

Commercialization of Space Commercial Space Launch Amendments Act of 2004

On March 4, 2004, the Commercial Space Launch Amendments Act of 2004¹ (“CSLAA”) was passed by the House of Representatives by a vote of 402 to one.² The bill is “designed to promote the development of the emerging commercial human space flight industry,” and is sponsored by Space and Aeronautics Subcommittee Chairman Representative Dana Rohrabacher (R-CA).³ If enacted, the CSLAA will establish a regulatory regime tailored to the needs and dangers of the commercial space launch business, thereby freeing the industry from the tangle of ill-suited regulations with which it has been forced to contend, and consequently allowing the private sector to challenge the hegemony of the National Aeronautics and Space Administration (“NASA”) in space.⁴ This Note will begin by briefly discussing the potential for valuable commercial development in space. Next, it will explore the key reasons why NASA has failed to tap this potential and why existing regulatory frameworks have prevented private enterprise from doing so. It will then describe how the CSLAA would advance the emerging suborbital human space flight industry by explicitly defining the industry to be regulated, by vesting control in a single regulator, and by limiting the regulatory obstacles standing in the way of commercial development. Finally, the Note will frame the CSLAA as one piece of a potentially much broader trend in the promotion of private space entrepreneurship by government.

Though its future prospects are far from certain,⁵ commercial human space flight is one of a number of industries whose activities in space could create substantial value on Earth.⁶ Proposed business

1. H.R. 3752, 108th Cong. (2004).

2. See Press Release, House Comm. on Sci., Space Bill Rockets Toward Congressional Approval (Mar. 4, 2004), available at <http://www.house.gov/science/press/108/108-195.htm>. The sole “nay” vote belonged to Rep. Ron Paul (R-TX). See Office of the Clerk, H.R., Final Vote Results for Roll Call 39, available at <http://clerk.house.gov/evs/2004/roll039.xml> (Mar. 4, 2004).

3. Press Release, House Comm. on Sci., *supra* note 2.

4. See *id.*; H.R. 3752; see also Rand Simberg, *Permission to Fly*, FOXNEWS.COM, Oct. 15, 2003, at <http://www.foxnews.com/story/0,2933,100181,00.html> (discussing existing regulatory framework).

5. See Press Release, House Comm. on Sci., *supra* note 2 (quoting Rep. Bart Gordon (D-TN) as stating that “[n]o one can say for certain whether commercial human space flight will become a major industry. However, I believe that the provisions in [the CSLAA] will help nurture its growth while at the same time ensuring that public health and safety are protected”).

6. Historically, commercial efforts have been focused primarily on satellites. See Tidal W. McCoy, *Structure of the Space Market: Public and Private Space Efforts*, in *SPACE: THE FREE-MARKET FRONTIER* 127, 134 (Edward L. Hudgins ed., 2002); Ty S. Twibell,

models present new opportunities both in suborbital and orbital space.⁷ A number of plans have been proposed to take advantage of suborbital space flight. For example, individuals such as Fred Smith, the founder of FedEx, have discussed the use of suborbital vehicles for faster-than-overnight delivery, which would prove particularly useful for transporting human organs, electronic equipment, and just-in-time manufacturing supplies.⁸ Suborbital science, reconnaissance, and tourism opportunities abound.⁹ Private orbital launches also present numerous potential opportunities. Notable ideas include television and film studios, research labs, agricultural production facilities, zero-gravity healthcare facilities, hotels, and theme parks.¹⁰ One of the most ambitious business plans involves the harvest of solar energy in orbit and the transfer of that energy to Earth.¹¹

In light of this vast array of commercial opportunities, it is easy to lose sight of the original purposes — both historical and statutory — for American involvement in space. Less than a year after the Soviet Union launched Sputnik I into orbit,¹² Congress passed the National Aeronautics and Space Act of 1958 (“Space Act”).¹³ In the Space Act, Congress established NASA and proclaimed as official policy “that activities in space should be devoted to peaceful purposes for the

Note, *Space Law: Restraints on Commercialization and Development of Outer Space*, 65 UMKCL REV. 589, 620 (1997).

7. There is no formal definition of the boundary between sky and space. In essence, suborbital space flight is flight into the upper atmosphere that does not reach an altitude high enough to obtain orbit. But just because orbit is not achieved does not mean one is not in “space.” For example, a flight of more than fifty miles in altitude (fifty miles in altitude not being high enough to achieve orbit) is required for an award of “astronaut wings” by the U.S. Air Force. See Open Letter from Peter H. Diamandis, Chairman and President, The X Prize Foundation, at <http://xprize.org/press/president.html> (last visited Apr. 5, 2004). The X Prize, a private award which was established to stimulate the creation of reusable manned space vehicles, will be awarded for flights of 100 kilometers (about sixty-two miles) in altitude. See *id.*

8. See ROBERT ZUBRIN, ENTERING SPACE 50 (1999).

9. See *id.* at 50–53; Press Release, S.W. Research Inst., Suborbital Mission Looks at Mercury, Seeks Vulcanoids (Jan. 24, 2003), at <http://www.spaceflightnow.com/news/n0401/23vulcanoids/>.

10. See GREG KLERKX, LOST IN SPACE 223–25 (2004); ZUBRIN, *supra* note 8, at 58–69.

11. See Edward L. Hudgins, *Introduction to SPACE: THE FREE-MARKET FRONTIER*, *supra* note 6, at ix, xvii. But see ZUBRIN, *supra* note 8, at 70–73 (suggesting that this plan is economically unfeasible at any realistic launch cost).

12. On October 4, 1957, at 19:28 Greenwich mean time, a Soviet R7 rocket was launched from the Baikonur Cosmodrome in southern Kazakhstan. Minutes later, Sputnik I, a small Soviet satellite capable of little more than emitting a simple radio signal, achieved orbit; it was the first man-made object ever to do so. See Craig Covault, *Policy and Technology Shape Manned Space Ops*, AVIATIONWK. & SPACETECH., Jan. 8, 2001, at 44; JOHN F. GRAHAM, SPACE EXPLORATION: FROM TALISMAN OF THE PAST TO GATEWAY FOR THE FUTURE 58 (1995), available at <http://www.space.edu/projects/book/book-6.doc>.

13. National Aeronautics and Space Act of 1958, Pub. L. No. 85-868, 72 Stat. 429 (codified as amended at 42 U.S.C. §§ 2451–84 (2000)) (“Space Act”).

benefit of all mankind.”¹⁴ The Act “set forth a broad mission for NASA to ‘plan, direct, and conduct aeronautical and space activities’; to involve the nation’s scientific community in these activities; and to disseminate widely information about these activities.”¹⁵

The stated statutory purpose aside, there can be little doubt that NASA was established as a direct response to the Soviet launch of Sputnik I into orbit.¹⁶ President John F. Kennedy saw NASA’s function as securing victory in the “space race” to the Moon:

Kennedy, quietly emphatic: “Everything we do ought to be tied into getting onto the moon ahead of the Russians.”

Webb, almost shouting: “Why can’t it be tied to pre-eminence in space?”

Kennedy, loudly and insistently: “By God, we’ve been telling everybody for five years that we’re pre-eminent in space and nobody believes us!”¹⁷

NASA proved extremely effective at achieving this goal, landing the first men on the Moon on July 20, 1969.¹⁸ However, the last manned mission to the Moon returned to Earth on December 19, 1972,¹⁹ and the Soviet Union dissolved in late 1991. Following its victory in the “space race,” NASA struggled to find a new *raison d’être*. The establishment of the Space Shuttle program functioned as a “life preserver” for the agency.²⁰

14. *Id.*

15. Roger D. Launius, *Foreword* to LEGISLATIVE ORIGINS OF THE NATIONAL AERONAUTICS AND SPACE ACT OF 1958 3, 3 (NASA History Office, Monographs in Aerospace History, Series No. 8, 1998), available at <http://www.hq.nasa.gov/office/pao/History/40thann/legislat.pdf> (quoting Space Act, *supra* note 13).

16. See, e.g., NASA, Sputnik and the Dawn of the Space Age, at <http://www.hq.nasa.gov/office/pao/History/sputnik/> (last updated Feb. 21, 2003) (“The Sputnik launch . . . led directly to the creation of [NASA].”).

17. KLERKX, *supra* note 10, at 154 (chronicling White House conversation between President Kennedy and NASA Administrator James Webb, Nov. 21, 1962).

18. See GRAHAM *supra* note 12, at 97.

19. See, e.g., David R. Williams, Apollo 17, at <http://nssdc.gsfc.nasa.gov/planetary/lunar/apollo17info.html> (last updated Dec. 11, 2003).

20. ROGER HANDBERG, REINVENTING NASA: HUMAN SPACEFLIGHT, BUREAUCRACY, AND POLITICS 63 (2003). With respect to the Space Shuttle program, one commentator has charged: “The disheartening truth is that NASA clings to the shuttle because it is terrified to give it up. The shuttle was so hard to get in the first place that the entire agency is, in essence, tailored directly to the task of keeping it flying even at the expense of advancing NASA’s Turnerian dream (now somewhat faded) of expanding humanity’s space frontier.” KLERKX, *supra* note 10, at 164.

Two decades ago, NASA was given a new purpose: the advancement of commercial activity in space.²¹ Although “NASA historically collaborated with the private sector through its aeronautics programs, academic grants, commercial satellite launch support, and dissemination of remote-sensing and other data,”²² NASA’s responsibility with respect to commercial activity did not become explicit statutory policy until July 16, 1984.²³ On that date, Congress amended the Space Act to include the following provision: “The general welfare of the United States of America requires that [NASA] seek and encourage, to the maximum extent possible, the fullest commercial use of space.”²⁴

Assessments of NASA’s success in fulfilling this purpose have been mixed,²⁵ and an exhaustive cataloguing of NASA’s efforts in this area is beyond the scope of this Note. However, in order to evaluate the CSLAA, it is crucial to understand that one of the driving forces behind the bill is likely the perceived failure of NASA to “seek and encourage . . . the fullest commercial use of space.”²⁶ Bill sponsor Rep. Rohrabacher stated, “It is my sincere hope that this bill will encourage individuals . . . to continue leading the way in pushing the boundaries of technology and safety by building and flight testing hardware, *something NASA has yet to do.*”²⁷

Furthermore, in order to understand why private individuals, bolstered by legislation such as the CSLAA, might succeed at exploiting the commercial potential of space, it is important to appreciate why NASA is largely incapable of doing so. As a government agency, NASA is poorly suited to manage and promote innovative commercial opportunities in space. Though NASA’s subject matter is perhaps more lofty than that of the typical government agency, it is nonetheless a federal administrative agency and therefore susceptible to many of the problems faced by government bureaucracies. This Note will

21. See generally NASA, NASA HISTORICAL DATA BOOK VOL. VI: NASA SPACE APPLICATIONS, AERONAUTICS AND SPACE RESEARCH AND TECHNOLOGY, TRACKING AND DATA ACQUISITION/SUPPORT OPERATIONS, COMMERCIAL PROGRAMS, AND RESOURCES, 1979–88, at 355–62 (Judy A. Rumerman ed., 1999), available at <http://history.nasa.gov/SP-4012/vol6/cover6.html>.

22. *Id.* at 355.

23. See National Aeronautics and Space Administration Authorization Act of 1985, Pub. L. No. 98-361, 98 Stat. 422 (codified as amended at 42 U.S.C. § 2451 (2000)).

24. *Id.*

25. See, e.g., Doris Hamill et al., *Space Commerce: An Entrepreneur’s Angle, in SPACE: THE FREE-MARKET FRONTIER*, *supra* note 6, at 151, 155–57 (identifying NASA’s successes and failures at commercialization); Lillian M. Trippett, *Legislative Initiatives to Encourage Private Activity*, 4 J.L. & TECH. 49 (1989) (discussing contemporary legislation implicating the relationship between NASA and commercial activity with respect to the space launch industry).

26. 42 U.S.C. § 2451.

27. Press Release, House Comm. on Sci., *supra* note 2 (emphasis added).

explore the implications for commercialization of NASA's susceptibility to influence by industrial partners and its lack of efficiency.

NASA's industrial partners — most notably Lockheed Martin and Boeing — have multi-billion dollar contracts with the agency and wield tremendous influence over the agency's actions.²⁸ Boeing, for example, received \$2 billion in revenue from NASA programs in 2003.²⁹ In addition to their highly lucrative individual deals, Boeing and Lockheed Martin formed a joint venture, "United Space Alliance," to operate the Space Shuttle program; the venture has an eight-year contract with NASA worth \$9.8 billion.³⁰ In light of the significant revenue they receive from NASA, it comes as no surprise that the two industrial giants devote more than \$19 million annually to lobbying.³¹

Generally speaking, the influence of the agency's industrial partners almost certainly runs counter to the goal of advancing the competitive commercial use of space. As an illustrative example, consider the potential for development of reusable space vehicles.³² In the words of one commentator:

Few disagree that reusability is the key to unlocking Part Two of the Space Age promise — frequent, inexpensive and reliable popular access to near-Earth space. The point where opinions diverge, and radically, is whether the lack of a truly reusable spacecraft is due to insufficient technology or insufficient motivation. The latter charge is usually leveled at NASA and its Big Aerospace partners by those in the entrepreneurial space sector: what real incentive do Boeing and Lockheed, and by extension the shuttle's owner, NASA, have to change the way things are?³³

While "Boeing, Lockheed Martin and [others] are competing to develop a new generation of reusable launch vehicles, a multibillion-dollar endeavor that Congress could accelerate if it has lost confi-

28. See KLERKX, *supra* note 10, at 100.

29. See Robert Little, *Space Shuttle Loss Hurts Lockheed, Other NASA Programs*, BALTIMORE SUN, Feb. 4, 2003, at 1D.

30. See *id.*

31. See KLERKX, *supra* note 10, at 254. Of course, some of these lobbying dollars are devoted to the companies' activities in other areas, such as defense and homeland security; it is extremely difficult to tell how these sizeable funds are specifically targeted. See, e.g., Sheryl Fred, *The Best Defense: A Guide to the Interests Driving the FY 2004 Defense Budget*, OPENSECRETS.ORG, Oct. 1, 2003, at <http://www.opensecrets.org/news/defensebudget/index1.asp>.

32. See KLERKX, *supra* note 10, at 98. For a discussion of one private effort to stimulate the creation of a reusable manned space vehicle, see *supra* note 7 and accompanying text.

33. KLERKX, *supra* note 10, at 98.

dence in the shuttle,”³⁴ this development does little to defend against the claim that the involvement of NASA’s industrial partners has plotted an undesirable course for the nation’s space program.³⁵ Arguably, the companies’ endeavors to develop reusable space vehicles are not motivated by the desire to create economically sound commercial opportunities in space. Rather, in the wake of the *Challenger* and *Columbia* losses, these companies may have recognized that a continued focus on the Space Shuttle program will not provide a reliable revenue stream in the future;³⁶ by refocusing their efforts on new reusable space vehicles, NASA’s industrial partners may merely be seeking to preserve their lucrative relationships with the agency.

In addition, NASA’s economic inefficiency renders it ill-suited to advance the commercial use of space. Though NASA is a civilian agency, it has its origins in the military, and starting with the Apollo program it adopted the military approach to budgeting — giving “relatively free rein to its industrial contractors, with budgets being a minor consideration when weighed against performance.”³⁷ The results of this approach are, predictably, staggering budgets and increasingly skyrocketing price tags for NASA initiatives. As an illustrative example, consider the current costs of launching a payload into orbit; the economic viability of commercial opportunities will likely hinge on these costs.³⁸ Launching a payload into orbit on a Russian rocket currently costs about \$3,000 per pound.³⁹ Launching a payload into orbit on an American rocket costs about \$6,000 per pound; the cost of using NASA’s Space Shuttle to launch a payload into orbit has been estimated at between \$10,000 and \$20,000 per pound.⁴⁰ Inefficient

34. Little, *supra* note 29.

35. Dan Goldin, a former NASA administrator, charged: “[T]he shuttle has suppressed a lot of science we could be doing We spent ten billion on the space station and didn’t produce a piece of hardware, but boy did the contractors have fun. It’s shameful.” KLERKX, *supra* note 10, at 145–46.

36. In addition to its possible future implications for the companies’ revenue streams, the *Columbia* loss had an immediate effect on the companies’ stock prices. Shortly following the loss, the price of Boeing shares fell \$0.48, or 1.5%, and the price of Lockheed Martin shares fell \$1.50, or 3%. See Little, *supra* note 29.

37. KLERKX, *supra* note 10, at 166.

38. See ZUBRIN, *supra* note 8, at 23–27; Jon C. Garcia, *Heaven or Hell: The Future of the United States Launch Services Industry*, 7 HARV. J.L. & TECH. 333 (1994). The share of the United States in the world’s commercial launch market declined from 48% in 1996 to 29% in 2000. See U.S. DEP’T OF COM., OFFICE OF SPACE COMMERCIALIZATION, TRENDS IN SPACE COMMERCE 18 (2000), available at <http://www.technology.gov/space/library/reports/2001-06-trends.pdf>. This steady decline throughout the late 1990s garnered a fair amount of attention.

39. See KLERKX, *supra* note 10, at 94; see also FUTRON CORP., SPACE TRANSPORTATION COSTS: TRENDS IN PRICE PER POUND TO ORBIT 1990–2000 (2002), available at www.futron.com/pdf/FutronLaunchCostWP.pdf (evaluating current and future launch cost estimates and emphasizing the difficulty of consistent calculation).

40. See KLERKX, *supra* note 10, at 94.

government control over launches, both in the United States and abroad, may be a major contributing factor to these high costs. This control does not give rise to any significant incentive for the development of creative — and potentially less expensive — solutions that would benefit commercial activity in space.⁴¹ More generally, it is simply unreasonable to expect a government agency that pays such little attention to economic factors to effectively promote space entrepreneurship, where economic factors are the bottom line.

Where NASA has proven ineffective at promoting space entrepreneurship, so too have the regulations that have been applied by default to private attempts to commercialize space. That is, the regulatory framework that has been adapted to those commercial attempts in space undertaken without any assistance from NASA has proven incapable of cultivating the industry.

Private commercial space flight — whether manned or unmanned — has been governed by an ad hoc array of legislation and regulations. When the Federal Aviation Act of 1958 created the Federal Aviation Administration (“FAA”), “commercial space [flight], including commercial rocket launches, was not envisioned.”⁴² Therefore, as the commercial space industry grew over the next decades, “principally in communications satellites,”⁴³ the law lagged behind. Not until the late 1980s did regulation of private rocketry finally begin to be centered within a single government agency, the Office of Commercial Space Transportation (“OCST”).⁴⁴ And not until the pas-

41. *See id.* at 94–95. Whether these high launch costs are owing to NASA’s own inefficiency, the influence on the agency by its industrial partners, or a combination of the two, is unclear. For a discussion of the artificial freezing of space activity costs, see Otis Port, *Space Travel: Bringing Costs Down to Earth*, BUSINESSWEEK, Feb. 2, 2004, at 74 (“Since man last set foot on the Moon in 1972, NASA has enjoyed a monopoly on U.S. manned space missions, doling out contracts to its aerospace cronies. As a result, the cost of putting people into orbit is about the same now as it was 30 years ago.”).

42. David M. Livingston, *Barriers to Space Enterprise*, in SPACE: THE FREE-MARKET FRONTIER, *supra* note 6, at 67, 70.

43. *Id.*

44. *See id.* at 70–71.

[I]n 1984, President Reagan created the [OCST] within the [Department of Transportation (“DOT”)] largely because of the confusion that came about after the first private launch of the *Conestoga I* in 1982. At that time, Space Services, Inc., had sought permission to launch a privately built booster rocket for a suborbital test flight. The company had to obtain approval from five different federal agencies through a process that took six months and cost in excess of \$250,000 in legal fees.

When it was initially created, the OCST identified at least a dozen federal bureaus, as well as states and other districts, that could have some jurisdiction in regulating space activities . . . Even with the mandate given the OCST, various federal bureaus and states still retained regulatory authority over aspects of space activities, thus giving rise to many of the problems affecting space enterprise today.

sage of the Commercial Space Act of 1998 was the FAA granted definitive authority to regulate space launches and landings.⁴⁵ Adding to the confusion, the OCST became part of the FAA in 1995 and was renamed the Office of the Associate Administrator for Commercial Space Transportation (“FAA-AST”).⁴⁶

For the suborbital space flight industry in particular, the regulatory muddle is further complicated by the nature of the vehicles that have been developed thus far; while these vehicles are rocket-powered and designed to enter space, they “take off and land like airplanes.”⁴⁷ This has led to “an ongoing turf fight within the [FAA] over which [office] will regulate” human suborbital space flight.⁴⁸ On one hand, the FAA-AST regulates commercial rocket launches. Regulation of human suborbital space flight by the FAA-AST has two primary problems. First, the FAA-AST’s licensing scheme was developed for non-reusable rockets — rockets that are so expensive that the millions of dollars required for licensing are not prohibitive because such expenses constitute “a sufficiently small fraction of the total” cost.⁴⁹ By contrast, for relatively inexpensive launches using reusable vehicles, the cost of licensing every flight could easily be prohibitive.⁵⁰ Second, the substance of the FAA-AST’s regulatory scheme addresses issues for “one-shot expendable launch systems,” and does not address “whether and how passengers and crew should be regulated.”⁵¹

On the other hand, the FAA’s Regulation and Certification Group (“FAA-AVR”) regulates experimental aircraft. Regulation of human suborbital space flight by the FAA-AVR is also problematic. Compliance with the regulatory regime “is so expensive (it can increase development costs by at least an order of magnitude) that it is in fact a barrier to entry to new players in the business.”⁵² The high expense of the FAA-AVR regulatory regime may be attributed to the fact that the regulations matured along with the aviation industry.⁵³ Had these regulations existed from the outset, “it’s likely that the industry would have been stillborn, because [the regulations] would have been much too stringent for companies still trying to figure out what worked and what didn’t.”⁵⁴ Therefore, the danger exists that this regulatory regime

Id. at 70–71 (footnotes omitted).

45. *See id.* at 71.

46. *See id.*

47. Simberg, *Permission to Fly*, *supra* note 4.

48. *Id.*

49. *Id.*

50. *See id.*

51. *Id.*; *see also* Rand Simberg, *Certifiable*, FOXNEWS.COM, July 24, 2003, at <http://www.foxnews.com/story/0,2933,92840,00.html>.

52. Simberg, *Certifiable*, *supra* note 51.

53. *See id.*

54. *Id.*

could prove prohibitively expensive for the nascent suborbital human space flight industry.

Thus, there remains an array of untapped opportunities for commercial activity in space. Both NASA's inability to advance commercial activities in space and the fact that the regulations applicable to wholly private space entrepreneurship are neither clearly laid out nor designed with innovative and technologically pioneering commercial space enterprises in mind have stifled substantial development of these opportunities. The CSLAA may alleviate these factors. The bill includes several important provisions designed to "promote the development of the emerging commercial human flight industry."⁵⁵ If enacted, the bill will encourage commercial activity in space by identifying commercial manned space flight as separate from the well-established (and heavily regulated) air transportation industry, by defining the terms necessary to carve commercial manned space flight from the regulatory framework into which it has previously been forced, by clearly vesting the authority to regulate this industry in a single entity, by simplifying the regulatory process for the commercial development of manned space vehicles, and by more generally establishing a regulatory framework that will nurture rather than stifle the development of this burgeoning industry.⁵⁶

The CSLAA would define what exactly the human space flight industry is. This result is the combined effect of several provisions of the bill. First, it would officially recognize human space flight as a distinct industry, placing it alongside more established (and congressionally recognized) commercial space ventures such as those in the fields of telecommunications and private scientific research.⁵⁷ To this end, the bill would also provide definitions for the terms "crew"⁵⁸ and "space flight participant"⁵⁹ and amend existing commercial launch legislation to include these terms alongside the inanimate payloads currently covered.⁶⁰ In addition, the bill would provide definitions for the terms "suborbital rocket"⁶¹ and "suborbital trajectory"⁶² in order to facilitate the specific regulation of the human space flight industry.

Another result of the CSLAA would be to establish the identity of the regulator by vesting the authority to regulate this industry specifi-

55. Press Release, House Comm. on Sci., *supra* note 2.

56. *See* H.R. 3752, 108th Cong. (2004).

57. *See id.* § 3(a).

58. *Id.* § 3(b)(2).

59. *Id.* § 3(b)(9).

60. As its name suggests, the CSLAA is drafted as an amendment to the Commercial Space Launch Act of 1984, as codified at 49 U.S.C. §§ 70101–19 (2000).

61. H.R. 3752 § 3(b)(10).

62. *Id.*

cally in the FAA-AST.⁶³ In doing so, the CSLAA would replace the agency infighting that currently has left the industry uncertain as to what regulations apply⁶⁴ to commercial suborbital spaceflight. In its place, the CSLAA would establish a clear regulatory regime to govern the industry.⁶⁵

The CSLAA would also establish a tone of very limited regulation for the suborbital space flight industry. For example, the “experimental permits” required by human space vehicle operators would be issued by the Secretary of Transportation no later than ninety days after receipt of an application.⁶⁶ Moreover, if any issues arose during the review of an application, the Secretary of Transportation would be obliged to inform the applicant of those issues, as well as what actions could be taken to resolve them, within the first sixty days after the application was received.⁶⁷ In setting the stage for limited regulation in the early days of commercial human space flight, the CSLAA would hopefully avoid “the potential danger of industry-killing over-regulation.”⁶⁸ In addition to passively supporting the suborbital human space flight industry by establishing a deregulatory tenor, the CSLAA would also support the industry more actively by temporally extend-

63. *See id.* § 2(4).

64. *See supra* note 48 and accompanying text.

65. *See* H.R. 3752 § 2(5).

66. *Id.* § 3(c)(7).

67. *See id.*

68. Simberg, *Certifiable*, *supra* note 51. Though the CSLAA may appear to represent strong deregulation, a previous version of the CSLAA, the now-abandoned Commercial Space Act of 2003, went further in emphasizing deregulation in the commercial human space flight industry. *See* H.R. 3245, 108th Cong. (2003). For example, the previous bill explicitly ordered the Secretary of Transportation to “focus the Department’s regulation of commercial human spaceflight activities on protecting the safety of the general public, while allowing spaceflight participants who have been trained and meet license-specific standards to assume an informed level of risk.” H.R. 3245 § 4. Under this provision, the DOT, including the FAA-AST, would have been explicitly precluded from regulating passenger safety on commercial space flights, as the FAA-AST’s present responsibility is to ensure only third-party safety. *See id.*; *see also* Simberg, *Permission to Fly*, *supra* note 4. Though this text has been removed from the current version of the bill, the FAA-AST still has no explicit authority to regulate space vehicle payloads — including human payloads — and the CSLAA does indeed require commercial space launch operators to inform passengers in writing as to the dangers of space flight, and to obtain written informed consent to undertake those risks. *See* H.R. 3752 § 3(c)(13). However, the CSLAA’s present form would require training and medical standards for passengers and crews to be specified “in accordance with regulations promulgated by the Secretary.” *Id.* Such regulation of passenger and crew safety could potentially impose a high burden on the suborbital human space flight industry. *See* Simberg, *Permission to Fly*, *supra* note 4.

This industry is simply too immature to impose unreasonable safety requirements on it — the providers don’t yet know exactly how to do it, and the regulators don’t either, and attempting to do so would raise costs so high that it won’t be possible for anyone, even those willing to take the risk, to afford it.

Id.

ing indemnification by the federal government to commercial space flight operators for liability to third parties. Currently, commercial space launch operators are required to obtain liability insurance for the “maximum probable loss” of third parties (up to \$500 million, but usually less),⁶⁹ and the federal government provides indemnity up to \$1.5 billion beyond the required insurance.⁷⁰ The CSLAA would extend the indemnification provision until December 31, 2007.⁷¹ This extension would represent an economic benefit, helping to protect the commercial human space flight industry from high insurance costs due to the risk of even a single catastrophic incident.⁷²

69. *Commercial Space Act of 2003: Hearing on H.R. 3245 Before the Subcomm. on Space & Aeronautics, House Comm. on Sci.*, 108th Cong. 6 (2003) (testimony of Pamela L. Meredith, Co-Chair, Space Law Practice Group, Zuckert, Scoutt & Rasenberger, L.L.P.) (citing 49 U.S.C. § 70113(a)(1) (2000)), available at <http://www.house.gov/science/hearings/space03/nov5/meredith.pdf>. As these provisions are substantially unchanged from H.R. 3245 to H.R. 3752, the testimony remains applicable.

70. *See id.*

71. *See* H.R. 3752 §4.

72. The magnitude of this economic benefit is unclear. On one hand is the historical record, which suggests the value may be quite low; “[i]n the past fifty years there have been no third party injuries or fatalities from space launches in the Western world.” *Commercial Space Act of 2003: Hearing on H.R. 3245 Before the Subcomm. on Space & Aeronautics, House Comm. on Sci.*, 108th Cong. 4 (2003) (testimony of Gary C. Hudson), available at <http://www.house.gov/science/hearings/space03/nov5/hudson.pdf>; *see also* Michael Cabbage, *NASA Might Revise Shuttle Flight Paths to Curb Risks*, ORLANDO SENTINEL, Aug. 1, 2003, at A1 (describing the low probability of deaths on the ground from falling aircraft and spacecraft). *But see* Kathy Sawyer, *NASA Rethinks Paths for Shuttle Descents; Study Will Look at Steering Clear of Urban Areas*, WASH. POST, May 19, 2003, at A3 (speculating that a change in Columbia’s break-up time by mere moments could have led to fatalities in downtown Dallas or Fort Worth). On the other hand, the federal government’s control over human space activities allowed it to choose isolated launch venues, and the selections of the Kennedy Space Center in Florida and Vandenberg Air Force Base in California were made in part because of the low risk to populated areas. *See* John Cramer, *Sky’s No Limit, Space Center Director Tells Students*, ROANOKE TIMES & DAILY NEWS, Feb. 14, 2004, at B1 (describing Kennedy Space Center Director James Kennedy’s comments that space shuttles are launched from Florida to avoid populated areas in case of launch problems); R.C. Henry & Aubrey B. Sloan, *The Space Shuttle and Vandenberg Air Force Base*, 27 AIR U. REV., Sept.–Oct. 1976, 19, available at <http://www.airpower.maxwell.af.mil/airchronicles/aureview/1976/sep-oct/sloan.html> (describing overflight of highly populated areas as a key concern in shuttle launch site selection). With the emergence of commercial human space flight, however, individual states are now offering incentives to attract launches. *See, e.g.*, Steve Ramirez, *New Mexico Aims to Be Location for Aerospace Competition*, LAS CRUCES SUN-NEWS, Mar. 10, 2004 (chronicling a conditional state grant of \$9 million to help fund the X Prize if New Mexico is selected as the launch site); Press Release, Rep. Frank Lucas, Lucas, Istook Announce Funding for Oklahoma Spaceport (Feb. 12, 2004), available at http://www.house.gov/apps/list/press/ok03_lucas/pr_030212_spaceport.html (outlining steps toward completing a spaceport at Burns Flat, Oklahoma, and noting that one space tourism company has already “broken ground at the spaceport”). Assuming the current launch sites are the safest, launches from new sites in other states may increase the risk of harm. Moreover, individual states are likely to have fewer concerns about the safety of areas outside their own territory. Thus, the historical record may not reflect the true risks of third-party injury from future space activities. Therefore, the value of the indemnification may be substantial.

Through its recognition of commercial human space flight as a legitimate but delicate industry requiring specifically tailored regulation, the CSLAA, if enacted, would help promote the commercialization of one corner of space. The CSLAA is only one signal of the ongoing shift in American space policy toward encouraging private initiative in space. A number of other recently considered bills also demonstrate this trend. One example is the Invest in Space Now Act of 2003, which includes both strong support for the privatization of space and a series of findings describing the importance of commercial human space flight to the United States.⁷³ These findings emphasize the industry's "essential" role in the national economy and its importance to national security and foreign policy.⁷⁴ Striking a different note, the Zero Gravity, Zero Tax Act of 2003 includes an income-tax exemption for goods and services produced in space, an investment credit for the purchase of stock in certain companies doing business in space, and a capital gains tax exemption for investments in these companies.⁷⁵

In addition to these bills being considered in the House of Representatives, a bill currently being considered by the Senate serves as yet another example of this shift in American space policy. The National Space Commission Act would create a permanent commission to manage American space policy and help oversee the reform of NASA.⁷⁶ Among the commission's specific duties would be to "assess the future use of space for exploration, science, research, national security, and public safety [and] ensure that such uses are consistent with the long-term economic development of space, and are designed to enhance the industrial and commercial capabilities of space flight whenever possible."⁷⁷ Moreover, this bill would include the following finding:

Commercial markets requiring space launch that are crucial to establishing the firm economic basis for

73. See H.R. 2358, 108th Cong. (2003).

74. *Id.* §§ 2(1), 2(3). There are several links between commercialization of space and national security. First, private advancements in space can be directly leveraged by the military. See, e.g., Hugh D. Wisely, *Iridium Satellite Communications Are the Wave of the Future*, PROC. OF THE U.S. NAVAL INST., Feb. 2004, at 76 (describing the critical role in Department of Defense communications performed by the private Iridium Satellite System telephones). Second, reduced launch costs and improved lift capacities may meet needs of the Department of Defense. See Buzz Aldrin & Ron Jones, *Changing the Space Paradigm: Space Tourism and the Future of Space Travel*, in *SPACE: THE FREE-MARKET FRONTIER*, *supra* note 6, at 177, 187. Third, commercialization of space may assist the United States in maintaining technological superiority in space, relative to potential competitors like China. See PAULA BERINSTEIN, *MAKING SPACE HAPPEN: PRIVATE SPACE VENTURES AND THE VISIONARIES BEHIND THEM* 285-89 (2002).

75. See H.R. 914, 108th Cong. (2003).

76. See S. 1821, 108th Cong. (2003).

77. *Id.* § 5(b)(1)(E).

the development of space and for the commercial development of space technology have not emerged but have withered. Although the use of space for science and national security purposes is expanding, the economic and commercial development of space continues to be fledgling. Although the Nation stands on the doorstep of the permanent human habitation of space, a mature agenda for safe, economic operation in space necessary to broaden the Nation's participation and interest in the peaceful development of space is lacking.⁷⁸

When Sputnik I first achieved orbit in 1957, the space age began. Now, nearly half a century later, concerns are growing that mankind has failed to realize the potential ushered in by this age. Commercial development in space could be the next giant leap for mankind.⁷⁹ NASA has been charged with promoting commercial development in space for at least the last twenty years, but has largely failed. Likewise, private efforts in space have been hindered by the lack of appropriately tailored regulatory frameworks for space entrepreneurship. The CSLAA may very well represent the first significant step in a shift of American space policy toward nurturing and supporting commercial efforts beyond Earth's atmosphere. This shift will herald the beginning of a new era in which mankind finally may realize the enormous potential for value creation in space. If so, the sky is no longer the limit.

78. *Id.* § 2(6).

79. Upon becoming the first man ever to set foot on the Moon, Astronaut Neil Armstrong famously remarked, "That's one small step for man, one giant leap for mankind." John N. Wilford, *Astronauts Land on Plain; Collect Rocks, Plant Flag*, N.Y. TIMES, July 21, 1969, at 1.