

42 – Preserving Artifacts and the Environment

SUMMARY

Along with the roads chapter, this chapter discusses the need to preserve the lunar landscape by keeping vehicular tracks on roads. Also, new artifacts such as the first exploratory footprints at unique sites deserve to be preserved. How this can be done while allowing later tourist visits is discussed.

Preserving Historic Sites

There is some good work being done by Michelle Hanlon (For All Moonkind) and others seeking to preserve historic artifacts on the Moon. This includes things such as the Apollo landing craft, Soviet landers and rovers, footprints, etc. The Space Development Network joins the many others who support this work.

Various efforts are being made to ensure that the historic artifacts will be preserved for future generations. Ultimately, the goal is to achieve an internationally recognized agreement whereby the historic sites are preserved from damage by the curious who would like to take a little "souvenir" for home.

Landing Blast

As a lunar lander comes down, its exhaust velocity exceeds orbital speed at kilometers per second. The lunar dust is very fine grain such that each landing essentially sandblasts the local area. It is generally felt that vehicles should not land closer than two kilometers from important artifacts lest those artifacts get covered by a layer of dust and in the case of boot prints, go away completely. Telerobots could create sintered (microwaved) landing pads which could help but two kilometers is not too far for visitors to travel by rover after landing.

The Environment

Whereas there is likely no life that needs protection on the surface of the Moon, there is an environment. For example, later visitors might be disappointed to find a landscape covered with rover tracks. Tracks and boot prints on the Moon will remain visible (even pristine) for a very long time. Yet there are historic (e.g. first) tracks and boot prints that would be considered historic as they tell an important tale. What to do to protect these important artifacts?



Making roads to prevent permanent tire tracks everywhere.

A Network of Roads

Keeping the lunar landscape free from a lot of rover tracks is possible using two approaches. The first would be to create a network of roads between locations likely to be those most highly visited. From a preservation standpoint, keeping vehicles confined to roads will be the key to ensuring that the environment isn't defaced with tire tracks going every which way.

Chapter 10 goes into some depth as to how those roads could be made. But in a nutshell, a set of electric RoadBots could smooth out and compact the regolith so that crew and cargo vehicles could drive over them at fairly high speeds allowing for transport from poles to equator in about three days. Groups of RoadBots would follow a pre-determined, low-slope path, deviate as necessary, fill in small craters, rake out rocks, level with a blade, and firmly compact the regolith to ensure a gentle, very smooth, dirt road. Operating 24/7 the groups of RoadBots could complete even long-distance, compacted dirt roads in less than a year.

Stick Walkers

After visitors drive along the road network close to a site that they want to visit, they may wish to leave the road and travel to a new site. So, should the rovers just drive off the road thereby permanently leaving permanent track marks across the landscape?

It is proposed that the crew vehicle pull up to another chassis that, instead of having wheels, it would have six vertical poles what would act as legs. The poles would press vertically down into the lunar dirt for each step. In this way, nearly invisible holes would be pressed into the ground thereby leaving behind little if any track marks. It would definitely be slower than driving on circular wheels, but this approach would preserve the environment.

Protecting Artifacts / Sites

As private individuals land on the Moon and conduct their own tourism in large numbers, systems will need to be set into place to ensure that historically sensitive sites are protected. An internationally agreed system needs to be established to decide what qualifies as heritage sites to be registered and protected.

Sites of interest need to be developed including roads leading to overlooking platforms and walkways. At those locations, there could also be visitor centers with large windows that would allow tourists a relaxed indoor environment to enjoy the view.

Additionally, physical systems need to be put in place to ensure that these space heritage sites are protected from a practical standpoint. Should there be markers, fences, or even robotic protectors and what would that even look like? So, there is more work to be done to ensure that our space heritage is protected.

Potentially Many Artifacts

Currently there are a few recognizable artifacts on the Moon from landers to rovers to impact sites. But, as cost-effective, commercial transportation systems become operational between the Earth and the Moon, then many countries of the world could afford to purchase at least one seat on a mission of lunar exploration. Given the decent number of countries that have had their own astronauts on the Mir or ISS, it seems likely that most countries would take advantage of such an opportunity.

Each time astronauts from a new country land on the Moon, they would be creating artifacts in the form of their boot prints of great interest to later visitors from that country. It would seem a pity if later visitors would deface that historic record. So, what could be done to preserve those many historic features?

Whenever a lander first lands at a new location, it would sandblast an otherwise undisturbed area. But dust being blown on dusty terrain wouldn't change the appearance substantially apart from the immediate blast pattern. But, as the astronauts exit the lander, they will be placing their historic, first boot prints on the ground and towards the destination site. As they get back into the lander and ascend, the blast would destroy their historic boot prints. Yet, an accompanying small telerobotic rover could place little plastic domes over their footprints, thereby ensuring their preservation when the lander takes off again. Later visitors could land on a landing pad away from those historic boot prints and then ride on walking stick chassis to the point of interest as well as to an area overlooking the prints and tracks of the first explorers to that point.

Why the Moon?

The Moon is no longer a distant symbol of exploration – it is a near-term strategic domain in which American leadership, or its absence, will shape the future of space.

For more than half a century, the Moon has been treated as a destination for flags and footprints rather than as the foundation for sustained presence beyond Earth. That assumption is now outdated. Advances in launch capability have quietly transformed what is technically and economically feasible with the coming years.

In this book, *The Case for the Moon* argues that establishing permanent lunar bases—and ultimately settlements—is not a speculative ambition but a practical policy choice. Drawing on current engineering realities and emerging commercial capabilities, the book outlines how a sustained lunar presence can strengthen America’s strategic preeminence creating the setting where the nations of the world will want to follow America’s lead in exploring the Moon while establishing humanity’s first permanent foothold beyond Earth.

Rather than treating the Moon as an end in itself, the book examines it as infrastructure: a place to develop operational experience, mature off-Earth resource utilization, build resilient space logistics, and develop the framework whereby the values that America promotes will become the values that spread beyond Earth.

Written for policymakers, strategists, and informed citizens, *The Case for the Moon* provides a clear case for why the question is no longer whether the Moon should be developed, but how soon and under what rules. Decisions made in the near term will shape humanity’s presence in space for generations.



Doug Plata, MD, MPH is a physician and space advocate in Redlands, CA with a background in biophysics, Family and Preventive Medicine. Doug brings a keen eye to the subject of lunar development starting with the technical foundation and building up to include its impact on the public, international leadership, and ultimately, humanity’s future in space.

