

From: Billy Kihei

To: Behnam Ghaffari
Date: October 30, 2020

Subject: FCC File No. 0007-EX-PM-2020

Message:

In summary we are asking approval to:
Transmit and Receive in 5.9GHz Band, for Vehicle-to-Everything communications (V2X) and Intelligent Transportation Systems applications using DSRC (IEEE 802.11p) and C-V2X (3GPP LTE-V2X Rel 14 and Rel 16).

Our deployment is all about testing 5.9GHz V2X applications using technologies that are unreachable with the current equipment available on the market. To date, it is near impossible to work with a vendor, understand their API, and write an application using DSRC/C-V2X vendors software stacks. They are essentially locked boxes, and it is stifling scientific discovery. We have bootstrapped and developed our own DSRC radio using open-source hardware, open-source software, and commercial-off-the-shelf (COTS) wi-fi cards, we will hereafter refer to our platform as "research equipment". We want to study technologies such as blockchain, machine learning/deep learning, etc; applied to the edge. Currently these technologies are implemented in programming languages supported by the web-development community. We would like to conduct research into deploying applications for V2X, that are nearly impossible to develop when working with a vendor. We only need access to the packets entering the radio, and then build new applications using other programming languages than C/C++/Java.

We seek to deploy Dedicated Short Range Communications (DSRC) radios, Cellular-Vehicle-to-Everything (C-V2X) radios, and research equipment in the 5.9GHz band across our Marietta, GA campus.

We desire to conduct various studies in partnership with various organizations such as: Departments of Transportations (DOT) in the metro-Atlanta area. Including, but not limited to: Marietta, DOT, Cobb County DOT, Atlanta DOT, Gwinett DOT, Georgia DOT. We also intend to partner with regional partners such as Curiosity Labs at Peachtree Corners, and Alpharetta, GA iATL, and the Atlanta Regional Commission.

The deployment area for experimentation will be the Kennesaw State University Marietta, GA campus.

The purpose of our deployment is to conduct application testing using our 5.9GHz research equipment. We have a custom kernel which allows us to use commercially available off the shelf (COTS) Wi-Fi cards in the 5.9GHz band. We desire to use this COTS equipment as research equipment which can be configured as a: U-NII-4 Unlicensed Wi-Fi equipment and/or DSRC equipment. Our research equipment will allow us to develop an open-source framework to rapidly develop and prototype V2X applications quickly for performing academic research, and supporting Department of Transportations around the US.

According to the recent NPRM (Notice of Proposed Rulemaking – ET Docket No. 19-138), we also intend to conduct various tests between configuring our device operating similar to a U-NII-4 unlicensed devices at (5.850-5.895), similar to a DSRC radio at (5.895-5.905 GHz), and potentially similarly as a C-V2X radio at (5.905-5.925 GHz). The DSRC and C-V2X radios will be bought from commercial vendors. We currently have 9 DSRC OBUS, 1 DSRC RSU, 4 C-V2X OBUs, 1 C-V2X RSU (nothing is deployed yet). Our research equipment are custom COTS devices which are open-source hardware platforms with COTS Wi-Fi cards (from laptops).

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