**Before the**

**Federal Communications Commission**

**Washington, D.C. 20554**

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In the Matter of )

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Request for Waiver of CBRS Transition ) WT Docket 18-353

Deadline filed by WISPA and UTC )

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COMMENTS OF INTERISLE CONSULTING GROUP

The Commission should grant the Petition filed for extension of the CBRS transition deadline. It is now clear that there is no realistic way for most existing users of the 3650-3700 MHz Wireless Broadband Service band to transition all, or even a substantial fraction, of their Part 90Z operations to Part 96 CBRS prior to the April 17, 2020 date on which most of these licenses expire. A date five years in the future that seemed reasonable at the time it was adopted in 2015 turns out to be unreasonable in light of the fact that it is now only 16 months away and CBRS is nowhere near operational. It is not worth hashing out why it has taken so long for CBRS to go live, and certainly not for lack of effort; it is merely sufficient to note that what originally seemed likely by 2017 is now not likely to happen until 2019. And even when the band initially goes live, transition will be a lengthy process.

Interisle Consulting Group provides design and technical services to Wireless ISPs. One project that we are deeply involved in is now in its final pre-construction design stage, to serve remote hill towns in western Massachusetts. An Interisle client has won CAF II auction grants and is thus committed to ensure service, and additional state grants are expected to help with capital expenses. Approximately 1050 homes are in the initial service area, with some additional homes in other nearby CAF-II covered census blocks. Slightly more than half of the homes served are currently planned to be covered by CBRS, but as construction will begin before CBRS is ready, they will initially be installed, in 2019, under the grandfathered 3650 MHz WBS license held by the WISP who will operate the network. This is one example; other clients including ISPs and government public safety agencies also currently make use of the 3650 MHz band. If CBRS transition cannot be completed by the time the license expires, most subscribers, for many of whom this is their only broadband option, and many of whom will be receiving their primary fixed telephone service via this network as well, will lose service.

CBRS rules are intended to accommodate multiple use cases. One, of course, is “small cells”, the mobile use case in which CBSDs will serve mobile EUDs within a typical radius of 150-200 meters. In that use case, the only CBSD is a base station which must be approved both for its Part 96 emission testing and for its conformance to the SAS-CBSD protocol specification approved by the Wireless Innovation Forum (WInnForum). The EUD, however, is limited to +23 dBm EIRP (typical hand-held device power) and does not communicate directly with the SAS. By merging the 3650 MHz band into CBRS, however, the Commission also committed to supporting the fixed use case, both for WISPs and for utilities. Indeed major investments have been made by WISPs *since* the 2015 approval of CBRS, in *reliance* upon a smooth transition. But much needs to be completed before the transition can take place.

In the fixed use case, the customer premise equipment (CPE) radio typically has a highly directional gain antenna, and thus operates at a higher EIRP than is allowed for an EUD. Part 90Z permits fixed devices to operate at 1 watt/MHz EIRP. Thus a device can operate at +40 dBm EIRP on 10 MHz. An EUD is limited to +23 dBm EIRP/10 MHz, 17 dB lower than Part 90Z devices. A Category B CBSD, however, is allowed +47 dBm EIRP/10 MHz. In practice, then, the preponderance of CBRS CPE devices will need to be authorized by the SAS and operated as CBSDs, not EUDs. This is consistent with 96.47, *End user device additional requirements*:

(b) Any device operated at higher power than specified for End User Devices in §96.41 will be classified as, and subject to, the operational requirements of a CBSD.

This creates a category of devices which WInnForum generally refers to as CPE-CBSDs. WISPA and others have been actively engaged with the FCC in developing methods by which CPE-CBSDs can gain SAS authorization over the air, which is generally required for fixed devices, at higher EIRP levels than an EUD. But that “handshake” procedure has not been approved yet, as it is awaiting Department of Defense study. Thus manufacturers of equipment cannot even begin to develop the firmware upgrades needed to convert a Part 90Z device into a CBRS CPE-CBSD. This will take some months of coding and testing. Then each such device will be subject to both the type approval testing required of an EUD, the test cycle required of a CBSD, and a test of the handshake procedure. Even if the proposed handshake procedure is approved by January, 2019, it is unrealistic to expect widespread approval of CPE-CBSD upgrades by early 2020. It is even more unrealistic to expect service providers to be able to upgrade *all* of their operational equipment to CBRS by April, 2020.

There will also be some WBS devices that do not get upgraded to CBRS. These include devices that are technically incapable of handling the strict emission mask required of CBSDs, and devices that are deemed obsolete by their manufacturers even if they still work. A large share of 3650 MHz operation, for example, uses WiMAX technology. Even vendors who are still in business are unlikely to invest in upgrading WiMAX to meet CBRS standards. Thus users will need to replace this equipment in the field. In many areas, especially in the northern states, snow and ice make some rural base stations very hard to access during the winter months. Thus some upgrades are best planned for summertime. Since there will not be any CPE-CBSDs on the market during the 2019 summer season, such upgrades will have to wait until the summer of 2020 *at the very earliest*, which is already after the current license expiration date. But as the Petition notes, a smooth transition requires more than one year.

## Satellite protection

We wish to point out that some issues not directly addressed by the Petition may need to be considered by the Commission. Current rule 96.21(c) is problematic:

(c) Grandfathered Wireless Broadband Licensees and Citizens Broadband Radio Service users must protect authorized grandfathered FSS earth stations in the 3650-3700 MHz band, consistent with the existing protection criteria in 47 CFR part 90, subpart Z, until the last Grandfathered Wireless Broadband Licensee's license expires within the protection area defined for a particular grandfathered FSS earth station. Thereafter, the protection criteria in §96.17 applicable to FSS earth stations in the 3600-3700 MHz band shall apply.

What appears to be the case here is that FSS earth stations are only subject to *one* of two interference protection criteria at a time. Under Part 90Z criteria, any operation within a (typically) 150 km radius of FSS requires the permission of the FSS operator. (This is not available to CBRS operators.) Under 96.17, FSS is protected from CBRS interference by the SAS, which uses propagation modeling to ensure that the *aggregate* interference level from CBRS operation does not exceed its defined limits.

The transition from Part 90Z to Part 96 protection occurs only after the very *last* Part 90Z device within the 150 km protection radius expires. Until then, no CBRS operation at all is permitted within the protection zone on FSS-shared frequencies below 3700 MHz. This presumably was intended to prevent *aggregate* interference from exceeding thresholds by having *both* Part 90Z (static permission) and Part 96 (SAS-regulated) devices operate at once. But in practice it is a *severe* limit on CBRS operation, especially GAA, which is where the preponderance of fixed and utility operation will remain. At its worst case (i.e., a Part 90Z device whose permission to operate is *at* the maximum level below that which would impair FSS operation), having *both* Part 96 and Part 90Z devices operating within the 150 km limit would result exceeding the margin by 3 dB. But that is not likely to occur in practice.

Thus we recommend that the static protections in 96.21(c) be terminated by 2020 even as Part 90Z operation by existing operators is extended until January, 2023. If absolutely necessary, during the extended transition period requested by the Petition, the interference thresholds in 96.17, enforced by the SAS, can be *temporarily* reduced by 3 dB, to ensure that in no case will the combination of Part 96 and Part 90 operation create harm. But that frankly seems excessive. Most of the Part 90Z devices are not at the margin, and they will mostly transition to CBRS when it is feasible. It is also notable that the FSS protection mechanisms used by the SAS do not fully take clutter into account, and thus the actual amount of interference received from CBSDs will be less than the nominal calculation indicates.

## Grandfathered Wireless Protection Zones

Under 96.21, a Part 90Z device that was registered in ULS by April 17, 2015 and in operation by April 17, 2016 may be granted Incumbent status and thus protected against interference from CBRS operations. Grandfathered Wireless Protection Zones (GWPZs) are thus established around such devices, provided that they filed for protection during a window in 2017. ULS lists 2450 such devices entitled to protection.

However, in taking its 2017 filings, the Commission asked for licensees to specify the “Lower/Center Frequency”, “Upper Frequency”, and emission designator. Part 90Z operation is frequency agile – licensees are allowed to select their own frequencies within the band, with Restricted-approval devices limited to the lower 25 MHz. In most cases, the “Lower/Center Frequency” was thus filed as 3650 MHz, while the upper frequency was filed as 3675 or 3700 MHz. Thus the GWPZ protects 25 or 50 MHz. However, only 29.5% of these filings listed, via the emission designator, a bandwidth of 10 MHz or greater. 70.5% are using less than 10 MHz. Yet of the 97.8% who did include an upper frequency in their filing, only 6 (0.25%) indicated a protected frequency range (difference between “Lower/Center Frequency” and “Upper Frequency”) of *less than* 25 MHz. Thus the current grandfathering database is likely to cause the SAS to protected several times as much spectrum as is actually being used.

While Incumbent status is beneficial, it is not vital. The Commission can simply allow GWPZs to expire on the originally planned date (for the most part, April 17, 2020), after which point operation is co-equal with GAA. Or it can ask licensees to amend the 2017 filing to include their *actual* center frequencies (vs. “Lower/Center”) and bandwidths with either the ULS or with a SAS. That will again reduce unnecessary limits of GAA operation in the 3650-3700 MHz part of the CBRS band.