Google NASA Annex Agreement

For

Google NASA Planetary Content Team

Project Type: *reimbursable*

Project Lead (Google): B-6 B-6

Project Lead (NASA): Chris C. Kemp

This Agreement Annex is an amendment to the Google-NASA Space Act Agreement dated November 3rd, 2006 (the "Agreement"), as specified in Section II of that Agreement.

1 Project Overview

1.1 Introduction and Purpose

The objective of the Google NASA Planetary Content Team is to develop the tools to make NASA's geospatial information universally accessible to the public. By leveraging the ubiquitous and freely available planetary browsers Google Earth and Google Maps, publicly available data, and open standards, this project will develop a platform for users to access scientific data and enhance NASA's outreach activities by making this content more accessible.

1.2 Objectives

1. Develop interactive content that will help users understand and navigate the scientific information collected by NASA and allow them to connect viscerally to the agency's Exploration mission.
2. Make NASA's publicly released geospatial information more universally accessible and useful.
3. Develop software tools for geospatial information processing and publication.

1.3 Project Description

1. This Project will make NASA's geospatial planetary content more accessible and engaging to the general public through planetary browsers such as Google Earth by developing software for collecting data and related content, processing this data into formats suitable for online distribution, and presenting content from various sources in an integrated manner that communicates its scientific or historical importance.

1.4 Responsibilities and Technical Summary

1.4.1 Google shall use reasonable efforts to perform the following tasks:

- Provide responsive feedback to the Google NASA Planetary Content team.
- Provide hosting, when appropriate, for popular NASA content in Google Earth.

1.4.2 NASA Ames Research Center shall use reasonable efforts to perform the following tasks:

- Develop software tools to make NASA planetary data more accessible and useful to the general public, leveraging open standards where applicable.
- Develop demonstration content and "presentation layers" in KML using these tools, releasing this content as appropriate.
- Provide feedback to Google on Google Earth.

1.5 Expected Results

1. Develop and release software tools to assist in publishing content via planetary browsers such as Google Earth.
2. Make select publicly released NASA Earth content accessible on a new "NASA layer" viewable with planetary browsers such as Google Earth.

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3. Generate a composite Moon dataset and content overlays for use with planetary browsers such as Google Earth.
4. Prototype a composite Mars dataset and content overlays for use with planetary browsers such as Google Earth.

2 Project Management

2.1 Proposed Deliverables. The parties will use reasonable efforts to perform the following proposed deliverables:

Phase I

1. Improved KML overlays of select publicly released Earth maps and time series (e.g. biosphere or sea surface temperature).
2. Global base map of the Moon (drawing from e.g. the Clementine Lunar Basemap Mosaic), served via web services and as KML overlays.
3. Select high-resolution images of historically or scientifically interesting locations on the Moon as KML overlays, such as Apollo landing sites or sites of possible future exploration.
4. Geographical features (e.g. IAU place names) for the Moon as KML overlays.

Phase II

1. Demonstration of interactive Earth content overlays in KML and HTML relating to one or more selected Earth focus topics.
2. Additional high-resolution and non-aerial images of the Moon and associated informational content (e.g. Apollo exploration stories, NASA press releases and associated imagery, the NASA Lunar exploration architecture).
3. Improved global base map of the Moon and alternative maps (e.g. temperature, mineralogy) via web services and KML.
4. A global base map of Mars and select high-resolution images and placemarks, served via web services and as KML overlays.
5. Topographical base maps of Moon and Mars served via web services and integrated with prototype Google tools if/when appropriate.

Ongoing Activities

1. Develop and release open-source software tools to assist in publishing content via planetary browsers such as Google Earth.
2. Provide expertise to NASA science instrument teams of ongoing missions to get up-to-date data into standard formats and available via planetary browsers such as Google Earth as quickly as possible.

In addition to these milestones, the following recurring meetings will be scheduled:

1. Monthly technical interchange meeting with Google NASA Planetary Content Team at Google.
2. Quarterly meeting to review progress with Google NASA Planetary Content Team at Google.

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2.2 Personnel

Technical Key Personnel

NASA	Google
Name: Matthew Hancher	Name: B-6 B-6
Title:	Title:
Address: NASA Ames Research Center Mail Stop Moffett Field, CA 94035 – 1000	Address: Google, Inc. 1600 Amphitheater Parkway Mountain View, CA 94043
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Business Key Personnel

NASA	Google
Name: Chris Kemp	Name: B-6 B-6
Title:	Title:
Address: NASA Ames Research Center Mail Stop Moffett Field, CA 94035 – 1000	Address: Google, Inc. 1600 Amphitheater Parkway Mountain View, CA 94043
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Tel. No: 650-604-4822	Tel. No: B-6 B-6

NASA personnel for this Project will include Contractors.

2.3 Financial Obligations and Resources

2.3.1 NASA Ames Research Center's estimated cost for this Annex is $500K. Reimbursement provided by Google to NASA shall be subject to Financial Obligations in Section V of the Agreement between NASA Ames Research Center and Google (signed November 3, 2006), as amended. Consistent with the Agreement, this Annex is intended to be the means to transfer funds or other financial obligations from Google to NASA in connection with the Agreement.

3 Liability and Risk of Loss

3.1 This Annex is subject to the Liability and Risk of Loss provisions contained within Section VI of the Agreement between NASA Ames Research Center and Google (signed November 3, 2006) , as amended.

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4 Identified Intellectual Property, including Proprietary Data

4.1 This Annex is subject to the Intellectual Property provisions contained within Section VII of the Agreement between NASA Ames Research Center and Google (signed November 3rd, 2006). The Parties agree to adjust the Data Produced by NASA protection period under Section VII.B.4 as follows: No change.

4.2 **Background NASA Software intended to be used in this Project**

- ARC-15761-1 NASA Vision Workbench, an open source, modular, extensible computer vision framework, to be licensed to Google under a separate agreement.
- ARC-15446-1 Ames Stereo Engine, rapid 3D surface reconstruction from stereo image pairs, to be licensed to Google under a separate agreement.

4.3 Data processing software produced by NASA under this Annex will be released in an open source manner.

5 Duration and Modification

Duration of this Annex is one year after the date of the last signature to this Annex. Modifications of this Annex may be approved only by a written modification of this Annex, signed by the authorized representatives of the Parties.

IN WITNESS WHEREOF, each party has caused this Agreement Annex to be executed by its duly authorized representative.

GOOGLE INC.	**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**
By:	By:
Name: Urs Hoelzle	Name: SIMON P. WORDEN
Title: Sr. VP of Operations	Title: CENTER DIRECTOR, ARC
Date: 12 January 2007	Date: 22 JAN 07

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