Everybody Wants to Rule the World: Federal vs. State Power to Regulate Drones

By Mark J. Connot and Jason J. Zummo

The U.S. Constitution established a unique form of government involving a division of powers between the federal government and the states. The advent of new technologies, however, has challenged the allocation of regulatory power between federal and state governments. A litany of groundbreaking technologies—steamboats, railroads, airplanes, automobiles, telecommunications, the Internet—has raised tough questions about a long-standing debate: whether a single national body of federal law or a mix of differing state laws would better advance the public interest. Now, drone technology is poised to be one of the fastest growing industries in U.S. history, with the potential to revolutionize commercial activity as well as the public's perspective of robotics and autonomous systems. In doing so, drones raise similar questions about the appropriate balance between federal and state regulation.

As commercial uses of drones continue to develop, their popularity is skyrocketing. Studies estimate that during the first decade following drone integration into the national airspace system (NAS), the industry will

India’s New Aviation Policy: Will It Be a Game Changer?

By Ramesh Vaidyanathan

India’s booming economy and growing middle class have helped to make it the world’s fastest-growing air travel market. India is the ninth largest civil aviation market in the world and aims to become the third largest by 2022. More than 85 international airlines operate in India, and five Indian carriers offer service to over 40 countries. The Government of India (GoI) aims to grow domestic passenger traffic from 80 million in 2015 to 300 million by 2022. Because the development of the Indian aviation sector can have a multiplier effect on the nation’s economy in terms of investments, tourism, and employment, the

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This summer was a busy one for the Forum on Air and Space Law and the editorial staff of The Air and Space Lawyer! Another very fine issue is before you, including several articles on important developments in the commercial space law arena. We are especially thankful to the authors of these articles, both of whom presented at the Forum’s Space Law Conference held in June of this year in Washington, D.C. These articles provide valuable insights into the future development of space law while also affording an opportunity to reflect on the industry’s evolution.

Looking back at the early field of space law also provides an opportunity to remember a space pioneer who helped build the regulatory framework for the commercial space industry and also served on the Governing Committee of the Forum on Air and Space Law. Patti Grace Smith died in June in Washington, D.C. From 1997 to 2008, Mrs. Smith served as the associate administrator of the Federal Aviation Administration (FAA), overseeing the Office of Commercial Space Transportation. She and her FAA staff paved the way for the licensing, regulatory, and support structure of the commercial spaceflight industry as we now know it. She was also an important member of the Forum’s Governing Committee, providing insight to members of the Forum on space law and other issues. We pause to remember her and express gratitude to her family for allowing us to benefit from her foresight and dedicated service.

The Planning Committee of the Forum’s Annual Air and Space Law Conference, under the leadership of Program Chair Marc Warren of Crowell & Moring, has prepared a tremendous program. The conference, scheduled for September 15–16, 2016, at the Ritz-Carlton Buckhead in Atlanta, Georgia, features keynote speakers: Brendan Canavan, President, UPS Airlines; John Laughter, Senior Vice President, Corporate Safety, Security and Compliance, Delta Airlines; Franklin Rucker, Assistant General Manager, Planning and Development, City of Atlanta Department of Aviation; and Katie Thomson, former General Counsel of the U.S. Department of Transportation. Exciting panel discussions on important issues facing aviation and space law practitioners will include: competition and consolidation challenges; safety compliance and enforcement developments; assessments of aviation and airport security; legal implications of new technologies and business in the aviation and space industries; readiness and implementation in aviation crisis management; the American Space Renaissance Act and its impact on the future of space; navigating trade sanctions in emerging markets, including Iran and Cuba; traffic management challenges, reform, and regulation; and an industry general counsel’s panel providing perspectives on legal and business ethics. Our thanks go to Marc and the Planning Committee. We hope to see you in Atlanta!

As always, we welcome your input on future Forum events!

Monica R. Hargrove
Chair, Forum on Air and Space Law
Our first cover article in this issue examines “the potentially fraught relationship between the interests of federal, state, and local governments in regulating” unmanned aircraft systems (UAS). It considers the extent to which federal preemption—a core principle of civil aviation regulation under the Airline Deregulation Act and other laws—should apply to UAS regulation. Authors Mark Connot and Jason Zummo of Fox Rothschild's Las Vegas office discuss a bill recently introduced in Congress that would have enshrined into federal law an express preemption provision for UAS, but that bill did not pass. The FAA, in its recently issued final rule establishing regulations governing the commercial use of small UAS, declined to address preemption because “preemption issues involving [small UAS] necessitate a case-specific analysis that is not appropriate in a rule of general applicability.” The FAA acknowledged that some legal issues relating to UAS use, including individual privacy protections, “may be best addressed at the state or local level.” Mark and Jason conclude that state and local authorities should regulate with restraint, recognizing the need to promote the rapidly developing UAS industry.

Our second cover article provides a fascinating overview of India's recently adopted, wide-ranging reforms of its civil aviation system and industry. Author Ramesh Vaidyanathan of Mumbai-based Advaya Legal is a former general counsel of the Mumbai Airport and thus is well qualified to provide insights into India's ambitious new Civil Aviation Policy, which aims to fundamentally restructure key elements of India's aviation infrastructure and promote private investment, including by non-Indian investors. India also has adopted a presumptive “open skies” policy with all countries beyond a 5,000 km radius from Delhi based on principles of reciprocity. Ramesh argues that the new Policy and liberalization of foreign investment rules, while imperfect, represent an important step in promoting the growth and modernization of India's aviation sector.

We complete this issue with two articles on space law topics: First, Professor Michael Dodge of the University of North Dakota's Department of Space Studies analyzes the content and implications for the commercial space industry of the recently enacted U.S. Commercial Space Launch Competitiveness Act. As Michael explains, the Act promotes public-private partnerships in U.S. commercial space launches, as well as private investments in space-based remote sensing and space mining. Michael concludes that the Act is an important landmark in the development of the commercial space industry and reflects Congress's continuing interest in promoting and overseeing the industry's development.

Finally, Melissa Force of MK Force Consulting in Los Angeles analyzes the complex problem of space debris and the compelling need for its removal (or, more realistically, mitigation) to avoid collisions with other debris and operational satellites. Melissa, who also teaches air and space law courses at Loyola Law School in Los Angeles, argues that existing international space law treaties provide a sufficient legal framework to enable nations to adopt and implement active debris removal (ADR) policies.

As always, please send your article ideas and comments on The Air & Space Lawyer to me at dheffernan@cozen.com.

David Heffernan
Editor-in-Chief

David Heffernan is a member of Cozen O'Connor, based in the firm’s Washington, D.C., office.
On November 25, 2015, President Obama signed into law the U.S. Commercial Space Launch Competitiveness Act (CSLCA), leading to a new stage in the U.S. commercial space industry. What began as a series of proposed bills in the U.S. House of Representatives was consolidated into H.R. 2262 and passed by both the House and Senate with an eye toward reinvigorating, and in some ways reinventing, the industry, as well as making needed changes to federal government activities. In an era when private industry is seeking new ways to profit from space activities, and the federal government is learning to rely on commercial space companies to share the burden in providing public goods—like the delivery of materials to the International Space Station and potentially even ferrying astronauts into space—the CSLCA represents the evolving interests of government and industry. The CSLCA also reflects a serious congressional commitment to the expansion of the private space industry in the United States through the modification of existing laws, such as the Commercial Space Launch Act (as amended in 2004), and the establishment of new frameworks to accommodate novel enterprises like resource extraction.

Because the CSLCA is likely to have far-ranging implications for the U.S. space industry, both domestically and internationally, a review of its key provisions is in order. The majority of the CSLCA concerns modifications and additions to title 51 of the U.S. Code, particularly subtitle V (Programs Targeting Commercial Opportunities) and subtitle VII (Access to Space). Structured on its four titles, the following analysis reviews how the CSLCA advances the U.S. space industry in the areas of commercial space launches, commercial remote sensing, the Office of Space Commerce (formerly Commercialization), and, most notably, the exploration and use of space resources.

**Spurring Private Aerospace Competitiveness and Entrepreneurship Act**

The first title to the CSLCA, the “Spurring Private Aerospace Competitiveness and Entrepreneurship Act of 2015” or “SPACE Act of 2015,” focuses on changes to the commercial launch industry in the United States. The SPACE Act updates elements of the Commercial Space Launch Act of 1984 to reflect new realities in the ongoing public-private partnerships defining modern U.S. commercial space launches, as well as updates the probable loss claim methodology that is employed for insurance acquisition purposes during launches. To this end, three attributes of title I deserve attention here: first, Congress has reaffirmed its commitment to enhancing and enabling the development of the commercial space launch industry by requiring a reassessment of insurance requirements for launches; second, Congress has sought to clarify the lines of authority within the federal government for oversight of U.S. commercial space policy; and third, Congress has introduced new language defining government astronauts as NASA-designated, federal government employees, which reflects the realities of government-commercial partnerships in space activities. This latter development is critical because it provides a much-needed boon to NASA and its low Earth orbit missions.

The first provision of the SPACE Act concerns the insurance requirements that underlie every launch governed by the Commercial Space Launch Act. Specifically, the SPACE Act records the “sense of Congress” that it is necessary to update the calculations used in determining the “maximum probable loss from claims” arising under commercial space launch activities. Such calculations have long been required under 51 U.S.C. section 50914, and were intended to provide a pool for compensating third parties who might be injured as a consequence of commercial space launch activities. Because the federal government covers successful third-party claims that exceed the liability insurance required by section 50914, this new language is designed to ensure that the quantities obtained for insurance reflect what might actually be expected to impact the federal government. The reevaluation process is also designed to ensure that private launch providers do not purchase more insurance than necessary. In short, through the SPACE Act, Congress is calling for the reexamination of the insurance requirements, their efficiency, and the calculations used to generate those numbers.

A second major change to the law includes adding indemnification protection to “spaceflight participants,”
who previously did not benefit from the statutory scheme in the same way as government employees, contractors, and subcontractors. This protection represents a substantial addition to statutory protections that will presumably encourage future participation in commercial space launch activities by spaceflight participants.

The SPACE Act also recognizes a critical deficiency in the current regulatory structure of United States commercial space activities—the country lacks a clear commercial space supervisory authority. The new law partially redresses this issue by directing the secretary of state, the secretary of transportation, the administrator of NASA, and the heads of other “relevant” federal agencies to work with the director of the Office of Science and Technology Policy, the president’s lead science advisor within the executive office of the presidency, to review current and proposed near-term commercial space activities and develop a plan for authorizing and supervising these activities. The goal is to develop a coherent U.S. government approach to commercial space that prioritizes safety, utilizes existing authorities, minimizes burdens to the industry, and promotes this growing sector of the economy. This legislative directive is also in conformity with U.S. obligations under Article VI of the Outer Space Treaty, which requires that “[t]he activities of non-governmental entities in outer space . . . shall require authorization and continuing supervision” by the state party responsible for that entity.

Finally, the SPACE Act addresses the new reality of commercial space: the intermixing of government and private enterprise in human spaceflight. It has been long-standing policy for the federal government to encourage private space companies to participate in space activities, which have been traditionally government-led operations. As indicated in recent statements from NASA, the federal government intends to rely on the private sector for conducting spaceflight activities involving U.S. astronauts. The SPACE Act directly addresses this issue by finding that NASA “has a need to fly government astronauts . . . within commercial launch vehicles.” In turn, this dynamic has exposed the need for a new definition of “government astronauts” that expressly distinguishes such individuals from other crew or spaceflight participants engaged in commercial space activities, while acknowledging that such astronauts may be part of an operation involving a privately owned launch vehicle or reentry vehicle. The SPACE Act fills this legal gap by providing NASA with the authority to designate “government astronauts,” defined as individuals who are carried in space launch vehicles or reentry vehicles in the course of their employment with the federal government, in either a civil or military capacity, or who are international partner astronauts.

In effect, the SPACE Act establishes a unique regime in which separate categories of astronaut actors, with different legal status and protection, can coexist on board a single spacecraft, and conduct a mission critical to both government and private interests. The legal implications of these “mixed” operations deserve further attention by Congress in subsequent legislation, if for no other reason than to clarify and resolve potential conflicts before they should arise.

**Commercial Remote Sensing**

The second title to the CSLCA, “Commercial Remote Sensing,” reinforces congressional oversight of the commercial space industry in the form of additional executive branch reports. Through these new reporting requirements, Congress seeks a greater role in ensuring that the United States maintains its leadership in the field of private remote sensing.

Congress has amended subchapter III of 51 U.S.C. chapter 601 to add “annual reports” to the Land Remote Sensing Policy. The secretary of commerce must submit this new report to the Senate Committee on Commerce, Science, and Transportation as well as the House Committee on Science, Space, and Technology. These reports will assist congressional oversight by providing greater visibility on and understanding of the licensing process for private space-based remote sensing systems. For example, the reports must contain information on the number of licenses applied for in the previous calendar year, a list of all of those applications granted, a list of denied applications and the reasons for said denials, and a list of applications that needed more information than initially provided. The new reporting requirements also allow for classified annexes in order to protect sensitive information.

Additionally, no later than one year after the enactment of the CSLCA, the secretary of commerce, along with other “appropriate” heads of federal agencies, must submit findings on the necessary changes to statutes that affect licensing of private remote sensing space systems to the Senate Committee on Commerce, Science, and Transportation and to the House Committee on Science, Space, and Technology. This special report will take into consideration both the continuing U.S. leadership role in private remote sensing as well as national security concerns.

**Office of Space Commerce**

Title III of the CSLCA—“Office of Space Commerce”—renames and clarifies the role of the office within the Department of Commerce that is responsible for issues concerning commercial activity in space. The first task of this title was to rename the “Office of Space
Commercialization” the “Office of Space Commerce.”¹⁶ For consistency, the change from “commercialization” to “commerce” is repeated in several sections of the previous rule. While these changes appear more cosmetic than substantive, Congress took additional action to clarify and strengthen the role and functions of the Office of Space Commerce. For example, the new legislation empowers the Office of Space Commerce to: foster good conditions for the economic growth and technological advancement of the U.S. space commerce industry; coordinate space commerce issues inside the Department of Commerce; promote U.S. space commerce in negotiations with foreign countries; help grow and advance U.S. geospatial technologies, including by working with interagency groups; and assist the federal government with its ongoing efforts in developing space-based positioning, navigation, and timing (PNT) policy.¹⁷ Congress, however, still left open the question of what exactly are the “good conditions” necessary for promoting the U.S. space commerce industry. It may be that Congress was delegating the responsibility for defining these partially defined goals to the Office of Space Commerce.

**New reporting requirements will assist congressional oversight by providing greater visibility on and understanding of the licensing process for private space-based remote sensing systems.**

**Space Resource Exploration and Utilization Act of 2015**

The CSLCA's title IV—“Space Resource Exploration and Utilization Act of 2015” (SREU Act)—represents a significant shift in space governance by expanding the potential for resource extraction in outer space.¹⁸ The final iteration of the SREU Act represents the end product of years of legislative attempts to create a legal basis for the nascent industry. The successful passage of the SREU Act may be due to its brevity and simplicity, particularly in contrast to two previous bills, the ASTEROIDS Act and H.R. 1508, which provided more detail and covered additional matters.¹⁹ Through H.R. 2262, Congress adopted significant portions of H.R. 1508, with notable changes made to address concerns over definitions, harmful interference in space activities, and sovereignty over materials taken from locations in space.

The reasons for congressional action on space resource extraction, or “space mining” as it is colloquially termed, are myriad. Congress may have desired to empower efforts by space resource corporate entities, such as Planetary Resources or Deep Space Industries, which have a commercial interest in exploring space, to extract economically or scientifically valuable resources from asteroids. The continued growth of these businesses, despite not having conducted mining operations yet, is evidence of their conviction that these space activities will eventually be authorized and recognized by law. The SREU Act gives credence to this belief, and may jumpstart actual operations. Furthermore, the new law is consistent with longstanding U.S. space policy, which includes as a goal the commercialization of space activities—such as Shuttle payloads,²⁰ remote sensing activity,²¹ transport of materiel²² and personnel to space stations, and more.²³ Indeed, the initial Commercial Space Launch Act of 1984 was designed, in part, to encourage private entities by protecting investments in spacecraft launches and other commercial space activities.²⁴

In light of other legislative efforts to increase the U.S. commercial space industry, title IV of the CSLCA represents an important extension of overall U.S. policy in the field. Nevertheless, Congress removed certain controversial sections of previous bills in order to ensure passage of the law. As a result, the SREU Act arguably leaves unaddressed critical issues and future challenges underlying resource extraction in space. A brief review of the structure and language of the CSLCA is useful in highlighting this issue.

The SREU Act is divided into three sections: “definitions” (section 51301), “commercial exploration and commercial recovery” (section 51302), and “asteroid resource and space resource rights” (section 51303). The SREU Act first defines the scope of the resources subject to extraction and utilization. For example, section 51301 defines an “asteroid resource” as “a space resource found on or within a single asteroid.”²⁵ “Space resource” is then defined as any nonbiological resource found “in situ” in outer space.²⁶ Furthermore, and of great potential utility to both federal government efforts and private enterprises in space activities, both water and minerals are included in the concept of space resources.²⁷ The choice of words here seems deliberate, giving notice that the United States has no intention to claim, or to allow private actors to claim, any lifeforms discovered on other celestial bodies; additionally, by maintaining that the resources contemplated for use and extraction are “in situ” (rather than the asteroid itself), the SREU Act may be countering fears that mining operations would be contrary to the prohibition on appropriation of celestial bodies enshrined in Article II of the Outer Space Treaty.²⁸

Next, the SREU Act actively promotes U.S. commercial exploration and commercial recovery in space. Congress directs the president, along with “appropriate” agencies, to encourage the development of, and removal of barriers to, the nascent space resources industry. Section 51302 specifically discourages any governmental barriers to the successful growth of an “economically viable, safe, and stable” space resource industry.²⁹ The law further instructs the president to
facilitate the commercial exploration and recovery of space resources.\textsuperscript{30} Taken together, these provisions represent a stronger government role in supporting an industry that has yet to truly “take off” and which has called for government support in the past.

In one of the clearest interstices of the law, however, the SREU Act leaves open the task of identifying which federal agencies are “appropriate” for executing the tasks and objectives set forth by Congress.\textsuperscript{31} By not explicitly designating the federal agencies responsible for practical issues such as oversight of on-orbit operations, traffic management as between private and state spacecraft, and authorization for space or asteroid extractions, Congress has effectively delegated the challenge of successful implementation of the SREU Act to the president.\textsuperscript{32}

The third and final section of the SREU Act provides an important boost to private space mining interests. Section 51303 grants new property rights to industry entities that obtain in situ asteroid resources or space resources. The entitlements include the right to own, sell, transport, and use the resources, with the only restriction being that these must be exercised in accordance with “applicable law,” including the “international obligations of the United States.”\textsuperscript{33} Even though this section may be short in length, the legislative language has broad implications for commercial operators in space, and provides guidance to counsel that are or will be involved in the evolution of space mining operations.

Even as the SREU Act represents a potential “game changer” for the industry, much remains to be determined before practical operations could commence. For instance, the SREU Act lacks specific guidance in terms of where “United States citizens” (as noted by section 51301(3)) should go to resolve problems that occur in space. On the other hand, the ASTEROIDS Act and H.R. 1508 made significant strides in this direction. H.R. 1508 specifically provided for clear and exclusive jurisdiction of federal district courts for actions arising under the bill and civil actions as a remedy for instances of harmful interference with activities contemplated by the bill.\textsuperscript{34} In contrast, the SREU Act does not provide for any such remedy and only provides that the federal government will promote the prevention of harmful interference.\textsuperscript{35} The SREU Act does not completely abandon the issue of legal redress for disputes arising from space mining activities: section 51303 notes that the laws of the United States and its international obligations will apply. This provides commercial mining entities with a starting point, if not a clear or definitive jurisdiction, for determining the appropriate forum and method for conflict resolution.

There are additional matters that need to be addressed by subsequent legislation or executive action. As noted above, though the SREU Act encourages the development of a commercial exploration and utilization industry within the United States, it does not make clear which agency or agencies will have authority over such activities. In addition, the federal government may face challenges regarding whether the creation of private property rights in space is within the purview of U.S. law and consistent with U.S. international treaty obligations. With respect to the above, the law directs the president to issue a report to Congress, no later than 180 days after enactment, that specifies: (1) recommendations for the allocation of responsibilities among federal agencies conducting said oversight activities; and (2) the authorities necessary to meet the international obligations of the United States, including authorization and continuing supervision by the federal government of commercial exploration for and commercial recovery of space resources by United States citizens.\textsuperscript{36}

Through this mandatory reporting requirement, Congress appears to be acknowledging potential controversies arising under the Outer Space Treaty. More specifically, the law’s implicit reference to U.S. international treaty obligations may be an attempt to deflect criticism that the SREU Act ignores commitments under Article II of the Outer Space Treaty,\textsuperscript{37} which prohibits the extension of sovereignty into space. Indeed, one possible reason that prior legislation, such as the ASTEROIDS Act, stalled is due to the fact that the bills failed to fully address international concerns on this issue.\textsuperscript{38}

**Conclusion**

The CSLCA makes significant advances in furthering U.S. commercial space industry in four areas: First, the new law updates existing law to promote the growing dynamic of public-private partnerships in U.S. commercial space launches and provide a more cohesive approach to oversight within the federal government. Second, the CSLCA encourages the development of private space-based remote sensing through increased congressional oversight of the federal licensing process. Third, the Act clarifies and strengthens the role and functions of the Office of Space Commerce as the lead policy coordinator at the Commerce Department. Fourth, and most importantly, the CSLCA fosters the space mining industry through the creation of private property rights in relation to the extraction of certain space and asteroid resources.

Even with this progress, the CSLCA leaves open issues for future debate. For example, although the Act puts the United States in a global leadership role vis-à-vis space...
mining operations, these legal innovations will need to stand up to rigorous analysis under the current international treaty regime governing outer space. In addition, the federal government must implement the CSLCA's substantial changes to extant law. Input and participation of key stakeholders within government and private industry will be critical to the success of this implementation effort. Mandatory reporting requirements, spread throughout the law, suggest that Congress will be actively engaged in overseeing these developments. In short, the CSLCA is a critical step forward in U.S. commercial space, but it is not the last one.

Endnotes
3. Id. § 102(a).
4. 51 U.S.C. § 50915(a)(1)(A) (“[T]he Secretary of Transportation shall provide for the payment by the United States Government of a successful claim (including reasonable litigation or settlement expenses) of a third party against a person described in paragraph (3)(A) resulting from an activity carried out under the license issued or transferred under this chapter for death, bodily injury, or property damage or loss resulting from an activity carried out under the license [when a claim is more than the amount of insurance . . . required under . . . this title.”).
5. H.R. 2262 § 102.
6. Id. § 103 (codified at 51 U.S.C. § 50914(a)(4)(E)).
7. Id. § 108.
8. 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, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty]. Arguably, the federal government fulfills its authorization requirements in the form of licensing authorities like the FAA (which licenses the commercial launches); however, identifying a supervisory authority for commercial missions progressing in outer space has proven more challenging.
10. H.R. 2262 § 112(b).
11. Id. § 112(c).
12. Id. § 201 (codified at 51 U.S.C. § 60126(a)).
13. Id. § 201; see also 51 U.S.C. § 60126(a)(1).
15. Id.
16. Id. § 301(a)(1).
17. Id. § 302.
26. Id. (codified at 51 U.S.C. § 51301(2)(A)).
27. Id. (codified at 51 U.S.C. § 51301(2)(B)).
28. Outer Space Treaty, supra note 8, at art. II.
29. H.R. 2262 § 402 (codified at 51 U.S.C. § 51302(a)(2)).
30. Id. (codified at 51 U.S.C. § 51302(a)(1)).
31. Id. (codified at 51 U.S.C. § 51302(b)(2)).
32. For example, section 51302 provides that the president “acting through appropriate Federal agencies” is responsible for implementation of the statutory tasks.
34. H.R. 1508, 114th Cong., 1st Sess. § 2 (2015) (providing in proposed section 51303(c), “Civil Action for Relief from Harmful Interference,” that “[a] United States commercial space resource utilization entity may bring a civil action for appropriate legal or equitable relief, or both, under this chapter for any action by another entity subject to United States jurisdiction causing harmful interference to its operations with respect to an asteroid resource utilization activity in outer space.”).
35. Enabling entities to be free of “harmful interference” is now something the president, along with the appropriate federal agencies, will “promote.” 51 U.S.C. § 51302(a)(3).
36. Id. § 51302(b)(1).
37. Outer Space Treaty, supra note 8, at art. II.
38. See Hearing on H.R. 5063 before the Subcomm. on Space of the H. Comm. on Sci., Space & Tech., 113th Cong. 6 (2014) (statement of Joanne Irene Gabrynowicz, Professor Emerita, University of Mississippi School of Law) (“The potential political impact of this kind of legislation on the international treaties is likely to be sizeable. Disagreement should be expected as to the meaning of this kind of legislation. . . . The legal status of some of the issues contained in the proposed bill is unclear and the concomitant international politics are highly contentious.”).
Active Space Debris Removal: When Consent Is Not an Option

By Melissa Kemper Force

We are all dependent on space resources in one way or another. That dependency has been increasing for over half a century, even though the extent of our reliance has only become apparent to the general population in the new millennium. The 2015 Space Report, published by the Space Foundation, reported that from 2005 through 2014, the global space economy nearly doubled, generating $330 billion in 2014.1

We rely on satellites for national security and everyday conveniences. A loss of communication, television, meteorological, remote sensing, GPS, or reconnaissance satellites would have profound consequences because there is virtually no facet of modern life that is not enabled by some satellite in space, which makes their vulnerability to damage or destruction by space debris a serious threat.

This article describes the phenomenon of space debris and the challenges involved in its removal or mitigation. Next, the article examines the framework of international space law pertaining to space debris and posits that interpretation of existing space treaty law may provide a legally valid and pragmatic means of addressing the problem of debris removal and the disconnect that generally exists between the responsibility for placing items in space versus removing them.

What Qualifies as Space Debris?

Since AT&T and Intelsat placed the first commercial satellites in orbit in the early 1960s, the world has launched about 6,600 satellites. Most of them, working or not, are still orbiting in space. Of the 300,000 objects currently being tracked, only 1,265 provide service; all of the others are uncontrolled and uncontrollable debris.

Historically, spontaneous explosions of rocket stages containing leftover propellant were responsible for creating most of the new debris in space. More recently, as the volume of debris has increased, collisions among objects are becoming more frequent. Two events—in 2007, when China destroyed its own weather satellite, and in 2009, when a Russian spy satellite collided with an American communications satellite—illustrate the problem. Fallout from these two incidents alone produced an additional 5,000 objects, each of which may cause new collisions, thereby creating a chain reaction of collisions known as “the Kessler syndrome,” generating constantly moving minefields of debris in the most popular orbits.2

The population of space debris is comprised of more than just fragments scattered from old collisions, explosions, and launch separations. It includes whole satellites that stopped working years, even decades, ago. Without any means of control, but considerable orbital velocity, these large objects pose a risk of crashing into each other or operational satellites. As more debris collisions occur, the riskier and more expensive it will become to ensure the continuity of space services on which we rely.

Space Debris Mitigation

In the 1980s, perceptive legal minds began asking the hard questions,3 but only in the 1990s did international law and policy begin to address the issue. Ultimately, the Inter-Agency Space Debris Coordination Committee (IADC)4 worked to promulgate international guidelines to minimize the production of debris, which were subsequently adopted (in varied form) by the U.N. Committee on the Peaceful Uses of Outer Space (UNCOPUOS) in 2007 as “Space Debris Mitigation Guidelines.”5

Active Debris Removal (ADR)

The danger posed by accumulated debris fields, and the need to take positive action to not only slow their propagation but to reverse it, is so well known that we have coined a phrase and an acronym—active debris removal (ADR)—to describe it. ADR encompasses the process, technology, and strategy to remove an immediate threat posed by a defunct satellite, a rocket body, or some other large piece of debris by nudging it into a safer orbit or forcing it to prematurely reenter the atmosphere.6

Mitigation measures alone are not sufficient to constrain the space debris population.7 Thus, the emphasis has shifted to removing large objects that travel in congested orbits.8 The European Space Agency has recommended ADR in low Earth orbit (LEO) as soon as possible,9 and a NASA study concluded that ADR of

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large debris over the next 200 years, at the removal rate of one to five objects per year beginning in 2020, would stabilize the LEO population. Other studies recommend an even faster rate of removal.

The challenges to develop technical, financial, and operational capabilities required to actively remove an old satellite and prevent its collision with working satellites in its path are formidable and have only recently approached the point of serious discussion. But the legal barriers are even more daunting because they risk preventing any active cleanup of space, even if all other obstacles are overcome, by chilling any prospective funding with the prospect of unknown regulatory hindrances.

Mitigation measures alone are insufficient to constrain the space debris population; thus, the emphasis has shifted to removing large objects that travel in congested orbits.

The International Space Law Framework

No country, organization, company, or individual may participate in a space endeavor unless it complies with the rules of international law. These rules are comprised primarily of five space treaties negotiated in the United Nations in the 1960s and 1970s, supplemented by customary international law. The treaties provide the definitive legal framework of the outer space regime. Of the five treaties that govern human actions in outer space, the most fundamental is the Outer Space Treaty.

The treaties were drafted and negotiated at a time in history when the contest for military superiority between two major spacefaring states was the dominant concern. All states agreed that no area in space would be subject to a claim of ownership by anyone. But ownership of objects in space was another matter. Ultimately, tensions on both sides were assuaged with mutual assurances that neither would interfere with the other’s spacecraft and that each would retain its ownership rights. Perpetual ownership of space objects was the natural corollary of that bargain; the resulting constraints on future commercial interests did not receive much scrutiny.

The Problem with Nonconsensual Use of ADR

ADR obtained by negotiated consent, with terms of payment, liability, and risk-shifting mechanisms agreed upon, presents no real legal issues. It is only when the owner of a hazardous nonfunctioning satellite withholds its consent or cannot be identified that legal challenges arise. Nonconsensual ADR presents a dilemma because international law does not prioritize among the opposing interests of the owner (including its budgetary constraints, potential collateral liability, and dual-use national security concerns) and those of other users of the orbit who require the orderly and productive use of the orbit without risk of collision.

The legal problem for ADR arises when, in the absence of explicit consent, any state or entity needs to protect its spacecraft from an impending collision by diverting another state’s debris. There has never yet been a need to employ such a tactic—happily, because there is no technical or financial means to do so and no geopolitical will to endorse it. However, the continued proliferation of satellites in a limited number of preferred orbits, coupled with the potential for cascades of future collisions, will force us to consider the use of ADR as part of a larger policy to maintain a safe and sustainable space environment. To that end, we must overcome the argument that removal of dangerous debris requires the owner’s explicit consent or, alternatively, abandonment of the object (which is impossible under the current space regime).

The implication of the rule of perpetual ownership is that, once launched, the owner’s property rights in the object confer absolute authority over that object in perpetuity, even after it ceases operation and the owner loses functional control over it. Although there are a number of interrelated legal issues that pose an impediment to ADR, it is this eternal fidelity to the superiority of ownership rights that prevents threatened users from using ADR to ameliorate the danger posed by hazardous space objects when their owners are unidentifiable or uncooperative.

Interpretation of the Outer Space Treaty

The Outer Space Treaty could be construed to require a state of registry to retain control over any object launched into outer space, such that permitting a nonfunctional satellite to remain in orbit would violate that obligation. But the travaux préparatoires of the treaty, discussions in the United Nations, and even the U.S. Senate hearings to ratify the treaty never considered orbital debris in this context (not that this should preclude such an interpretation). In the 1960s, the only recognized threat that other satellites could pose was radio interference.

There is no provision in the treaty that explicitly defines ownership of a space object as interminable; Article VIII of the treaty merely provides that ownership is “not affected” by an object’s presence in space. Propositions to curtail a state’s sovereignty—including challenges to its absolute control over dead satellites—have generally been avoided by politically sensitive diplomats and consensus-driven space lawyers. Thus, the legal and policy concerns of ADR have languished because the inertial force of conducting space activities as if there were no duty to remove debris is much stronger than the will to muster political support to make spacefaring states accountable for that debris.
example, despite the relative success of the mitigation
guidelines, about half of all satellites in orbit are not
properly deorbited at the end of their lives because
the guidelines are entirely voluntary; efforts to make
them mandatory have been consistently resisted.

Considering the difficulties of perpetual ownership
and the appeal of the less risky alternative of just doing
nothing, it is tempting to dismiss the invocation of inter-
national space law to support ADR activities. However, a
solution to the legal conundrum may be found
in nothing more obvious than treaty interpretation.

Addressing the Problem of Unbounded “Use” of Space

An interpretation of what use states are permitted
to make of space should support the treaty’s proscription
of nonappropriation. There are no temporal
limits on occupying any area of space for any given
use. Currently, the undefined term “use” has assumed
such an all-embracing reach that almost anything
short of outright hostility may qualify as a legitimate
“use” of space. The result is that even an object with
no purpose or function other than “being” can pos-
sess an orbit indefinitely as long as it merely occupies
the space. This understanding of “use” results in no
qualitative difference between occupation for the pur-
pose of some nebulous “use” and forbidden national
appropriation because the identical result is produced
in both instances: preclusion of all other states from
enjoying that area indefinitely.

Interpretation of the treaty language to limit “use” in
a constructive way could outlaw such eternal occupa-
tion of orbits or territory (which is essentially ownership
in all but name). Such an interpretation is supported by
analogues in the International Telecommunication Union
(ITU), which implicitly recognizes that active “use” of an
orbital position in a congested frequency spectrum is a
predicate to a state’s right to occupy it.

The ITU incorporates a “bring into use” require-
ment for satellite frequencies, reducing the nebulous
concept of “use” to practical applications that aid
in the interpretation of Article I of the Outer Space
Treaty. The “use” requirement derives from the key
ITU determination that “radio frequencies and any
associated orbits, including the geostationary-satellite
orbit, are limited natural resources and that they must
be used rationally, efficiently and economically.” The
ITU regime provides insight into how and why the
mere occupation of an orbit is not the kind of use
“carried out for the benefit and in the interests of all
countries” granted by the Outer Space Treaty, espe-
cially when its sole effect is to keep others from using
a limited natural resource.

Addressing the Problem of Perpetual Ownership

A second focus of treaty interpretation must address
the problem of perpetual ownership. As discussed
above, noninterference with another’s property rights
in an object is currently inviolate because the only jus-
tifiable grounds for interference are either very vague
e.g., the use is not “peaceful”) or extremely limited
e.g., “objects carrying nuclear weapons or any other
kinds of weapons of mass destruction”). But compari-
sions to national regimes that mandate action to keep
the highway system clear of debris may be useful to
demonstrate that ownership rights in an object do
not confer absolute protection in situations where the
object’s activity is inconsistent with the “due regard”
policies underlying space law.

For example, the U.S. Federal Highway Adminis-
tration systematically coordinates a national program
focused on the efficient clearing of traffic incidents from high-
ways and “authority removal” laws allowing removal of vehi-
cles from the roads without fear of liability claims from their
owners. If the car is not being “used” on the highway, it will
be removed—with or with-
out the owner’s consent—for the
greater safety of the travel-
ing public and regardless of any
ownership rights. Employment
of such analogues can demon-
strate why the bundle of rights
that accompany ownership of
uncontrolled space debris can
and should be curtailed when
social policy dictates (as when,
for example, a sustainable and
safe space traffic system must
be maintained for the benefit of all spacefaring states).

Space law currently provides little guidance to
define the types of conduct that cause prohibited
harm. However, generally accepted international stan-
dards may be imported from customary international
environmental law, which recognizes the obligation of
states to ensure that activities within their jurisdiction
and control respect the environment of other states
and areas beyond national control.

The duty not to cause significant transboundary
environmental harm is not absolute; there is an inter-
national due diligence standard, which is generally
considered to be appropriate and proportional to the
degree of risk of transboundary harm in the particu-
lar instance. That standard could apply to a state that
permits its space object to cause hazards to naviga-
tion of other space users in affected orbits, so that it is
vulnerable to a claim of violating generally accepted
international rules if it fails to take steps “appropriate
and proportional to the degree of risk” to abrogate or
ameliorate the danger—establishing a concrete stan-
standard to measure “negligent” conduct in space.
Conclusion

Scientists have warned for decades that ADR will eventually be necessary, but current interpretations of international space law provide no support or incentive for its use. The necessary space law provisions exist, but their ambiguous interpretation affords the owners of hazardous space debris unjustifiably broad control and discretion to defer indefinitely any action to curtail that danger. Adoption of an interpretation of the treaty language consistent with the original intent of the international community and in a way that addresses the law and policy issues exposed by ADR could offer a solution. Making law by treaty interpretation would require no treaty adoption or amendment and could provide the impetus for adoption of ADR policies on a domestic or national level. At the very least, widespread recognition of this interpretation of space law could contribute to the formation of customary international law supporting the use of ADR.

Endnotes


4. The IADC is an international body comprised of the world’s elite space agencies, including NASA, Roscosmos (Russia), JAXA (Japan), ESA (Europe), ISRO (India), CSA (Canada), SSAU (Ukraine), and other major European agencies, formed to harmonize their efforts to address orbital debris.


7. See Key Findings from the 5th European Conference on Space Debris, EUR. SPACE AGENCY (Apr. 2, 2009), http://www.esa.int/Our_Activities/Operations/Key_findings_from_the_5th_European_Conference_on_Space_Debri (accessed May 1, 2012); see also Joseph S. Umbriaga, Space Debris and Its Threat to National Security: A Proposal for a Binding International Agreement to Clean Up the Junk, 44 VAND. J. TRANNSAT’L L. 589 (2011); J.-C. Liou & Nicholas L. Johnson, Risks in Space from Orbiting Debris, 311 SCI. 340 (2006).


11. See, e.g., IICSD 2012 Report, supra note 6, at 21 (“The focus of [ADR] should . . . be on removal of larger objects capable of causing catastrophic collisions and massive fragmentations in space. . . . [Given certain realistic parameters], there will be the need to remove 9.1 objects per year from LEO by means of [ADR] in order to achieve the threshold of stability within the 200 year timeframe.”).


14. Even “by renouncing rights of ownership the state is not released from those obligations which rest upon it as the result of launching the object or from further consequences thereof” (i.e., liability). MANFRED LACHS, THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING 73 (1972).


16. Outer Space Treaty, supra note 12, at art. VIII (“A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched
into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth.


18. Outer Space Treaty, *supra* note 12, at art. II (“Outer 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.”).

19. *See id.* at art. I (“The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind. Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.”).

20. The fact that the indefinite “use” and occupation is performed by a nongovernmental entity is irrelevant, because all nongovernmental actors are required to be supervised and authorized by a state, thus making it a “national” activity. *See id.* at art. VI (“States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.”).

21. *See Const. of the Int’l Telecomm. Union art. 44, in Collection of the Basic Texts of the International Telecommunication Union Adopted by the Plenipotentiary Conference 3 (2011); see also Constitution and Convention, ITU, http://www.itu.int/en/history/Pages/ConstitutionAndConvention.aspx (last visited Aug. 22, 2016).* Article 44(2) of the ITU Constitution provides: “In using frequency bands for radio services, Member States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries.” Thus, any orbit associated with the use of the radio-frequency spectrum is a limited natural resource, including LEOs.


The proliferation of drones is being impeded by a muddled legal and regulatory framework that is the product of controversies over federal and state power.

Federal vs. State Power to Regulate Drones

continued from page 1

create more than 100,000 high-paying jobs and contribute nearly $100 billion to the nation’s economy. The proliferation of this remarkable technology is being impeded, however, by a muddled legal and regulatory framework that is the product of old controversies over federal and state power. Numerous state and local laws regulating drones conflict with both the Federal Aviation Administration’s (FAA’s) assertion of exclusive authority over the national airspace and its resolve to establish a single national policy for drones.

In 2012, Congress passed the FAA Modernization and Reform Act (FMRA), which required the FAA to integrate drones into the NAS. At the time of the FMRA’s passage, public concern about domestic drone use was at an all-time high. The media portrayed drones as having military applications, and the controversy surrounding the National Security Agency (NSA) collecting data on U.S. citizens was exposed. In reaction, many states and cities passed laws directly targeting drones, including laws that regulate or prohibit persons from operating, weaponizing, or using drones for spying.

In 2015, legislatures in 45 states considered 168 bills affecting drones, while 20 states enacted 26 laws regulating drone use. Yet many of those laws may encroach on the sovereignty of the federal government. Whether federal law and regulation will preempt state and local laws vis-à-vis drones is an emerging issue.

This article first describes how federal preemption currently applies in the aviation context, and then analyzes the potentially fraught relationship between the interests of federal, state, and local governments in regulating drones. The article next highlights a recently introduced federal legislative measure that could provide a path to reconciling those regulatory interests. The article concludes that state and local authorities should regulate drone uses with restraint, recognizing the need to encourage, not suffocate, the burgeoning drone industry and the breadth of federal regulatory authority over aviation.

Aviation and Federal Preemption

The doctrine of preemption derives from the Supremacy Clause of the U.S. Constitution, which states: “This Constitution, and the laws of the United States which shall be made in pursuance thereof . . . shall be the supreme law of the land . . . anything in the Constitution or laws of any State to the contrary notwithstanding.” Congressional intent to preempt state law can be either express or implied—that is, explicitly stated in a statute’s language or implicitly contained in its structure and purpose. When a court determines that federal law preempts state law, the state law must yield; at its core, the question is one of statutory intent.

The U.S. Supreme Court recognizes three types of preemption: (1) express preemption, (2) implied conflict preemption, and (3) implied field preemption. Express preemption is when the language of the federal statute explicitly demonstrates Congress’s intent to preempt state law. The FMRA does not contain an express preemption clause. In fact, within the aviation arena, statutes containing express preemption provisions are rare, the most notable of which being the Airline Deregulation Act of 1978. That Act prohibits states from enacting laws related to a price, route, or service of an air carrier that may provide air transportation. In addition, Congress has expressly asserted “exclusive sovereignty of airspace of the United States,” and placed “exclusive authority for regulating the airspace above the United States with the [FAA].” Although that clause seems to show Congress’s intent to preempt all state laws, courts have held that there is no general express preemption in the field of aviation. Instead, courts may infer intent either through a conflict between a federal law and a state law, or by finding that Congress has occupied the “field.”

Under implied conflict preemption, state law is preempted to the extent that it actually conflicts with federal law. This occurs when it is physically impossible for a private party to comply with both state and federal requirements, or where state law “stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress.” Under the physical impossibility doctrine, even if one sovereign’s law intends to give a person a right to engage in behavior that the other sovereign’s law intends to forbid, the U.S. Supreme Court has made clear that preemption does not ipso facto result. This is so because a person could comply with both federal and state law simply by abstaining from the behavior. Hence, when federal and state laws are mutually inconsistent, it is physically possible to comply with both unless federal law requires what state law forbids (or vice versa).

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Under the frustration of purpose doctrine, any state law that “stands as an obstacle” to the accomplishment of a federal statute’s objective would be preempted. The FMRA’s objective is to integrate civil drones into the NAS. Suppose a state law banned the civil use of drones entirely. That law would be subject to preemption: private sector drone use has risen considerably, and any such ban would only hinder the FAA’s efforts to integrate drones. In contrast, state laws prohibiting persons from weaponizing drones or using drones for voyeurism arguably would not be preempted. Those laws do not ban the operation of drones, restrict flight altitude and flight paths, or regulate navigable airspace. Nor do those laws conflict with current federal law. Thus, they would not “stand as an obstacle” to the “accomplishment and execution” of the federal objectives. In effect, states can place some restrictions in “areas that impact aviation as long as they do not prevent the [FMRA] from accomplishing its purpose.” Further, any threat of conflict preemption may be assuaged by certain exceptions in state laws that specifically allow FAA integration of drones into the national airspace while addressing concerns for privacy or safety.

Under implied field preemption, state law is preempted where it regulates conduct in a field that Congress intended the federal government to occupy alone. That intent—typically determined on a case-by-case basis—may be inferred from a “scheme of federal regulation . . . so pervasive as to make reasonable the inference that Congress left no room for the States to supplement it,” or where an act of Congress “touch[es] a field in which the federal interest is so dominant that the federal system will be assumed to preclude enforcement of state laws on the same subject.” Although the breadth of federal laws and regulations in aviation is extensive, courts have routinely held that states may enact laws within aviation subfields.

At the same time, any attempt by states to regulate certain subfields within aviation, including noise control and safety, will almost certainly be preempted. Likewise, any law restricting—directly or indirectly—flight altitude and flight paths, operational bans, or any regulation of navigable airspace could be preempted. In fact, the FAA has stated that it has sole “authority to regulate the areas of airspace use, management and efficiency, air traffic control, safety, navigational facilities, and aircraft noise at its source.” Thus, the FAA considers any state operational drone restrictions on flight altitude, flight paths, or airspace to infringe on its authority. On the other hand, if the state narrowly targets a highly localized area of drone operations and relates it to matters of traditional state concern generally not subject to or addressed by federal regulation—such as land use, zoning, privacy, or trespass—preemption is less likely and the state law may survive.

Preemption and Drones

The FAA recently issued final regulations (14 C.F.R. part 107) allowing for the commercial use of drones weighing less than 55 pounds. Part 107, however, did not include a preemption provision. Addressing concerns about part 107’s lack of a preemption provision, the FAA noted that preemption issues involving drones necessitate a case-specific analysis that is not appropriate in a rule of general applicability. Additionally, the FAA conceded that certain legal aspects concerning drone use may be best addressed at the state or local level. For example, state law and other legal protections for individual privacy may provide recourse for a person whose privacy may be affected by another person’s use of a drone.

Whether it is better to have a single federal law or a variety of state and local laws is open to debate. The FAA contends that attempts by state and local governments to regulate the operation or flight of aircraft raise substantial safety issues. According to the FAA, if a significant number of states and cities enact laws regulating drone operations, fractionalized control of the navigable airspace could result. The FAA argues that this patchwork of differing restrictions conflicts with its jurisdiction and could severely limit its flexibility in controlling airspace and flight patterns to ensure safety and an efficient air traffic flow. From the FAA’s perspective, a navigable airspace free from inconsistent state and local restrictions is necessary to maintain a safe air transportation system.

Advocates of federal preemption of drone operations contend that a patchwork of state and local laws would not only cause “confusion about where commercial [drone] operators could fly,” but also “may erode, rather than enhance, safety.” This leitmotif echoes U.S. Supreme Court case law such as City of Burbank v. Lockheed Air Terminal, Inc. That case involved a local city ordinance that prohibited planes from taking off from the airport during certain hours of the day. The Supreme Court struck down that ordinance as preempted by the federal regulatory scheme. Expressing its fear regarding local control of airspace, the Court stated, “If we were to uphold the Burbank ordinance and a significant number of municipalities followed suit, . . . fractionalized control . . . would severely limit the flexibility of FAA in controlling air traffic flow. The difficulties of scheduling
flights to avoid congestion and the concomitant decrease in safety would be compounded.\textsuperscript{46}

Those advocates also argue that it is unnecessary for state or local governments to enact drone-specific legislation because existing state laws on privacy, harassment, and trespassing already cover unlawful acts committed with drones. For example, some are concerned about the use of drones to commit physical intrusions that capture photography in inappropriate locations or to advance voyeuristic interests. But existing state laws already address many of the public’s privacy-related concerns, such as unlawful surveillance, trespassing, voyeurism, and stalking.\textsuperscript{47} If anything, the invasion of someone’s privacy via a camera attached to a drone is just as offensive as if achieved by a person holding a zoom telescope, and is likely already prohibited. A technology-neutral approach that incorporates drone use in existing laws would alleviate the need for new laws and not undermine the potential for numerous beneficial uses of drones.

Opponents of federal preemption of laws regulating drone operations argue that a patchwork of state and local laws is not necessarily a bad thing. They note that most commercial drone activity takes place at limited altitudes close to the ground and within short horizontal ranges—typically no more than one mile. Further, any safety hazards from operating commercial drones are inherently local to proximate persons or property. They contend that drone operations directly affect the health and welfare of persons in their local communities. These quality-of-life matters are typically subject to regulation under state and local police powers. Generally, consideration under “the Supremacy Clause starts with the basic assumption that Congress did not intend to displace state law.”\textsuperscript{48} Thus, if a state enacts legislation for the protection and maintenance of the health, safety, or general welfare of its citizens in fields that the states have traditionally occupied—land use, zoning, privacy, trespass, and law enforcement operations—such laws fall within the historic concept of a state’s police power.\textsuperscript{49} These “police powers of the States [are] not to be [preempted] unless that was the clear and manifest purpose of Congress.”\textsuperscript{50} Therefore, unless that intent is clear, courts must not “invalidate state and local legislation.”\textsuperscript{51} In sum, opponents argue that states and cities—not the federal government—are in a better position to balance safety and economic productivity to regulate drones.

Similarly, FAA data pertaining to national drone incidents show that reckless drone use varies significantly from state to state and city to city.\textsuperscript{52} Indeed, almost one in five incidents of reckless drone use nationwide has occurred in densely populated areas with critical infrastructure. And not only does each state and city have its own topographic characteristics, but operating a drone in an urban area as opposed to a rural setting also differs and each poses unique risks. The federal government’s “one size fits all” approach for every state, city, county, park, and school in the country is not practical. Hence, opponents argue that states need flexibility to enact rules that address their unique challenges.

Reconciling the Federal/State Tension over Regulating Drones

A bill recently introduced in the U.S. Senate included a proposal to address this inherent tension between federal and state regulation of drone operations. The bill, titled the FAA Reauthorization Act of 2016 (FRA), specifically addressed federal preemption in the area of drone operations. Section 2142(a) of the FRA proposed to establish federal preemption of state and local laws relating to (1) the design, manufacture, testing, licensing, registration, certification, operation, or maintenance of a drone, including airspace, altitude, flight paths, equipment, or technology requirements; (2) the purpose of operations; and (3) pilot, operator, and observer qualifications, training, and certification.\textsuperscript{53} Yet under section 2142(b), state or local laws—including common-law causes of action—relating to nuisance, voyeurism, harassment, reckless endangerment, wrongful death, personal injury, property damage, or other illegal acts arising from the use of drones would not be preempted if they did not specifically relate to the use of a drone.\textsuperscript{54} Congress ultimately did not pass the FRA.\textsuperscript{55} Nonetheless, the FRA’s preemption framework is important because it attempts to establish a single national policy for drones by explicitly granting the FAA supremacy over all laws seeking to regulate drone operations.

Conclusion

While certain laws enacted by various states are susceptible to preemption, until litigated in court or repealed by the legislature, there will continue to be legal ambiguity. With the FAA’s final regulations for commercial use of small drones having gone into effect in August 2016, several variables will greatly influence the degree and scope of preemption. These include: (1) a reviewing court’s analysis of the breadth and pervasiveness of these regulations; (2) whether the FAA has previously regulated a particular subject matter within the relevant aviation subfield; (3) the nature of the state regulations, including whether the subject matter regulated by the state or city involves an issue within or related to matters of traditional state and local police powers; and (4) the degree of conflict between federal and state regulations on a subject.

In addition to the tension with federal authority, states must confront the confusing regulatory environment that arises when numerous local authorities seek to restrict drone operations. Concerned that individual political subdivisions in a state will pass separate and varying laws regulating the ownership or operation...
of drones, some states have enacted statutes barring local governments from doing so—in essence, preempting local governments from regulating drones. For example, statutes in Arizona, Maryland, Oregon, and Virginia prevent local governments from enacting more restrictive drone regulations. Each of these laws aims to strike a balance between the safety and privacy concerns of citizens and commercial interests, and to have a uniform, reasonable policy.

The surge in drone technology has tremendous economic potential for states that have a favorable regulatory environment for this burgeoning industry. Therefore, state lawmakers must exercise caution to avoid enacting reactionary, burdensome, and restrictive laws specifically directed toward drone operations. Those laws risk alienating the drone industry and impeding economic development. Instead, state lawmakers should strike a balance that allows the use of drones for commercial and recreational purposes while addressing citizen concerns in a narrowly tailored manner, recognizing that overreaching state laws may be preempted.

Endnotes


7. Although beyond the scope of this article, state and local rules that address privacy concerns by limiting a person’s ability to use drones to capture data in public airspace—that is, conduct surveillance—may be vulnerable to First Amendment challenges.

8. U.S. Const. art. VI, cl. 2; see also Hillsborough Cnty. v. Automated Med. Labs., Inc., 471 U.S. 707, 715–16 (1985) (finding that federal supremacy applies equally to issues involving agency regulations as well as federal statutes).


14. See 49 U.S.C. § 40103(a), (b); Riggs v. Burson, 941 S.W.2d 44, 49 (Tenn. 1997).


17. English, 496 U.S. at 79.


21. Id.


26. See supra note 1.

28. Carver, supra note 27, at 393.
31. Id. (alteration in original).
33. See Nw. Airlines, 322 U.S. at 303 (Jackson, J., concurring) (“Federal control is intensive and exclusive. Planes do not wander about in the sky like vagrant clouds.”); see also City of Burbank v. Lockheed Air Terminal, Inc., 411 U.S. 624, 628 (1973) (noise emissions from planes); Montalvo v. Spirit Airlines, 508 F.3d 464, 471 (9th Cir. 2007) (aviation safety); Skysign Int’l, Inc. v. City & Cnty. of Honolulu, 276 F.3d 1109, 1118 (9th Cir. 2002) (navigateable airspace); Abdullah v. Am. Airlines, Inc., 181 F.3d 363, 367 (3d Cir. 1999) (aviation safety); Allegheny Airlines, Inc. v. Vill. of Cedarhurst, 238 F.2d 812, 815 (2d Cir. 1956) (flight altitudes); Cnty. of Cook v. Priester, 318 N.E.2d 327, 331–32 (Ill. App. Ct. 1974), aff’d, 342 N.E.2d 41 (Ill. 1976) (aircraft flight weight); DOLAN & THOMPSON, supra note 27. But see Cleveland ex rel. Cleveland, 985 F.2d at 1444; Ward v. State, 374 A.2d 1118, 1125 (Md. 1977).
34. See Skysign Int’l, 276 F.3d at 1117 (noting the forbidden, exclusively federal areas: flight paths, hours, and altitudes). Imagine a state law banning the operating of a drone within the airspace of the city or within certain distances of a pipeline or water treatment facility. See, e.g., Nev. Rev. Stat. § 493.109; Tex. Gov’t Code Ann. § 423.0045.
37. Id. at 42,194.
38. Id.
40. Id.
41. Id.
42. Id.
45. Id. at 640.
46. Id. at 639 (footnote omitted); see also Nw. Airlines v. Minnesota, 322 U.S. 292, 302 (1944) (holding that any authorization of local burdens on our national air commerce will lead to their multiplication in this country); Montalvo v. Spirit Airlines, 508 F.3d 464, 473 (9th Cir. 2007) (“[A] patchwork of state laws [for passenger warnings] in this airspace . . . would create a crazyquilt effect.”).
47. See, e.g., Nev. Rev. Stat. §§ 200.571 (harassment), 200.575 (stalking), 200.603 (peering, peeping, or spying through window, door, or other opening of dwelling of another), 200.604 (capturing image of private area of another person), 206.140 (nuisance; trespass).
49. Vill. of Cuilzod, Ohio v. Ambler Realty Co., 272 U.S. 365, 395 (1926); Fla. E. Coast Ry. v. City of W. Palm Beach, 266 F.3d 1324, 1328 (11th Cir. 2001).
50. City of Burbank, 411 U.S. at 643.
51. Id.
53. FAA Reauthorization Act of 2016, S. 2658, 114th Cong. § 2142(a) (as passed by Senate, Apr. 19, 2016).
54. Id. § 2142(b).
55. In lieu of passing a long-term reauthorization of the FAA, Congress passed a 14-month funding extension of the FAA’s programs and the taxes that will fund those programs titled the FAA Extension, Safety, and Security Act of 2016, H.R. 636, 114th Cong. While that law also seeks to provide important aviation safety, security, and time-sensitive improvements for air travelers, it does not contain a federal preemption clause.
India’s New Aviation Policy

GoI has developed an aggressive plan to promote the sector. As the first significant step in implementing this plan, the GoI recently unveiled the much-awaited Civil Aviation Policy (Policy). This is the first time since India’s independence that the GoI’s Ministry of Civil Aviation (MoCA) has propounded an integrated civil aviation policy. The Policy reflects an intent to migrate to a more liberal administrative and regulatory regime for the aviation sector in India. It also seeks to relax rules for airlines to fly overseas and substantially increase regional air connectivity.

The Policy’s fundamental objectives are affordability and connectivity of air services and facilitation of doing business in India. With the Policy, the GoI plans to create an ecosystem that will facilitate an increase in air travel. It hopes to stimulate 300 million air ticket sales per year in the domestic sector by 2022 and 500 million by 2027, while for international travel, the target is 200 million annual ticket sales by 2027.

This article first describes the recent history of Indian civil aviation and the current state of the aviation sector and its regulatory framework. Next, the article describes the GoI’s reform initiatives, including liberalizing restrictions on foreign direct investment (FDI) in Indian air carriers and aviation companies and the new Policy, which promises to reform all of the key areas of India’s civil aviation sector. The article concludes that the FDI liberalization initiative and the Policy, while imperfect, provide a path to enable substantial growth and modernization of the aviation sector, which can play a vital role in India’s continuing economic development.

Recent Experience of Indian Aviation

India’s aviation sector has not always been so vibrant. For many years, air travel was a preserve of the rich as high fares deterred many from traveling by air. Over the last two decades, however, the air travel market has expanded due to rapid economic growth, an expanding middle class, higher disposable incomes, the emergence of low-cost carriers, modern airports, increased FDI, sophisticated information technology, and a growing emphasis on regional connectivity. A huge tide of first-time air passengers has emerged, attracted by the services of popular domestic low-cost carriers.

Largest Indian Airlines

The Indian air transport market has become highly competitive over recent years. While many airlines have suffered from escalating operating costs, flawed strategies, and inelastic pricing, consistent levels of traffic growth have kept them solvent. India’s largest domestic airlines are listed in table 1.

Indian Airports

India has about 449 airports and airstrips, of which around 125 airports are owned and managed by GoI-owned and controlled Airports Authority of India (AAI). Until recently, AAI was the only major player involved in developing and operating airports in India. Like most GoI-controlled enterprises, AAI suffered from a lack of resources and talent, governmental/bureaucratic interference, and a paucity of professional management. The GoI, recognizing the need for reform, decided to invite private investment into India’s civil aviation infrastructure.

The private sector, including foreign investors, was attracted to participate in the operation, management, and development of Indian airports through various public-private partnership (PPP) models, with substantial

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state support in terms of financing, concessionary land allotments, tax, and other incentives. This has helped to produce world-class airports at Mumbai, Delhi, Kochi, Hyderabad, and Bengaluru, which together account for over 60 percent of the nation’s air traffic. The largest PPP airports in India are listed in table 2.

**India’s Civil Aviation Regulatory Framework**

Aviation is a subject included in the Union List of the Constitution of India. Accordingly, the national parliament has exclusive power to legislate with respect to aviation. The current legal and regulatory framework for the aviation sector is as follows:

- The **Ministry of Civil Aviation (MoCA)** is responsible for the formulation of national policies and programs for the development and regulation of civil aviation and for devising and implementing schemes for the orderly growth and expansion of civil air transport.
- The **Airports Authority of India (AAI)** functions under the control and supervision of MoCA and is responsible for building and managing civil aviation infrastructure in India. Air navigation services are under AAI’s exclusive control.
- The **Airports Economic Regulatory Authority of India (AERA)** is a statutory body entrusted with setting tariffs for aeronautical services and establishing the amount of development and passenger service fees, as well as establishing and monitoring performance standards relating to quality, continuity, and reliability of aviation services.
- The **Directorate General of Civil Aviation (DGCA)** is the regulatory body primarily responsible for the regulation of domestic and international air transport services and enforcement of civil aviation regulations, air safety, and airworthiness standards. It also coordinates all regulatory functions with the International Civil Aviation Organization (ICAO).

**Liberalizing FDI in Civil Aviation**

In a significant reform initiative, the GoI now allows 100 percent FDI in scheduled air transport service/domestic scheduled passenger airline and regional air transport service. However, only nonairline foreign investors are allowed to acquire a 100 percent ownership interest in an Indian carrier. Under the new regime, foreign investors may acquire up to a 49 percent interest, but FDI exceeding that threshold will require prior government approval. Investments by foreign airlines in Indian airlines are limited to a minority (49 percent) interest. The new FDI regime for the aviation sector is summarized in table 3.

### Table 2

<table>
<thead>
<tr>
<th>Airport Location</th>
<th>Number of Passengers (in Millions, FY 2015–16)</th>
<th>Joint Venture Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi³</td>
<td>48.4</td>
<td>The Bengaluru-based GMR Group holds 64%, with AAI holding 26% and Fraport holding 10%.</td>
</tr>
<tr>
<td>Mumbai⁴</td>
<td>41.6</td>
<td>A Hyderabad-based, GVK-led consortium holds 74% stake (after acquiring the interest of Airports Company of South Africa), with AAI holding 26%.</td>
</tr>
<tr>
<td>Bengaluru⁵</td>
<td>18.1</td>
<td>GVK Group holds 43%, Siemens Project Ventures holds 26%, KSIIDC holds 13%, AAI holds 13%, and Flughafen Zürich AG holds 5%.</td>
</tr>
<tr>
<td>Hyderabad⁶</td>
<td>12.4</td>
<td>The GMR Group holds 63%, the GoI holds 13%, the Government of Telangana holds 13%, and Malaysia Airports Holdings Berhad holds 11%.</td>
</tr>
</tbody>
</table>

### Table 3

<table>
<thead>
<tr>
<th>Sector/Activity</th>
<th>FDI Permitted</th>
<th>Governmental Review Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenfield Airport Projects⁴</td>
<td>100%</td>
<td>None</td>
</tr>
<tr>
<td>Brownfield Airport Projects⁹</td>
<td>100%</td>
<td>None</td>
</tr>
<tr>
<td><strong>Air Transport Services¹⁰</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduled Air Transport Service/Domestic Scheduled Passenger Airline and Regional Air Transport Service</td>
<td>100%</td>
<td>Prior GoI approval required if investment exceeds 49%</td>
</tr>
<tr>
<td>Nonscheduled Air Transport Service</td>
<td>100%</td>
<td>None</td>
</tr>
<tr>
<td>Helicopter/Seaplane Services Requiring DGCA Approval</td>
<td>100%</td>
<td>None</td>
</tr>
<tr>
<td><strong>Other Services under Civil Aviation Sector</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Handling Services</td>
<td>100%</td>
<td>None</td>
</tr>
<tr>
<td>Maintenance, Repair, and Overhaul Organizations (MROs); Flight Training Institutes; Technical Training Institutions</td>
<td>100%</td>
<td>None</td>
</tr>
</tbody>
</table>

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Relaxation of FDI restrictions will provide a much-needed boost to the Indian aviation sector at a time when some airlines were struggling to remain solvent and many were reporting losses. By allowing up to 100 percent FDI subject to certain limitations, the GoI will enable Indian airlines to access new sources of capital, which will stimulate investments in expansion and consolidation. As a policy matter, however, it is unclear why airports, cargo, MROs, and general aviation have been opened up to 100 percent FDI, yet airlines remain subject to a 49 percent limit on FDI.

The New Civil Aviation Policy

The Policy sets forth plans for an ambitious overhaul of the aviation sector with an eye on the future. The cornerstones of the Policy are competition, consumers, connectivity (within India and internationally), and investment—from both domestic and foreign investors. The GoI is convinced that this will be the key to realizing its target of growing domestic passenger traffic nearly fourfold to 300 million by 2022. Following are key elements of the Policy.

Liberalized “Open Skies” and Codeshare Agreements

The Policy allows Indian carriers to enter into codeshare agreements with foreign carriers to any point in India and abroad consistent with the applicable bilateral air service agreement (ASA), with no prior MoCA approval required. Indian designated carriers will only have to inform MoCA 30 days prior to starting the codeshare flights. The liberalization of codeshare agreements and bilateral rights will lead to greater ease of doing business, increased competition, and wider choice for passengers. Under the present regime, India has an “open skies” ASA with the United States, but only a “near open skies” ASA with the United Kingdom, with restrictions on the frequency of flights between the United Kingdom and Delhi-Mumbai. The Policy allows India to have an “open skies” policy with all countries beyond a 5,000 km radius from Delhi based on principles of reciprocity. This will enable airlines of such countries to have unlimited access in terms of number of flights and seats to Indian airports. This is expected to increase flight frequencies with these countries. Unlimited flights above the existing ASA limitations will be allowed directly to and from major international airports within the country as notified by MoCA from time to time. For countries partly or fully within the 5,000 km radius, where Indian designated carriers have not fully utilized 80 percent of their capacity entitlements but foreign carriers have utilized their bilateral rights and are pressing for an increase in capacity, a system will be developed for the allotment of additional capacity.

Maintenance, Repair, and Overhaul (MRO)

The Policy recognizes the critical role of the MRO sector in the development of the aviation industry. Today, most Indian airlines send their aircraft overseas for maintenance and repair. As the MRO business of Indian carriers is valued at around $1 billion, 90 percent of which is currently spent outside India, the GoI is keen to develop India as an MRO hub in Asia as part of the “Make in India” initiative, which in turn will attract business from foreign airlines. MoCA will persuade state governments to make value added tax (VAT) zero-rated on MRO activities. Airport royalty and other charges will not be levied on MRO service providers for a period of five years from the date of approval of the Policy. Foreign aircraft brought to India for MRO work will be allowed to stay for the entire period of maintenance or up to six months (whichever is less), provided the aircraft does not operate any commercial flights during that period. The aircraft, however, may carry passengers on flights at the beginning and end of a stay period in India. The DGCA’s permission is required for a stay exceeding six months. The Policy also promises steps to ensure that foreign MRO experts are provided visas promptly, and in cases of an aircraft-on-ground situation, temporary landing permits will be issued, subject to certain conditions. Foreign pilots operating an aircraft to and from India for the purpose of servicing at an Indian MRO entity will be issued temporary landing permits, subject to certain conditions.

Airport Infrastructure Augmentation

Airport infrastructure is an area that needs immediate attention because the existing infrastructure is inadequate to meet the sector’s anticipated rate of growth. The Policy aims at the development and modernization of airports and upgrading of quality of services. The Policy encourages the development of airports by state governments and the private sector (including via PPPs), with greater regulatory certainty. Future greenfield and brownfield airports will have cost-efficient functionality, with no compromise on safety and security. To ensure uniformity and a level playing field across various operators, future tariffs at all airports in India will be calculated on a “hybrid till” basis, unless otherwise specified for any project being bid out. A total of 30 percent of nonaeronautical revenue will be used to cross-subsidize aeronautical charges. If the tariff in a particular year or contractual period proves to be excessive, the airport operator and regulator will explore ways to keep the tariff reasonable, and spread the excess amount over future years.
Cargo

India has tremendous potential for air cargo growth on domestic as well as international routes. Currently, the primary beneficiaries of the Indian cargo market are Indian Railways, road transporters, and foreign airlines. Development of regional cargo hubs is one of the GoI’s top priorities. Revenue from air cargo helps airlines to subsidize the cost of passenger tickets, thereby facilitating the development of a mass market for air transportation. The Policy aims to increase air cargo volumes to 10 million tons by 2027. The Policy further recognizes express delivery services as a separate segment within air cargo owing to their distinctive nature and process. The express industry is turning out to be a pivotal segment for enhancing exports, especially in the small and medium-sized enterprises segment, in view of the expansion of e-commerce and other new age industries. The Policy aims at encouraging airport operators to provide space for at least 10 years via lease to operators of express cargo freighters, which may then develop dedicated infrastructure to improve their operational efficiency. The Policy also aims to establish free trade and warehousing zones to facilitate transshipment cargo. With the GoI’s emphasis on “Make in India,” “ease of doing business,” and enhancement of exports, it is extremely important to enhance infrastructure to stimulate growth of the air cargo sector.

5/20 Rule Replaced

International operations are lucrative for airlines because they generate higher yields, enable better utilization of aircraft, and permit airlines to purchase cheaper jet fuel overseas. Under the 5/20 rule, only Indian airlines that had at least five years of operational experience and a minimum fleet of 20 aircraft were allowed to fly internationally. Over time, however, the increasingly prevalent view was that this restriction, which is unique to India, needed to be replaced by a scheme that would provide a level playing field and allow airlines, both new and old, to introduce international operations provided they continued to meet some obligation regarding domestic operations. The aviation ministry faced aggressive opposition to elimination of the 5/20 rule by older airlines such as Jet Airways, IndiGo, SpiceJet, and GoAir, while new entrants such as Vistara and AirAsia advocated for the rule’s abolition. The Policy discarded the controversial 5/20 rule, and now any domestic airline may fly overseas provided it deploys 20 planes or 20 percent of its total capacity11 for domestic operations. The GoI does not want airlines to focus on international operations to the detriment of domestic service; rather it wants airlines that are allowed to fly internationally to ensure that their domestic flights account for at least 20 percent of their total seats.

Ground Handling Policy

The existing ground handling policy is being replaced with a new framework to ensure fair competition. Under the new policy, domestic airlines will be permitted to self-handle at all airports to ensure competition as well as cost savings. In addition, airport operators must ensure that there will be at least three ground handling companies, including Air India’s subsidiary/joint venture partner, in competition with each other at all major airports. At nonmajor airports, the airport operator will determine the number of ground handling companies, based on traffic output and airside/terminal building capacity. All domestic scheduled airline operators, including helicopter operators, will be free to self-handle at all airports.

Helicopters

Helicopters play a key role in ensuring remote area connectivity, intra-city movement, tourism, law enforcement, disaster relief, search and rescue, and emergency medical evacuation. India currently has fewer than 300 civilian helicopters, which is abysmally low compared to other developing nations. The Policy aims at encouraging helicopter usage by facilitating the development of at least four heli-hubs initially across the country to promote regional connectivity. Airport charges for helicopter operations will be reduced, and a separate helicopter department will be created within the DGCA.

Regional Connectivity Scheme (RCS)

The Policy aims at enhancing regional connectivity within India through financial support and infrastructure development. As part of RCS, the GoI aims to connect unserved and underserved destinations for which fares will be capped at INR 2,500 (approximately US$35) for a one-hour flight. Airlines will be allowed to self-handle for operations under RCS at all airports. RCS will take “flying to the masses” by connecting India’s remote, unserved, or underserved regions, thereby increasing tourism and generating employment. RCS will require a huge number of small aircraft to cater to regional service, thereby creating a new opportunity to invest in the flourishing Indian aviation sector.

Conclusion

While India’s Civil Aviation Policy has flaws and limitations, its overall roadmap for reform and liberalization is clear and ambitious. The Policy aims to foster a more conducive investment climate, which should improve the Indian aviation sector’s access to capital, thereby stimulating growth. In conjunction with the liberalized FDI rules, the Policy is expected to pave the way for the launch of new airlines and increase the number of flights, lower prices, and elevate demand for skilled workers, while also fostering aviation leasing and financing activities. The real challenge will be the management of the exponential growth of Indian air traffic without compromising on safety.
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We look forward to you joining us in Atlanta!
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Endnotes
7. The Union List is a list of items enumerated in the Constitution of India over which the Indian Parliament has exclusive power to legislate.
8. A greenfield airport project involves constructing a new airport on an undeveloped site.
9. A brownfield airport project involves modifying or updating an existing airport.
10. Foreign airlines may not acquire more than a 49 percent ownership interest in an Indian company operating scheduled and nonscheduled air transport services, subject to GoI approval.
11. Total capacity is calculated based on the average number of seats for all departures.