

FCC response for modification of licenses – August 2021

Applicant: North Carolina State University
File Number: 0074-EX-CM-2021
Correspondence Reference Number: 63409
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1) AERPAW is an aerial platform. Per our rules, Mobility division would NOT allow aerial operations in 3700-4200 MHz band.

2) Provide information that you have coordinated or you are planning to coordinate with the Earth Stations a short distance from your operation.

AERPAW Response:

Regarding 1), we acknowledge the limitations of aerial operation in the 3700-4200 MHz band, and we will limit our experiments to include only non-aerial operations in this band.

For 2), we plan to coordinate with the nearby FSS earth station users, and monitor the spectrum in-use using RF spectrum monitoring tools and stop transmission if any conflict with FSS transmissions.

Based on our previous analysis of the data provided by FCC about the Fixed Satellite Service providers, the closest fixed earth station is about 5 miles away north from the LW1 location. The two closest FSS stations located to the north of our LW1 fixed transmitter (located at coordinates 35°43'38.2" N, 78°41'45.8" W) are as follows:

- Fox Broadcast (35° 46' 46.5" N, 78° 40' 28.8" W)
- Global Eagle (35° 46' 14.2" N, 78° 40' 52.0" W)

As we plan to operate **only in a rural area (Lake Wheeler area, marked as LW1 in the map)** on this specific frequency band which is far away from these fixed earth stations (see Fig. 1), we believe we can operate in this band without interfering with the existing fixed earth stations of FSS services. A worst case analysis of interference to the FSS earth stations (taking into account the directionality and orientation of the FSS antennas) indicates that as long as the AERPAW transmitters are greater than 1400 m from the earth station antenna, the received signals from the AERPAW transmitter will be at or below the thermal noise floor. Therefore, we believe the current 5 mile distance between the AERPAW transmitter and the closest FSS receiver (see Fig. 1) provides sufficient separation to protect the FSS receivers.

We also do not plan to operate in this 3700-4200 MHz frequency band on the Centennial campus area to avoid interference to the FSS earth stations nearby.

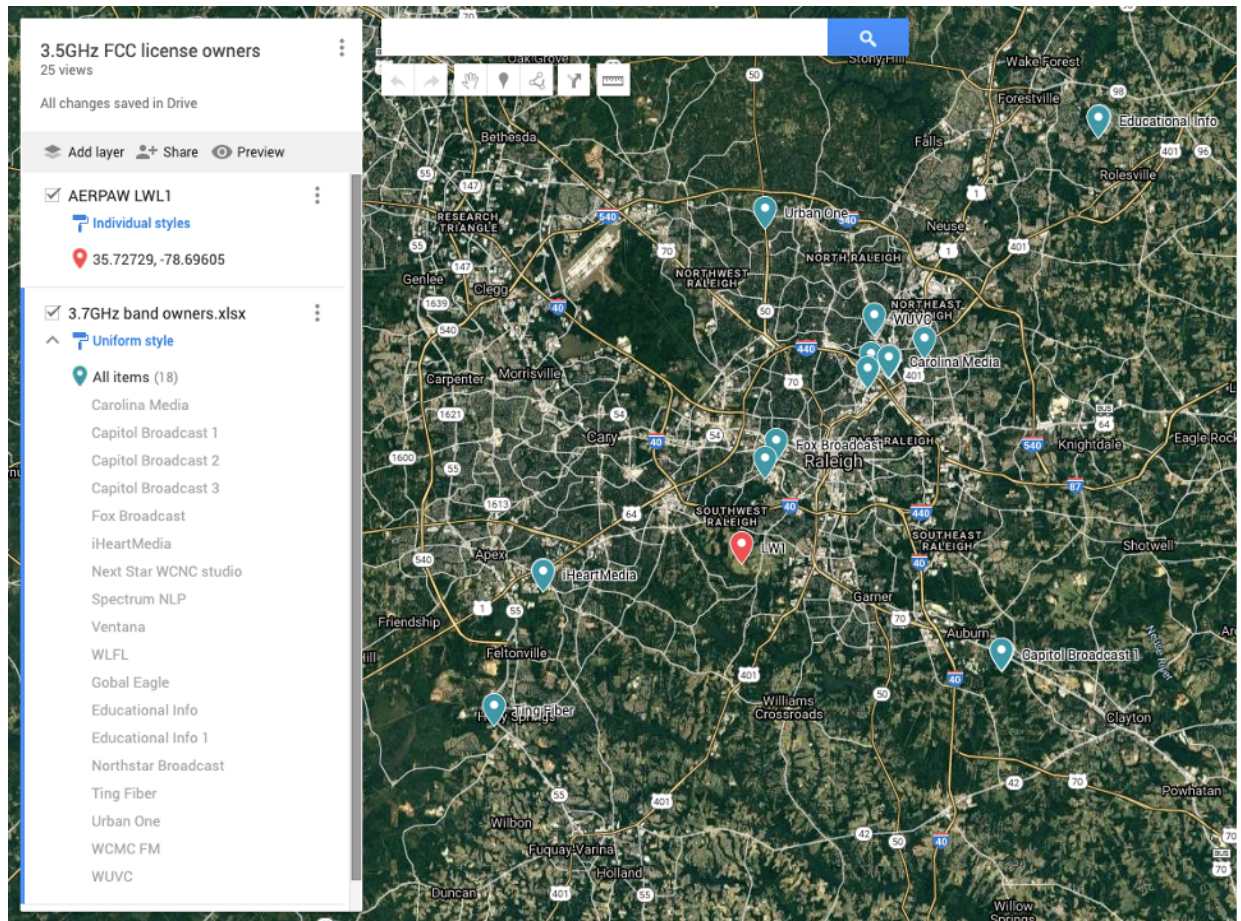


Figure 1: Location of the first AERPAW fixed node that may operate at 3.7-3.8 GHz band is indicated in red, and the nearby FSS receivers are indicated in blue.