NARRATIVE STATEMENT

Pursuant to Section 5.3 (e) through (h), Section 5.51, and Section 5.53 of the Federal Communications Commission ("FCC") rules, 47 C.F.R. §§ 5.3 (e)-(h), 5.51, and 5.53 (2018), Motorola Solutions, Inc., hereby respectfully requests an experimental license to operate in the 3650-3700 MHz band so that it may test and demonstrate the functionality and performance of prototype systems that are being designed for deployment in the Citizens Broadband Radio Service ("CBRS").

A. Purpose of Application and Justification for Nationwide Authority:

Motorola Solutions is a leading manufacturer of mobile radio infrastructure and is continually engaged in researching and developing new and innovative communications systems and solutions. Grant of the experimental authority requested in this application would allow the company to test and demonstrate the reliability and acceptability of prototype systems and to gather coverage, throughput, and other data needed to further its understanding of the specific requirements of potential users that will operate within the CBRS spectrum allocation.

The devices to be tested and demonstrated under the requested experimental license are generally subject to the FCC's equipment authorization procedures before they may be marketed (*e.g.,* pursuant to the certification requirements set forth in Section 2.1033 of the agency's rules, 47 C.F.R. § 2.1033 *et seq*. (2018)). Moreover, prototypes of these devices generally may not be operated without a regular or experimental license. *See id.* at § 2.804.

Motorola Solutions has in the past typically obtained either an experimental license or special temporary authority for each effort to conduct compliance, performance, functionality, and acceptance testing or demonstrations of its prototype products. There are currently over 600 experimental applications listed in the FCC's experimental licensing database that Motorola Solutions has filed in connection with such activities. Most of these applications were granted for a particular experiment or type of equipment or to allow operation at a specific site or sites.

Motorola Solutions believes that its current practice of obtaining a regular experimental license or special temporary authority for each test or demonstration does not provide it flexibility needed to adapt quickly to changes in its research and development plans related to CBRS technology. Although Motorola Solutions has to date conducted tests primarily at its company facilities in Schaumburg, Illinois, and at similar locations in Illinois and in Florida, it has entered the next phase of its efforts involving this band and now plans to test and demonstrate equipment at other locations in the United States. As it does not know at this time where these tests or demonstrations will be scheduled, however, Motorola Solutions requests authority to operate nationwide (within the United States and its territories), subject to the non-interference and other conditions described below.

Motorola Solutions submits that grant of its application is the public interest, necessity and convenience. Such action is consistent with the FCC's rule changes relating to program experimental licenses. *See Promoting Expanded Opportunities for Radio Experimentation and Market Trials under Part 5 of the Commission's Rules and Streamlining Other Related Rules*, ET Docket Nos. 06-155, 10-236, *Report and Order*, 28 FCC Rcd 758 (2013) ("Program Experimental Licensing Order") (Note: the operations proposed by Motorola Solutions are consistent with the principals underlying these rules, but are not eligible for a program experimental license because they will not be confined to geographic areas under its control).

Grant of the application would also be consistent with the FCC's rules adopted in ET Docket No. 96-256. *See Amendment of Part 5 of the Commission's Rules to Revise the Experimental Radio Service Regulations*, ET Docket No. 96-256, *Report and Order*, 13 FCC Rcd 21391 (1998)("ERS Streamlining Order"). As noted at paragraph 12 of the *ERS Streamlining Order*, grant of this request would "facilitate experimentation and decrease the regulatory burden on our licensees and staff." Specifically, such action would enhance the company's ability to obtain information needed to ensure that the products it designs will accommodate and promote new technologies and services. It would also allow Motorola Solutions to consolidate otherwise separate applications for experimental authorizations, thereby reducing the administrative burdens imposed upon the company and upon the Commission in connection with the processing of multiple initial applications for regular licenses and requests for special temporary authority or their renewals, when needed.

Last, FCC issuance of an experimental license as requested would be consistent with similar authority granted to Motorola Solutions initially in 1999 under call sign WB2XCJ (ELS File No. 0110-EX-PL-1999), which afforded the company with flexibility essential to similar testing efforts involving other spectrum bands.

B. <u>Locations of Proposed Operations</u>:

Motorola Solutions proposes to conduct its experimental operations primarily within 5 kilometers of its research and manufacturing facilities located at 1303 E. Algonquin Road, Schaumburg, Illinois (NAD83 coordinates: 42° 03' 44.6" North Latitude; 88° 03' 05.4" West Longitude). As noted above, however, Motorola Solutions also seeks authority to conduct experimental operations at other locations within the United States. Because Motorola Solutions cannot determine at this time the exact locations of the tests it would conduct over the term of the requested license (and because it often must conduct tests on short notice at the locations of new or prospective customers located across the United States), Motorola Solutions respectfully requests authority to operate on a nationwide basis (within the United States and its territories).

Such authority would allow Motorola Solutions to evaluate and demonstrate prototype devices: (1) at its own premises; (2) at the premises of entities working under Motorola Solutions' authorization in the design and development of the devices and related products; (3) at trade shows or non-residential exhibitions; and (4) at non-residential, business, commercial, industrial, scientific, or medical locations during the design, development, and pre-production stages. Indeed, such operations would be consistent with the requirements set forth in Section 2.804 of the Commission's marketing

rules. 47 C.F.R. § 2.804 (2018); *see also Revision of Part 2 of the Commission's Rules Relating to the Marketing and Authorization of Radio Frequency Devices*, ET Docket No. 94-45, *Report and Order*, released Feb. 12, 1997, at 11-13, 19-20 ("Marketing Rule Revisions").

In addition, Motorola Solutions seeks authority to operate devices at certain end user locations, including residential locations. The nature of the services and devices associated with CBRS technology would involve such usage and therefore should be tested at user locations.

C. Operational Safeguards and Conditions

1. Notification, Coordination and Reporting

Motorola Solutions recognizes that it is seeking authority to operate on channels that will be subject to conditions managed by Spectrum Access System ("SAS") administrators that will essentially serve as frequency coordinators. *See Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band,* GN Docket No. 12-354*, Report and Order and Second Further Notice of Proposed Rulemaking*, 30 FCC Rcd 3959 (2015). Accordingly, Motorola Solutions proposes to coordinate its activities with Federated Wireless, one of the FCC-approved SAS administrators, prior to commencing any operation under the requested authority. (See Section F below for the contact information of the Federated Wireless representative working with Motorola Solutions in this regard). Specifically, Motorola Solutions proposes to provide Federated Wireless with prior notification that would contain information (which has been modelled after the requirements adopted by the FCC under the *Program Experimental Licensing Order*) as follows:

> (a) A narrative statement describing the experiment, including a description and explanation of measures taken to avoid causing harmful interference to any existing service licensee;
> (b) Contact information for the researcher-in-charge of the described experiment;
> (c) Contact information for a "stop buzzer;" and
> (d) Technical details including: (i) the maximum equivalent isotropically radiated power (EIRP) or effective radiated power (ERP) under consideration; (ii) the emission designators to be used; (iii) a description of the geographic area in which the test will be conducted; and (iv) the number of units to be used.

Moreover, based on its coordination with Federated Wireless and its review of the FCC's licensing databases, Motorola Solutions proposes to operate on channel centers that are not currently assigned to other licensees in the area or that are spectrally separated from channel centers offset from the channel centers currently assigned to other licensees in the area. Company personnel will also monitor the operations of other users before commencing transmissions to avoid interference to such users and will cooperate with other users to ensure against interference

If deemed necessary to include as a condition on its experimental license, Motorola Solutions would also agree to file progress reports with the FCC of the details of its operations, consistent with the condition specified on its experimental license issued under call sign WB2XCJ, discussed above.

2. Limitations on Scope of Operations

a. Equipment Restrictions

Motorola Solutions requires authority to operate a sufficient number of units to conduct compliance, functionality, performance and acceptance testing and demonstration of its products. To obtain accurate data regarding real-world operations, Motorola Solutions seeks authority to deploy up to five (5) temporary base stations and up to twenty-five (25) portable/mobile units per location and not more than a total of 50 temporary base stations and 250 portable/mobile units overall for *all* of the tests combined under its authority. In other words, 50 temporary base stations and 250 portable/mobile units reflect the maximum number of unapproved or unlicensed units that would be in operation at any given time under the experimental authorization it has requested.

Moreover, after any specific test or demonstration is completed, Motorola Solutions will recall and recover all devices that are not in compliance with FCC regulations. If any different treatment becomes necessary during the course of its experimentation, Motorola Solutions would seek separate and additional authority from the agency.

b. Marketing Restrictions

Motorola Solutions understands that the FCC permits: (i) companies to enter into agreements and contracts to manufacturer new products; (ii) manufacturers to sell—but not deliver—products on a conditional basis to wholesalers and retailers; (ii) entities to . operate unintentional radiators for, among other things, compliance testing, demonstration at trade shows and other exhibitions with appropriate notices displayed; and (iv) entities to evaluate product performance and customer acceptability at a manufacturer's facilities or at certain non-residential sites during the developmental, design and pre-production stages. *See Marketing Rule Revisions* (changes to Section 2.804); *see also Memorandum Opinion and Order in GEN Docket No. 87-389*, 6 FCC Rcd 1683 (1991).

Notwithstanding these general rules, the FCC requires parties to seek authorization to deploy devices that normally require a license to operate. Such authority may be granted under the FCC's experimental rules set forth in Part 5 of the Code of Federal Regulations, 47 C.F.R. Part 5 (2018). Those rules permit such operation provided that: (1) participants are advised that the service or device is operated under experimental authority and is strictly temporary; and (2) the devices are owned by the licensee.

Consistent with these requirements, Motorola Solutions affirms that none of prototype units would be marketed to the public under this experimental license. It would not, without appropriate additional FCC authority, conduct market studies under its license or unconditionally market, sell, or lease any prototype equipment to the public or to end-users. Moreover, Motorola Solutions proposes to label prototype devices conspicuously, as required by Section 2.803 of the FCC's rules, as shown below.

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This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained. Thus, the user does not hold a property right in the device and may be required to return the device.

Permission to operate this device has been granted under experimental authority issued by the Federal Communications Commission to Motorola Solutions, Inc., is strictly temporary and may be cancelled at any time. Operation is subject to the condition that it not cause harmful interference.

c. Non-Interference Requirements

Motorola Solutions also recognizes that the operation of any unapproved or unlicensed devices under experimentation must not cause harmful interference to authorized facilities. Accordingly, Motorola Solutions will advise entities that the operation is subject to the condition that the equipment may not cause harmful interference. Conversely, Motorola Solutions understands that it must accept interference from any other users of the CBRS band and that all operations by Motorola Solutions will be on a secondary basis. Motorola Solutions will advise entities participating in the tests of these limitations as well.

In addition, Motorola Solutions recognizes that multiple experimental licenses might have been requested and granted by the FCC for operation in the same area to other entities, that all entities operating under experimental authority must effectively coordinate their operations, and that failure to do so may result in immediate suspension of the experimental license.

To ensure compliance with its non-interference obligations, Motorola Solutions has established a researcher-in-charge and point of contact ("POC") identified in Section F below with "kill switch" authority, and it agrees to cease operations immediately upon receipt of request to the kill switch POC.

Notwithstanding these precautions and safeguards, Motorola Solutions submits that its experimental operations are unlikely to cause interference. First, Motorola Solutions plans to coordinate its operations with Federated Wireless, as discussed above, and with any affected existing licensees in the areas of proposed operation. Indeed, it expects that certain of its experiments will be conducted on behalf of and with the cooperation of existing licensees. Second, Motorola Solutions intends to monitor use of the relevant frequencies before commencing transmissions, and it will not operate if the frequencies are in use. Last, as described above, Motorola Solutions will limit the total number of prototype devices that are operated at any given time to five or fewer temporary base stations and 25 or fewer portables/mobile units per location.

D. Technical Specifications:

1. Frequencies and Modulation Techniques

Motorola Solutions requests experimental authority to operate on channels in the 3650-3700 MHz portion of the Citizens Broadband Radio Service band. As noted above, during each activation, Motorola Solutions will determine the exact center frequencies to deploy to avoid the potential for interference based upon spectrum scans at each location and a review of the FCC licensing databases regarding the existence of licensed services within the test area. Additional channel quality methods will also be utilized during each test activation.

Motorola Solutions proposes to operate using TDD OFDMA LTE modulation on the downlink channels and TDMA/TDD LTE modulation on the uplink channels. Uplink and downlink transmissions will occur on the same channel utilizing bandwidths of 5 MHz, 10 MHz, and 20 MHz. The representative emission designators for the proposed operations are 5M00W7W, 10M0W7W, and 20M0W7W for the downlink transmissions and 5M00WXW, 10M0WXW, and 20M0WXW for the uplink transmissions of the TDD

LTE channel in use. Other emission modes may be utilized, but in no event will the emissions extend beyond the frequency band requested.

2. Effective Radiated Power

All power levels will comply with the limits set forth in the FCC's rules, including those relating to human exposure to radiation.

The temporary base units will operate with a +25 dBm transmitter power output ("TPO") and a mean effective radiated power ("ERP") of not more than 4 Watts (+36 dBm). The portable/mobile units will operate at power levels not to exceed a mean ERP of 125 mW. Motorola Solutions will reduce the actual powers to the minimum power needed for successful operation, based upon set-up and testing at the site of the exercise.

3. Antenna Information

The facilities will be configured with antennas exhibiting an omni-directional radiation pattern during various phases of testing. No antennas will be installed in a fashion that will require approval under FAA and FCC rules and regulations.

4. Equipment To Be Used

As noted above, Motorola Solutions expects to conduct its tests and demonstrations by deploying up to five ten (5) temporary fixed base stations per location and up to 25 portable/mobile units per location. Moreover, Motorola Solutions will limit the power, area of operation, and transmitting times to the minimum necessary to support an effective demonstration and collection of data.

E. Public Interest Statement:

Motorola Solutions submits that grant of the authority it has requested would serve the public interest, convenience and necessity, as it would allow the company to enhance its ability to continue its on-going efforts to develop innovative products to support the information needs of the public.

F. Contact Information:

Motorola Solutions Researcher-In-Charge/Point of Contact/Stop Buzzer-Kill Switch

Gregory J. Buchwald
DMTS Engineer
Motorola Solutions, Inc.
1303 E Algonquin Rd, 7th Floor
Schaumburg, IL 60196
Telephone: 815.351.4020
Email: greg.buchwald@motorolasolutions.com

Motorola Solutions FCC Contact:

Frank Korinek
Director, Government Affairs
Motorola Solutions, Inc.
1455 Pennsylvania Ave., #900
Washington, DC 20004
Telephone: 847.877.7179
Email: Frank.Korinek@motorolasolutions.com

Motorola Solutions FCC Legal Counsel:

Kurt DeSoto
Wiley Rein LLP
1776 K Street, N.W.
Washington, DC 20006
Telephone: 202.719.7235
Facsimile: 202.719.7049
Email: kdesoto@wileyrein.com

Motorola Solutions Contact at Federated Wireless:

Michael Aarons
Field Operations Engineer
Federated Wireless
3865 Wilson Blvd
Arlington, VA 22203
Telephone: 703.362.3234