companies such as Relativity Space, who manufacture 3-D printed rockets, and Astrobotic, which intends to land a spacecraft on the moon in 2021).

156. The National Space Policy, 85 Fed. Reg. at 81,761.

157. *Id.*

prior inefficient, fragmented regulatory approach exposed by the pre-FEMA emergency management framework.¹⁵⁸ The United States has a fleeting opportunity to establish a model system for commercial space activities that places expertise above politics through an independent agency. This framework has novel mechanisms that would encourage other countries to not only emulate it, but also to begin to lay the foundation for the development of a much needed globally-connected space ecosystem.

158. See FED. EMERGENCY MGMT. AGENCY, *supra* note 38, at 17.