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FROM AIRSPACE TO OUTER SPACE: THE LEGAL GREY ZONE OF SUBORBITAL FLIGHTS

~ *Vaibhav Mewada & Anadi Keshari*

ABSTRACT

Suborbital flights journeys that climb above the bulk of the atmosphere but do not achieve orbital velocity occupy a region that international law has never defined. Air law, built on the Chicago Convention's principle of complete and exclusive sovereignty over national airspace, and space law, built on the Outer Space Treaty's principles of freedom and non-appropriation, rest on contradictory premises, yet neither instrument identifies where one regime ends and the other begins. This paper examines how the absence of a legal boundary between airspace and outer space creates uncertainty for suborbital operations in five areas: sovereignty and overflight, registration, liability, the status of passengers, and air traffic integration. It surveys the spatialist and functionalist positions in the delimitation debate, evaluates domestic responses in the United States, the United Kingdom, Australia and India, and argues that a purpose-based hybrid regime, developed jointly by ICAO and UNCOPUOS and supported by harmonised national legislation, offers a more workable solution than the elusive search for a single altitude line.

Keywords: suborbital flight; delimitation of outer space; Chicago Convention; Outer Space Treaty; space tourism; liability.

I. INTRODUCTION

In July 2021, two privately built vehicles carried passengers to the edge of space within nine days of each other. Virgin Galactic's VSS Unity, released from a carrier aircraft over New Mexico, climbed to roughly 86 kilometres before gliding back to a runway; Blue Origin's New Shepard capsule, launched vertically from West Texas, crossed 100 kilometres and descended

under parachutes.¹ Both companies marketed the flights as journeys to space. Yet if one asks the lawyer's question, did these individuals, as a matter of law, ever leave national airspace and enter outer space?, there is no authoritative answer. The difference of some fourteen kilometres between the two apogees might be legally decisive or legally irrelevant, depending on which theory of delimitation one adopts.

This uncertainty is not merely academic. International air law and international space law are founded on opposite premises. The first treats the airspace above a State's territory as subject to its complete and exclusive sovereignty;² the second declares outer space free for exploration and use by all States and incapable of national appropriation.³ A vehicle that passes from one regime into the other, and back again, within a single ten-minute flight sits uneasily in both. Questions about who may license it, whose consent is needed for it to cross a border, how it must be registered, who pays when it causes damage, and whether its occupants are "astronauts" or ordinary air passengers all turn on a boundary that no treaty draws.

This paper maps that grey zone. After outlining the two legal regimes (Part II) and the delimitation debate (Part III), it analyses the specific problems suborbital flights generate (Part IV) and surveys national responses in the United States, the United Kingdom, Australia and India (Part V). Part VI argues that the search for a single altitude line, while useful, cannot by itself resolve the problem, and that a purpose-based hybrid regime coordinated between the International Civil Aviation Organization (ICAO) and the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) is the more realistic path.

II. TWO REGIMES BUILT ON OPPOSITE FOUNDATIONS

A. Air Law and the Principle of Sovereignty

The modern law of the air begins with the Paris Convention of 1919, which first recognised the complete and exclusive sovereignty of every State over the airspace above its territory.⁴ The Chicago Convention of 1944 restated the principle in Article 1, declaring that "every State has complete and exclusive sovereignty over the airspace above its territory," and

¹ Cong. Rsch. Serv., R48050, *Regulation of Commercial Human Spaceflight Safety: Overview and Issues for Congress* (2025).

² Convention on International Civil Aviation art. 1, Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295 [hereinafter Chicago Convention].

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies arts. I–II, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

⁴ Convention Relating to the Regulation of Aerial Navigation art. 1, Oct. 13, 1919, 11 L.N.T.S. 173 [hereinafter Paris Convention].

through Article 2 extended it to the airspace above territorial waters.⁵ The International Court of Justice has since confirmed that the principle forms part of customary international law, holding in the *Nicaragua* case that unauthorised overflight of a State's territory violates its sovereignty.⁶ The practical consequence is that foreign aircraft enter national airspace only with consent, whether given through bilateral air services agreements for scheduled services or under the more liberal Article 5 regime for non-scheduled flights.⁷

The Chicago system is also built around a particular kind of machine. ICAO's annexes define an "aircraft" as a machine that can derive support in the atmosphere from the reactions of the air, other than reactions of the air against the earth's surface.⁸ The definition is functional: it identifies aircraft by how they fly, not by how high. Article 8 adds that pilotless aircraft may not fly over another State without special authorisation, and Article 17 links an aircraft's nationality to its State of registry.⁹ Liability to passengers on international flights is governed by the Montreal Convention of 1999, which imposes strict liability up to a fixed threshold for death or bodily injury caused by an accident on board.¹⁰ Critically, none of these instruments specifies the upper limit of the "airspace" over which sovereignty is exercised.

B. Space Law and the Principle of Freedom

Space law developed in the opposite direction. The launch of Sputnik 1 in 1957 passed over dozens of States without any request for consent, and no State protested. That silence is frequently cited as the origin of a customary rule that orbital overflight does not infringe airspace sovereignty.¹¹ The Outer Space Treaty of 1967 then codified the core principles: outer space is free for exploration and use by all States (Article I) and is not subject to national appropriation by claim of sovereignty, use, occupation or any other means (Article II).¹² States bear international responsibility for national activities in space, including those of non-governmental entities, which require "authorization and continuing supervision" by the appropriate State (Article VI); the launching State is liable for damage caused by its space

⁵ Chicago Convention, *supra* note 2, arts. 1–2.

⁶ *Military and Paramilitary Activities in and against Nicaragua* (Nicar. v. U.S.), Judgment, 1986 I.C.J. 14, ¶¶ 212, 251 (June 27).

⁷ Chicago Convention, *supra* note 2, arts. 5–6.

⁸ Int'l Civ. Aviation Org., *Annex 7 to the Convention on International Civil Aviation: Aircraft Nationality and Registration Marks* ch. 1 (6th ed. 2012).

⁹ Chicago Convention, *supra* note 2, arts. 8, 17.

¹⁰ Convention for the Unification of Certain Rules for International Carriage by Air arts. 17, 21, May 28, 1999, 2242 U.N.T.S. 309 [hereinafter Montreal Convention].

¹¹ See generally Bin Cheng, *Studies in International Space Law* (1997).

¹² Outer Space Treaty, *supra* note 3, arts. I–II.

objects (Article VII); and the State of registry retains jurisdiction and control over objects and personnel (Article VIII).¹³

Three further treaties elaborate these principles. The Liability Convention imposes absolute liability on a launching State for damage caused by its space object on the surface of the Earth or to aircraft in flight, but fault-based liability for damage caused elsewhere.¹⁴ The Registration Convention requires the registration of objects “launched into earth orbit or beyond.”¹⁵ The Rescue Agreement obliges States to assist and return the personnel of a spacecraft who land in their territory through accident or distress.¹⁶ Like the Chicago Convention, however, none of these treaties defines “outer space” or “space object” in a manner that identifies where the regime begins.¹⁷

C. The Missing Boundary

The result is two complete legal systems, each internally coherent, joined by an undefined seam. For most of the twentieth century this mattered little: aircraft flew well below 20 kilometres, satellites orbited above 150, and rockets crossed the region between only briefly. Commercial suborbital flight changes this picture, because it makes the seam itself the destination.

III. THE DELIMITATION DEBATE

The question of where outer space begins has been on the agenda of UNCOPUOS and its Legal Subcommittee since 1967, making it one of the oldest unresolved items in the United Nations system.¹⁸ A 1970 Secretariat study catalogued the leading scientific and legal criteria, and subsequent papers have repeatedly updated the debate without producing consensus.¹⁹ Two broad schools of thought dominate.

¹³ *Id.* arts. VI–VIII.

¹⁴ Convention on International Liability for Damage Caused by Space Objects arts. II–III, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention].

¹⁵ Convention on Registration of Objects Launched into Outer Space art. II(1), Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

¹⁶ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space arts. 2–4, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].

¹⁷ The Liability Convention provides only that the term “space object” includes the component parts of a space object as well as its launch vehicle and parts thereof. Liability Convention, *supra* note 14, art. I(d); *see also* Registration Convention, *supra* note 15, art. I(b).

¹⁸ *See* Paul Stephen Dempsey & Maria Manoli, *Suborbital Flights and the Delimitation of Air Space vis-à-vis Outer Space: Functionalism, Spatialism and State Sovereignty* (McGill Univ. Inst. of Air & Space L. 2017).

¹⁹ U.N. Secretariat, *The Question of the Definition and/or the Delimitation of Outer Space*, U.N. Doc. A/AC.105/C.2/7 (1970); *see also* U.N. Secretariat, *The Question of the Definition and/or the Delimitation of Outer Space*, U.N. Doc. A/AC.105/C.2/7/Add.1 (1977).

A. Spatialist Approaches

Spatialists argue that the law should fix a boundary at a specified altitude, below which State sovereignty applies and above which the freedom of outer space prevails. The most familiar candidate is the Kármán line at 100 kilometres, named after the aerodynamicist Theodore von Kármán, who reasoned that above a certain height an aircraft would need to travel at orbital velocity to generate sufficient aerodynamic lift. The Fédération Aéronautique Internationale uses 100 kilometres for record-keeping purposes, and the Soviet Union in 1979 proposed to UNCOPUOS that the boundary be fixed at an altitude not exceeding 100 to 110 kilometres above sea level.²⁰ Other proposals have relied on the lowest perigee at which a satellite can sustain orbit, the outer limits of the atmosphere, the limits of effective State control, or the gravitational balance between the Earth and other bodies.²¹

The scientific basis of the 100-kilometre figure is itself contested. Jonathan McDowell has argued, on the basis of orbital data, that satellites can complete multiple orbits at perigees of 80 to 90 kilometres and that a line near 80 kilometres better reflects the physical transition.²² This aligns with the long-standing United States practice of awarding astronaut wings to those who exceed fifty miles, roughly 80 kilometres. The gap between these two figures is precisely the altitude band in which commercial suborbital vehicles operate, which explains why the 2021 flights described above could be treated differently depending on the threshold adopted. It also explains why India's first privately built rocket, Skyroot Aerospace's Vikram-S, which reached about 89.5 kilometres on its 2022 Prarambh mission, would be a "space" launch under one benchmark and an atmospheric one under the other.²³

B. Functionalist Approaches

Functionalists reject the premise that the applicable law should depend on altitude. On their view, the decisive question is the nature and purpose of the activity: if an object is designed to go to or operate in outer space, space law governs it throughout its flight, including its passage through airspace on ascent and descent.²⁴ The United States has long endorsed a

²⁰ Union of Soviet Socialist Republics, *Approach to the Solution of the Problems of the Delimitation of Air Space and Outer Space*, U.N. Doc. A/AC.105/C.2/L.121 (1979); see also Andrew G. Haley, *Space Law and Government* (1963).

²¹ See Cheng, *supra* note 11; Dempsey & Manoli, *supra* note 18.

²² Jonathan C. McDowell, *The Edge of Space: Revisiting the Karman Line*, 151 *Acta Astronautica* 668 (2018).

²³ *Mission Prarambh*, Indian Space Rsch. Org. (Nov. 18, 2022), https://www.isro.gov.in/mission_prarambh.html.

²⁴ See Stephan Hobe, *Legal Aspects of Space Tourism*, 86 *Neb. L. Rev.* 439 (2007); Steven Freeland, *Up, Up and . . . Back: The Emergence of Space Tourism and Its Impact on the International Law of Outer Space*, 6 *Chi. J. Int'l L.* 1 (2005).

version of this position, maintaining in UNCOPUOS that no practical problem has arisen from the absence of a boundary and that an arbitrary line could constrain future activities.²⁵

Each approach, however, has a serious weakness. Spatialism offers certainty but at the cost of arbitrariness; a line drawn for physical reasons tells us nothing about whether a ten-minute tourist flight should be governed by space-law liability rules or aviation-law passenger protections. Functionalism, conversely, is circular: it depends on a definition of “space activity” or “space object” that the treaties do not supply, and it invites operators and States to characterise their vehicles in whichever way yields the most favourable regime.²⁶ A winged vehicle that takes off from a runway, flies aerodynamically for most of its trajectory and briefly coasts above 80 kilometres can plausibly be described as either an aircraft or a spacecraft.

Some scholars suggest that customary law may already have settled the question at or around 100 kilometres, given that no State has objected to satellites passing over its territory at such heights and that several States have adopted the figure in domestic legislation.²⁷ The better view is that State practice establishes only a negative proposition—orbital overflight does not violate sovereignty—rather than a positive rule fixing the lower limit of outer space. Suborbital flights, which by definition never achieve orbit, fall outside even that negative proposition.

IV. SUBORBITAL FLIGHTS IN THE GREY ZONE

A. Defining the Activity

United States law offers the most developed definitions. A “suborbital rocket” is a vehicle, rocket-propelled in whole or in part, intended for flight on a suborbital trajectory, whose thrust is greater than its lift for the majority of the rocket-powered portion of its ascent; a “suborbital trajectory” is an intentional flight path whose vacuum instantaneous impact point does not leave the surface of the Earth.²⁸ These definitions are technical rather than spatial and specify no altitude.

Commercial suborbital vehicles typically fall into three categories: vertically launched capsules such as New Shepard; air-launched or horizontally launched winged vehicles such as SpaceShipTwo; and, prospectively, point-to-point vehicles that would carry passengers or

²⁵ See Dempsey & Manoli, *supra* note 18.

²⁶ See Tanja Masson-Zwaan & Steven Freeland, *Between Heaven and Earth: The Legal Challenges of Human Space Travel*, 66 *Acta Astronautica* 1597 (2010).

²⁷ See Cheng, *supra* note 11; *cf.* Space (Launches and Returns) Act 2018 (Cth) s 8 (Austl.).

²⁸ 51 U.S.C. § 50902 (defining “suborbital rocket” and “suborbital trajectory”); *see also* 14 C.F.R. § 401.7 (2024).

cargo between distant locations on a high ballistic arc. The third category is the most legally consequential, because it would routinely cross international borders.

B. Aircraft, Space Object, or Both?

ICAO examined the issue in 2005 and observed that a suborbital vehicle could, during the atmospheric phases of its flight, satisfy the definition of an aircraft, in which case the Chicago Convention and its annexes would in principle apply. It concluded, however, that applying the full body of aviation standards would be impractical and that ICAO need not take regulatory action at that stage.²⁹ That cautious conclusion has left the classification question open. A hybrid vehicle may be an aircraft while carried aloft by a mother ship, a rocket during powered ascent, a space object while coasting near apogee, and an aircraft again during an unpowered glide to the runway. No legal instrument tells us whether such a vehicle has one legal identity or several.

C. Sovereignty and Overflight

If suborbital vehicles are aircraft, or if they remain in national airspace for the whole of their flight, any crossing of foreign territory requires consent under the Chicago Convention. If they are space objects in outer space, no consent is needed for the portion above the boundary, but the space treaties grant no right of “innocent passage” through foreign airspace on ascent or descent.³⁰ The law of the sea offers an instructive contrast: ships enjoy an express right of innocent passage through foreign territorial seas.³¹ No equivalent exists in air or space law. The problem is manageable for flights that remain over the launching State or the high seas, but fundamental for point-to-point services, where the requirement of overflight consent from every State along the route could prove as restrictive for suborbital transport as it historically has been for aviation.

D. Registration

Under Article 17 of the Chicago Convention an aircraft has the nationality of the State in which it is registered, while the Registration Convention requires the launching State to register objects “launched into earth orbit or beyond.”³² Because suborbital vehicles do not reach orbit, the Registration Convention arguably does not apply to them at all. A winged

²⁹ Int’l Civ. Aviation Org. [ICAO] Council, *Concept of Sub-orbital Flights*, ICAO Doc. C-WP/12436 (May 30, 2005).

³⁰ See Freeland, *supra* note 24.

³¹ United Nations Convention on the Law of the Sea arts. 17–19, Dec. 10, 1982, 1833 U.N.T.S. 397.

³² Chicago Convention, *supra* note 2, art. 17; Registration Convention, *supra* note 15, art. II(1).

spaceplane may therefore be entered in a national aircraft register, or in no register at all, and the jurisdictional consequences under Article VIII of the Outer Space Treaty—which attach to the State of registry—remain uncertain.³³

E. Liability

Liability is the most practically significant aspect of the grey zone. If a suborbital vehicle is a “space object,” the launching State is absolutely liable under the Liability Convention for damage on the ground or to aircraft in flight, and the claim proceeds at the inter-State level.³⁴ If it is an aircraft, third-party surface damage falls under domestic tort law or the 1952 Rome Convention, which has attracted only limited ratification.³⁵ Passenger claims raise a separate problem. The Liability Convention expressly excludes from its protection nationals of the launching State and foreign nationals participating in the operation of the space object.³⁶ Paying participants on a commercial flight are therefore likely to be left to domestic law. The Montreal Convention offers little help, since it applies only to “international carriage,” and a flight that departs from and returns to the same spaceport in a single State, with no agreed stopping place abroad, does not qualify.³⁷ The passenger may thus fall between both treaty regimes and be left to rely on contractual waivers and domestic statutes.

The 2014 in-flight breakup of SpaceShipTwo during a test flight over the Mojave Desert, which killed one pilot and seriously injured the other, illustrates the hybrid character of these operations. The accident was investigated by the United States National Transportation Safety Board through an aviation-style process, while the vehicle itself operated under authorisation from the Federal Aviation Administration’s Office of Commercial Space Transportation.³⁸

F. The Status of Passengers

The Outer Space Treaty describes astronauts as “envoys of mankind” and, together with the Rescue Agreement, obliges States to render them all possible assistance.³⁹ Neither

³³ Outer Space Treaty, *supra* note 3, art. VIII; see Masson-Zwaan & Freeland, *supra* note 26.

³⁴ Liability Convention, *supra* note 14, art. II.

³⁵ Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Oct. 7, 1952, 310 U.N.T.S. 181.

³⁶ Liability Convention, *supra* note 14, art. VII; see Frans G. von der Dunk, *Passing the Buck to Rogers: International Liability Issues in Private Spaceflight*, 86 Neb. L. Rev. 400 (2007).

³⁷ Montreal Convention, *supra* note 10, art. 1(2).

³⁸ Nat’l Transp. Safety Bd., NTSB/AAR-15/02, *In-Flight Breakup During Test Flight, Scaled Composites SpaceShipTwo, N339SS, Near Koehn Dry Lake, California, October 31, 2014* (2015).

³⁹ Outer Space Treaty, *supra* note 3, art. V; Rescue Agreement, *supra* note 16, arts. 2–4.

instrument defines “astronaut” or “personnel of a spacecraft,” and it is doubtful that the drafters in the 1960s contemplated fare-paying tourists.⁴⁰ United States law distinguishes between “crew” and “space flight participants,” the latter being individuals who are neither crew nor government astronauts.⁴¹ Whether a space flight participant who lands in distress in a foreign State is entitled to rescue and return under the Rescue Agreement, or is merely an air passenger subject to ordinary immigration and consular rules, is unresolved. Given the Agreement’s humanitarian purpose, a broad interpretation is preferable.

G. Airspace Integration and Safety

Finally, suborbital vehicles must share airspace with conventional traffic during ascent and descent. Air navigation service providers currently manage this through temporary airspace closures and notices to airmen, a method that becomes burdensome as launch rates rise. Debris from a high-altitude breakup can also fall through busy airspace, sometimes across national boundaries. The integration of space operations into air traffic management falls naturally within ICAO’s competence, but the absence of an agreed classification for the vehicles concerned has slowed the development of global standards.

V. NATIONAL APPROACHES

A. United States

The United States regulates commercial launches and re-entries under the Commercial Space Launch Act, now codified in chapter 509 of Title 51 of the United States Code, which vests licensing authority in the Department of Transportation and, through delegation, the FAA.⁴² The Commercial Space Launch Amendments Act of 2004 brought suborbital human spaceflight squarely within this framework, created the category of space flight participant, and required operators to obtain the written informed consent of participants after informing them of the risks, including that the United States Government has not certified the vehicle as safe.⁴³ Implementing regulations in Part 460 set out crew qualification, training and disclosure requirements.⁴⁴ The 2004 Act also introduced a “learning period” that prevents the FAA from adopting regulations designed to protect occupants, except in response to serious incidents.

⁴⁰ See Hobe, *supra* note 24; Freeland, *supra* note 24.

⁴¹ 51 U.S.C. § 50902 (defining “crew” and “space flight participant”).

⁴² 51 U.S.C. §§ 50901–50923.

⁴³ Commercial Space Launch Amendments Act of 2004, Pub. L. No. 108-492, 118 Stat. 3974 (codified as amended in scattered sections of 51 U.S.C.); see 51 U.S.C. § 50905(b)(5).

⁴⁴ 14 C.F.R. pt. 460 (2024).

Congress has extended this moratorium several times, and it is now set to expire on January 1, 2028.⁴⁵ Several states have supplemented the federal scheme with statutes limiting operator liability to participants who sign informed-consent waivers.⁴⁶ The American model is therefore functional in design—it regulates by vehicle and activity rather than altitude—and deliberately light-touch on occupant safety.

B. United Kingdom

The United Kingdom’s Space Industry Act 2018 takes a notable intermediate position. It regulates both “spaceflight activities” and “sub-orbital activities,” defining the latter by reference to craft capable of operating above the stratosphere, and to balloons carrying crew or passengers into the stratosphere, without fixing a precise numerical altitude.⁴⁷ The Act and the Space Industry Regulations 2021 subject both categories to a common licensing regime administered by the Civil Aviation Authority, including requirements for informed consent and range control.⁴⁸ The British approach thus defines suborbital activity partly by reference to an atmospheric layer while regulating it through an aviation authority—an implicit acknowledgment of its hybrid nature.

C. Australia

Australia is one of the few States to have written a numerical figure into legislation. Its space legislation has, since 1998, used 100 kilometres above mean sea level as the threshold for launches into outer space, and it continues to rely on that figure in the Space (Launches and Returns) Act 2018, while regulating high-power rockets that do not reach that altitude separately.⁴⁹ Commentators have noted, however, that the figure was adopted for domestic regulatory purposes rather than as a definitive Australian position on the international delimitation question.⁵⁰

⁴⁵ 51 U.S.C. § 50905(c)(9); *Human Space Flight*, Fed. Aviation Admin., https://www.faa.gov/space/human_spaceflight (last visited Oct. 5, 2026); *see also* Cong. Rsch. Serv., *supra* note 1.

⁴⁶ *See, e.g.*, N.M. Stat. Ann. §§ 41-14-1 to -4 (2024); Va. Code Ann. §§ 8.01-227.8 to -227.10 (2024).

⁴⁷ Space Industry Act 2018, c. 5, § 1 (UK).

⁴⁸ *Id.*; Space Industry Regulations 2021, SI 2021/792 (UK).

⁴⁹ Space (Launches and Returns) Act 2018 (Cth) s 8 (Austl.).

⁵⁰ *See* Dempsey & Manoli, *supra* note 18.

D. India

India presents a different picture. It has no dedicated space statute; a Draft Space Activities Bill was circulated in 2017 but was not enacted.⁵¹ Space activities are governed principally by executive policy, most recently the Indian Space Policy 2023, which opens the full range of space activities to non-governmental entities and assigns their authorisation to the Indian National Space Promotion and Authorisation Centre (IN-SPACe).⁵² Aviation, by contrast, rests on a detailed statutory foundation, now the Bharatiya Vayuyan Adhiniyam, 2024, which replaced the Aircraft Act, 1934.⁵³ The Vikram-S mission, authorised by IN-SPACe and launched from the sounding-rocket complex at Sriharikota, peaked at roughly 89.5 kilometres—above the American eighty-kilometre convention but below the Kármán line—yet it raised no classification problem in practice because it was handled administratively as a sounding-rocket launch.⁵⁴ As Indian private industry moves toward more ambitious suborbital and orbital operations, however, the absence of a statutory definition of “space activity,” a liability allocation scheme and a formal mechanism for coordination between IN-SPACe and the Directorate General of Civil Aviation will become pressing. A future Indian space statute should address suborbital operations expressly rather than leaving them to the interstices between aviation and space regulation.

VI. TOWARD A COHERENT REGIME

Three paths are available. The first is a multilateral agreement fixing the boundary of outer space, probably at 100 kilometres. Such an agreement would provide certainty for overflight and sovereignty questions and would end a debate that has lasted nearly six decades. The second path, leaving each State to characterise activities as it sees fit, reflects current practice but entrenches fragmentation and invites regulatory arbitrage. A boundary treaty, moreover, would not by itself resolve the problems identified above. A tourist vehicle that peaks at 86 kilometres would remain wholly within airspace, with all the regulatory consequences that entails, while one that peaks at 105 kilometres would spend perhaps three minutes in outer space and the remainder of its flight in airspace, leaving the classification of the vehicle itself unresolved.

⁵¹ Draft Space Activities Bill, 2017 (India) (circulated by the Department of Space for public comment).

⁵² Dep’t of Space, Gov’t of India, *Indian Space Policy – 2023* (2023).

⁵³ The Bharatiya Vayuyan Adhiniyam, 2024 (India); *see also* India Const. sched. VII, list I, entry 29.

⁵⁴ *Mission Prarambh*, *supra* note 23.

The third and preferable path is a purpose-based hybrid regime, developed jointly by ICAO and UNCOPUOS. Under such a regime, a suborbital vehicle would be treated as a single legal object with a single State of registry, whatever its altitude at a given moment. Aviation rules would govern its integration into air traffic management, its safety standards and passenger protection, because these are the areas in which ICAO has expertise and in which the risks most resemble those of aviation. Space law principles—State responsibility under Article VI, inter-State liability for third-party damage and the obligations of rescue—would continue to apply wherever the vehicle is launched toward or returns from outer space. A short protocol or a set of jointly adopted guidelines could (i) define suborbital flight functionally; (ii) recognise a limited right of transit for suborbital vehicles over foreign States on notified trajectories, subject to safety conditions; (iii) clarify that space flight participants are entitled to assistance and return under the Rescue Agreement; and (iv) establish minimum liability and insurance requirements for passengers on flights that fall outside the Montreal Convention. ICAO and the United Nations Office for Outer Space Affairs have already begun joint consultations through a series of aerospace symposia, which provide a foundation for this work.⁵⁵

Soft law is a realistic vehicle for this effort. The space law community has repeatedly shown that non-binding guidelines—such as the Space Debris Mitigation Guidelines and the Guidelines for the Long-term Sustainability of Outer Space Activities—can shape State practice faster than new treaties.⁵⁶ A comparable instrument on suborbital operations could guide domestic legislation in emerging spacefaring States, including India, and could over time crystallise into customary norms.

VII. CONCLUSION

Suborbital flight exposes a structural flaw that international law has carried since the beginning of the space age: two complete regimes, founded on opposite principles, with no agreed boundary between them. While such flights were rare and governmental, the flaw could be ignored. Commercial operators carrying paying passengers, India's emerging private launch industry and prospective point-to-point services make that no longer possible. The questions

⁵⁵ See, e.g., Int'l Civ. Aviation Org. & U.N. Off. for Outer Space Affs., *ICAO/UNOOSA AeroSpace Symposia* (2015–2017).

⁵⁶ G.A. Res. 62/217, ¶ 26 (Dec. 22, 2007) (endorsing the Space Debris Mitigation Guidelines); Rep. of the Comm. on the Peaceful Uses of Outer Space, U.N. Doc. A/74/20, annex II (2019) (Guidelines for the Long-term Sustainability of Outer Space Activities).

raised—sovereignty, registration, liability, passenger status and airspace integration—cannot all be answered by drawing a line in the sky, though such a line would help. They require a regime that recognises suborbital vehicles for what they are: hybrid machines engaged in hybrid activities. A coordinated, purpose-based framework developed by ICAO and UNCOPUOS, implemented through harmonised domestic legislation, offers the most promising way to bring these flights out of the legal grey zone and into a coherent body of law before the industry outpaces the rules that should govern it.