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Pushing Capabilities of 6 Ghz

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OVERVIEW

In 2020 the Commission issued the 6 GHz Report & Order to designate additional spectrum for unlicensed operations with a vision of its use for “new innovative technologies and services that will advance the Commission’s goal of making broadband connectivity available to all Americans, especially those in rural and underserved areas.” Unlicensed Use of the 6 GHz Band, 35 FCC Rcd 3852, 3853 (2020). Through this application for an experimental license, Triple Crown Internet, Inc seeks to advance these goals by testing this new Cambium equipment across the UNII-5 band for potential delivery of enhanced fixed wireless at current spec broadband standards to the rural areas envisioned by the Commission's goal.

GOALS

1. Build network configuration to allow 1 Gig or higher traffic to each of the 4 sectors.
2. Prove the equipment can deliver high bandwidth to commercial customers within one mile at a rate of 400 Mbps Download and 200 Mbps Upload, or higher.
3. Prove the solution will work at volume in a real practical configuration. With 40 customers on a sector, the provides 100 Mbps Download and 20 Mbps Upload (100/20) while adding no more than 25 ms of latency.
4. Prove the solution can provide volume and distance, with 100/20 services available at 4+ miles, with no service degradation, on a sector loaded with at least 30 customers with mixed services.
5. Determine the minimum channel size required to meet the above goals. (40,80,160 MHz)

SPECIFICATIONS

The experimental operations will involve field deployment and testing of the latest Cambium Networks ePMP 4600 6 GHz radio technology on 1 tower at the SW edge of Denver City Texas, which is a rural community with cable and some fiber in the town itself but very poor quality internet availability in the area’s around the town. Outside of town about 3 to 4 miles is a small

community called Alred which is devoid of internet solutions. This will be a target area to show both volume and distance on a single sector. The experiment will evaluate 40, 80, and 160 MHz channel sizes to determine the minimum required to maintain the desired throughput to customers, given distance and maximum bandwidth on the sector.

Triple Crown Internet, Inc will perform this data collection without causing harmful interference to incumbent users, especially given the small rural airport close by. Triple Crown Internet, Inc will work with any nearby licensed incumbents that it identifies based on information provided in the FCC's databases, to ensure its operations will avoid any harmful impact on such existing users.

MILESTONES

Install Completion

The tower currently exists. Triple Crown Internet, Inc will establish a new data center, obtain backhaul, and build out equipment on the tower. The tower will have Fiber and DC power installed from the Data Center to about 40 ft elevation to a Tower mounted outdoor rated switch which will provide CAT6 with POE to the individual radios mounted at approx 85 ft.

Analysis of available spectrum

Triple Crown Internet, Inc will use the FCC databases and frequency scans to determine any current users of the 6 GHz spectrum and find at least 2 usable 160 GHz bands for use in a ABAB configuration on the tower which provide efficient use of the spectrum.

Service Delivery

After approval and near mid Spring 2023, Triple Crown internet will begin providing services to local business and residential customers. A targeted area will be the Alred community to provide them with true broadband. Variations of channel sizes will be tested to see how that affects both bandwidth and distance performance.

Data Analysis

Triple Crown Internet will monitor performance while building up connection counts on the sectors. Once target levels are achieved, the performance will be validated at several customer locations during busy hours to make sure the equipment meets the specs and goals.

CONCLUSION

This experimental test will demonstrate the effectiveness of the technology in a scenario with volumes rather than a small number of customers in a controlled environment. Thus if successful will prove the suitability of the equipment to provide broadband to rural users in a true commercial landscape.