

Date: October 3, 2017

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

To Whom It May Concern:

Waymo LLC (Waymo), 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 an 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, Waymo'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, Waymo provides the following information:

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

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

Exhibit:

Waymo requests confidential treatment of the following underlined text that contains confidential and proprietary information regarding the proposed tests/experiments:

Under Sections 5.3(a), (e), and (k), 5.63, and 5.602 of the Commission's Rules, 47 C.F.R. §§ 5.3(a), (e), and (k), 5.63, and 5.602, Waymo LLC (Waymo) requests authorization to conduct experimentation [REDACTED] in support of developing autonomous driving technologies, using experimental transmitters installed on [REDACTED] vehicles nationwide. The experimental authorization is sought for a period of 24 months commencing November 1, 2017. Waymo outlines below its need for the requested authorization and the reasons why it should be granted expeditiously.

I. Narrative Statement

Waymo aims to bring self-driving vehicle technology to as many people as possible. As part of that effort, Waymo currently provides transportation in vehicles outfitted with Waymo equipment at no charge to volunteer testers, using experimental radar technology authorized under Call Sign WH2XCD (File Nos. 0035-EX-PL-2014, 0055-EX-RR-2016, and 0026-EX-AU-2016). The instant experimental authorization is needed to expand upon current testing [REDACTED].

Specifically, authority is needed for demonstration and testing of radar transmitters operating in the 76.0-77.0 GHz (76 GHz) band deployed on automobiles operated by Waymo. The Commission recognizes the important public interest benefits that vehicular radar applications in the 76 GHz band may contribute, including the ability to prevent or lessen the severity of traffic accidents. Equipment operated under the requested authorization will be optimized experimentally for the special needs of autonomous vehicles in diverse, real-world environments, particularly with regard to field of view, azimuth and elevation resolution, and the need to detect and avoid pedestrians and other objects with low radar cross sections.

The proposed prototype hardware will comply with all requirements and emission limits for vehicle-mounted field disturbance sensors used as radar systems in the 76 GHz band, as specified in 47 C.F.R. § 15.253. Given that the Commission has determined that such 76 GHz vehicular radar systems do not pose a meaningful interference threat to co-primary radioastronomy sites due to numerous factors (for example, vehicular radar beams have a low elevation/horizontal path, experience significant blockage created by natural and manmade structures, employ modest power, and are generally isolated geographically from radioastronomy sites), and because Waymo's experimental hardware complies with Section 15.253 limits, Waymo's experimental testing should not affect other authorized spectrum users. Waymo is not aware of any issues involving harmful interference under Call Sign WH2XCD, which [REDACTED]. Waymo, moreover, intends to limit [REDACTED].

At the conclusion of the experiments described in this application, the authorized radio equipment will be recovered by Waymo or made inoperative.

II. Technical Information

As noted, the technical characteristics of the proposed experimental hardware are [REDACTED]. Authorization is sought for [REDACTED].

The technical information for the requested authorization is as follows:

Applicant Name Waymo LLC
Applicant FRN 0026114363

Legal Contact Details

Name of Contact	Tom Lue
Contact Details	100 Mayfield Avenue Mountain View, CA 94043 Phone: 650-253-3696 Email: tlue@waymo.com

Technical Contact Details

Name of Contact	Dan McCloskey
Contact Details	100 Mayfield Avenue Mountain View, CA 94043 Phone: 650-214-4102 Email: dmccloskey@waymo.com

Area of Operation

Waymo seeks authorization to operate at any geographic location in the United States. The operations will be consistent with the further restrictions below.

Transmitter #1 Details

Radio Information

Equipment	[REDACTED]
Quantity	[REDACTED]

Frequency	Low (GHz)	High (GHz)
[REDACTED]	76.00000	77.0000

Configuration	Modulation	Emission Designator	Bandwidth (MHz)	Max Output Power (W)	Max ERP (W)
[REDACTED]	FM	1G00F3N	1000	0.008	48.780
[REDACTED]	FM	1G00F3N	1000	0.015	9.146
[REDACTED]	FM	1G00F3N	1000	0.015	0.915

Antenna #1 Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	40 dBi
Beam Width at Half-Power Point	5 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Antenna #2 Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	30 dBi
Beam Width at Half-Power Point	22.5 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Antenna #3 Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	20 dBi
Beam Width at Half-Power Point	30 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Transmitter #2 Details

Radio Information

Equipment	[REDACTED]
Quantity	[REDACTED]

Frequency	Low (GHz)	High (GHz)
[REDACTED]	76.00000	77.0000

Configuration	Modulation	Emission Designator	Bandwidth (MHz)	Max Output Power (W)	Max ERP (W)
[REDACTED]	FM	1G00F3N	1000	0.040	15.389
	BPSK	1G00G3N	1000	0.040	15.389

Antenna Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	28 dBi
Beam Width at Half-Power Point	90 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Transmitter #3 Details

Radio Information

Equipment	[REDACTED]
Quantity	[REDACTED]

Frequency	Low (GHz)	High (GHz)
[REDACTED]	76.00000	77.0000

Configuration	Modulation	Emission Designator	Bandwidth (MHz)	Max Output Power (W)	Max ERP (W)
[REDACTED]	FM	1G00F3N	1000	0.040	4.866

Antenna Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	23 dBi
Beam Width at Half-Power Point	65 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

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

The above-referenced Exhibit was submitted to the Commission in support of the Experimental License. The Exhibit was filed with the Office of Engineering and Technology on October 3, 2017. For additional information, please see File No. 0781-EX-CN-2017.

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 Waymo'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.

In addition, agreements entered into between Waymo and any parties that provided equipment for testing or will provide analysis of test results require that confidential information of the parties be held in strict confidence, and that such information not be disclosed to any third party (with limited exceptions not applicable to this request). The manufacturer name and model number constitutes confidential trade secrets, technical information, and business information under the agreements.

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).

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 Waymo'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 Waymo'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.

Waymo has taken steps to keep confidential the information set forth in the confidential Exhibit by limiting the number of people involved in the tests/experiments to only those on a "need to know" basis, and by requiring any third parties involved in the testing process to 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 Exhibit is not available to the public, and has only been disclosed to third parties pursuant to restrictive safeguards.

Waymo 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 '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.

Waymo 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 Waymo's request for an experimental authorization.

Moreover, public disclosure of the sensitive information in the confidential Exhibit 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), Waymo requests notification if release of the information subject to this request is requested pursuant to the FOIA or otherwise, so that Waymo may have an opportunity to oppose grant of any such request.

Sincerely yours,

A handwritten signature in blue ink, appearing to read 'Tom Lue', with a stylized flourish extending to the right.

Tom Lue

EXHIBIT

Under Sections 5.3(a), (e), and (k), 5.63, and 5.602 of the Commission's Rules, 47 C.F.R. §§ 5.3(a), (e), and (k), 5.63, and 5.602, Waymo LLC (Waymo) requests authorization to conduct experimentation [REDACTED] in support of developing autonomous driving technologies, using experimental transmitters installed on [REDACTED] vehicles nationwide. The experimental authorization is sought for a period of 24 months commencing November 1, 2017. Waymo outlines below its need for the requested authorization and the reasons why it should be granted expeditiously.

I. Narrative Statement

Waymo aims to bring self-driving vehicle technology to as many people as possible. As part of that effort, Waymo currently provides transportation in vehicles outfitted with Waymo equipment at no charge to volunteer testers, using experimental radar technology authorized under Call Sign WH2XCD (File Nos. 0035-EX-PL-2014, 0055-EX-RR-2016, and 0026-EX-AU-2016). The instant experimental authorization is needed to expand upon current testing [REDACTED].

Specifically, authority is needed for demonstration and testing of radar transmitters operating in the 76.0-77.0 GHz (76 GHz) band deployed on automobiles operated by Waymo. The Commission recognizes the important public interest benefits that vehicular radar applications in the 76 GHz band may contribute, including the ability to prevent or lessen the severity of traffic accidents. Equipment operated under the requested authorization will be optimized experimentally for the special needs of autonomous vehicles in diverse, real-world environments, particularly with regard to field of view, azimuth and elevation resolution, and the need to detect and avoid pedestrians and other objects with low radar cross sections.

The proposed prototype hardware will comply with all requirements and emission limits for vehicle-mounted field disturbance sensors used as radar systems in the 76 GHz band, as specified in 47 C.F.R. § 15.253. Given that the Commission has determined that such 76 GHz vehicular radar systems do not pose a meaningful interference threat to co-primary radioastronomy sites due to numerous factors (for example, vehicular radar beams have a low elevation/horizontal path, experience significant blockage created by natural and manmade structures, employ modest power, and are generally isolated geographically from radioastronomy sites), and because Waymo's experimental hardware complies with Section 15.253 limits, Waymo's experimental testing should not affect other authorized spectrum users. Waymo is not aware of any issues involving harmful interference under Call Sign WH2XCD, which [REDACTED]. Waymo, moreover, intends to limit [REDACTED].

At the conclusion of the experiments described in this application, the authorized radio equipment will be recovered by Waymo or made inoperative.

II. Technical Information

As noted, the technical characteristics of the proposed experimental hardware are [REDACTED]. Authorization is sought for [REDACTED].

The technical information for the requested authorization is as follows:

Applicant Name Waymo LLC
Applicant FRN 0026114363

Legal Contact Details

Name of Contact	Tom Lue
Contact Details	100 Mayfield Avenue Mountain View, CA 94043 Phone: 650-253-3696 Email: tlue@waymo.com

Technical Contact Details

Name of Contact	Dan McCloskey
Contact Details	100 Mayfield Avenue Mountain View, CA 94043 Phone: 650-214-4102 Email: dmccloskey@waymo.com

Area of Operation

Waymo seeks authorization to operate at any geographic location in the United States. The operations will be consistent with the further restrictions below.

Transmitter #1 Details

Radio Information

Equipment	[REDACTED]
Quantity	[REDACTED]

Frequency	Low (GHz)	High (GHz)
[REDACTED]	76.00000	77.0000

Configuration	Modulation	Emission Designator	Bandwidth (MHz)	Max Output Power (W)	Max ERP (W)
[REDACTED]	FM	1G00F3N	1000	0.008	48.780
[REDACTED]	FM	1G00F3N	1000	0.015	9.146
[REDACTED]	FM	1G00F3N	1000	0.015	0.915

Antenna #1 Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	40 dBi
Beam Width at Half-Power Point	5 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Antenna #2 Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	30 dBi
Beam Width at Half-Power Point	22.5 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Antenna #3 Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	20 dBi
Beam Width at Half-Power Point	30 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Transmitter #2 Details

Radio Information

Equipment	[REDACTED]
Quantity	[REDACTED]

Frequency	Low (GHz)	High (GHz)
[REDACTED]	76.00000	77.0000

Configuration	Modulation	Emission Designator	Bandwidth (MHz)	Max Output Power (W)	Max ERP (W)
[REDACTED]	FM	1G00F3N	1000	0.040	15.389
	BPSK	1G00G3N	1000	0.040	15.389

Antenna Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	28 dBi
Beam Width at Half-Power Point	90 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA

Transmitter #3 Details

Radio Information

Equipment	[REDACTED]
Quantity	[REDACTED]

Frequency	Low (GHz)	High (GHz)
[REDACTED]	76.00000	77.0000

Configuration	Modulation	Emission Designator	Bandwidth (MHz)	Max Output Power (W)	Max ERP (W)
[REDACTED]	FM	1G00F3N	1000	0.040	4.866

Antenna Details

Type	[REDACTED]
Quantity	[REDACTED]
Gain	23 dBi
Beam Width at Half-Power Point	65 degrees
Orientation in Horizontal Plane	NA
Orientation in Vertical Plane	NA