

Application for a Conventional Experimental License

Prof. Harsha Chenji, Assistant Professor, School of EECS, Ohio University (chenji@ohio.edu)

1 NATURE OF THE RESEARCH BEING CONDUCTED

This experiment is part of the National Institute of Standards and Technology (NIST) Public Safety Communications Research (PSCR) funded project “DistressNet-NG: Resilient Mobile Broadband Communication and Edge Computing for FirstNet” at Ohio University (subcontract to Texas A&M University). We are investigating the resilience of the LTE infrastructure, specific to two public safety use case scenarios. For more information, please see the project website <http://distressnet.net/>

1.1 Equipment

The experiment setup consists of two small cells in LTE band 42/43. They can be configured to operate in any 20MHz portion of the 3500-3700 MHz band. We intend to operate mainly in the 3650-3670 MHz band, but are willing to move if interference is detected.

1. Baicells pBS2120 small cell at 250mW per antenna, internal 13.5dBi directional antenna
2. Baicells mBS110 small cell at 1W per antenna, external 9dBi omni antenna

The LTE user equipment (UEs) connect to these base station. The smartphones that we will be using as UEs are the Essential PH-1 phone bearing FCC ID 2ALBB-A11.

1.2 Methodology

The NIST use case scenarios will be simulated on the campus of Ohio University, but mainly on the 3rd floor of Stocker Center and surrounding lawn and parking lots. The small cells will be setup in a particular location (that differs between experiment runs), and ISM band backhaul will be deployed to connect them to the Internet. Then, the UEs will roam around the area of deployment, moving in and out of coverage of the base station. The algorithm and research output we are developing is designed to automatically detect connectivity condition, and failover the user application to run locally or connect to other networks such as WiFi.

We note that the small cells will not deployed more than 6m above the ground or 6m above the building. We will be using portable tripods at a max height of 2-3m to mount these small cells, or will set them on a desk or table when indoors.

2 REQUESTED COMMUNICATION FACILITIES ARE NECESSARY FOR THE PROJECT

The main objective of the project is to investigate the resiliency of LTE based public safety networks. Band 14 has been allocated for FirstNet (public safety broadband network), but we are using inexpensive small cells to emulate this Band 14 network. Note that we are unable to use ISM band techniques such as LTE-U or WiFi simply because the experiments will not be faithful to the real operating conditions of Band 14 (no interference, licensed spectrum). Therefore, we request permission to perform experiments in the 3600-3700 MHz band. I will use my Program Experimental License (WA3XAU) for frequencies not contained in 47 CFR 15.205(a).

3 EXISTING COMMUNICATION FACILITIES ARE INADEQUATE

I already have a current Program Experimental License (callsign WA3XAU), but this type of license does not allow me to register experiments in the 3600-3700 MHz band (which is part of 47 CFR 15.205 (a) band 3600-4400 MHz). Recently, the 3600-3700 MHz band became part of the CBRS 3.5 GHz

“innovation band”, and is well suited for LTE band 42/43 small cells. I intend to use small cells in this band as noted below. This is why I am filing for a conventional license in this band.