

Elon, Fly Me to the Moon!

Legal Dimensions of Space Tourism beyond Earth Orbit

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Abstract

SpaceX founder and chief executive Elon Musk announced on February 27, 2017 plans to launch two paying “private individuals” on a touristic space orbital journey around the moon and back to earth by the end of 2018. While several companies are applying for governmental licenses to launch “space tourists” into sub-orbital trajectories, SpaceX’s proposal is among the first initiatives to expand commercial space tourism beyond the earth orbital region. This paper examines whether states, already conducting governmental space missions outside earth’s orbital region, will perceive a legal or policy obligation to regulate commercial space tourism in the lunar region as a new category of space activity within the context of the Outer Space Treaty’s Article VI stipulation for “continuing supervision” of space activities and the Moon Agreement’s provisions regarding exploitation of the moon and other celestial bodies.

Keywords: National space law, Outer Space Treaty, space tourism, Moon Treaty.

1. Introduction: Expansion of Commercial Space Activities and Actors beyond the Earth Orbital Region

This paper investigates whether the regulatory authority originating with existing outer space treaties adequately encompass the expanding realm of commercial space activities now reaching the moon. 2017 marks the 50th anniversary of the Outer Space Treaty’s (OST) promulgation.¹ The OST represents a legal milestone reached two years before Apollo 11’s not so “small step,” but which for international law in today’s privatized and booming “NewSpace” market may require a legal “giant leap” to keep pace and peace for all mankind. As the UN begins a one-year countdown to Unispace +50, this is a highly relevant moment to consider whether the existing international legal

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1 United Nations, *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies* (Outer Space Treaty), entry into force October 10, 1967. 18 UST2 2410; TIAS3 6347; 610 UNTS4 205.

framework provides a sufficient basis for regulating the growing plethora of commercial space activities on and near the moon.

The growing commercial interest in cislunar commercial activities was an important factor prompting a U.S. congressional hearing conducted on May 23, 2017, that focused on the possible effect(s) the 1967 OST may exert on future “American Commerce and Settlement in Space.”² Of course, the United States is not alone as a growing number of countries, companies, and entrepreneurs join the movement to explore cislunar space. Looking forward, this paper postulates how ESA’s “Moon Village” concept may be prescient about complex lunar governance amid governmental and commercial entities.

Technological progress is bringing the moon into the commercial gravitational pull of “virtual” and “real” touristic missions. As the first foray into the realm of “virtual” lunar tourism, the Google X Prize established in 2007 a competition among privately-funded teams to land and operate a rover on the moon. The first team to land a rover that successfully travelled more than 500 meters while transmitting high-definition images of its lunar landing site back to earth-bound viewers would win a \$ 30 million prize. During this same period, space flight entrepreneurs were ramping up private commercial efforts to launch “real” tourists into near-space altitudes, such as those being actively marketed by Sir Richard Branson’s *Virgin Galactic* and Jeff Bezo’s *Blue Origin* companies, among others. Meanwhile, Elon Musk’s Space Exploration Technologies (“SpaceX”) offer to launch fare-paying “space flight participants” (i.e., “tourists”) into a circumlunar trajectory marks the first time a commercial firm has offered touristic flights to another celestial body. Meanwhile SpaceX is also actively launching payloads for private and governmental customers, and (possibly) reducing orbital costs further for eventual touristic ventures by landing the first stage launchers for re-use. Jeff Bezos Blue Origin has also landed launchers for re-use. Clearly, the world of tourism is being boosted again by technology to offer new frontiers of experience, eventually near or on the moon.³

While suborbital commercial ventures are being regulated by existing national regulatory entities, the question of regulating commercial activities on and near the moon brings some interesting questions to legal and regulatory consideration. Several scenarios come to mind: Are national regulatory entities on a firm legal basis for regulating private manned and unmanned activities and launches from another celestial body, namely the moon? The Moon Treaty has entered into effect, but with a minimal number of ratifying parties, a list

2 D. Messler, Cruz’s Subcommittee Holds Hearing on Outer Space Treaty, *parabolicarc.com*, May 25, 2017. Source: www.parabolicarc.com/2017/05/25/cruzs-subcommittee-holds-hearing-outer-space-treaty/ (accessed August 8, 2017).

3 John Thornhill, “The billionaire space race,” *Financial Times*, August 8, 2017.

most notably missing the major lunar exploring states.⁴ While prohibitions on extensions of sovereignty or appropriation of celestial property are clearly spelled out in the existing treaties, they are silent for instance about historical preservation of earlier robotic or manned landing sites, potentially of great interest to commercial touristic operators. *This paper, therefore, takes the “long look” at these provisions and asks whether an extension of national regulatory mechanisms governing commercial touristic trips to the moon would also require additional international legal provisions.* Or, are the current space treaties adequate?

This paper’s analysis will proceed through a three-step analysis: (1) An overview of the existing legal framework encompassing governmental, civilian and commercial activities in outer space; (2) an overview of the national regulatory regimes in the long-standing U.S. regulatory agencies and new entrant New Zealand providing supervision of outer space activities as required by the Outer Space Treaty; and, (3) a somewhat imaginary preview of scenarios arising from private space touristic ventures into the lunar vicinity that give rise to legal and regulatory questions under existing legal frameworks. Finally, the paper posits its conclusion to the question raised about the necessity of additional international legal provisions.

1.1 Overview of Outer Space Legal Agreements

The legal status of private non-governmental entities conducting outer space activities has long been an issue of contention among the states promulgating the core instruments defining the outer space legal regime. During OST negotiations in the mid-60s, while the United States favored a more inclusive regime encompassing governmental as well as non-governmental entities, the Soviet Union pressed for a more exclusive regime primarily recognizing only governmental entities. The eventual compromise can be seen in Article VI’s provisions stipulating “supervision” of all entities conducting space activities:

“Article 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. When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance

4 United Nations, *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* (Moon Treaty), entry into force July 11, 1984. 1363 UNTS 21; 18 ILM 1434 (1979); 18 UST 2410.

with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.” [Emphasis added].⁵

Thus, while international legal instruments do not specifically recognize non-governmental entities it does provide for their outer space activities as long as they are “supervised” by the registering or launching state.

Non-governmental entities’ space activities are likewise encompassed within the international legal regime by provisions in the *Registration Convention*, *Rescue Agreement*, as well as the *Liability Convention*. Although it has entered into force, the low number of ratifications for the Moon Agreement question its overall validity as hard treaty law for private entities operating in the moon’s vicinity.

In addition, the Radio Regulations promulgated by the UN’s International Telecommunication Union (ITU) also establish a legal link to supervision of private entities’ use of radio frequencies while conducting a mission. While the justification for the ITU’s Radio Regulations is to prevent “harmful interference” among users on earth, the state parties to the Radio Regulations actively supervise entities’ use of radio spectrum subject to their jurisdiction. For example, vessels in the air and on the seas fall likewise into a state’s radio jurisdiction through registration stipulations of international treaties, even though the vessels may operate far outside a state’s territorial or sea boundaries.⁶

Analogously, outer space is the “international waters” for extraterritorial jurisdiction of state registration and supervision of commercial entities conducting operations in outer space regions. On earth, centuries of maritime transportation and commerce have generated a comprehensive compendium of public and private international law regulating a wide plethora of activities on the seas, and since the 20th Century, in the air as well. Gaps in legal coverage spark movements to promulgate international agreements. For example, the UNIDROIT Cape Town Convention on International Interests in Mobile Equipment illustrates how a “hard” law treaty may be promulgated to address needs arising through new technological capabilities. The Cape Town Treaty includes a protocol covering space assets.⁷

5 *Outer Space Treaty*, Article VI.

6 International Telecommunication Union (ITU), *Constitution and Convention of the International Telecommunication Union, Radio Regulations*. Source: www.itu.int/pub/R-REG-RR (accessed September 4, 2017).

7 UNIDROIT, Source: www.unidroit.org/instruments/security-interests/cape-town-convention (accessed August 7, 2017).

See, www.unidroit.org/instruments/security-interests/space-protocol (accessed September 4, 2017).

1.2 Overview of National Regulatory Entities and Legislation – The United States and New Zealand

1.2.1 The United States – Space Vehicle Certification

States launching and/or registering space objects assume a supervisory role under provisions of the OST. While the operator-supervisory linkage for governmental entities is immediate and direct, for private commercial entities that supervision may be subject to a range of interpretations as to how direct that supervision must or will be exercised. In the United States, the government has consistently fostered a commercial space industry that would operate in outer space alongside governmental entities. Since the early 1960s, satellites such as *Telstar*, were operated by AT&T, a private commercial telecommunications firm. In 1984, the *Commercial Space Launch Act* was passed to foster a commercial space launch industry. [Under provisions of the law, commercial launch firms would first secure a license from the Office of Commercial Space Transportation (OCST, now “AST”), initially in the Office of the Secretary of the Department of Transportation. The OCST would ensure that international stipulations for launch and space object registration, radio spectrum and liability provisions would be observed and followed by the space firm. In 1995, the AST was transferred to the Federal Aviation Administration. Under provisions of the 1984 *Commercial Space Launch Act*:

“... as amended and re-codified at 51 U.S.C. 50901 – 50923 (the Act), authorizes the Department of Transportation (DOT) and, through delegations, the Federal Aviation Administration’s (FAA) Office of Commercial Space Transportation (AST), to oversee, authorize, and regulate both launches and reentries of launch and reentry vehicles, and the operation of launch and reentry sites when carried out by U.S. citizens or within the United States. The Act directs the FAA to exercise this responsibility consistent with public health and safety, safety of property, and the national security and foreign policy interests of the United States. The Act also directs the FAA to encourage, facilitate, and promote commercial space launches and reentries by the private sector, including those involving space flight participants.”⁸

In the closing months of 2015, the U.S. Congress passed and President Obama signed the *U.S. Commercial Space Launch Competitiveness Act* (H.R. 2262) which addresses multiple aspects of commercial space activities, including those of “space flight participants,” i.e., fare-paying space passengers. In addition, the AST conducted a post-accident review following a crash of Virgin

8 U.S. Congress, *The Commercial Space Launch Act of 1984*, (<http://uscode.house.gov/view.xhtml?path=/prelim@title51/subtitle5/chapter509&edition=prelim>) serves as the legislative authorization for the Federal Aviation Administration’s Office of Commercial Space Transportation (FAA-AST), About the Office, Source: https://www.faa.gov/about/office_org/headquarters_offices/ast/ (accessed August 7, 2017).

Galactic's *SpaceShipTwo* on October 31, 2014, which killed one of the two pilots conducting the test flight.⁹

1.2.2 United States – Radio Spectrum Certification

On the international level, the UN's International Telecommunication Union promulgates at periodic World Radio Conferences (WRCs) the Radio Regulations, "hard" treaty law that allocates specific frequency bands for use by space objects and operations. Thereupon, national regulatory entities assign specific frequencies within the allocated ITU frequency bands for use by specific space vehicles in both space and ground segments. In the United States, the Federal Communications Commission (FCC) carries the predominate responsibility for certifying to the ITU that commercial and civilian space vehicles and missions are operating in accordance with ITU Radio Regulations. Before the AST may issue a launch license, the commercial applicants must submit certification that their use of telecommunications and radio spectrum are licensed by the FCC and comply with national and international regulations.

1.2.3 New Zealand

New Zealand is among the most recent national entrants into the NewSpace commercial marketplace and as such it represents a most interesting case study for other countries considering space regulatory frameworks without extensive prior experience with domestic entities. The May 25, 2017 launch of the *Electron* launch vehicle marks New Zealand's inauguration as a space launch state. The launch has pushed the promulgation of domestic regulatory law, as the *Outer Space and High-altitude Activities Act 2017* (the "Act") was assented to on 10 July 2017 and will come into force on 21 December 2017. The Act is newly promulgated and yet to be properly tested in light of the

9 U.S. Congress, *U.S. Commercial Space Launch Competitiveness Act*, HR 2262. Source: https://www.faa.gov/about/office_org/headquarters_offices/ast/media/US-Commercial-Space-Launch-Competitiveness-Act-2015.pdf (accessed September 4, 2017). See, Planetary Resources, President Obama Signs Bill Recognizing Asteroid Resource Property Rights Into Law, Planetary Resources, November 25, 2015. Source: www.planetaryresources.com/2015/11/president-obama-signs-bill-recognizing-asteroid-resource-property-rights-into-law/ (accessed August 7, 2017). From the FAA-AST Website: "Virgin Galactic's SpaceShipTwo performed two powered flight tests from Mojave Air and Space Port authorized under an FAA experimental permit issued to Scaled Composites, the vehicle manufacturer. The second flight on October 31st resulted in a catastrophic failure and death of one of the pilots. The second pilot survived but suffered injuries. The cause of the crash is currently being investigated." Source: https://www.faa.gov/about/office_org/headquarters_offices/ast/media/FAA_YIR_2014_02-25-2015.pdf (accessed on August 7, 2017).

special arrangement between the New Zealand Government and Rocket Lab (US) under the Technology Safeguard Agreement.¹⁰

Given New Zealand's location on the planet, it offers unique Low Earth Orbital (LEO) launch trajectories services, which may eventually translate into greater tourism ventures. Whether the New Zealand legislation is equipped to deal with the rise of future space tourism ventures, remains ambiguous. The Act was implemented as a result of the announcement by New Zealand's commercial sector that it would be soon ready to commence space launches and missions. As a result of New Zealand's ongoing international obligations, the Act became a necessary component of other legislation as part of the developing regulatory framework on both the domestic and international levels. However, the speed upon which the Act was promulgated and came into force, some uncertainty exists pertaining to the utility of the Act to adequately address the needs of commercial touristic ventures. With regard to the regulatory bottomline: there is a strong likelihood to see a need for additional legislation or at least new regulations to fill regulatory gaps with the existing Act as space launches and activities grow in New Zealand.

1.2.3.1 New Zealand – Space Vehicle Certification

In New Zealand, space vehicle certification differs to a large extent from its US counter-part. As of this writing (2017), New Zealand has yet to implement a framework that deals with vehicle certification. However, paramount to much of New Zealand's legislation is the need for vehicles to at least be suitable for their purpose and comply with health and safety requisites. For example, under section 9(1)(b): "The applicable has taken, and will continue to take, all reasonable steps to manage risks to public safety."¹¹

In this vein, vehicles must be safe as they fly over the public. New Zealand has recently undertaken a revision of its Health and safety legislation (2015) as a result of the Pike River tragedy where many miners lost their lives. Health and safety for the public over any launch would be a paramount consideration towards the compliance of space vehicle certification.¹²

10 Jeff Foust, "Telemetry glitch kept first Electron rocket from reaching orbit," *SpaceNews.com*, August 7, 2017. Source: <http://spacenews.com/telemetry-glitch-kept-first-electron-rocket-from-reaching-orbit/> (accessed on August 11, 2017).

11 Ministry of Business, Innovation and Enterprise Website, New Zealand, "Govt signs contract authorising Rocket Lab launches" Source: www.mbie.govt.nz/about/whats-happening/news/2016/govt-signs-contract-authorising-rocket-lab-launches (accessed September 4, 2017).

12 The AusIMM Bulletin: An Update on New Zealand's post-Pike River mining health and safety regulatory regime, October 2015. Source: <https://www.ausimmbulletin.com/feature/an-update-on-new-zealands-post-pike-river-mining-health-and-safety-regulatory-regime/> (accessed September 4, 2017).

1.2.3.2 ***New Zealand – Radio Spectrum Certification***

The New Zealand Space Act is silent on the issue of radio spectrum certification for commercial space entities. However, as this is a necessary part of New Zealand's space operations, with the ITU Radio Regulations no doubt playing an important role in the on-going efforts to regulate and certify space ventures. The establishment of the New Zealand Radio Sector Group is important towards New Zealand's on-going development into space. The group which was initiated through the ITU's Radiocommunications Sector whose task is to consider radio spectrum and management issues as they may become due in the future as well as how they relate to LEO enterprises from New Zealand.¹³

- Presently, New Zealand is still very much within its genesis stages of operations, which is both exciting and challenging. The necessary lessons that its counterparts have learnt could be a useful way for New Zealand to navigate through the new terrain of commercial space flight.

2. **NewSpace Tourism and Scenarios**

By the second decade of the 21st Century, the scale and breadth of private commercial space missions reached an intensity that earned the moniker "NewSpace" to contrast this dynamic sector from the traditional governmental-military-civilian space industrial complex. On April 28, 2001, U.S. citizen Dennis Tito became the first fare-paying "space" tourist launched by the Russia's Federal Space Agency to the International Space Station (ISS). [] That flight was followed by other space tourists willing to spend \$ 20-\$ 40 million of their own funds for a trip to the ISS.¹⁴

By 2010, a literal "bevy of billionaires" from the entertainment and information technology industrial sectors were making significant investments into commercial start-up space ventures involving tourism. Some of the notable entrepreneurial initiatives include:

- Robert Bigelow – inflatable space hotels – currently being tested on the ISS.¹⁵
- Sir Richard Branson – *Virgin Galactic* suborbital space tourism – vehicles in testing.

13 Radio Spectrum Management, New Zealand. "*New Zealand Radio Sector.*" Source: <https://www.rsm.govt.nz/about-rsm/international-relations/new-zealand-radio-sector>, (accessed July 2017).

14 Mike Wall, "First Space Tourist: How a U.S. Millionaire Bought a Ticket to Orbit," *Space.com*, April 27, 2011. Source: <https://www.space.com/11492-space-tourism-pioneer-dennis-tito.html> (accessed August 7, 2017).

15 See, Wikipedia, "Bigelow Expanded Activity Module," Source: https://en.wikipedia.org/wiki/Bigelow_Expandable_Activity_Module (accessed August 8, 2017).

- Elon Musk – *SpaceX* orbital and cislunar tourism – crewed vehicles to the ISS currently being tested.
- Jeff Bezos – *Blue Origin* re-usable launch vehicles for space tourism – in testing.¹⁶

2.1 Scenarios

To answer the question about whether additional international legal provisions are required to adequately regulate commercial tourism beyond earth orbit, it is perhaps most useful to consider the following scenario of a hypothetical commercial lunar tourism firm “LonelyLunar”: (with apologies to *LonelyPlanet*)

Scenario 1. Visits by *LonelyLunar* “virtual” and “real” tourists to sites of particular historical or environmental significance on the moon.

There is growing awareness of the potential commercial draw to sites of particular historical significance on the moon, especially the six Apollo landing sites which feature the remaining spacecraft parts and rover vehicles, scientific instruments, and the tracks and footsteps of those first lunar explorers. A company selling “drive time” of a lunar rover to “virtual” earthbound tourists remotely driving the vehicle with high-definition video links, could advertise the opportunity to re-visit the Apollo 11 landing site. What is the legal status of Apollo landing sites on moon – does international law allow their classification as lunar “national” parks allowing only those visitors with highly restricted access credentials? While the treaties ensure that the Apollo hardware still belongs and remains under the supervision of the USG, the treaty ban on appropriation and/or claims of sovereignty would appear to ensure open access to the lunar sites, if not the hardware or relics there.¹⁷

On earth, sites with significant historical, cultural importance may be certified as such by the UN Economic, Social and Cultural Organization (UNESCO). However, as currently promulgated, the UNESCO world heritage treaty applies only to sites on earth, not the moon or in outer space.¹⁸

16 Wikipedia, “Space tourism,” Source: https://en.wikipedia.org/wiki/Space_tourism (accessed August 8, 2017).

17 Clara Moskowitz, “Should the Apollo Lunar Landing Sites Be Protected? On the anniversary of the first moon landing many wonder what will become of the Apollo sites and their artifacts,” *Scientific American*, July 19, 2014. Source: <https://www.scientificamerican.com/article/apollo-lunar-landing-sites-preservation-protection/> (accessed August 11, 2017). Leonard David, “Protection of Apollo Moon Landing Sites Sparks Controversy,” *Space.com*, July 26, 2013. Source: <https://www.space.com/22131-moon-landing-sites-bill-controversy.html> (accessed August 7, 2017).

18 UNESCO, *Convention Concerning the Protection Of The World Cultural and Natural Heritage*, Adopted by the UNESCO General Conference at its seventeenth session at

Collecting “souvenirs” of earlier lunar hardware is not something new or theoretical. In November 1969, the *Apollo 12* lunar module landed on the moon’s surface directly on target and in sight of the U.S. *Surveyor 3* lunar lander that had preceded the manned mission by touching down in the Ocean of Storms in 1967. [] Moonwalkers Alan Bean and Gordon Conrad removed the *Surveyor 3* television camera and other pieces of spacecraft hardware for examination by scientists on earth. In the *Apollo 12 – Surveyor 3* case, the astronauts and space vehicles as governmental employees and property of the United States were clearly under direct supervision by the launching state which authorized and directed the sample collection and return. What would change legally if the moonwalkers were a commercial rover or tourist from a state party other than the owner of the space hardware?

LonelyLunar lands a rover near the *Apollo 12 – Surveyor 3* site, advertising a “Two for One” sale – See two important historical relics from early lunar explorations at one site!” In a moment of great excitement, the virtual *LonelyLunar* tourist paying for joystick time inadvertently drives the rover into one of the *Surveyor 3* landing pads, ripping the insulation. Does NASA have standing under international legal provisions to sue the *LonelyLunar* company, the launching state of the *LonelyLunar* vehicle, or the rover driver for damages to their historical piece of hardware?¹⁹

Scenario 2. Launch of the *LonelyLunar* private rocket from the lunar surface. *LonelyLunar*’s “deluxe” package includes the *Kangaroo* lunar exploration rocket “hopper” that allows high altitude surveys of the surrounding lunar terrain. The *Kangaroo* uses its small rocket motor to “hop” in ballistic arcs around areas of interest on the lunar surface. Since the *Kangaroo* is assembled from components and fuel lifted earlier to the lunar surface, it exists as a space vehicle only after its assembly on the lunar surface. A billionaire tourist pilot is clumsy with the joystick on a launch from the surface, resulting in damage and injuries to nearby tourists from the competing lunar tour firm, *CraterX*. Since liability follows the launching state for earth to space missions, who or what may the injured *CraterX* parties sue?

Status of International Space Law: Article VIII of the Outer Space Treaty establishes a clear ownership link to the assembled lunar launch vehicle:

“OST ARTICLE 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

Paris, 16 November 1972. Source: <http://whc.unesco.org/archive/convention-en.pdf> (accessed August 11, 2017).

19 NASA, “Astronauts pay a visit to *Surveyor 3*,” April 17, 2014. Source: <https://www.nasa.gov/content/astronauts-pay-a-visit-to-surveyor-3> (accessed August 8, 2017).

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.** Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.”²⁰

Scenario 3. Environmental protection of celestial bodies – responsibility of space tourism operator?

Recent discoveries of lunar water deposits existing in permanent shadow areas of polar craters has sparked a growing interest in exploiting these resources for human use in the moon’s environment. At the same time, the discovery of water outside the earth brings with it the possibility of previous or current life forms and concerns about earthly contamination. Planetary explorations conducted up to now by governmental space agencies have long operated with “super clean” spacecraft and under strict international and national guidelines to prevent possible contamination, such as the Committee on Space Research (COSPAR) Planetary Protection Policy.²¹

However, as these are “soft law” guidelines rather than “hard law” treaty provisions, activities by commercial tour operators will be supervised by the responsible state parties as set out under the OST’s Article VI. Human visitors bring human waste and the potential for biological contamination of lunar water is an issue awaiting resolution as it would be applied by state parties to commercial entities operating under a national license.

3. Concluding Remarks

From this cursory review and examination of the legal issues hypothetically arising with commercial tourism in the lunar region and on the lunar surface, historical preservation of early lunar exploration sites is perhaps the scenario most in need of international legal guidance. Legal bans on appropriation and/or claims of sovereignty by the OST seem to preclude state party regulatory efforts to control access to the sensitive sites. However, a UNGA resolution recognizing the historical significance of the lunar sites and request

20 United Nations, *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies* (Outer Space Treaty), entry into force October 10, 1967. 18 UST2 2410; TIAS3 6347; 610 UNTS4 205. See, The Conversation, “One giant leap for preservation: protecting moon landing sites,” *theconversation.com*, October 28, 2014. Source: <http://theconversation.com/one-giant-leap-for-preservation-protecting-moon-landing-sites-33139> (accessed August 11, 2017).

21 COSPAR, *COSPAR Planetary Protection Policy* (published in Space Research Today, COSPAR’s information bulletin, Number 193, August 2015). Source: <https://cosparhq.cnes.fr/scientific-structure/ppp> (accessed August 11, 2017).

for UNESCO to amend the World Heritage Treaty could suffice as guidance to touristic firms. A lunar launch vehicle is subject to OST compliance as are also commercial touristic operations in the vicinity of lunar water. In sum, the foresight of the OST's promulgators has ensured that Elon Musk's courageous lunar visitors will not be flying into a legal void after all.²²

There will be much for New Zealand to learn from its counterpart, but the same is also true vice-versa. With new participants joining in the race for the Google X Prize and beyond, the dynamics change and scope for a change within the industry through participation is an exciting time not only for entrepreneurs and "flight participants," but also for regulators seeking ways to tweak the stiffening joints of a 50-year-old legal regime.

22 Commercial entities will be formally represented in the newly re-established National Space Council in the United States. Space News, Source: <http://spacenews.com/op-ed-dont-pull-the-trigger-before-you-load-the-gun-solving-a-decades-old-problem-with-a-national-space-council> – (accessed September 4, 2017).