The Moon Society

Response to NASA Request for Information (RFI)

Capability Demonstrations & Supply Chain Challenges for NASA Moon Base Development

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1. Executive Summary

The Moon Society is a 501(c)(3) nonprofit educational and scientific organization, founded in 2000, dedicated to the permanent civilian settlement of the Moon and the development of a cislunar economy. We are not a hardware prime and we are not seeking to position ourselves as one. We are responding to this RFI in the capacity the solicitation explicitly invites: a **partner stakeholder** with roughly twenty-six years of community, archival, and convening capacity directly relevant to the Moon Base program.

We submit five concrete offers that we believe NASA can use immediately, at low cost, to accelerate the Phase One build-out of the Moon Base and strengthen the industrial base that must sustain it:

- **Lunar Development Forum.** Elevate our annual Lunar Development Conference into a formal, NASA-recognized public engagement venue for the Moon Base program, providing a neutral forum for small and nontraditional entrants to reach NASA technical staff.
- **Open Moon Base Knowledge Commons.** Expand Lunarpedia and the Moon Miners' Manifesto archive into a curated, openly licensed knowledge base keyed to NASA's Architecture-Driven Technology and Science Gaps.
- **Academic & Maker Payload Coordinator.** Serve as an intake, review, and proposal-shaping clearinghouse for low-cost university and community-lab payloads suitable for CLPS-class landers and LTV-class rovers, in coordination with the Lunar Surface Innovation Consortium andCommercial Lunar Payload Services program office.

- **Architecture Gap Whitepaper Series.** Produce a vetted series of short whitepapers, authored by subject-matter experts in our network, addressing specific NASA-identified capability shortfalls (ISRU, power, surface mobility, dust mitigation, long-duration life support, settlement-scale logistics).
- **Test Facility & Skilled Trades Network.** Leverage our chapter network to catalog underutilized university and community test capacity and to partner with community colleges on the welding, machining, and specialty fabrication trades that are the root constraint on several supply chain items called out in this RFI.

None of these offers requires NASA to assume hardware development risk through the Society. Each is structured to be additive to existing NASA and contractor efforts, to close gaps that commercial primes are not incentivized to close, and to be executable within the 2 to 4 year window the RFI targets.

2. Organization Overview

The Moon Society is a membership-based nonprofit incorporated in 2000, with tax-exempt status under IRC 501(c)(3) and an international membership spanning scientists, engineers, educators, entrepreneurs, and advocates focused on lunar development and settlement. The Society's principal ongoing activities include:

- **Annual Lunar Development Conference (LDC).** A peer-reviewed technical and policy conference now in its fifth continuous year, with a 2026 Book of Abstracts already published. LDC convenes industry, academia, policy, and advocacy stakeholders specifically on lunar-surface topics, and is distinct in scope from broader space conferences.
- **Lunarpedia.** An openly licensed online encyclopedia dedicated to lunar settlement, resource utilization, and surface operations, maintained by a volunteer editorial community and hosted at lunarpedia.org.
- **Moon Miners' Manifesto (MMM).** A lunar development publication with an archive spanning issues from 1986 through the present, including themed issues on ISRU, habitats, logistics, life support, and lunar industrial capacity.
- **Luna City Press.** Our book imprint, which has published A Pioneer's Guide to Living on the Moon, Return to the Moon proceedings volumes, and Building the Space Infrastructure (2025), among others.
- **Chapters and Outposts.** An active chapter and outpost network including Clear Lake, TX; Nashville, TN; Phoenix, AZ; Seattle, WA; St. Louis, MO; Tequesta, FL; and an international chapter in Sweden. Chapters conduct K through 12 outreach, public observing, and community science events.
- **Standing Projects.** The Artemis Project (commercial lunar base design study, predating and distinct from NASA's Artemis program), a Power Beaming Project focused on space-based solar power concepts built from lunar materials, and a Mare Cognitum Virtual Chapter supporting monthly technical discussions.

We are an affiliate of the National Space Society (since May 22, 2005) and maintain cooperative relationships with the Mars Society, the Space Frontier Foundation, the Moon Village Association, and peer academic institutions. The Society's founding purpose, in its own governing documents, is "complementing NASA initiatives and goals by looking for alternative options to advance research goals NASA is not able to undertake." That remains the frame of this response.

3. Response to Requested Information

3.1 Technical Capabilities

The RFI requests technologies and hardware solutions that can be rapidly repurposed or developed for lunar surface demonstration within 2 to 4 years, with integration on CLPS-class landers, LTV-class rovers, and orbital relay or observation platforms. The Moon Society does not propose itself as the developer or integrator of such hardware. Instead, we propose five supporting capabilities that materially reduce the time, cost, and risk of the demonstrations NASA is seeking from industry and academia.

3.1.1 Open Moon Base Knowledge Commons. We propose to expand Lunarpedia and the Moon Miners' Manifesto archive into a curated, openly licensed knowledge commons keyed directly to the structure of NASA's Moon to Mars Architecture Definition Documents, with particular focus on the Architecture-Driven Technology Gaps and Architecture-Driven Science Gaps published by NASA. The Commons would serve three purposes: (1) a searchable common reference for CLPS payload proposers, small businesses, and university teams who do not currently have efficient access to consolidated lunar-surface design heuristics; (2) a vetted library of whitepapers on specific capability gaps (see 3.1.3 below); and (3) a public-facing education asset supporting workforce pipeline development (see 3.1.5). The Commons would be a living resource, under open license, fully compatible with NASA's preference for open knowledge products.

Readiness. Lunarpedia has been operational since 2005. Moon Miners' Manifesto has published continuously since 1986. The incremental effort is editorial organization, cross-linking with NASA taxonomies, and curated whitepaper commissioning, not new platform development.

3.1.2 Academic and Maker Payload Coordinator. NASA's Moon Base plan targets up to thirty robotic CLPS landings beginning in 2027, with payload manifest slots available to non-traditional proposers. A persistent bottleneck for low-cost university, community college, and maker-lab teams is not scientific merit but proposal pathway: these teams often lack the cost-share, integration engineering, and proposal-writing infrastructure that primes and large academic institutions take for granted. The Moon Society proposes to stand up a volunteer-and-contractor Coordinator function that (a) publishes an open call for lunar-surface payload concepts targeted to Moon Base architecture gaps, (b) convenes a technical review panel drawn from our advisors and LDC program committee, (c) matches selected concepts with experienced mentors from our membership and affiliated organizations, and (d) works with selected teams to prepare submissions to the appropriate NASA solicitation (CLPS task orders, PRISM, Lunar Surface Instrument and Technology Payloads, and similar). The Coordinator would provide NASA with a curated, pre-vetted pipeline of low-cost candidate payloads in the 5 to 30 kg class that are unlikely to emerge through existing channels.

3.1.3 Architecture Gap Whitepaper Series. We propose to commission and publish a rolling series of short (8 to 15 page) whitepapers, each directly keyed to a specific NASA-identified technology or science gap, authored by the appropriate subject-matter experts in our membership, advisor network, and LDC community. Target topics include: ISRU pilot-scale processing of highland and mare regolith simulants; sintered-regolith surface construction and dust mitigation; long-duration closed-loop life support suitable for a Phase Two crew rotation; surface-to-surface and orbit-to-surface optical power beaming, where Moon Society-affiliated researchers have contributed to the literature for over a decade; and settlement-scale logistics and resupply economics. Each whitepaper would be delivered to NASA prior to open publication, to allow integration into agency planning.

3.1.4 Lunar Development Forum. We propose to formalize our annual Lunar Development Conference as a recurring Moon Base Industry and Academic Engagement Forum. NASA technical staff would have standing invitations to present program updates, capability calls, and supply chain requests directly to the assembled lunar-focused community, with structured time for small and nontraditional entrants to present capabilities and concepts to NASA. LDC already draws the right audience; what is missing is deliberate NASA programmatic engagement with it. This is the lowest-cost, fastest-executing element of our response: LDC 2026 is already scheduled.

3.1.5 Supply Chain and Test Facility Support. The RFI lists specific supply chain pain points (propellant tank dome manufacturing, isolation and control valves, high-thrust hypergolic engines, large-scale bespoke welding, heat pipes, radiation-hardened electronics) and test facility pain points (altitude-capable hypergolic test stands, commercial test house DPAS prioritization, NASA test facility scheduling conflicts, and limited full acceptance test capacity). Every one of these is ultimately a skilled-trades and skilled-engineering constraint as much as a capital equipment constraint. Large-scale bespoke welding in particular is a workforce issue: the certified welders capable of the geometries and materials involved in propellant tank domes are aging out of the workforce faster than they are being replaced.

We propose two complementary contributions in this area:

- **Distributed Test Capacity Survey.** A volunteer-led, chapter-coordinated survey of university and community test infrastructure (thermal-vacuum, vibration, thermal cycling, dust abrasion, regolith simulant handling) that could be made available to NASA contractors on a fee or cooperative basis, with the survey product delivered to NASA as a queryable dataset. This is a volunteer-driven effort well suited to a distributed nonprofit with an academic membership.
- **Skilled Trades Pipeline Pilot.** A modest pilot program through two or three of our U.S. chapters, partnering with local community colleges and union training programs, to seed awareness of aerospace welding, machining, and radiation-hardened electronics assembly as career paths, and to produce a small number of lunar-themed capstone projects each year. This directly addresses the root cause of several RFI supply chain items and is in our natural wheelhouse as an educational nonprofit.

3.2 Public / Private Partnerships

The RFI invites ideas for public and private partnerships in which NASA could facilitate the launch and landing of partner-provided science and technology payloads. The Moon Society offers three partnership constructs:

- **Manifest Access in Exchange for Curated Pipeline.** NASA allocates a small percentage of CLPS payload mass per flight (on the order of 5 to 15 kg) to a Moon Society-aggregated slate of academic and maker payloads selected through the process described in 3.1.2. NASA does not fund the payloads themselves. The Society covers aggregation, technical review, and proposal-shaping costs via philanthropic and member funds. This is modeled on the successful TechEdSat and ELaNa CubeSat precedents in Earth orbit, adapted for the lunar surface.
- **Data and Education Cooperative Agreement.** A cooperative agreement (NASA Cooperative Agreement Notice or Space Act Agreement) between NASA and the Society establishing the Open Moon Base Knowledge Commons (3.1.1) as a sanctioned public-facing educational resource, with NASA contributing non-proprietary technical content and the Society contributing editorial infrastructure, authoring network, and open-license hosting.
- **Outreach and Constituency Cooperative Agreement.** A parallel cooperative agreement in

which the Society's chapters and outposts deliver a coordinated schedule of public events tied to Moon Base mission milestones (landings, crew launches, major demonstrations), using NASA-approved imagery and messaging. The Moon Base program is multi-decade and multi-administration; the political and public-support infrastructure to sustain it through funding cycles is a legitimate risk that the Society is well positioned to help mitigate.

In each case, the Society is the Recipient or Cooperator, not a contractor, and cost-share is expected on the Society's side through member dues, foundation grants, and in-kind volunteer contributions.

3.3 Cost Estimates (Rough Order of Magnitude)

The following ROM figures reflect full program cost for the Society's execution role and should be treated as illustrative for NASA planning purposes. They do not include NASA internal costs (program management, civil servant time, launch and landing services) or the cost of the payloads themselves, which in our proposed model are funded through independent academic and philanthropic channels. All figures are in FY2026 dollars.

Capability	Initial (Yr 1)	Sustainment (Yr/Yr)	Notes
Lunar Development Forum (3.1.4)	$75K – $150K	$75K – $150K	Incremental to existing LDC operations; covers NASA-facing programming, captioning, publication of proceedings.
Open Moon Base Knowledge Commons (3.1.1)	$250K – $500K	$100K – $175K	Build-out of editorial infrastructure, taxonomy alignment, contracted senior editor(s), hosting, accessibility compliance.
Academic & Maker Payload Coordinator (3.1.2)	$400K – $700K	$250K – $400K	Program staff (0.5 to 1.0 FTE contractor), review panel honoraria, travel, proposal-development support; excludes payload build cost.
Architecture Gap Whitepaper Series (3.1.3)	$150K – $300K	$125K – $250K	Commissioning honoraria for 8 to 12 whitepapers per year, peer review, editing, open publication.
Distributed Test Capacity Survey (3.1.5a)	$100K – $175K	$40K – $75K	One-time build of dataset, annual update cycle, simple queryable interface.
Skilled Trades Pipeline Pilot (3.1.5b)	$150K – $300K	$100K – $200K	Pilot across 2 to 3 chapters, partnership with local community colleges, modest capstone project support.

Capability	Initial (Yr 1)	Sustainment (Yr/Yr)	Notes

Portfolio total	**$1.1M – $2.1M**	**$0.7M – $1.2M**	Three-year full portfolio ROM: approximately $2.5M to $4.5M.

The Society's expectation is that federal participation would typically take the form of a cost-shared cooperative agreement or Space Act Agreement, with the Society sourcing a portion of the cost from member dues, foundation support, and in-kind volunteer effort. Actual cost share ratio would be negotiated per instrument.

3.4 Integration Potential

The offerings in 3.1 and 3.2 are deliberately structured to require no modifications to NASA hardware, launch infrastructure, or program management systems. Specifically:

- The **Open Moon Base Knowledge Commons** is a public-facing educational resource under open license; it integrates with NASA's existing public communication channels and does not require integration with Agency-internal systems or ITAR-controlled data.
- The **Academic and Maker Payload Coordinator** feeds the existing CLPS task order and PRISM solicitation processes. It does not propose a new acquisition pathway or require changes to CLPS lander interfaces; it simply increases the quantity and quality of small-payload candidates reaching those pathways.
- The **Architecture Gap Whitepaper Series** is keyed to the structure of NASA's already-published Architecture Definition Documents, so NASA technical staff can map Society-produced content directly to existing architecture elements and capability gap statements. • The **Lunar Development Forum** is an existing event. NASA engagement does not require new infrastructure on either side.
- The **Test Capacity Survey** delivers a dataset in standard tabular or JSON format, deliverable to NASA and partners directly or hosted on the Knowledge Commons.
- The **Skilled Trades Pipeline Pilot** interfaces with existing NASA STEM engagement programs (for instance, NASA EPSCoR and the Artemis Student Challenges) through information sharing; it does not propose a new federally funded curriculum.

3.5 Business Size and Socioeconomic Category

The Moon Society, Incorporated is a tax-exempt nonprofit organization under Internal Revenue Code 501(c)(3), registered in the State of Texas with additional operations out of Olean, New York. The Society is not a for-profit business concern and therefore does not carry an SBA size standard classification or a socioeconomic designation under FAR Part 19. For federal acquisition purposes, the Society is most appropriately characterized as a **nonprofit educational and scientific organization**. The Society has no employees at this time; all operational work is performed by its elected leadership, volunteer members, and occasional specific-purpose contractors. Any work under a NASA cooperative agreement or Space Act Agreement would be staffed via short-term contractors and member volunteers, which we view as a strength for fast-start activities.

3.6 Teaming Arrangements

The Society anticipates and welcomes teaming with established and emerging organizations in the lunar community. Candidate teaming partners, subject to mutual agreement, include:

- **National Space Society** (NSS), with which the Moon Society has been an affiliate since May 22, 2005. NSS brings a broader policy and advocacy footprint complementary to our

lunar-specific focus.

• **Moon Village Association** (Vienna), providing international coordination consistent with NASA Artemis Accords commitments.

• **Space Studies Institute** and **Space Frontier Foundation**, historically aligned with lunar resource development and entrepreneurial space policy.

• **Lunar and Planetary Institute** (USRA), for science gap whitepaper authorship and peer review.

• **Colorado School of Mines Space Resources Program**, **University of Central Florida**, and **Michigan Technological University**, among other academic partners with active lunar and ISRU research programs, for payload incubation and whitepaper authorship.

• **Community college and trade school partners** co-located with Society chapters, for the Skilled Trades Pipeline Pilot.

• **Peer advocacy organizations** (for instance, the Mars Society, Explore Mars, Beyond Earth Institute) on cross-cutting public engagement and workforce themes.

Government resources requested in support of the partnership would be limited and well-scoped: (1) liaison access to the Moon Base program office and the Commercial Lunar Payload Services program office for routine coordination; (2) permission to cite and link NASA Architecture Definition Documents, technology and science gap lists, and approved public imagery in Commons content; (3) manifest consideration for Society-aggregated academic and maker payloads on CLPS flights where mass margin permits; and (4) standing invitations for NASA technical staff to participate in the Lunar Development Forum. We do not request access to NASA test facilities, civil-servant-performed hardware work, or ITAR-controlled data under this concept.

4. Alignment with Moon Base Phase One Architecture

NASA's published phased approach (Build, Test, Learn; Sustain; Expand) places a premium on repeatable, modular capability demonstrations in the Phase One window. Our offerings map to Phase One as follows:

Moon Base Phase One Emphasis	Moon Society Contribution
Accelerated CLPS cadence, up to 30 landings beginning 2027	Academic & Maker Payload Coordinator (3.1.2) expands the pipeline of low-cost, high-science-value candidates for CLPS manifest slots.
Repurpose and repeat, rather than bespoke missions	Architecture Gap Whitepaper Series (3.1.3) highlights where modest standardization investments (for instance, common mechanical and electrical payload interfaces) would compound benefits across CLPS missions.
Public-private partnership and international cooperation	Cooperative agreement constructs (3.2) and teaming partners (3.6) provide a vetted, NASA-aligned channel for nontraditional contributors, including international partners consistent with the Artemis Accords.

Moon Base Phase One Emphasis	Moon Society Contribution
Sustained public support across multiple administrations	Outreach and Constituency Cooperative Agreement (3.2) and chapter network engagement provide durable, nonpartisan public support infrastructure.
Workforce and supply chain resilience	Skilled Trades Pipeline Pilot (3.1.5b) and Distributed Test Capacity Survey (3.1.5a) address root-cause workforce and facility constraints identified in the RFI's supply chain and test facility lists.

5. Closing and Point of Contact

The Moon Society appreciates NASA's explicit inclusion of partner stakeholders alongside industry and academia in this RFI. A permanent lunar outpost by 2030 is exactly the kind of national undertaking that requires, in addition to hardware and launch services, a broad and durable infrastructure of public knowledge, academic engagement, workforce development, and informed public support. Those are the layers in which the Society has invested for twenty-six years, and we offer that investment in service of the Moon Base program.

We would welcome the opportunity to discuss any of the concepts above in more detail, to refine scope, cost share, and program timing, or to support NASA planning through focused whitepapers or briefings on request.

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Respectfully submitted,

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Appendix A. Selected References and Prior Work

The following Moon Society publications and projects may be of interest to NASA reviewers as evidence of prior technical and community work relevant to this response:

- Moon Miners' Manifesto (1986 to present), themed issues on in-situ resource utilization, regolith processing, habitats, and lunar industrial development. Archive available at moonsociety.org/MMM.
- Lunarpedia (2005 to present), lunarpedia.org.
- A Pioneer's Guide to Living on the Moon, Peter Kokh, Luna City Press, 2018. • Return to the Moon VII, Proceedings of the Lunar Development Conference, Luna City Press. • Building the Space Infrastructure: Developing the Cis-Lunar Neighborhood, Alastair Storm Browne, Luna City Press, 2025.
- Lunar Development Conference 2026 Book of Abstracts, March 2026, moonsociety.org. • Moon Society Power Beaming Project materials, including whitepapers on space-based solar power built substantially from lunar materials.
- Mars Desert Research Station Crew 45 (2006), a two-week lunar analog rotation conducted by a Moon Society crew.

Appendix B. RFI Section 3 Cross-Reference

For the convenience of NASA reviewers, the following table maps the RFI's Section 3 requested information elements to the sections of this response:

RFI Section 3 Element	Response Section
Technical Capabilities	3.1 (subsections 3.1.1 through 3.1.5)
Public / Private Partnerships	3.2 and 4
Cost Estimates (ROM)	3.3
Integration Potential	3.4
Business Size	3.5
Teaming Arrangements	3.6

Supply Chain Challenges (Section 2 of RFI)	3.1.5 (supply chain and workforce pipeline)
Test Facility Challenges (Section 2 of RFI)	3.1.5a (Distributed Test Capacity Survey)