



**National Aeronautics and Space Administration
NASA Headquarters
Advanced Exploration Systems Division
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Washington, D.C. 20546-0001**

Next Space Technologies for Exploration Partnerships -2 (NextSTEP-2)

Broad Agency Announcement NNHZCQ001K-Habitat

Appendix A: Habitat Systems

**Originally Issued: April 19, 2016
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Proposals Due: June 15, 2016, 5:00 PM Eastern Time**

1 Introduction and Background

1.1 Background

NASA supports public-private partnerships for achieving its strategic goals and objectives for expanding the frontiers of knowledge, capability, and opportunities in space. The next step for human spaceflight beyond Low Earth Orbit (LEO) into cislunar space and on a Journey to Mars is the development of deep space habitation capabilities, which are needed to support ambitious missions in the proving ground and beyond cislunar space.

NASA has outlined the next phases in human spaceflight into distinct phases; Phase 0 - Exploration Research and Systems Testing on ISS, Proving Ground Phase 1 - Initial deep space use of exploration technologies and systems via a series of flight test missions in cislunar space that culminate in the Asteroid Redirect Crewed Mission (ARCM), and Proving Ground Phase 2 - Cislunar validation of exploration capability via a series of demonstration missions in cislunar space that culminates in a long duration shakedown mission. This shakedown mission will use a long duration deep space transit habitat that joins the initial Phase 1 cislunar capabilities and leverages the capabilities tested on ISS in Phase 0 for missions that are Mars class distances and durations of 1000 days or more.

An important part of NASA's strategy is to stimulate the commercial space industry while leveraging those same commercial capabilities through public-private partnerships and potentially future contracts to deliver mission capabilities at lower costs.

The progression of human spaceflight missions with the ability to support long duration via habitation capabilities requires NASA and industry to create capabilities that can operate independently, with other potential international contributions, the Asteroid Redirect Vehicle, potential logistics capabilities, and Orion.

Orion is the first in-space component of human exploration beyond low Earth orbit and will have a capability of sustaining a crew of 4 for 21 days in deep space and returning them safely to Earth. In Phase 1, it may be advantageous to develop habitation, logistical and EVA capabilities that would support flight test objectives, extended Orion missions, missions such as the ARCM, domestic/international partner goals, and/or system demonstration for long duration deep space habitation required for Phase 2. NASA is considering multiple options for meeting any Phase 1 habitation capabilities including domestic and international partner contributions. Any short duration capabilities must demonstrate extensibility to the long duration deep space habitation required for Phase 2.

Plans for Phase 2 include validation of all the elements, systems, and operations necessary to send humans beyond the Earth-Moon system for Mars class long duration interplanetary missions by the end of the 2020's.

The mission that defines the end of Phase 1 and the entrance into the build up of Phase 2 is the reference ARCM, which includes two 4-hour EVAs for sampling. The early delivery of any short duration habitation capabilities as an initial step towards long duration deep space cislunar habitation should be evolvable to the full capability required for Phase 2.

Additional activities that may benefit from new habitation capabilities include:

- Long Duration Exploration Systems Testing
- Automation, Tele-operations, and Robotics
- Human Assisted Sample Return beyond the ARCM
- In Situ Resource Utilization (ISRU) Demonstration Missions
- Human Research in Deep Space
- Logistics Support
- General Science
- Deep space long duration (e.g., Mars) spacecraft assembly, refurbishment and validation

To obtain innovative concepts from outside, NASA awarded four habitation concept study contracts through the NextSTEP BAA in 2015 to help define feasible potential habitation architecture concepts that address NASA's objectives while leveraging available industry existing or planned capabilities in LEO. These objectives are still valid for NextSTEP-2 efforts. The selected studies from NextSTEP were to include one or more of the objectives under the three (3) areas listed below:

Transportation

Under Transportation, the concept studies could include the following elements:

- Include the flexibility to dock with the ISS for development, outfitting, and/or testing prior to use in the lunar vicinity such as in Distant Retrograde Orbit (DRO)
- Operate in lunar DRO by itself, with and without crew and in conjunction with any combination of the Orion, Asteroid Robotic Vehicle (ARV) and/or logistics resupply spacecraft
- Provide for attitude control, power and thermal management, command, telemetry, and guidance either in combination with and/or separate from Orion functionality

Habitation

Under Habitation, the concept studies could include:

- Provide habitable volume for crew and logistics.
- Along with Orion, provide for an initial crew of four a stay of 30-60 days in DRO.
- Enhancements and testing of deep space habitation systems such as Environmental Control and Life Support Systems (ECLSS), such as atmosphere revitalization and monitoring, water processing, lighting, and fire detection

Operations & Environment

Under Operations and Environments, the concept studies could include:

- NASA would like an operational lifetime in cislunar space of at least 15 years.
- Provide airlock/docking node capability for cislunar missions and operate as an independent spacecraft if other vehicles are not present. Support the ability to operate with the ARV bus
- Have the facility to support two crew-members in conducting multiple 8 hour Extra-vehicular Activities (EVAs) without depress of the pressurized module or Orion.
- Support test and/or use options of exploration EVA capability and Airlock capability
- Have the ability to support visiting vehicles to dock (Orion, logistics resupply, Asteroid Redirect Vehicle, etc.)
- Long duration shakedown mission validation of elements, systems, operations and human health and performance for missions beyond the Earth-Moon system.

These initial studies were to identify evolvable concepts as options for the short duration mission opportunities. The studies also were to identify what missions they can support and show how the capabilities developed would also benefit industry LEO commercialization plans. These original objectives will be expanded upon in NextSTEP Phase 2 and NextSTEP-2 Appendix A efforts as described in the following section.

1.2 Proving Ground Strategy

To support development and maturation of crewed, deep space long duration habitat systems, NASA's strategy is to implement a phased approach of incrementally increasing capabilities toward fulfilling the durations and missions required for the journey to Mars. For any Proving Ground Phase 1 operations, current architecture and strategy studies conducted by NASA envision an evolvable, modular architecture employing standards and common interfaces so that individual elements of the overall aggregate system potentially may be developed, launched and deployed by different commercial, government, or international partners. This evolvable and interoperable modularity also provides additional flexibility for launch options, whether it be leveraging the co-manifest capability on SLS or other alternative capabilities. Notionally, the modular architecture could contain four categories of capabilities: habitat, service module, node/airlock, and logistics. Approaches to meeting the capabilities could vary however in the number of physical elements and operational capability. To enable this modular approach, it will be imperative that a set of standards and common interfaces be developed and agreed upon by the developers of all capabilities.

NextSTEP -2 will focus on 1) refining the development of the agreed upon standards and common interfaces to accomplish NASA's mission of validating long duration deep space elements, systems, operations, and human performance in deep space; 2) the feasible modular elements, which could include any deployment and operations during Phase 1 with direct evolvability to Phase 2; and 3) determining the intersection with private industry interest in commercial activities, for example in LEO.

To demonstrate the feasibility of the integration of elements via standards and common interfaces, the NextSTEP – 2 habitat system effort envisions integrated ground prototype testing and demonstrations.

To accomplish the development of the standards and common interfaces, the NextSTEP-2 Habitat awardees will participate in a government-led standards and common interface working groups. These working groups will also discuss the desirability of systems testing on ISS in addition to prototype ground testing. The working groups will be made up of government and industry team members working together. The working group activity, along with the ground prototype development and testing activities of the awarded contractors, will inform the requirements and architecture for meeting NASA's requirements for the Phase 2 validation of the long duration deep space habitat.

In addition, a limited number of the awarded ground prototype development units may be requested for government testing to validate or capture lessons learned in form, fit, and functionality of the prototypes and interfaces. All proposers should include the option for this additional NASA on-site testing.

2 Funding Opportunity Description of Solicitation Topic

2.1 Description of Solicitation Topic

As the initial Phase 1 studies are nearing completion, NASA desires to move forward with validation of

multiple potentially feasible approaches to meeting NASA requirements for deep space long duration habitation. In addition, NASA would like to provide an opportunity for additional contractors that did not participate in Phase 1 studies to propose their innovative approaches that will both satisfy NASA's initial NextSTEP Phase 1 objectives and the objectives contained in this Appendix.

Therefore, NASA is seeking proposals to provide complete deep space long duration architecture designs (including standards, common interfaces, and testing approach) and the development of full size, ground prototype units no later than 2018. NASA envisions development and integrated test of prototypes by the end of this phase with potential follow-on phases. NASA Procedural Requirements NPR 7120.8 defines a prototype as: "A high fidelity unit that demonstrates critical aspects of the engineering processes involved in the development of the operational unit. Engineering test units are intended to closely resemble the final product (hardware/software) to the maximum extent possible and are built and tested so as to establish confidence that the design will function in the expected environments." The intended outcome of activities from this solicitation are complete long duration deep space architectures from the awarded contractors, and development and test of full size ground prototypes of selected units using co-developed and agreed upon standards and common interfaces.

NASA expects proposals submitted in response to this Appendix to be based upon rigorous concept development, architecture and trade studies. We understand that respondents may not have complete access or understanding of all NASA requirement information and feedback from subject matter experts so early milestones in proposals for this Appendix may include validation of concepts relative to NASA's long duration deep space habitation system strategy.

The following is a listing of objectives for this phase of the habitation system development:

- Develop and refine the evolvable, modular architecture, functional allocation options, standards, and common interfaces required to enable interoperability of the aggregate system to provide long duration deep space transit habitation.
 - Achieve a level of fidelity in technical and programmatic feasibility concepts for ground protoflight vehicle(s)/modules/units
- Further define and develop deep space habitation capabilities that can be flown as co-manifested payloads on SLS Block 1B with an initial SLS co-manifesting capability of 4 – 6 metric tons starting in early-to-mid 2020s, or later in the 2020s on a cargo-only version of SLS, or on alternative launch vehicles. Note the habitation system concept can be separated into multiple integrated modules with distributed functions. If the habitation concept is not flown on SLS, provide details of the launch vehicle assumptions.
- Mature the design of the overall deep space integrated system(s) and, at a minimum, develop a full size, ground prototype of the portion of your design that provides the majority of the habitation capabilities for form, fit, and partial function integration testing
- Identify commercial capability development for LEO that intersects NASA long duration deep space habitation requirements along with any potential option to maximize the leveraging of commercial LEO advancements towards meeting NASA long duration deep space habitation needs.
- Provide information on company end-to-end development effort and ROM costs for flight development - companies to provide a proposal, SOW, and fully priced Appendix A efforts and ROM costs for subsequent phases for engineering and flight unit development.

2.2 General Information for Participants

- **Agency:** National Aeronautics and Space Administration
- **Announcement Title:** NextSTEP-2 BAA, Appendix A: Habitation Systems
- **Responsible Office:** Advanced Exploration Systems Division
Human Exploration and Operations Mission Directorate
NASA Headquarters
Washington, DC 20546
- **Point of Contact:** Jason Crusan
Director, Advanced Exploration Systems
Human Exploration and Operations Mission Directorate
NASA Headquarters
E-mail: HQ-NextSTEP-BAA@mail.nasa.gov
- **Notice of Intent: Due May 13, 5:00pm Eastern Time.** To assist in the planning of the proposal evaluation process, NASA strongly encourages the submission of a Notice of Intent (NOI) to propose by all prospective offerors. The NOI should contain the following information: name, address, telephone number, e-mail address, and institutional affiliation of the offeror, and the solicitation topic in which you intend to propose (NextSTEP-2, Appendix A: Habitation Systems). NOIs shall be submitted electronically to the Point of Contact e-mail address above. **Please note that NOIs are strongly encouraged, but are not required. Not submitting an NOI will not impact the selection process.**
- **Inquiries: Due May 2, 5:00pm Eastern Time.** There will be an opportunity to submit written questions for each appendix released. The questions shall not contain proprietary information nor require proprietary information in the response. NASA will not provide evaluations, opinions, or recommendations regarding any suggested approaches or concepts. All questions shall be directed to the NextSTEP e-mail box HQ-NextSTEP-BAA@mail.nasa.gov no later than the date specified above. Inquiries shall identify the BAA number and this Appendix in the subject field of e-mails.
- **Industry Forum:** A NextSTEP-2 Partnership virtual forum will be held electronically for this Appendix and proposers will have a chance to ask questions about this particular solicitation. The tentative date for the forum is April 25, 11:00am Eastern Time. The meeting agenda and related information will be posted to the NextSTEP website.
- **Proposals Due:** Proposals must be submitted electronically in accordance with instructions no later than June 15, 2016, 5:00pm Eastern Time to the NextSTEP e-mail box HQ-NextSTEP-BAA@mail.nasa.gov. The e-mail submission shall include the BAA number and “Appendix A – Habitat Systems Proposal” in the subject field of the e-mail.

- **Web Site for Reference Information:** www.nasa.gov/nextstep

3 Eligibility Information

3.1 Eligibility of Applicants

This solicitation topic is open to non-Government U.S. institutions (companies, universities, nonprofit organizations) and foreign institutions. NASA civil servants, Jet Propulsion Laboratory (JPL) employees, national laboratories, and Federally Funded Research and development Centers (FFRDCs) shall not be proposed as a Prime Contractor on any effort associated with this announcement but may participate as a team member. Proposals from foreign organizations must comply with Section 3.1, Guidelines for Foreign Participation. Other eligibility information is included in the omnibus portion of this BAA.

3.2 Corporate Resources

Offerors are required to show a minimum corporate contribution of **30%** of the overall effort for eligibility to participate in this solicitation effort. The overall effort is defined as the combination of corporate contribution and government resources invested in the proposed effort. At least half of the corporate resources must be direct in-kind contributions during the period of performance. The remainder of CR may be prior investments made within one year prior to submission of the proposal. Additional information on corporate resources is contained in the omnibus portion of this BAA.

4 Proposal Submission Information

4.1 Instructions for Proposals

See omnibus BAA for general instructions. Where instructions are different, the specific instructions in this section are in addition to or supersede the general instructions in the omnibus BAA.

4.1.1 Proposal Format and Contents

The proposal format and content requirements as outlined in this section below are the same for all proposals. The required sections of the proposal must be submitted as one searchable, unlocked PDF file with edit permission enabled. Applicants must comply with the format and page limit requirements described in this omnibus BAA, as well as any additional requirements specified in the appendices. The provisions in each appendix will apply to that specific opportunity and will supersede any conflicting provisions in this omnibus solicitation.

There is a 10MB file size limit for proposals (Section 2.3.1(c) of the NASA Guidebook for Proposers). In order to meet the 10 MB file size limit, applicants should crop and compress any embedded photos and graphic files to an appropriate size and resolution. Only attachments that are specifically requested either in this solicitation or in appendices to this solicitation should be submitted.

Requirements in the appendices supersede any requirements in the NASA Guidebook for Proposers or in this omnibus solicitation.

Proposal Section	Page Limitations
Title Page	1
Executive Summary (Section I)	4
Proof of Eligibility (Section II)	3

System Concept, Technical Approach, Business Addendum (Sections III-V)	15
Capabilities (Section VI)	2
Data Rights (Section VII)	1
Price Proposal (Section VIII)	No limit
Attachments:	No limit

A page is defined as one side of a sheet, 8 1/2" x 11" with at least one-inch margins on all sides, using not smaller than 12-point font, with the exception of tables and figures, which may use 8-point font. Pages in excess of the page limits for each section will not be evaluated.

Proposals received by the Government after the published date and time for receipt will not be accepted.

4.1.1.1 Title Page:

- Include any Notice of Restriction on Use and Disclosure of Proposal Information.
- An optional graphic image may be included.
- The Proposer's name of the proposal or proposed project
- Date of the proposal
- The title, solicitation number and Appendix being responded to of this Announcement
- Organization name and address.
- Proposer Point of Contact name, title, e-mail address, and phone number.

4.1.1.2 Executive Summary: Describe the proposal's prominent and distinguishing features. The Executive Summary should provide an overview of the proposed effort that is suitable for release through a publicly accessible archive should the proposal be selected.

4.1.1.3 Proof of Eligibility: Provide information showing that the Respondent and all team members are eligible participants as stipulated in Section 3 of the omnibus BAA and this Appendix. Describe compliance with participation requirements as needed. Explain how the required corporate contribution resources will be satisfied.

4.1.1.4 System Concept: The offeror shall describe the overall system concept and its functions (concept of deployment and operation), how it addresses the objectives and requirements in this Announcement, and its maturity (Technology Readiness Level, if appropriate). Proposers should describe how the proposed system is on the path to a long duration deep space transit habitat.

4.1.1.5 Technical Approach: The offeror shall describe the approach and schedule for designing, analyzing, and testing the proposed system concept, including the plans to mature key technologies. At a minimum, the following items should be addressed:

- Overview of enveloping engineering approach with supporting test campaign
- What interface standards need to be identified before Phase 3
- Contractors shall support a NASA-led standards and common interface working group
- Include brief summary of past activities/tests
- Overview of end-to-end development schedule with estimated price for follow on phases developing protoflight units

- Technical Risks

4.1.1.6 Business Addendum: The offeror shall describe how this activity advances the intent of the public-private partnership concept and meets NASA's strategy to stimulate the commercial space industry while leveraging those same commercial capabilities through this partnership and future contracts to deliver mission capabilities, by:

- Providing a business overview
- Defining customer/partnership model
- Listing business case(s) that are leveraged by the hardware development
- Identifying any overlaps between Commercial LEO / Initial cislunar capabilities/technologies / and long duration deep space habitation activities and how any investments before the long duration deep space habitation activities are relevant or required in reaching the objectives
- Explaining business risks

4.1.1.7 Capabilities: The offeror shall provide evidence of existing capabilities for designing and developing space-qualified systems applicable to the objectives of this Announcement.

4.1.1.8 Intellectual Property: The offeror shall describe the approach for data rights and inventions, and how they meet the objectives outlined under Section 2.3, Intellectual Property.

4.1.1.9 Price Proposal: The price proposal shall include the overall firm fixed price for the concept study or capability/technology development project. The offeror shall provide total direct labor hours by skill mix, travel, and subcontracts in accordance with the sample format set forth in omnibus Attachment A.

- For proposals exceeding \$750K, fully certified cost or pricing data will be required. Offerors should reference corporate resources described in Section II (Eligibility).
- Pricing shall be structured by Contract Line Item Numbers (CLINs) and sub-CLINs such that the Government may select execution of CLINs based on programmatic requirements and availability of resources
- In the Price Forms contained in the omnibus BAA instructions, the offeror shall add a table listing the breakout and value of corporate resources
- In the Price Forms contained in the omnibus BAA instructions, the offeror shall add a list of government-contributed resources, including GFE/GFP, and the estimated value

4.1.1.10 Attachments:

- *Quad chart:* The proposal shall contain a quad chart in MS PowerPoint format summarizing the proposed objectives, team, major milestones, and funding requirements. A PowerPoint template of the chart will be posted with this Announcement.
- *Draft Statement-of-Work:* The offeror shall provide a draft statement-of-work that includes a work breakdown structure and a description of the major tasks, and products linked to the milestone achievements. The draft SOW shall also contain proposed milestones and deliverables.

- Proposed Technical and Payment Milestones: The offeror shall provide a list of proposed capability/technology development and demonstration milestones. Each milestone shall include a descriptive title, objective entrance/success criteria, and planned achievement dates (month and year). Milestones should represent significant technical and business progress in the program. At least one milestone per calendar quarter is recommended. The proposal shall also include payment milestones with a title, associated objective success criteria/deliverables, payment amount, and planned dates for completion of the milestone.
- *Deliverables*: Describe the products to be delivered and estimated delivery dates. Unless specified in the Appendix, format is assumed to be contractor format with approval by the Government. Exemplar deliverables could include: routine status and/or technical reports and briefings, Technical Interchange Meeting presentations and notes, action items, design, integration and test documentation, final briefings, technical data and papers.
- *Resumes*: Resumes may be included for key personnel. In general, resumes should be limited to no more than 2 pages each.
- *Corporate Resources documentation* (as necessary): This attachment should include documents containing verifiable evidence of the corporate contributions that are being proposed.
- *Key Facilities and Equipment* (as necessary): Facilities critical to the proposed effort or with unique features and/or capabilities should be identified and described here
- *Requested GFP/GFE*: Include a SOW or description of tasks, government facilities and equipment, or other Government in-kind contributions and a related cost estimate for those resources and any associated letters of commitment and associated points of contact.
- *Supporting Concept/Architecture studies* (as necessary): The offeror may include studies in concepts of operation, mission capability, architecture and trade studies to support the sections in the proposal. These studies will not be evaluated, but may serve as reference to support the approach proposed in the main sections.

4.2 Additional Proposal Guidance

4.2.1.1 Contract Structure

- Proposals shall structure the SOW tasks, sub-system development and associated activities and deliverables into severable CLINs and sub-CLINs integrated with the priced milestones such that the government can quickly negotiate and activate CLINs based on programmatic priorities and funding availability. Inclusion of “No Later Than” Start dates for each CLIN will facilitate government decisions.
- The 18 month development effort shall consist of a 12 month base period and 6 month option 1. It is the government’s intent to exercise the option and associated CLINs to complete development contingent upon successful completion of milestones during the base period. Option 2 is intended to be a no-cost option to accommodate potential transition to follow on phases.
- Contractors are to propose fixed price performance based milestones that mature the design and development of the system concept up to a full size ground prototype unit(s)
- Payment milestones should occur approximately every quarter, but not more frequently than monthly
- Payment milestones should reference technical milestones accomplished for that payment

- Exemplar technical milestones include: subsystem development and test, hardware or software testing, design reviews, integration milestones.
- May use NASA NPG 7123 as reference/lessons learned on design review content
- May propose optional fixed price performance based milestones that provide additional system maturation or risk reduction

4.2.1.2 Deliverables

- The NextSTEP-2 Habitat Systems activity is focused on six main types or categories of deliverables. There is no intent to take ownership/title of any hardware. Offerors shall propose the items they will deliver as milestone events. Examples of acceptable milestone events include:
 - o Design documentation for hardware/software for ground prototype systems and/or modules (covering all high-level functions of habitation, node/airlock, services, logistics)
 - o Full size ground prototype(s) of any proposed elements to provide the capabilities of habitation, node/airlock, service modules, and/or logistics concepts and associated test documentation
 - o Participation in government-led standards and common interface working group
 - o Final reports of integrated performance and Phase 3 SOW, price, milestones, deliverables
 - o Contract requirements documentation such as progress/status reports, design review and technical information meeting documentation, safety/health plans, and technology/invention reports
- In addition to the fixed price performance based milestones and major deliverables above, contractors shall propose routine deliverables as well as the technical data and engineering briefings, minutes and reports on the development:
 - o Quarterly project status/technical briefings in contractor format (past quarters activities, upcoming activities, risks retired, financials, other)
 - o Quarterly technical reports (NASA will provide a format)
 - o Monthly progress/status reports (NASA will provide an abbreviated format)
 - o Bi-weekly coordination telecons with NASA
- Safety and Health plans. Proposers shall include appropriate documentation to address hazardous materials/activities, environmental and facilities considerations commensurate with their proposal and in accordance with NASA policy and regulations
- The contractor shall develop a proposal for potential follow-on work containing a SOW, schedule/milestones, deliverables, and estimated price.

4.2.1.3 Schedule.

The intended schedule for this activity, referred to as NextSTEP Habitation Phase 2, is depicted in Enclosure 1 and is divided into three main periods (2a, 2b, 2c). The tasks and deliverables for Phases 2a and 2b are the base period and 6 month option 1 of the contract during which all achievement-based milestones will be executed. The 6 month option will provide the flexibility required by the government to match the CLINs proposed with available resources and appropriated funding. The second option is a period that may vary from three to six months to allow for transition to potential follow on phases.

Phase 2a is the primary development period for the contractor's complete, integrated deep space habitat architecture and concepts, development of ground prototypes and participation in the government interface working group and modular reference architecture.

Phase 2b is the period when the contractor shall complete ground prototype development and testing. Phase 2b also includes refinement of the contractor architecture to incorporate results of the interface working group and reference architecture in Phase 2a, and formulate detailed Phase 3 plans (SOW, schedule/milestones, deliverables, and Price).

Phase 2c is the period when the government evaluates and tests selected results from Phase 2a/b results. Phase 2c also marks the transition of selected efforts to Phase 3.

4.2.1.4 Government Testing.

After the 12 month base period of the contracts in Phase 2a, NASA will designate a limited number of the prototypes being developed for independent government testing. This designation does not constitute a downselect decision and all contractors will continue to execute the CLINs and options agreed to in the terms and conditions of their contracts. The nature of the testing has not been fully decided, but testing is anticipated to occur at the end of or after completion of the contractor's testing in Phases 2a and 2b (approximately ATP +18 months). The contractor shall include an option for a priced sub-CLIN to provide potential support for shipping of selected modules to a NASA center. Note: For purpose of pricing this option, the government intends to pay for shipping as part of the resulting awards under this solicitation and the contractor will be responsible for providing a shipping concept, developing associated shipping hardware (special fittings), and preparing and packaging the article for shipping. Alternatively or in addition, NASA may participate in or observe contractor testing of ground prototypes.

4.2.1.5 Launch Requirements.

If choosing to launch on SLS, the initial payloads must address how they will fit within a 4-6MT co-manifest limit, including adapter, and must address cargo version characteristics necessary to accommodate elements or modules. If not exclusively using SLS, the concepts must include other launch vehicle assumptions.

4.2.1.6 GFP/GFE/NASA Subject Matter Expertise.

Offerors may request access to Government facilities or Government services in their proposals. It is the responsibility of offerors to determine the availability of any Government facilities or Government services. Offerors proposing to use Government facilities and Government services shall ensure the Government effort is a discrete effort/SOW. It is not NASA's intent to provide access to Government facilities or Government services except to the extent this access is referenced in the contract through a special provision acknowledging that the Government effort is necessary for the successful completion of the contract.

4.2.1.7 Standards Working Group.

The contractors shall support standards working groups lead by NASA.

4.2.1.8 Access to Research Results/Data Management Plan.

Offerors will not be required to provide a Data Management Plan with proposals for this Appendix.

5 Proposal Review Information

NASA will execute proposal review as defined in the omnibus BAA section of this solicitation.

6 Award Information

- 6.1 Period of Performance:** Period of performance (PoP) for the contracts may be up to 5 years over multiple phases with no period exceeding 12 months. The period of performance for the 12 month base contract will start as of the authorization to proceed effective date which is intended to be Aug 2016. The anticipated PoP for this Habitation Phase 2 effort is 18 months or August 2016 – March 2018, consisting of a 1 year base period and 6 month option with price depending upon the CLIN's selected by the Government. In addition, the proposal shall also include a 3-6 month no-cost option period after the first option (estimated July – Sept 2018) to accommodate government evaluation of Phase 2 results and facilitate potential transition to a follow-on phase.
- 6.2 Award Date:** Award is anticipated on or about August 2016. The price proposal should be based on this anticipated award date. Any reduced appropriations or continuing resolution may effect NASA's ability to award selected offerors or exercise options.
- 6.3 Funding Allocation:** NASA anticipates initially allocating a total of \$65M in FY16 and FY17 (in accordance with the President's Budget request). These are total amounts covering the first year of efforts selected to continue from currently executing Phase 1 contracts efforts as well as efforts selected from this Appendix A solicitation. Contracts shall be firm fixed price with milestone payments structured in CLINs and sub-CLINs. The Government's obligation to make awards is contingent upon the availability of appropriated funds from which payments can be made and the receipt of proposals that NASA determines are acceptable.

Enclosure 1: NextSTEP-2 Phase 2 Notional Schedule

