APPLICATION EXHIBIT – FORM 442

Introduction

By this application, Ford Motor Company seeks experimental authority to operate certain modular Cellular-V2X (C-V2X) prototype 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 the emerging C-V2X platforms, Ford Motor Company 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. Ford Motor Company is integrating the C-V2X functionality into the 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)	Bandwidth (MHz)	Power (dBm EIRP)	Power (mW EIRP)	Antenna Height (m)
Fixed	5850-5925	10	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 maneuvers. 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.

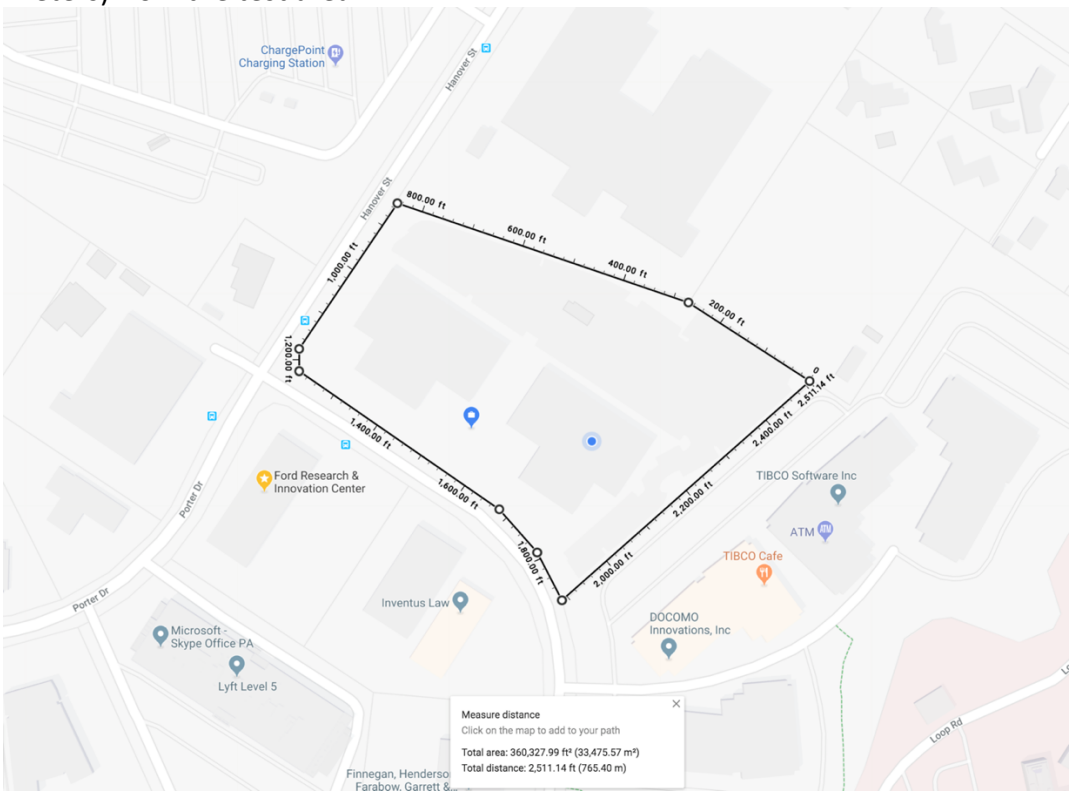
Transmitter operating parameters:

Type	Frequency (MHz)	Bandwidth (MHz)	Power (dBm EIRP)	Power (mW EIRP)	Antenna Height (m)
Mobile	5850-5925	10	23 dBm (max)	200 (max)	1 (max)

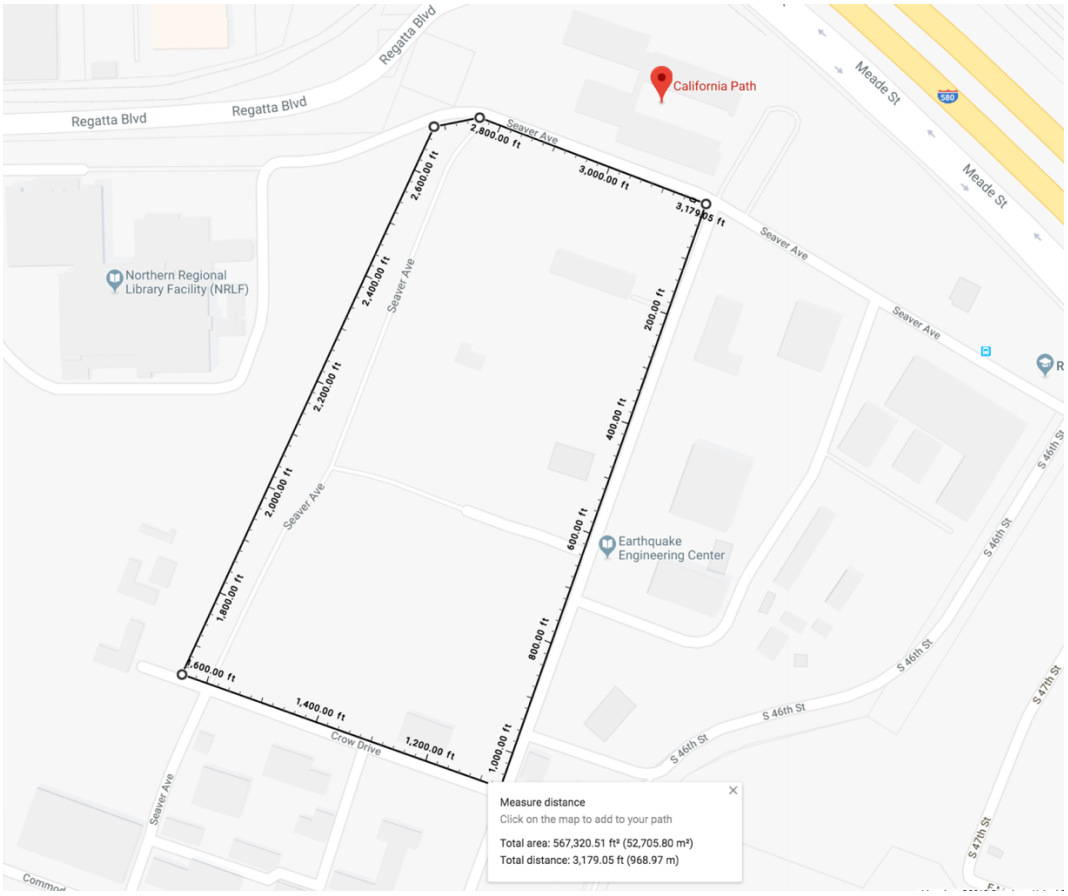
Test Locations

Testing will be restricted to the following locations:

1. Ford Greenfield Labs, 3251 Hillview Ave, Palo Alto, CA 94304
   Approximate test area is about 765 square meters (including the parking lot at this location). The closest public roads are Handover St (9 meters) and Hillview Ave (6 meters) from the test area.



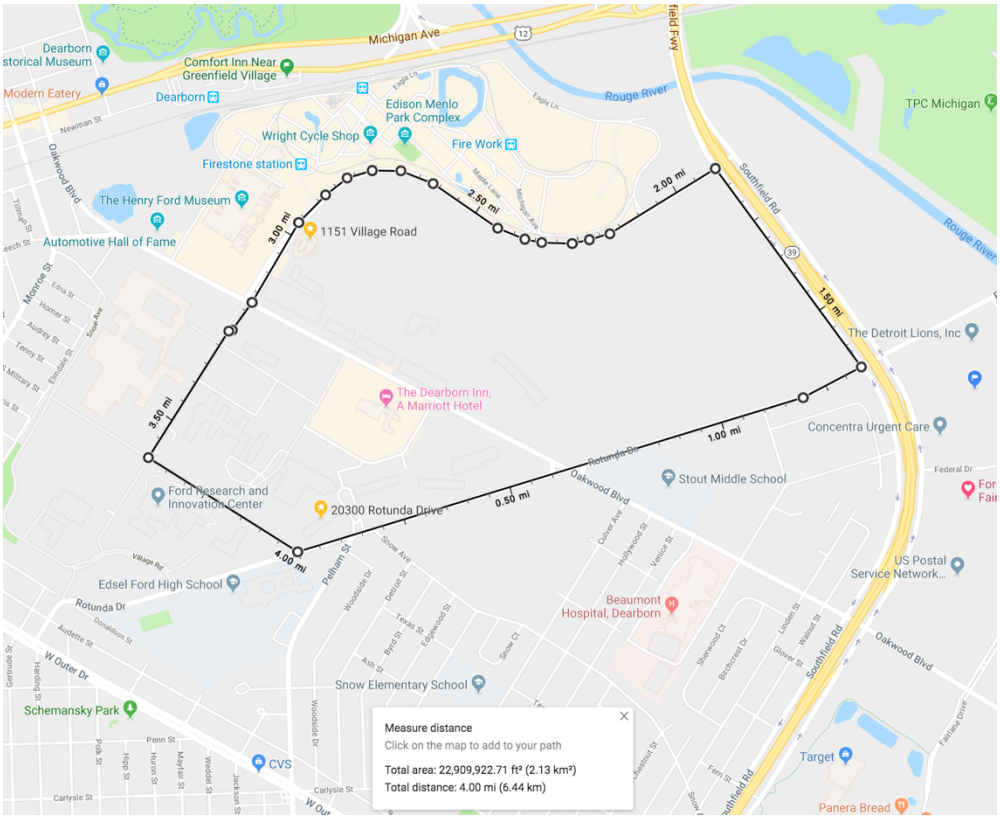
2. California PATH, 1357 S 46th St. Richmond, CA 94804
   Approximate test area is about 969 square meters. The closest public roads are Meade St (89 meters) and Regatta Blvd (53 meters) from the test area.



3. Mcity, 2905 Baxter Rd. Ann Arbor, MI 48109

Approximate test area is about 1230 square meters. The closest public roads are Baxter Rd (106.6 meters) and Plymouth Road (88.7 meters) from the test area.

4. Ford Dearborn, 20300 Rotunda Dr. Dearborn, MI 48124
   Approximate test area is about 2130 square meters. The closest public roads are Rotunda Rd (9 meters) and Southfield Road (16 meters) from the test area



Minimizing Interference

Ford 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. Ford is not aware of any DSRC installations near Ford Greenfield Labs, but aware DSRC test equipment installation in the California PATH, Mcity, and Ford Dearborn testing locations which is only for test-on-demands. 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.