

FURTHER REVISED NARRATIVE STATEMENT

I. Introduction and Background

Pursuant to Section 5.51 of the Commission's rules, 47 C.F.R. § 5.51 (2005), Motorola, Inc., respectfully requests an experimental license commencing **July 15, 2006**, to research, design and demonstrate prototype equipment and applications for use in Dedicated Short Range Communications ("DSRC") systems operating in the 5.9 GHz band. The following information is provided in support of this request:

II. Purpose of Experimentation and Justification for Nationwide Authority

Motorola is a leading manufacturer of electronic and radiofrequency equipment and systems in the United States and overseas. It currently is involved in designing, developing and demonstrating devices and applications to be deployed in Vehicle Infrastructure Integration ("VII") and other operations related to vehicle safety and traffic management. Motorola seeks to test the functionality and acceptability of such equipment as well as evaluate technology alternatives to meet the requirements and standards applicable to operations in the 5.850-5.925 GHz DSRC frequency allocation. For example, Motorola proposes to test equipment and applications to be deployed for collision avoidance, road hazard detection, panic braking alerts, traffic congestion detection, traffic re-routing, traffic signal interaction, public safety agency/private citizen safety coordination and other uses to be determined by public and private participants that will be involved in specific tests. Thus, grant of Motorola's request for an experimental license would allow it to advance both the communications technology and the application technology needed to further the national agenda of improving the operational safety and efficiency of vehicles on U.S. highways.

Industry research and development in VII technology has reached a stage that now requires "real-world" field tests, operational trials, and proof of concept evaluations to determine the availability and reliability of communications capabilities needed to support VII systems. In the long term, these capabilities will be provided by DSRC equipment licensed under standards to be implemented under Parts 90 and 95 of the FCC's rules, 47 C.F.R. Parts 90, 95 (2005). In the meantime, however, the FCC has approved only interim standards for trial use.

Under the experimental authority requested herein, Motorola will be able to test and analyze the ability of DSRC equipment to meet industry needs while operating in compliance with FCC equipment and operational rules. It will also be able to investigate alternative communications technologies not presently included in the standards so that the Commission may benefit from Motorola's experimental findings should it choose to amend or modify the standards.

Motorola proposes to conduct experimental operations centered primarily at its company facilities located at Schaumburg, IL (NAD83 coordinates: 42 04'N; 88 03' W). To obtain statistically valid engineering results, however, it must also conduct experimental operations at other locations within the United States. Motorola anticipates that the products that will ultimately be approved by the FCC for VII applications will be sold in quantities numbering in the hundreds of thousands. Indeed, the potential market for VII products includes the approximately 250 million registered vehicles registered in the United States alone. To ensure accurate data regarding real-world operations, Motorola must deploy test equipment at a number of locations and under a variety of operating conditions. Unfortunately, Motorola cannot at this time determine the specific locations of such tests. The locations will depend to a great extent upon which public and private entities or agencies will seek to evaluate or test equipment and applications. Accordingly, Motorola respectfully requests authority to operate nationwide (within the United States and its territories).

Motorola could obtain either an experimental license or special temporary authority for each specific effort to conduct compliance, performance, functionality, and acceptance testing of its prototype products. In fact, the FCC's experimental licensing database references over 300 authorizations that Motorola has obtained for other developmental activities. Most of these authorizations were granted for a particular experiment or type of equipment or to allow operation at a specific site or sites.

Motorola believes, however, that an approach requiring it to obtain a regular experimental or special temporary authority for each product or experiment before it conducts research and development of VII systems does not provide it needed flexibility to adapt quickly to changes in its research plans and requirements. Consequently, Motorola is seeking a nationwide experimental license to test, demonstrate and operate prototype products at unspecified temporary locations in the United States. This request is fully consistent with the FCC's rule changes regarding blanket licenses 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"*).

In addition, Motorola seeks authority to demonstrate and operate products: (1) at its own premises; (2) at the premises of entities working under Motorola's 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, these operations are consistent with the requirements set forth in Section 2.803 of the Commission's marketing rules. 47 C.F.R. § 2.803 (2005); *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"). Motorola also seeks authority to operate mobile devices at certain residential locations. The nature of the services and devices associated with VII technology typically involve such usage and therefore should be authorized under the requested experimental license.

Motorola submits that the public interest, necessity and convenience are served by the grant of a nationwide license under these circumstances. As noted at paragraph 12 of the *ERS Streamlining Order*, 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 will also allow Motorola to consolidate various experimental authorizations, thereby reducing the administrative burdens imposed upon the company and upon the Commission in connection with the processing of a variety of specific initial applications for regular licenses and requests for special temporary authority or their renewals when needed.

Consistent with the *ERS Streamlining Order* as well as the conditions specified on certain other licenses, Motorola will file progress reports notifying the FCC of the details of its operations if requested. Other operational safeguards are discussed in Section IV below.

III. Technical Specifications

Bandwidth / Emissions Designators:

10M0D2D, 20M0D2D. The modulation technique is QDMA (Quadrature Division Multiple Access). Motorola seeks to employ various modes of modulation, bandwidth and data rates. Nevertheless, none of these modes of operation would extend beyond the limits set forth for 5.850 to 5.925 GHz band.

Antenna Data / Temporary Fixed Units:

Temporary fixed transmitters ("RSUs") will comply with Section 90.375 for Class C RSUs. Channelization and power limits will conform with Section 90.377 of the Commission's Rules. These rules limit power levels depending on the channel and the antenna height. Although Motorola will limit the power levels in accordance with these rules, the maximum power levels are provided below:

State and Local Government Test RSUs:

Maximum Power Output (TPO): 20 dBm or 100 mW.

Maximum ERP / EIRP: 30 Watts / 44.8 dBm

Non-Government Test RSUs:

Maximum Power Output (TPO): 20 dBm or 100 mW.

Maximum ERP / EIRP: 2 Watts / 33 dBm

Antenna Data / Mobile Units:

The power levels of the mobile units ("OBUs") will conform with Section 95.639, Subpart L of the FCC's Rules as well as ASTM E2213-03. Section 8.9.1 of the ASTM provides that Public Safety RSU and OBU operations shall not exceed 28.8 dBm antenna input power and 44.8 dBm EIRP. Private RSU and OBU operations shall not exceed 28.8 dBm antenna input power and 33 dBm EIRP. These rules limit power levels depending on the channel and the antenna height. Although Motorola will limit the power levels in accordance with these rules, the maximum power levels are provided below:

State and Local Government Test OBUs:

Maximum Power Output (TPO): 20 dBm or 100 mW.

Maximum ERP / EIRP: 30 Watts / 44.8 dBm

Non-Government Test OBUs:

Maximum Power Output (TPO): 20 dBm or 100 mW.

Maximum ERP / EIRP: 2 Watts / 33 dBm

The mobile transmitters will generally be mounted in the trunks of the test vehicles and the antennas will generally be mounted on the roofs of the test vehicles. In all cases, the transmitting antennas will be greater than 20 cm from users or other persons. No portable units will be tested under the authority requested herein. Motorola recognizes that the maximum power output for portable DSRC OBUs is 1.0 mW.

Overall Height of Antenna(s) Above Ground:

The antennas deployed under this experimental authority will not extend more than six meters above the ground or, if mounted on an existing building, will not extend more than six meters above the building. If an antenna is mounted on an existing structure other than a building, it will be installed in accordance with FAA and FCC rules and regulations.

IV. Equipment Installed and Operational Safeguards

As discussed above, Motorola requires authority to obtain accurate "real-world" engineering data regarding the compliance, performance, functionality, and acceptability of its products as well as to demonstrate its products. Thus, it must deploy a sufficient number of units during its studies to simulate actual usage. Motorola anticipates that it will be able to conduct such experimentation at no more than three test sites simultaneously with a maximum of 200 temporary fixed stations ("RSUs") and 2,000 mobile units ("OBUs") at two of these three locations and with a maximum of 100 RSUs and 1,000 OBUs at the third location. Mobile-to-mobile operation without the need for infrastructure will be supported and this operation will be limited to locations within approximately 400 meters of the nearest point of coverage for the temporary fixed installations, as specified in Section 90.375 of the FCC's Rules for Class C devices.

Motorola expects to implement two types of test configurations. The first will be a linear deployment along a highway and/or arterial roadway. To provide continuous coverage, RSUs are required to be spaced approximately every 0.5 kilometers. Motorola plans to establish a looped driving path for this type of configuration. With 200 RSUs positioned along two parallel roadways connected at each end, the resulting loop would cover an area with less than an 80-kilometer radius. The second type of test configuration will involve a grid layout with RSUs located primarily at major intersections or interchanges in an area with less than an 80-kilometer radius.

Motorola will limit the power, area of operation, and transmitting times of these units to the minimum necessary to evaluate the equipment. As required, Motorola would also seek separate and specific authority if more units or a larger coverage area is needed to conduct a particular experiment.

Motorola understands that the number of units it seeks to test might be higher than the FCC usually approves under experimental authorizations. To facilitate action on its request, Motorola would agree to the placement of appropriate conditions on its authorization to reflect the limitations specified in this narrative as well as to provide

other safeguards to ensure against the potential for interference. Specifically, Motorola will agree to conditions identical or similar to those listed on below:

Special Conditions:

- (1) Licensee is authorized to operate a maximum of 200 fixed stations and 2000 mobile units at up to two test locations with an 80 km radius of operation each and a maximum of 100 fixed stations and 1000 mobile units at a third test location with an 80 km radius of operation. Licensee is authorized to conduct a maximum of three tests at any given time.
- (2) Licensee shall comply with the power limits set forth in the FCC's rules applicable to the specific channel and type of device tested. Licensee shall comply with the reduced power limits when operating devices for entities other than state and local governments.
- (3) Licensee is required to notify the Commission of the specific details of each individual test, including location, number of fixed and mobile units, power, emission designator, and any other pertinent technical information. No operation shall take place until the Commission has received the required notification. This notification should be uploaded electronically via the OET Experimental Licensing Branch's Electronic Filing Web Site at https://gulfoss2.fcc.gov/prod/oet/index_els.html using the "Add Attachments" feature.

Motorola also notes that FCC rules for DSRC operation in this frequency band require registration with the FCC of the location of each fixed equipment installation, and it will comply with this requirement.

Motorola does not propose to market, sell, or lease prototype equipment to end users or conduct a market study in conjunction with this test inconsistent with these requirements. Moreover, upon termination of the experimentation, all unapproved equipment will be returned to Motorola for disposal as required by FCC rules. If any different treatment becomes necessary during the course of its experimentation, Motorola will seek separate and additional authority from the agency.

Motorola also recognizes that the operation of any unapproved devices must not cause harmful interference to authorized facilities. It does not anticipate that such interference will occur, as the prototype equipment will operate at low power. Should interference occur, however, Motorola will immediately take reasonable steps to resolve the interference, including if necessary discontinuing operation. To that end, Motorola would advise entities using the equipment that permission to operate the equipment has been granted under experimental authority issued to Motorola, is strictly temporary and may be canceled at any time. Specifically, Motorola proposes to label the equipment or user information conspicuously as follows:

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Permission to operate this device has been granted under experimental authority issued by the Federal Communications Commission to Motorola, Inc., is strictly temporary, and may be canceled at any time.

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.

In any event, Motorola submits that its experimental operations are unlikely to cause interference. First, Motorola plans to coordinate its operations with any existing licensees in the areas of proposed operation as appropriate. Second, Motorola intends to monitor use of the relevant frequencies before commencing transmissions, and it will not operate if the frequencies are in use.

In addition, per Section 90.371 of the FCC's Rules, 47 C.F.R. § 90.371 (2005), Motorola will coordinate with the NTIA regarding any temporary fixed station operations within 75 kilometers of any government installation listed in the table contained in that section.

V. Conclusion

Motorola submits that authorization of a license on a nationwide basis 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.

VI. Contacts for Inquiries

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