

FCC response for modification of licenses – September 2021

Applicant: North Carolina State University
File Number: 0074-EX-CM-2021
Correspondence Reference Number: 64248
Date of Original Email: 08/26/2021

Please clarify few things.

1) Will you have any airborne operations in 3.55-3.7 GHz? (Yes/No) 2) For ground operations, are you currently working with a SAS which is a requirement in CBRS spectrum? (Yes/No) 3) Further, you did not say anything about coordinating with the FSS earth stations in 3.7-4.2 GHz band. To be clear, you need to show that you will be coordinating with a SAS in CBRS, and with FSS ESs. in C Band.

AERPAW Response:

1) Will you have any airborne operations in 3.55-3.7 GHz? (Yes/No)

Ans: No.

2) For ground operations, are you currently working with a SAS which is a requirement in the CBRS spectrum? (Yes/No)

Ans: No – we are not using the CBRS band now, but we may use it in the future. When we use the CBRS band we will coordinate with SAS, and we will submit a separate experimental request.

3) Further, you did not say anything about coordinating with the FSS earth stations in the 3.7-4.2 GHz band. To be clear, you need to show that you will be coordinating with a SAS in CBRS, and with FSS ESs. in C Band.

Ans: For FSS ESs coordination, as we have explained in our previous response 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 km distance between the AERPAW transmitter and the closest FSS receiver (see Fig. 1) provides sufficient separation to protect the FSS receivers.

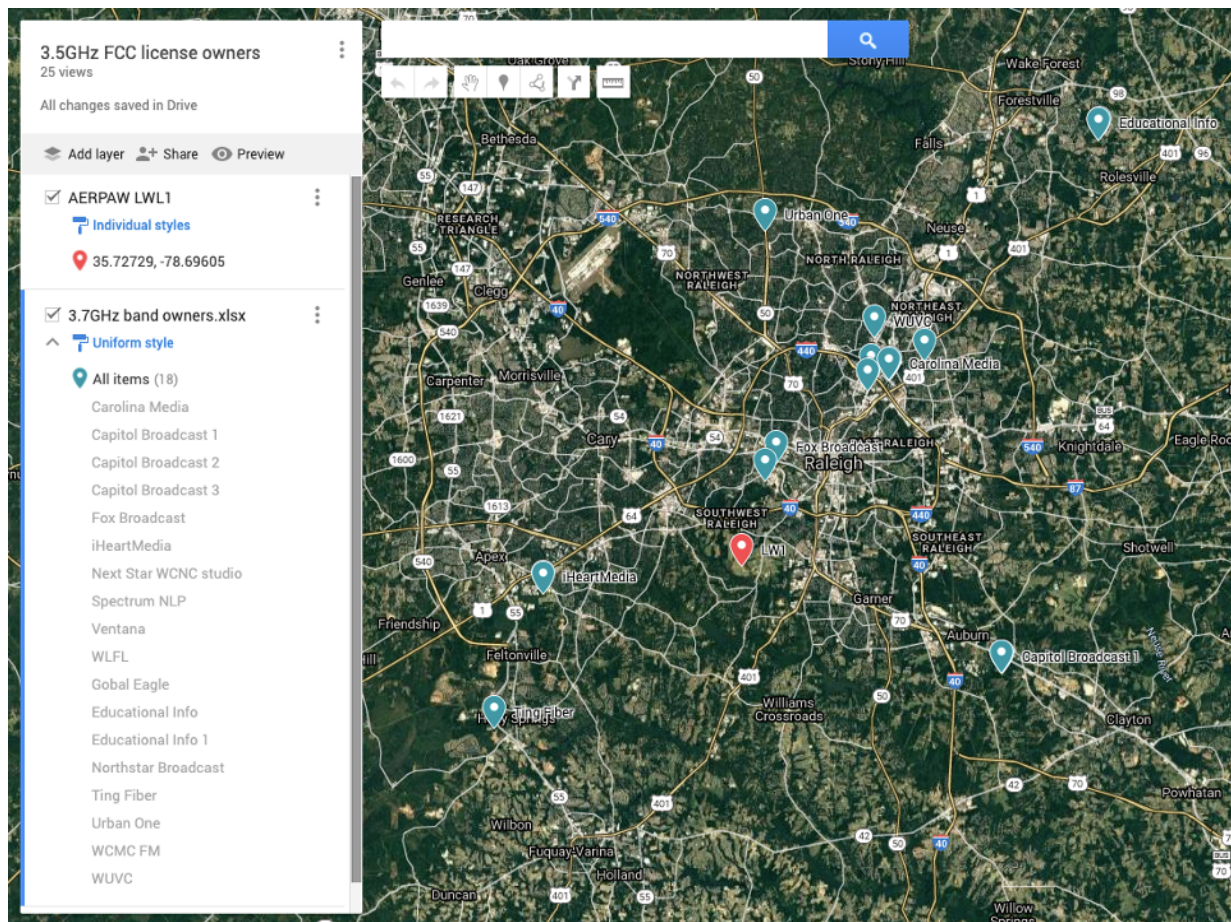


Figure 1: Location of the first AERPAW fixed node that may operate at 3.7-3.8 GHz band is indicated in red, and the nearby FSS receivers are indicated in blue.

Further, we will limit the transmit power to limit the interference to the nearby FSS stations as follows:

- Fixed node - 5 W nominal and 10 W max transmit power
- Mobile node - 1 W nominal, 3 W max transmit power