

APPLICATION EXHIBIT – FORM 442

Introduction

Harman International Industries, Inc. (Harman) is a leading pioneer in developing reliable and secure platforms for the Connected Car, providing integrated solutions for the automotive industry. By this application, Harman seeks experimental authority to operate certain modular Cellular-V2X (C-V2X) prototypes at specified locations for purposes of testing, development, and evaluation.

The Commission has established the Dedicated Short Range Communications (DSRC) service in the 5.850-5.925 GHz band for enabling vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications. See 47 CFR §§90.371-90.377; Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, ET Docket No. 98-95, *Report and Order*, 14 FCC Rcd 18221 (1999). Recently, cellular specifications have emerged that support vehicle-to-everything (V2X) communications – V2V, V2I, vehicle-to-pedestrian (V2P), and vehicle-to-network (V2N). In recognition of both the DSRC and the emerging C-V2X platforms, Harman wishes to test modular technologies that would employ C-V2X functionality as an add-on module in a manner that allows for developmental flexibility.

Proposed Testing and Objectives

The proposed testing would support equipment research and development, field testing, and proof of concept. Harman is integrating the C-V2X functionality into its Telematics Control Units (TCU) by using an add-on module that would attach to the TCU. The devices to be tested would operate on frequencies allocated to DSRC service.

The proposed testing will be done in two stages: (1) Indoor Laboratory; and (2) Outdoor Vehicular.

(1) Indoor Laboratory Testing

The C-V2X module would be tested using a “bench” setup. Various parameters of basic operational states would be evaluated, including message transmission and reception statistics; latency; error rate; effects of fading and congestion; and effects of variations in transmit power.

Transmitter operating parameters:

Type	Frequency (MHz)	Power (dBm EIRP)	Power (mW EIRP)	Antenna Height (m)
Fixed	5850-5925	23 dBm (max)	200 (max)	1 (max)

(2) Outdoor Vehicular Testing

The C-V2X module would be installed in test vehicles, and communication between the vehicles would be evaluated while engaged in low-speed controlled manoeuvres. Testing would occur in secured outdoor areas on the properties identified below. Transmission and reception would be tested using up to ten vehicles simultaneously. In addition to the same parameters tested in the indoor laboratory, various use cases would be evaluated, including collision avoidance messaging; intersection messaging; blind-spot warnings; and emergency braking warnings.

Transmitter operating parameters:

Type	Frequency (MHz)	Power (dBm EIRP)	Power (mW EIRP)	Antenna Height (m)
Mobile	5850-5925	23 dBm (max)	200 (max)	1 (max)

Test Locations

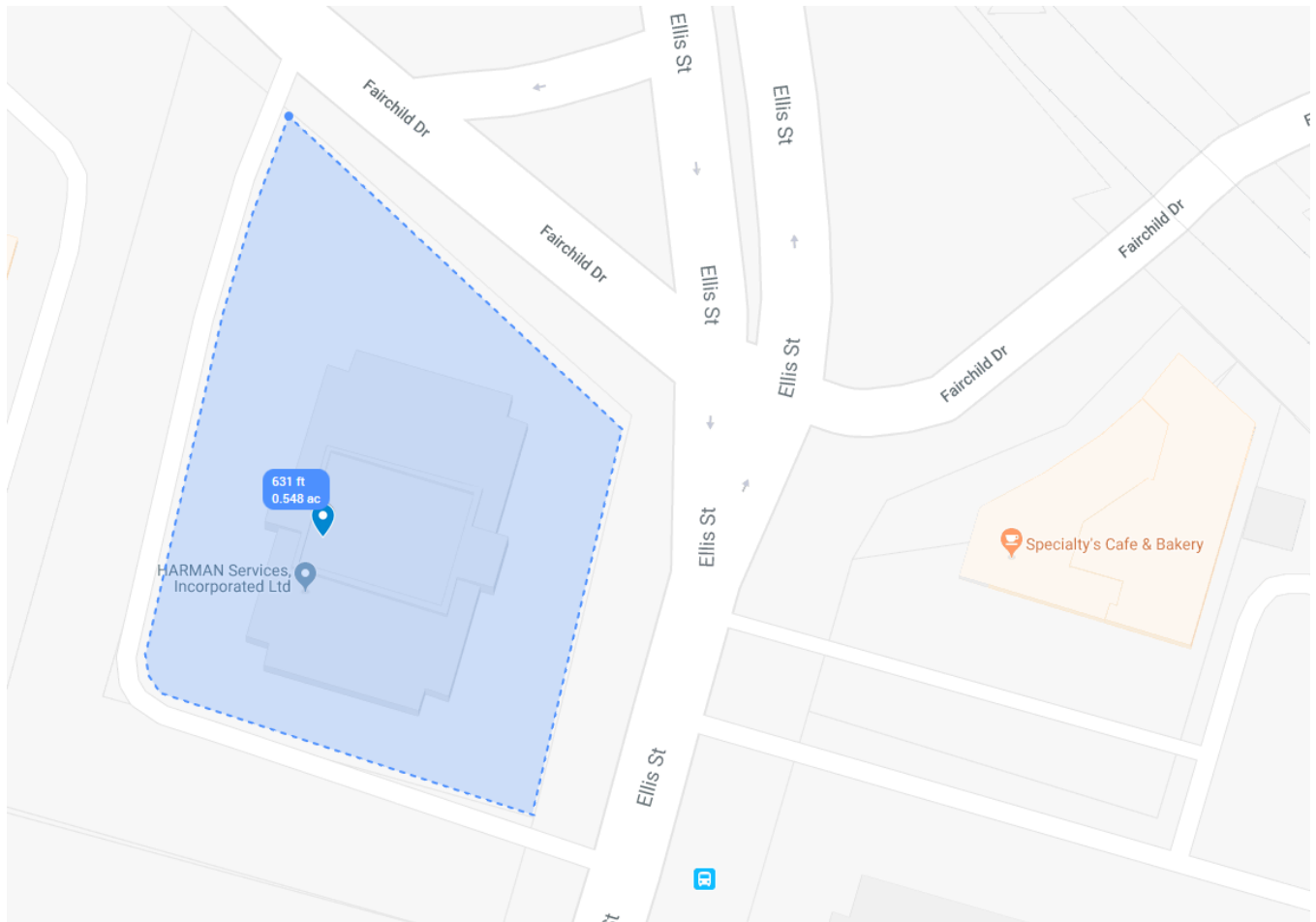
Testing will be restricted to the following locations:

1. Harman Connected Services, 636 Ellis Street, Mountain View, CA-94043
Approximate test area is about 59 square meters (including the parking lot at this location). The closest public roads are Ellis Street (6 meters) and Fairchild Drive (4.5 meters) from the test area.

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400 Atlantic Street, 15th Floor

Stamford, CT 06901 USA

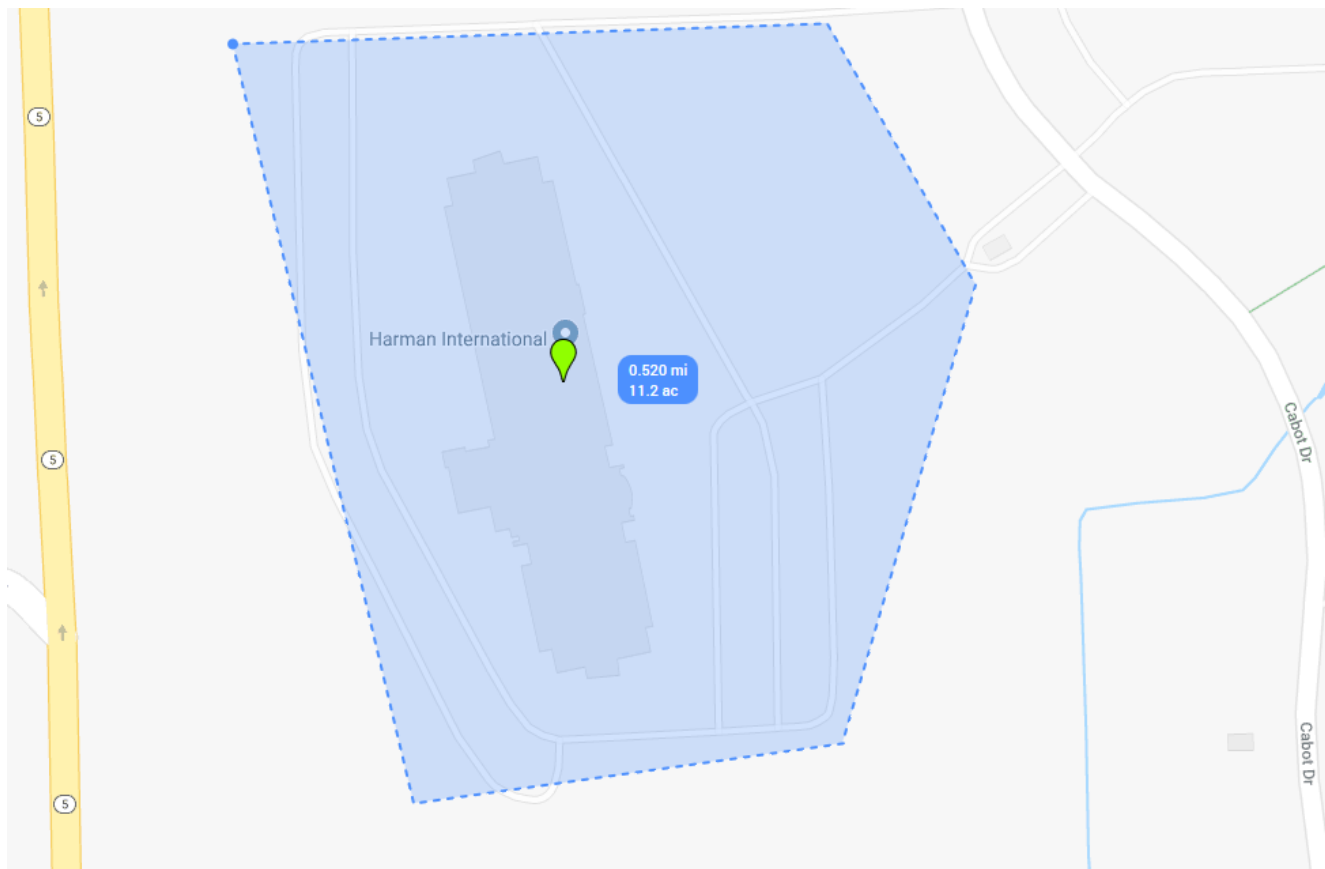


2. Harman Connected Car, 30001 Cabot Drive, Novi, MI-48377
The total test area (including the parking lot at this location) is about 1.35 square kilometres. The nearest public roads are Michigan I-5 (70 meters) and Cabot Drive (46 meters).

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Minimizing Interference

Harman understands that the proposed experiment under Part 5 of the Commission's rules must avoid causing interference to co-channel licensed operations. As noted, the devices to be tested would operate on frequencies allocated to DSRC service. Harman is not aware of any DSRC installations near either of the proposed testing locations. Given the maximum transmitting antenna height of 1 meter, the low power operation, and the sporadic and non-continuous nature of the testing, it is highly unlikely that the proposed experiment would result in harmful interference.