PUBLIC REDACTED VERSION

Google Inc.
File No. 0722-EX-PL-2014

Date: October 13, 2014

Subject: Public and Redacted Version of Request for Confidential Treatment and Complementary Exhibits

FCC File No.: 0722-EX-PL-2014

To Whom It May Concern:

Google Inc. (Google), pursuant to 5 U.S.C. § 552 and Sections 0.457 and 0.459 of the Commission's Rules, 47 C.F.R. §§ 0.457, 0.459, hereby requests that certain information complementary to its above-referenced application for Experimental Radio Service License (Experimental License) be treated as confidential and not subject to public inspection. The designated information constitutes confidential and proprietary information that, if subject to public disclosure, would cause significant commercial, economic, and competitive harm. As described below, Google's request satisfies the standards for grant of such requests set forth in Sections 0.457 and 0.459 of the Commission's Rules.

In accordance with Section 0.459(b) and in support of this request, Google provides the following information:

1. Identification of the Information for Which Confidential Treatment is Sought:

Google's request for confidential treatment is limited to the following information that has been redacted from the Experimental License and Exhibit B. Google does not seek to withhold from public inspection information in the Experimental License necessary for interference mitigation, including applicant name, contact information, test location, frequency, output power, effective radiated power, emission characteristics and modulation.

Exhibit B - Technical Information:

Google requests confidential treatment of the following underlined text from Exhibit B that contain confidential and proprietary information regarding the proposed tests/experiments:

Applicant Name: Google Inc.
Applicant FRN: 0016069502

Legal Contact Details

Name of Contact	Aparna Sridhar
Contact Details	Counsel 25 Massachusetts Avenue NW, Ninth Floor Washington DC 20001

Technical Contact Details

Name of Contact	Andrew Clegg
Contact Details	1818 Library Street Suite 400 Reston, VA 20190 Phone: (202) 370-5644 Email: aclegg@google.com

Arlington, VA: Transmitter Equipment and Station Details

Radio Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 52’ 53” N, 77° 06’ 32” W

Frequency Range	**High (MHz)**	**Low (MHz)**
[REDACTED]	3575	3550

Amplifier Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 52’ 53” N, 77° 06’ 32” W

Antenna Details

Antenna 1	[REDACTED]
Type	Panel
Quantity	1
Gain	16 dBi
Beam Width at Half-Power Point	90° horizontal; 7° vertical
Orientation in Horizontal Plane	162° to 42° (no pointing toward 42° to 162°)
Orientation in Vertical Plane	0° to -30°

Antenna 2	[REDACTED]
Type	Patch
Quantity	1
Gain	8 dBi
Beam Width at Half-Power Point	75° horizontal; 65° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
Orientation in Vertical Plane	0° to -30°

Antenna 3	[REDACTED]
Type	Omnidirectional antenna
Quantity	1
Gain	2.2 dBi
Beam Width at Half-Power Point	NA
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	0°

Radio	Modulation	Emission Designator	Bandwidth	Maximum Power Out	Maximum EIRP
[REDACTED]	Continuous waveform	100HN0N	100 Hz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3
[REDACTED]	Digital (QPSK, 16QAM, and 64QAM)	10M0W7D	10 MHz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3

Reston, VA: Transmitter Equipment and Station Details

Radio Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 57’ 31” N, 77° 21’ 33” W

Frequency Range	High (MHz)	Low (MHz)
[REDACTED]	3575	3550

Amplifier Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 57' 31" N, 77° 21' 33" W

Antenna Details

Antenna 1	[REDACTED]
Type	Panel
Quantity	1
Gain	16 dBi
Beam Width at Half-Power Point	90° horizontal; 7° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
Orientation in Vertical Plane	0° to -30°

Antenna 2	[REDACTED]
Type	Patch
Quantity	1
Gain	8 dBi
Beam Width at Half-Power Point	75° horizontal; 65° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
Orientation in Vertical Plane	0° to -30°

Antenna 3	[REDACTED]
Type	Omnidirectional antenna
Quantity	1
Gain	2.2 dBi
Beam Width at Half-Power Point	NA
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	0°

Radio	Modulation	Emission Designator	Bandwidth	Maximum Power Out	Maximum EIRP
[REDACTED]	Continuous waveform	100HN0N	100 Hz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3
[REDACTED]	Digital (QPSK, 16QAM, and 64QAM)	10M0W7D	10 MHz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3

Mountain View, CA: Transmitter Equipment and Station Details

Radio Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 37° 25’ 16” N, 122° 04’ 14” W

Frequency Range	High (MHz)	Low (MHz)
[REDACTED]	3575	3550

Amplifier Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 37° 25’ 16” N, 122° 04’ 14” W

Antenna Details

Antenna 1	[REDACTED]
Type	Panel
Quantity	1
Gain	16 dBi
Beam Width at Half-Power Point	90° horizontal; 7° vertical
Orientation in Horizontal Plane	Various (0° to 360°, but will avoid 42°-162°)
Orientation in Vertical Plane	0° to -30°

Antenna 2	[REDACTED]
Type	Patch
Quantity	1
Gain	8 dBi
Beam Width at Half-Power Point	75° horizontal; 65° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
Orientation in Vertical Plane	0° to -30°

Antenna 3	[REDACTED]
Type	Omnidirectional antenna
Quantity	1
Gain	2.2 dBi
Beam Width at Half-Power Point	NA
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	0°

Radio	Modulation	Emission Designator	Bandwidth	Maximum Power Out	Maximum EIRP
[REDACTED]	Continuous waveform	100HN0N	100 Hz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3
[REDACTED]	Digital (QPSK, 16QAM, and 64QAM)	10M0W7D	10 MHz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3

2. Identification of the Commission proceeding in which the information was submitted or a description of the circumstances giving rise to the submission.

Exhibit B was submitted to the Commission in support of the Experimental License. The Exhibit was filed with the Office of Engineering and Technology on October 13, 2014. For additional information, please see File No. 0722-EX-PL-2014.

3. Explanation of the degree to which the information is commercial or financial or contains a trade secret or is privileged.

The information requested to be kept confidential has significant commercial value. The details of the Experimental License tests/experiments may include trade secret information. The Commission has clarified that confidential treatment should be afforded

to trade secrets.[1] Google's tests/experiments and proprietary wireless applications using particular radio frequency equipment represent a "secret commercially valuable plan" within the meaning of a trade secret as recognized by the Commission.

4. Explanation of the degree to which the information concerns a service that is competitive.

The services and technologies that are the subject of this Experimental License have not yet been fully developed but are expected to lead to material developments in markets subject to competition from multiple U.S. and non-U.S. third parties.

5. Explanation of how disclosure of the information could result in substantial competitive harm.

The technology under development is highly sensitive and confidential in nature. The release of such information would provide valuable insight into Google's technology innovations and potential business plans and strategies. Public disclosure would jeopardize the value of the technology under examination by enabling others to utilize Google's information to develop similar products in a similar time frame.

6. Identification of any measures taken by the requesting party to prevent unauthorized disclosure.

Google has taken steps to keep confidential the information set forth in the confidential exhibits by limiting the number of people involved in the tests/experiments to only those on a "need to know" basis, and by requiring that all third parties involved in the preliminary analysis execute robust nondisclosure agreements.

7. Identification of whether the information is available to the public and the extent of any previous disclosures of the information to any third parties.

The information contained in the confidential exhibits is not available to the public, and has only been disclosed to third parties pursuant to the restrictive safeguards described above.

Google voluntarily provides the information to the Commission at this time with the expectation that it will be treated confidentially in accordance with the Commission's rules. *See Critical Mass Energy Project v. Nuclear Regulatory Comm'n*, 975 F.2d 871, 879 (D.C. Cir. 1992) (commercial information provided on a voluntary basis "is

[1] *Examination of Current Policy Concerning the Treatment of Confidential Information Submitted to the Commission*, Report and Order, GC Docket No. 96-55, at para. 3, (released Aug. 4, 1998) (defining "trade secrets" for purpose of Commission rules on confidential treatment).

'confidential' for the purpose of Freedom of Information Act (FOIA) Exemption 4 if it is of a kind that would customarily not be released to the public by the person from whom it was obtained.")

8. Justification of the requested period of confidentiality.

Google expects that confidential treatment will be necessary for the length of the proposed experiment and thereafter in order to protect its evolving business and technology strategies.

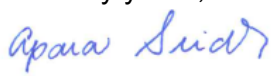
9. Any other information that would be useful in assessing whether this request should be submitted.

The information subject to this request for confidentiality should not be made available for public disclosure at any time. There is nothing material that public review of this information would add to the Commission's analysis of Google's request for an experimental authorization.

Moreover, public disclosure of the sensitive information in the confidential exhibits to the Experimental License after the Commission has ruled on the Request for Confidentiality is not necessary for the Commission to fulfill its regulatory responsibilities.

Consistent with 47 C.F.R. § 0.459(d)(l), Google requests notification if release of the information subject to this request is requested pursuant to the FOIA or otherwise, so that Google may have an opportunity to oppose grant of any such request.

Sincerely yours,



Aparna Sridhar

EXHIBIT A – NARRATIVE STATEMENT

Consistent with the standards set forth in Section 5.63 of the Federal Communications Commission's (FCC's or Commission's) Rules, 47 C.F.R. § 5.63, Google Inc. (Google) requests an Experimental Radio Service License (Experimental License) and outlines below the reasons that an Experimental License should be granted expeditiously. The Experimental License is sought for a period of 24 months beginning on November 13, 2014.

The Experimental License is needed for testing and measuring propagation losses in the 3.5 GHz band, which the Commission is now assessing for broader commercial use. Data obtained under this Experimental License will be used to demonstrate the service range of small-cell networks in this band and will help validate propagation models used to protect incumbent operations.

Testing under this Experimental License will be limited to three stations, each consisting of a low-power signal generator connected to an amplifier and antenna. Each signal generator/amplifier combination will be placed in a different location: one in Arlington, Virginia, one in Reston, Virginia, and one in Mountain View, California. The conducted power generated by each signal generator/amplifier combination will be limited to 3 Watts. At different times the signal generators and amplifiers covered by this Experimental License will be operated in conjunction with either a low-gain omnidirectional antenna or one of two directional antennas. The omnidirectional antenna will have maximum gain of 2.2 dBi. One directional antenna will have a maximum gain of 16 dBi; the beamwidth for this antenna is 90 degrees horizontal and 7 degrees vertical. The second directional antenna will have a maximum gain of 8 dBi; the beamwidth for this antenna is 75 degrees horizontal and 65 degrees vertical. The maximum EIRP for transmissions relying on the higher gain directional antenna will be 51 dBm. The maximum EIRP for transmissions relying on the lower gain directional antenna will be 43 dBm. The maximum EIRP for transmissions using the omnidirectional antenna will be 37 dBm. To test both indoor and outdoor propagation, the antennas will be located either in buildings or on buildings. In either case, the antenna will not extend more than 6 meters above a building.

Grant of this Experimental License will not adversely impact any authorized user of RF spectrum for the reasons stated below.

- **Fixed-Satellite Earth Station Licenses:** Based on a query of the FCC's IBFS licensing system, there are no active or pending U.S.-based earth station licenses in the 3550-3575 MHz band. A search of current licensees for the 3550-3575 MHz band returns one result, FCC call sign E050348, but the license reveals that the licensee is not in fact authorized to receive on these frequencies in the United States, and that reception on these frequencies is limited to the Netherlands and Italy.

- **Land Mobile Radiolocation Licensees:** Based on a query of the FCC's universal licensing system, there are three active land mobile radiolocation licenses in the 3550-3575 MHz band. Call signs WQLW310 and WQLX454 are limited to a radius of 113 kilometers around a centerpoint near Boulder, Colorado. They are far removed from the Arlington, Reston, and Mountain View test sites; therefore, there is no risk of harmful interference to these operations. The third license, call sign WQHK852, is a

nationwide license covering a total of two units. There are no specific locations associated with the license. Google e-mailed the licensee, Mobile Data Solutions Ltd., on September 30, 2014, to request any additional information necessary to ensure that harmful interference is avoided. To date, Google has received no response. Google is prepared to coordinate as necessary with Mobile Data Solutions Ltd. to avoid harmful interference to callsign WQHK852.

- **Federal Operations:** The principal federal incumbent in this band is the Department of Defense, which uses the band for radars aboard Navy ships and at two land-based locations.

  According to ITU Recommendation M.1465 and a 2010 report by the National Telecommunications and Information Administration, these radars can tolerate a maximum interfering signal level of -115 dBm, assuming a -10 dB interference-to-noise ratio, a 0 dB noise figure (which corresponds to a -105 dBm noise level), and an effective receive bandwidth of 8 MHz.[1]

  On the east coast, the closest (northwestern) edge of the Navy's Virginia Capes Operations Area is 187 kilometers away from the Arlington test site and 211 kilometers away from the Reston test site. The St. Inigoes, Maryland, land-based radar site is 100 kilometers from the Arlington test site and 120 kilometers from the Reston test site. On the west coast, the Navy's Southern California Operations Area is 32 kilometers away from the Mountain View test site, but separated by a mountain range.

  Using the terrain-based Longley-Rice propagation model to determine the propagation loss associated with transmissions from the Arlington, Reston, and Mountain View test sites to the closest coastal area, the experimental signal will be at least 10 dB below the radar's interference objective in all circumstances except one: transmissions from Arlington in the direction of the Virginia Capes Operation Area may exceed -115 dBm at the Virginia Capes location. Google predicts that if its transmit antenna is pointed directly towards the Virginia Capes Operations Area, the interference objective could be exceeded by 1 dB, based on Longley-Rice predictions using the standard continental temperate climate. For this reason, when operating at the Arlington test site, Google will avoid pointing the highest-gain antenna within 60

[1] International Telecommunication Union, Recommendation ITU-R M.1465, *Characteristics of and protection criteria for radars operating in the radiodetermination service in the frequency band 3 100-3 700 MHz*, at Table 1 (2007) (noting receiver sensitivity of -112 dBm for ship system A), *available at* https://www.itu.int/dms_pubrec/itu-r/rec/m/R-REC-M.1465-1-200703-I!!PDF-E.pdf; National Telecommunications and Information Administration, *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, and 4200-4220 MHz, 4380-4400 MHz Bands*, at Table 4-5 (2010) (noting interference threshold of -114 dBm for Shipborne radar -1), *available at* http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation_11152010.pdf. Because these numbers are not fully consistent, Google has adopted a conservative interference threshold of -115 dBm for this analysis.

degrees of the bearing towards the closest point of the operations area (102 degrees). The antenna gain pattern is reduced by at least 6 dB outside of 60 degrees from boresight, so the interference objective will be met by at least 5 dB. Nevertheless, Google is prepared to coordinate as necessary with the Department of Defense and the National Telecommunications and Information Administration to ensure that harmful interference to federal operations is avoided.

The proposed experimental operations in the 3.5 GHz band accordingly will be conducted without harmful interference to other authorized users. For these reasons, Google requests approval of this Experimental License.

EXHIBIT B - TECHNICAL INFORMATION

Applicant Name: Google Inc.
Applicant FRN: 0016069502

Legal Contact Details

Name of Contact	Aparna Sridhar
Contact Details	Counsel 25 Massachusetts Avenue NW, Ninth Floor Washington DC 20001

Technical Contact Details

Name of Contact	Andrew Clegg
Contact Details	1818 Library Street Suite 400 Reston, VA 20190 Phone: (202) 370-5644 Email: aclegg@google.com

Arlington, VA: Transmitter Equipment and Station Details

Radio Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 52’ 53” N, 77° 06’ 32” W

Frequency Range	**High (MHz)**	**Low (MHz)**
[REDACTED]	3575	3550

Amplifier Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 52’ 53” N, 77° 06’ 32” W

Antenna Details

Antenna 1	[REDACTED]
Type	Panel
Quantity	1
Gain	16 dBi
Beam Width at Half-Power Point	90° horizontal; 7° vertical
Orientation in Horizontal Plane	162° to 42° (no pointing toward 42° to 162°)
Orientation in Vertical Plane	0° to -30°

Antenna 2	[REDACTED]
Type	Patch
Quantity	1
Gain	8 dBi
Beam Width at Half-Power Point	75° horizontal; 65° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
Orientation in Vertical Plane	0° to -30°

Antenna 3	[REDACTED]
Type	Omnidirectional antenna
Quantity	1
Gain	2.2 dBi
Beam Width at Half-Power Point	NA
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	0°

Radio	Modulation	Emission Designator	Bandwidth	Maximum Power Out	Maximum EIRP
[REDACTED]	Continuous waveform	100HN0N	100 Hz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3
[REDACTED]	Digital (QPSK, 16QAM, and 64QAM)	10M0W7D	10 MHz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3

Reston, VA: Transmitter Equipment and Station Details

Radio Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 57’ 31” N, 77° 21’ 33” W

Frequency Range	High (MHz)	Low (MHz)
[REDACTED]	3575	3550

Amplifier Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 38° 57’ 31” N, 77° 21’ 33” W

Antenna Details

Antenna 1	[REDACTED]
Type	Panel
Quantity	1
Gain	16 dBi
Beam Width at Half-Power Point	90° horizontal; 7° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
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Antenna 2	[REDACTED]
Type	Patch
Quantity	1
Gain	8 dBi
Beam Width at Half-Power Point	75° horizontal; 65° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
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Antenna 3	[REDACTED]
Type	Omnidirectional antenna
Quantity	1
Gain	2.2 dBi
Beam Width at Half-Power Point	NA
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	0°

Radio	Modulation	Emission Designator	Bandwidth	Maximum Power Out	Maximum EIRP
[REDACTED]	Continuous waveform	100HN0N	100 Hz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3
[REDACTED]	Digital (QPSK, 16QAM, and 64QAM)	10M0W7D	10 MHz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3

Mountain View, CA: Transmitter Equipment and Station Details

Radio Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 37° 25’ 16” N, 122° 04’ 14” W

Frequency Range	High (MHz)	Low (MHz)
[REDACTED]	3575	3550

Amplifier Information

Equipment Manuf / PN	[REDACTED]
Number of Units	1
Area of Operation	Operation not to exceed 10 km from the following geographic centerpoint: ● 37° 25’ 16” N, 122° 04’ 14” W

Antenna Details

Antenna 1	[REDACTED]
Type	Panel
Quantity	1
Gain	16 dBi
Beam Width at Half-Power Point	90° horizontal; 7° vertical
Orientation in Horizontal Plane	Various (0° to 360°, but will avoid 42°-162°)
Orientation in Vertical Plane	0° to -30°

Antenna 2	[REDACTED]
Type	Patch
Quantity	1
Gain	8 dBi
Beam Width at Half-Power Point	75° horizontal; 65° vertical
Orientation in Horizontal Plane	Various (0° to 360°)
Orientation in Vertical Plane	0° to -30°

Antenna 3	[REDACTED]
Type	Omnidirectional antenna
Quantity	1
Gain	2.2 dBi
Beam Width at Half-Power Point	NA
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	0°

Radio	Modulation	Emission Designator	Bandwidth	Maximum Power Out	Maximum EIRP
[REDACTED]	Continuous waveform	100HN0N	100 Hz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3
[REDACTED]	Digital (QPSK, 16QAM, and 64QAM)	10M0W7D	10 MHz	3 W	21 dBW with antenna 1 13 dBW with antenna 2 7 dBW with antenna 3