

NONREIMBURSABLE SPACE ACT AGREEMENT
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
TRANSFORMATIONAL SPACE CORPORATION
FOR
COMMERCIAL SPACE TRANSPORTATION CAPABILITIES

BACKGROUND

The National Aeronautics and Space Administration (NASA) has established the Commercial Crew & Cargo Program Office at the Johnson Space Center (JSC) as part of the Exploration Systems Mission Directorate. The objectives of the Commercial Crew/Cargo Program are to:

- implement U.S. Space Exploration policy with an investment to stimulate commercial enterprises in space,
- facilitate U.S. private industry demonstration of cargo and crew space transportation capabilities with the goal of achieving reliable, cost effective access to low-Earth orbit, and
- create a market environment in which commercial space transportation services are available to Government and private sector customers.

Under this program, NASA is entering into agreements with private industry to develop and demonstrate the vehicles, systems, and operations needed to resupply, return cargo from, and transport crew to and from a human space facility, with the International Space Station providing the representative requirements for such a facility.

Once demonstrated, industry will be able to provide these new services to non-NASA customers. NASA also plans to enter the next phase of the Commercial Crew & Cargo Program and purchase services from commercial providers to support the International Space Station.

This SAA represents the signatories' commitment to meet these goals. Specifically, the approach of t/Space to meet these goals is outlined in Appendix 2.

ARTICLE 1. AUTHORITY

This Agreement is entered into by the National Aeronautics and Space Administration, located at 300 E Street, SW, Washington, DC 20546 (hereinafter referred to as "NASA"), and Transformational Space Corporation, (hereinafter referred to as "t/Space" or "PARTICIPANT") with a place of business at 11710 Plaza America Drive #2000, Reston, VA 20190. NASA's authority to enter into this Agreement is in accordance with the authority set forth in Sections 203(c)(5) and 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended, and NPD 1050.1G.

ARTICLE 2. PURPOSE AND AGENCY COMMITMENT

A. NASA and t/Space enter into this Agreement to facilitate t/Space's anticipated development of a commercial transportation system capable of ferrying cargo and crew between Earth and Low Earth Orbit (LEO). As part of its commitment to developing this commercial capability, t/Space anticipates investing private capital towards its activities. Furthermore, t/Space anticipates completing the first demonstration flight by December 2010.

B. NASA is committed to partnering with the private sector to facilitate the commercialization of LEO and the development of a commercial capability to ferry goods and people to LEO destinations. Accordingly the agency's Commercial Crew & Cargo Program Office is partnering with t/Space, through this agreement, to provide insight and assistance to t/Space in its attempt to develop this capability.

C. The scope of the t/Space effort, as applicable, involves the development and operation of an end-to-end space transportation system including ground operations and integration, launch, rendezvous, proximity operations, docking, orbital operations, reentry, and safe disposal or return. The purpose of this system is to transport crew and cargo between Earth and a LEO destination. This system can also pick up cargo from a LEO destination and dispose of the cargo.

D. This Agreement shall not be construed to allow t/Space use of the International Space Station (ISS). In the event NASA determines that the ISS may be available for use, this Agreement shall be amended to reflect the change or use of

the ISS shall be covered by a separate agreement.

ARTICLE 3. GENERAL PROVISIONS

A. t/Space agrees that all news/press statements, arising out of activities to this Agreement, shall be reviewed and concurred on by the NASA JSC Director of Public Affairs, prior to release.

B. NASA does not endorse or sponsor any commercial product, service, or activity. NASA's participation in this Agreement and/or supply of equipment, facilities, technical information, or services under this Agreement does not constitute endorsement by NASA. t/Space agrees that nothing in this Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of t/Space resulting from activities conducted under this Agreement, regardless of the fact that such product or service may employ NASA-developed technology.

t/Space agrees the words "National Aeronautics and Space Administration" and the letters "NASA" will not be used in connection with a product or service in a manner reasonably calculated to convey any impression that such product or service has the authorization, support, sponsorship, or endorsement of NASA, which does not, in fact, exist. In addition, with the exception of release of general information more particularly described below, t/Space agrees that any proposed public use of the NASA name or initials (including press releases resulting from activities conducted under this Agreement and all promotional and advertising use) shall be submitted by t/Space in advance to the NASA JSC Director of Public Affairs or designee ("NASA Public Affairs") for review and approval. Approval by NASA Public Affairs shall be based on applicable law and policy governing the use of the NASA name and initials.

Use of NASA emblems/devices (i.e., NASA Seal, NASA Insignia, NASA logotype, NASA Program Identifiers, and the NASA Flag) are governed by 14 C.F.R. Part 1221. t/Space agrees that any proposed use of such emblems/devices shall be submitted for review and approval in accordance with such regulations.

NASA or t/Space may, consistent with Federal law and this Agreement, release general information regarding its own participation in this Agreement as desired.

C. The Parties shall comply with all applicable laws and regulations including, but not limited to, safety, security, export control, and environmental laws and regulations.

D. The scope of the collaborative efforts under this Agreement is defined in Article 4 and Appendix 1. All requests for support from NASA covered or related to the efforts of this Agreement shall be coordinated through the NASA Key Official designated in Article 17, including any separate agreements for reimbursable or non-reimbursable work t/Space desires at any NASA center.

E. The parties agree that nothing in this Agreement shall be construed to imply an agreement to contract in the future. It is the intent of both parties that, should future phases of this collaborative effort materialize, these phases will be accomplished under separate agreements, reimbursable or otherwise.

ARTICLE 4. RESPONSIBILITIES

A. t/Space shall use reasonable efforts to:

1. Conduct its development program according to the milestones identified in Appendix 1 to this Agreement.
2. Provide NASA with data regarding its progress towards the milestones.
3. Conduct a quarterly meeting with NASA regarding the past quarter's milestones, demonstrating that the success criteria have been met.

B. NASA shall use reasonable efforts to:

1. Provide a point of contact for t/Space within the Commercial Crew & Cargo Program Office within 60 days after the effective date of this agreement.
2. Provide a library of relevant NASA data/information including, but not limited to, projected requirements of the International Space Station (ISS) for crew and cargo

transportation services, ISS visiting vehicle requirements, and NASA human rating requirements.

3. Provide Program know-how regarding the ISS visiting vehicle and NASA human ratings requirements and processes. Resources will be provided on an as-available basis by the Commercial Crew & Cargo Program Office.

4. Review data provided by t/Space.

5. Attend quarterly meetings with t/Space regarding the past quarter's milestones.

6. Within 30 days of each quarterly meeting, provide t/Space a written acknowledgement of milestone completion if NASA ascertains that the milestones of the previous quarter have been accomplished. Nothing in the acknowledgement of milestone completion shall be construed to imply that NASA endorses or sponsors any t/Space product or service resulting from activities conducted under this Agreement. NASA's acknowledgement shall not be construed to imply approval or endorsement of the safety, reliability or appropriateness of any t/Space design, system, architecture or testing methodology.

7. NASA may, at its discretion and after coordination with t/Space, attend and observe t/Space milestones.

ARTICLE 5. SCHEDULE AND MILESTONES

The scheduled major milestones are as documented in Appendix 1.

ARTICLE 6. FINANCIAL OBLIGATIONS

There shall be no transfer of funds or other financial obligations between NASA and t/Space in connection with this Agreement. Each party shall fund its own participation under this Agreement.

ARTICLE 7. SCHEDULING CONFLICTS

The above schedule and milestones are estimated based upon the parties' current understanding of the projected use of

NASA resources. Both parties agree to put forth reasonable efforts and cooperate in good faith to achieve the objectives of this Agreement. In the event NASA's projected usage of its resources changes, t/Space shall be given reasonable notice of the change, so that the schedule and milestones may be adjusted accordingly. The parties agree that NASA's usage of its resources shall have priority over the usage planned in this Agreement should a conflict arise, and NASA, in its sole discretion, shall determine whether to exercise that priority. Likewise, should a conflict arise as between two users, NASA, in its sole discretion, shall determine the priority as between the two users. The parties agree that the facilities, equipment, supplies, or services contemplated by this Agreement shall not be performed in any manner which interferes with NASA's overall mission.

ARTICLE 8. NONEXCLUSIVITY

This Agreement is not exclusive; accordingly, NASA may enter into similar Agreements for the same or similar purpose with other U.S. private or public entities.

ARTICLE 9. LIABILITY AND RISK OF LOSS

A. Each Party hereby waives any claim against the other Party, employees of the other Party, the other Party's related entities (including, but not limited to, contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors and subcontractors, at any tier), and employees of the other Party's related entities for any injury to, or death of, the waiving Party's employees or the employees of its related entities, or for damage to, or loss of, the waiving Party's property or the property of its related entities arising from or related to activities conducted under this Agreement, whether such injury, death, damage or loss arises through negligence or otherwise, except in the case of willful misconduct.

B. Each Party further agrees to extend this cross-waiver to its related entities by requiring them, by contract or otherwise, to waive all claims against the other Party, related entities of the other Party, employees of the other Party and employees of its related entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement.

ARTICLE 10. INTELLECTUAL PROPERTY AND DATA RIGHTS - RIGHTS
IN DATA

A. General

1. "Related Entity" as used in this Data Rights clause, means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or Participant that is assigned, tasked, or contracted with to perform specified NASA or Participant activities under this Agreement.

2. "Data," as used in this Data Rights clause, means recorded information, regardless of form, the media on which it may be recorded, or the method of recording. The term includes, but is not limited to, data of a scientific or technical nature, computer software and documentation thereof, and data comprising commercial and financial information.

3. "Proprietary Data," as used in this Data Rights clause, means Data embodying trade secrets or comprising commercial or financial information that is privileged or confidential.

4. The Data rights set forth herein are applicable to employees of Participant and employees of any Related Entity of Participant. Participant shall ensure that its employees and employees of any Related Entity that perform Participant activities under this Agreement are aware of the obligations under this clause and that all such employees are bound to such obligations.

5. Data exchanged between NASA and Participant under this Agreement will be exchanged without restriction as to its disclosure, use, or duplication except as otherwise provided in this clause.

6. No preexisting Proprietary Data will be exchanged between the Parties under this Agreement unless specifically authorized in this clause or in writing by the owner of the Proprietary Data.

7. In the event that Data exchanged between NASA and Participant include a restrictive notice that NASA or Participant deems to be ambiguous or unauthorized, NASA or Participant may notify the other Party of such condition. Notwithstanding such a notification, as long as the restrictive notice provides an indication that a restriction on use or disclosure was intended, the Party

receiving such Data will treat the Data pursuant to the requirements of this clause unless otherwise directed in writing by the Party providing such Data.

8. Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this clause, the Parties will not be restricted in the use, disclosure, or reproduction of Data provided under this Agreement that:

(a) is publicly available at the time of disclosure or thereafter becomes publicly available without breach of this Agreement;

(b) is known to, in the possession of, or developed by the receiving Party independent of carrying out the receiving Party's responsibilities under this Agreement and independent of any disclosure of, or without reference to, Proprietary Data or otherwise protectable Data hereunder;

(c) is received from a third party having the right to disclose such information without restriction; or

(d) is required to be produced or released by the receiving Party pursuant to a court order or other legal requirement.

9. If either NASA or Participant believes that any of the events or conditions that remove restriction on the use, disclosure, or reproduction of the Data apply, NASA or Participant will promptly notify the other Party of such belief prior to acting on such belief, and, in any event, will notify the other Party prior to an unrestricted use, disclosure, or reproduction of such Data.

10. Disclaimer of Liability: Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this clause, NASA will not be restricted in, nor incur any liability for, the use, disclosure, or reproduction of any Data not identified with a suitable restrictive notice in accordance with paragraphs B and H of this clause or of any Data included in Data which Participant has furnished, or is required to furnish to the U.S. Government without restriction on disclosure and use.

11. Participant shall use the following, or a similar, restrictive notice as required by paragraphs B and H of this clause. In addition to identifying Proprietary Data with such a restrictive notice, Participant should mark each page containing Proprietary Data with the following, or a similar, legend: "Proprietary Data - use and disclose only in accordance with notice on title or cover page."

Proprietary Data Notice

These data herein include *<enter as applicable: "Background Data" or "Data Produced by Participant under a Space Act Agreement">* in accordance with the Data Rights provisions under Space Act Agreement *<provide applicable identifying information>* and embody Proprietary Data. In accordance with the Space Act Agreement, NASA will use reasonable efforts to maintain the data in confidence and limit use, disclosure, and reproduction by NASA and any Related Entity of NASA in accordance with restrictions identified in the Space Act Agreement *<may list specific restrictions listed in the Agreement>*.

B. Data First Produced by Participant under this Agreement

In the event Data first produced by Participant in carrying out Participant responsibilities under this Agreement is furnished to NASA, and Participant considers such Data to be Proprietary Data, and such Data is identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for carrying out NASA responsibilities under this Agreement. Upon completion of activities under this Agreement, such Data will be disposed of as requested by Participant.

C. Data First Produced by NASA Under this Agreement

Except for data disclosing an invention owned by NASA for which patent protection is being considered, in the event Participant requests that Data first produced by NASA (or any Related Entity of NASA) in carrying out NASA's responsibilities under this Agreement be maintained in confidence, and to the extent NASA determines that such Data would be Proprietary Data if it had been obtained from Participant, NASA will mark such Data with a restrictive notice and will maintain such marked Data in confidence for a period of two (2) years after development of the Data, with the express understanding that during the aforesaid restricted period such marked Data may be disclosed and used (under suitable protective conditions) by or on behalf of the U.S. Government for U.S. Government purposes only,

and thereafter for any purpose whatsoever without restriction on disclosure and use. Participant agrees not to disclose such marked Data to any third party without NASA's written approval until the aforesaid restricted period expires.

D. Publication of Results

1. Recognizing that section 203 of the National Aeronautics and Space Act of 1958 (42 U.S.C. § 2473), as amended, requires NASA to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof, and that the dissemination of the results of NASA activities is one of the considerations for this Agreement, NASA will coordinate proposed publication of results with Participant in a manner that allows Participant a reasonable amount of time to review and comment on proposed publications.

2. Consistent with other obligations in this clause, NASA agrees that it will not publish any results without first receiving permission from Participant.

E. Data Disclosing an Invention

In the event Data exchanged between NASA and Participant discloses an invention for which patent protection is being considered, the furnishing Party specifically identifies such Data, and the disclosure and use of such Data is not otherwise limited or restricted herein, the receiving Party agrees to withhold such Data from public disclosure for a reasonable time (presumed to be one (1) year unless mutually agreed otherwise or unless such information is restricted for a longer period herein) in order for patent protection to be obtained.

F. Copyright

In the event Data is exchanged with a notice indicating that the Data is copyrighted and there is no indication that such Data is subject to restriction under paragraphs B or C of this clause (i.e., Data is not marked with a restrictive notice as required by paragraphs B or C of this clause), such Data will be presumed to be published and the following royalty-free licenses will apply.

1. If it is indicated on the Data that the Data existed prior to, or was produced outside of, this

Agreement, the receiving Party and others acting on its behalf, may reproduce, distribute, and prepare derivative works only for carrying out the receiving Party's responsibilities under this Agreement.

2. If the Data does not contain the indication of (1) above, the Data will be presumed to have been first produced under this Agreement and, except as otherwise provided in paragraph E of this clause for the protection of reported inventions, the receiving Party and others acting on its behalf may reproduce, distribute, and prepare derivative works for any purpose.

G. Data Subject to Export Control

Technical data, whether or not specifically identified or marked, that is subject to the export laws and regulations of the United States and that is provided to Participant under this Agreement will be treated as such, and will not be further provided to any foreign persons or transmitted outside the United States without proper U.S. Government authorization, where required.

H. Background Data

In the event Participant furnishes NASA with Data developed at private expense (or in the case of state or local government Data at government expense) that existed prior to, or was produced outside of, this Agreement, and such Data embody Proprietary Data, and such Data is so identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for carrying out NASA responsibilities under this Agreement. Upon completion of activities under this Agreement, such Data will be disposed of as requested by Participant.

I. Handling of Data

1. In the performance of this Agreement, Participant and any Related Entity of Participant may have access to, be furnished with, or use the following categories of Data:

(a) Proprietary Data of third parties that the U.S. Government has agreed to handle under protective arrangements; and/or

(b) U.S. Government Data, the use and dissemination of which, the U.S. Government intends to control.

2. Data provided by NASA to Participant under the Agreement:

(a) At the time of execution of this Agreement, the Parties agree that the following Proprietary Data of third parties will be provided to the Participant with the express understanding that Participant will use and protect such DATA in accordance with this clause: None

(b) At the time of execution of this Agreement, the Parties agree that the following U.S. Government Data will be provided to Participant with the express understanding that Participant will use and protect such U.S. Government Data in accordance with this clause: None

(c) At the time of execution of this Agreement, the Parties agree that the following software and related Data will be provided to Participant under a separate Software Usage Agreement with the express understanding that Participant will use and protect such related Data in accordance with this clause. Unless Participant has entered into a license, consistent with 37 C.F.R. Part 404, for software provided under this Agreement, upon completion of activities under this Agreement, such related Data will be disposed of as instructed by NASA: None

3. With respect to such Data specifically identified in this Agreement or specifically marked with a restrictive notice, Participant agrees to:

(a) Use, disclose, or reproduce such Data only to the extent necessary to perform the work required under this Agreement;

(b) Safeguard such Data from unauthorized use and disclosure;

(c) Allow access to such Data only to its employees and any Related Entity that require access for their performance under this Agreement.

(d) Except as otherwise indicated in 3(c) above, preclude access and disclosure of such Data outside Participant's organization;

(e) Notify its employees who may require access to such Data about the obligations under this clause and ensure that such employees comply with such obligations,

and notify its Related Entity that may require access to such Data about their obligations under this clause; and

(f) Return or dispose of such Data, as NASA may direct, when the Data is no longer needed for performance under this Agreement.

J. Oral and Visual Information

If information that Participant considers to be Proprietary Data is disclosed orally or visually to NASA, NASA will have no duty to limit or restrict, and will not incur any liability for, any disclosure or use of such information unless (a) Participant orally informs NASA before initial disclosure that such information is considered to be Proprietary Data, and (b) Participant reduces such information to tangible, recorded form that is identified and marked with a suitable restrictive notice as required by paragraphs B and H above and furnishes the resulting Data to NASA within 10 calendar days after such oral or visual disclosure.

K. Classified Material

In the event that access to, acquisition of, or delivery of classified material is required under this Agreement, the Participant must provide a completed Contract Security Classification Specification (DD Form 254 or equivalent) to the NASA Technical Point of Contact identified herein. Transmission and access to classified material shall be in accordance with NASA and U.S Federal Government statutes, regulations, and policies.

ARTICLE 11. INTELLECTUAL PROPERTY AND DATA RIGHTS - PATENT AND INVENTION RIGHTS

Based on the purpose and scope of this Agreement, and the responsibilities of the Parties, NASA has made an administrative determination that the provisions of section 305(a) of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. § 2457(a)), do not apply to this Agreement. Therefore, title to inventions made (conceived or first actually reduced to practice) as a result of activities performed under this Agreement will remain with the respective inventing party(ies). No invention or patent rights are exchanged between or granted by such parties under this Agreement except that NASA and t/Space agree to use reasonable efforts to identify and report to

each other any invention that is believed to have been made jointly by employees of t/Space and employees of NASA (including employees of such NASA contractors, subcontractors, or other entities), and to consult and agree as to the responsibilities and course of action to be taken to establish and maintain patent protection on such invention and on the terms and conditions of any license or other rights to be exchanged or granted by or between NASA and t/Space.

ARTICLE 12. DISCLAIMER OF WARRANTY

Equipment, facilities, technical information, and services provided by NASA under this Agreement are provided "as is." NASA makes no express or implied warranty as to the condition of such equipment, facilities, technical information, or services, or as to the condition of any research or information generated under this Agreement, or as to any products made or developed under or as a result of this Agreement including as a result of the use of information generated hereunder, or as to the merchantability or fitness for a particular purpose of such research, information, or resulting product, or that the equipment, facilities, technical information, or services provided will accomplish the intended results or are safe for any purpose including the intended purpose, or that any of the above will not interfere with privately owned rights of others. Neither the government nor its contractors shall be liable for special, consequential or incidental damages attributed to such equipment, facilities, technical information, or services provided under this Agreement or such research, information, or resulting products made or developed under or as a result of this Agreement.

ARTICLE 13. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect until the completion of all obligations of both parties hereto, or 3 years from the date of the last signature, whichever comes first.

ARTICLE 14. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Agreement by providing 30 calendar days written notice to the other Party.

ARTICLE 15. CONTINUING OBLIGATIONS

The obligations of the Parties set forth in the following provisions shall continue to apply after the expiration or termination of this Agreement:

ARTICLE 9, "LIABILITY AND RISK OF LOSS"

ARTICLE 10, "INTELLECTUAL PROPERTY AND DATA RIGHTS - RIGHTS IN DATA"

ARTICLE 11, "INTELLECTUAL PROPERTY AND DATA RIGHTS - PATENT AND INVENTION RIGHTS"

ARTICLE 21, "EXPORT LICENSES"

ARTICLE 16. DISPUTE RESOLUTION

Except as otherwise provided in the article of this Agreement entitled "Scheduling Conflicts," for those activities subject to 37 C.F.R. Part 404 under the articles of this Agreement entitled "Intellectual Property and Data Rights," and those situations where a pre-existing statutory or regulatory system exists (e.g. under the Freedom of Information Act, 5 U.S.C. § 552), all disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the appropriate person identified as the "KEY PERSONNEL".

The persons identified as the KEY PERSONNEL for NASA and the t/Space will consult and attempt to resolve all issues arising from the implementation of this Agreement. If the Parties remain unable to resolve the dispute, then the NASA Associate Administrator, Exploration Systems Mission Directorate, or that person's designee will issue a written decision which shall be a final Agency decision for all purposes including judicial review. Nothing in this section limits or prevents either Party from pursuing any other right or remedy available by law after exhaustion of administrative remedies.

ARTICLE 17. KEY PERSONNEL

The following personnel are designated as the key officials for their respective party.

NASA

Alan Lindenmoyer
Manager, Commercial Crew &
Cargo Program
Mail Stop: QA
2101 NASA Parkway
Houston, Texas 77058
Phone: 281-244-7064
Fax: 281-483-5970
alan.j.lindenmoyer@nasa.gov

t/Space, Inc.

ARTICLE 18. MODIFICATION/AMENDMENTS

Any modification to this Agreement shall be executed, in writing, and signed by an authorized representative of NASA and t/Space. Any modification that creates an additional commitment of NASA resources must be signed by the original NASA signatory authority, or successor, or a higher level NASA official possessing original or delegated authority to make such a commitment.

ARTICLE 19. ASSIGNMENT OF RIGHTS

Neither this Agreement nor any interest arising under it will be assigned by either party without the express written consent of the other party.

ARTICLE 20. ANTI-DEFICIENCY ACT

All activities under or pursuant to this Agreement are subject to the availability of appropriated funds, and no provision shall be interpreted to require obligation or provision of funds in violation of the Anti-deficiency Act, 31 U.S.C. 1341.

ARTICLE 21. EXPORT LICENSES

t/Space will be responsible for:

A. Compliance with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this Agreement. In the absence of available license exemptions/exceptions, t/Space will be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data, and software, or for the provision of technical assistance.

B. Obtaining export licenses, if required, before utilizing foreign persons in the performance of this Agreement, including instances where work will be performed on-site at NASA Centers, where the foreign person will have access to export-controlled technical data or software.

C. All regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

D. Ensuring that the provisions of this Article apply to its subcontractors.

In the event that either party intends to utilize a foreign person (as defined in the International Traffic in Arms Regulations and the Export Administration Regulations) in the performance of this Agreement, such party shall be responsible for obtaining the required export licenses in advance of the foreign person's participation.

ARTICLE 22. APPLICABLE LAW

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of this Agreement, the meaning of its provisions, and the rights, obligations and remedies of the parties.

ARTICLE 23. SIGNATURE BLOCK

The signatories to this Agreement covenant and warrant that they have authority to execute this Agreement. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

TRANSFORMATIONAL SPACE
CORPORATION

for BY: Douglas R Cooke
Scott J. Horowitz
Associate Administrator,
Exploration Systems Mission
Directorate

BY: Charles Duelfer
Charles Duelfer
CEO

DATE: 1/31/2007

DATE: 1/29/07

APPENDIX 1: Milestones and Success Criteria

Date	Milestone Description/ Objective Success Criteria
Oct 2007	<p>Milestone 1: Structural Definition</p> <p>Description: t/Space shall complete the Crew Transfer Vehicle (CXV) structural definition.</p> <p>Success criteria:</p> <ul style="list-style-type: none"> 1) Preliminary specifications complete: <ul style="list-style-type: none"> a) CAD drawing delivered. b) Mass properties report delivered. c) Structural, dynamic and thermal analysis reports delivered.
Dec 2007	<p>Milestone 2: Facility Readiness Review</p> <p>Description: t/Space shall conduct a Design and Fabrication Facility Readiness Review.</p> <p>Success criteria:</p> <ul style="list-style-type: none"> 1) The facility is determined to be adequate for design and fabrication activities. 2) The facility is ready to be placed in an operational status before arrival of spacecraft hardware. 3) All facility deficiencies have been documented and are accepted by contractor for correction with agreed schedule. 4) Facility lease contract is signed.
Mar 2008	<p>Milestone 3: System Design Review</p> <p>Description: t/Space shall conduct a CXV preliminary system design review.</p> <p>Success criteria:</p> <ul style="list-style-type: none"> 1) Systems requirements and any customer imposed constraints are defined. 2) All technical requirements are allocated, and the flow down to subsystems is adequate. 3) The technical approach is credible and

	<p>responsive to the identified requirements.</p> <p>4) Technical plans have been updated, as necessary.</p> <p>5) The preliminary systems design definitions are complete.</p> <p>6) Risks to mission success are understood, and plans and resources exist to effectively manage them.</p>
Mar 2008	<p>Milestone 4: Carrier Aircraft Procurement</p> <p>Description: t/Space shall complete the carrier aircraft procurement.</p> <p>Success Criteria: Procurement contract signed.</p>
Jun 2008	<p>Milestone 5: TPS</p> <p>Description: t/Space shall conduct TPS water immersion and arc jet tests to determine reusability of SIRCA tile following water impact and soak and thermal loading.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned are captured.
June 2008	<p>Milestone 6: Booster Core Rocket Test</p> <p>Description: t/Space shall perform a booster core rocket test firing to determine engine and nozzle performance, functional check, and validate VAPAK model.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for organizational improvement and system operations are captured.
Sep 2008	<p>Milestone 7: Modified Carrier Aircraft Flight Test</p> <p>Description: t/Space shall complete the carrier aircraft flight test.</p>

	<p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for organizational improvement and system operations are captured.
Sep 2008	<p>Milestone 8: CXV Structural Tests</p> <p>Description: t/Space shall complete the CXV structural test article static load and modal tests</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for organizational improvement and system operations are captured.
Dec 2008	<p>Milestone 9: Structural Test Article Pressure Integrity</p> <p>Description: t/Space shall complete the CXV structural test article pressure integrity test.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for system operations are captured.
Dec 2008	<p>Milestone 10: Parachute Test</p> <p>Description: t/Space shall complete the altitude parachute system test.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for organizational improvement and system operations are captured.
Mar 2009	<p>Milestone 11: Wind Tunnel Tests</p> <p>Description: t/Space shall complete wind tunnel tests.</p>

	<p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for system operations are captured.
Mar 2009	<p>Milestone 12: CXV Crew Compartment #1 Delivery</p> <p>Description: t/Space shall receive the Crew Compartment (CC) #1 flight article from contractor.</p> <p>Success Criteria:</p> <ol style="list-style-type: none"> 1) Inspection and acceptance complete. 2) Hardware meets the established acceptance criteria. 3) Shipping, handling, and checkout are complete and the hardware is ready for further processing. 4) Technical data package is complete and reflects the delivered system.
April 2009	<p>Milestone 13: Weight Growth Mitigation Strategies Review</p> <p>Description: t/Space shall conduct a review of the spacecraft weight growth and strategies to mitigate weight growth.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Weight growth is documented. 2) Mitigation strategies are defined. 3) The technical approach is credible for any required solutions. 4) Technical plans have been updated, as necessary. 5) Risks to mission success are understood, and plans and resources exist to effectively manage them.

<p>May 2009</p>	<p>Milestone 14: Program Risk Analysis Review</p> <p>Description: t/Space shall conduct a review of the probabilistic risk assessment (PRA) for crew survivability and high value cargo.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) PRA is documented. 2) Mission reliability for crew survivability and high value cargo are defined. 3) The technical approach is credible. 4) Risks to mission success are understood, and plans and resources exist to effectively manage them.
<p>May 2009</p>	<p>Milestone 15: Launch Abort Review</p> <p>Description: t/Space shall conduct a review of CXV ascent abort scenarios and analyses related the safety and survivability of the t/Space launch abort system.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Abort scenarios are defined. 2) Trade studies and analyses are documented. 3) The technical approach is credible. 4) Risks to mission success are understood, and plans and resources exist to effectively manage them. 5) Tests are planned to validate selected launch abort system.
<p>Jun 2009</p>	<p>Milestone 16: RCS Tests</p> <p>Description: t/Space shall complete installation of RCS system in CC.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. All applicable lessons learned for system operations are captured.

<p>June 2009</p>	<p>Milestone 17: Orbital Module Flight Test Article Delivery</p> <p>Description: t/Space shall receive Orbital Module (OM) flight test article from contractor</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Inspection and acceptance complete. 2) Hardware meets the established acceptance criteria. 3) Shipping, handling, and checkout are complete and the hardware is ready for further processing. 4) Technical data package is complete and reflects the delivered system.
<p>June 2009</p>	<p>Milestone 18: Booster Flight Test Article #1 Delivery</p> <p>Description: t/Space shall receive the booster flight test article from its contractor.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Inspection and acceptance complete. 2) Hardware meets the established acceptance criteria. 3) Shipping, handling, and checkout are complete and the hardware is ready for further processing. 4) Technical data package is complete and reflects the delivered system.
<p>Sep 2009</p>	<p>Milestone 19: CXV Flight Article Pressure Integrity Test</p> <p>Description: t/Space shall complete the CXV flight article pressure integrity test.</p> <p>Success criteria:</p>

	<p>1) Test results are documented.</p> <p>2) All applicable lessons learned for system operations are captured.</p>
Dec 2009	<p>Milestone 20: Carrier Aircraft Tests</p> <p>Description: t/Space shall conduct the carrier aircraft and booster captive carry flight test.</p> <p>Success criteria:</p> <p>1) Test results are documented.</p> <p>2) All applicable lessons learned for organizational improvement and system operations are captured.</p>
Dec 2009	<p>Milestone 21: CXV Suborbital Uncrewed Flight Test</p> <p>Description: t/Space shall conduct the CXV suborbital uncrewed flight with abort test.</p> <p>Success criteria:</p> <p>1) Test results are documented.</p> <p>2) All applicable lessons learned for organizational improvement and system operations are captured.</p>
Mar 2010	<p>Milestone 22: Flight Rules and Crew Training Products</p> <p>Description: t/Space shall complete the demonstration flight rules development and crew training products development.</p> <p>Success criteria:</p> <p>1) Demonstration flight rules complete.</p> <p>2) Crew training products listed are complete:</p> <p>a) Crew Operations Manual</p> <p>b) CXV Systems Data Book</p>

<p>Mar 2010</p>	<p>Milestone 23: Booster Flight Test Article #2 Delivery</p> <p>Description: t/Space shall receive booster test article #2.</p> <p>Success Criteria:</p> <ol style="list-style-type: none"> 1) Inspection and acceptance complete. 2) Hardware meets the established acceptance criteria. 3) Shipping, handling, and checkout are complete and the hardware is ready for further processing. 4) Technical data package is complete and reflects the delivered system.
<p>Jun 2010</p>	<p>Milestone 24: Recovery Readiness Test</p> <p>Description: t/Space shall complete the recovery readiness test.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Test results are documented. 2) All applicable lessons learned for organizational improvement and system operations are captured.
<p>Oct 2010</p>	<p>Milestone 25: Orbital Test Flight</p> <p>Description: t/Space shall write a test plan for and then complete a CXV orbital flight test verifying booster and CXV system performance. This flight shall demonstrate compliance with applicable crew transportation requirements.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Complete orbital test in accordance with test plan. 2) Test results are documented. 3) All applicable lessons learned for organizational improvement and system operations are captured.

Dec 2010	<p>Milestone 26: Orbital Piloted Test Flight</p> <p>Description: t/Space shall write a test plan for and then complete a piloted orbital CXV flight test with rendezvous and docking to a LEO test bed. This flight shall demonstrate compliance with applicable crew transportation requirements.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Complete orbital piloted test flight in accordance with the test plan. 2) Test results are documented. 3) All applicable lessons learned for organizational improvement and system operations are captured.
Dec 2010	<p>Milestone 27: Kickoff of Crew Transportation Development</p> <p>Description: t/Space shall host a kickoff meeting to describe the plan for crew transportation program implementation, which includes an integrated schedule, financing, risks, and anticipated mitigations.</p> <p>Success criteria:</p> <ol style="list-style-type: none"> 1) Program implementation plan documented. 2) The technical approach is credible. 3) Risks to mission success are understood, and plans and resources exist to effectively manage them.
Jan 2011	<p>Milestone 28: t/Space Human Rating Plan Review</p> <p>Description: To begin implementation of the crew transportation program, t/Space shall conduct a t/Space Human Rating Plan review.</p> <p>Success Criteria:</p> <ol style="list-style-type: none"> 1) t/Space Human Rating Plan is documented. 2) The technical approach is credible.
Feb 2011	<p>Milestone 29: Human Rating Plan Ground Verification</p> <p>Description: t/Space shall conduct ground testing to verify compliance with the Human</p>

	<p>Rating Plan.</p> <p>Success Criteria: Completion of ground verification in accordance with the Human Rating Plan.</p>
Mar 2011	<p>Milestone 30: Crew Transportation Mission #1 - Piloted CXV with Rendezvous and Docking to Orbital Test Bed</p> <p>Description: t/Space shall write a test plan for and then complete a piloted orbital CXV flight test with rendezvous and docking to an orbital test bed. This flight shall demonstrate compliance with applicable crew transportation requirements.</p> <p>Success Criteria: Complete Crew Transportation Demonstration Mission #1 in accordance with the test plan.</p>
Jun 2011	<p>Milestone 31: Crew Transportation Mission #2 - Piloted CXV with Rendezvous and Docking to Orbital Test Bed</p> <p>Description: t/Space shall write a test plan for and then complete a piloted orbital CXV flight test with rendezvous and docking to an orbital test bed. This flight shall demonstrate compliance with applicable crew transportation requirements.</p> <p>Success Criteria: Complete Crew Transportation Demonstration Mission #2 in accordance with the test plan.</p>

APPENDIX 2: TECHNICAL OVERVIEW

With a single-flight mission, the CXV spacecraft can deliver three crew and 940 kg of internal cargo to Low Earth Orbit, and return 50 kg. On single-flight missions with two crew, it can deliver 1140 kg of internal cargo to LEO and return 250 kg.

With a two-flight mission, t/Space launches a cargo canister that carries 1795 kg of internal cargo, and then the CXV is launched to rendezvous with it. Counting the CXV's 940 kg of internal cargo, this delivers a total of 2,735 kg and up to three crew members.

For external cargo, a canister that opens like the Shuttle bay will be used. It can deliver 1025 kg in a two-flight mission; the CXV delivers an additional 940 kg of internal cargo and up to three crew members in such a mission.

All missions are air-launched, which means t/Space flights will not be delayed by local weather conditions; the carrier aircraft simply flies to clear skies. The carrier aircraft also can fly across longitudes to match its release point with the desired orbit path. (The ability to fly out east over the Atlantic also permits launches on southbound ISS passes in addition to northbound passes.)