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To Whom It May Concern:

re: Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24GHz, GN Docket No. 17-183

CBNL is strongly supportive of increased flexibility in the usage of 'mid-band' spectrum for advanced wireless service provision.

Elsewhere in the world, CBNL has deployed many tens of thousands of point-to-multipoint systems in the ITU-R harmonized 10.5GHz band[1]. The relatively favourable propagation characteristics in this band allow ranges of up to approximately 15 miles, at an availability of 99.99% considering typical rainfall for most locations.

This combination of long range with the economic benefits of a point-to-multipoint architecture (namely, the capital and operating cost of the central station equipment is amortized across all links served by that equipment) result in an extremely attractive proposition. Because the coverage area is large, a single inexpensive hub provides potential coverage to many thousands of possible fixed end user locations.

The business consequence of the large coverage area is that the conversion rate from potential user, to actual paying customer, required for the network to operate at a profit is low. This incentivizes operators to instantiate service in locations where other technologies, with a smaller coverage area (and a commensurately higher coversion rate needed to reach a positive ROI), may not be viable.

Mid-band spectrum offers something of a 'sweet-spot' because large channel bandwidths can be available, so allowing high data rate services to be offered to the end user. Meanwhile the propagation characteristics result in the potential for large coverage areas, with the desirable business consequences noted previously. There is therefore a win-win scenario for both network operator and end user.

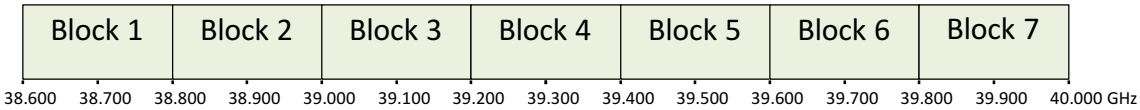
From a regulatory perspective, therefore, CBNL applauds the initiative to expand the use of these bands. We note that area-based licensing is commonplace for these bands and applications, and is well suited to same because the number of links can be extremely large (thus link-by-link coordination becomes cumbersome).

Duplexing arrangements

As CBNL has noted in previous comments to the FCC[2], for general wide-area licensed band operations, both fixed and mobile, FDD is the predominant mode of duplexing and interference avoidance. This is because of the simplicity of interference avoidance, even where systems adhering to differing technical standards are deployed at the same location in adjacent channels. In particular, the independence of the interference avoidance function from the detailed technical standard facilitates rapid innovation in the latter.

[1] RECOMMENDATION ITU-R F.1568 *Radio-frequency block arrangements for fixed wireless access systems in the range 10.15-10.3/10.5-10.65 GHz*.
[2] CBNL, *CBNL comment on new 39GHz band plan*, September 2016.

We therefore urge that FDD operations not be prejudiced by the band plans adopted for mid-band spectrum. One way in which such prejudice can arise, for example, is where block allocation such as the following exist:



In such a scenario, the minimum number of blocks required to operate a TDD system is one. However, the minimum number of blocks required to operate an FDD system is two. Notwithstanding that such an FDD system will, all else being equal, have twice the capacity of the TDD system, this does represent a higher financial barrier to entry for FDD operations.

One possible solution is to allocate TDD blocks starting at the bottom of a band, and FDD blocks starting at the top, with the combined size of an FDD paired block being equal to that of a TDD block. This approach is taken in recent ITU-R recommendations for millimeter wave bands, for example[3]. It should be noted that this does not constrain the transmit and receive FDD blocks to be of equal size. For instance, it may make sense for the example given here to pair 150MHz of spectrum for the downlink with 50MHz for the uplink, for obvious reasons concerning typical demand bias.

12 GHz band

The 12.2—12.7GHz band, in CBNL's view, represents ideal sweet-spot spectrum allowing both cost-effective wide area coverage (thanks to its propagation characteristics and amenability to use in a point-to-multipoint fashion) and high end-user data rates (thanks to its reasonable 500MHz size). However, the current technical rules for terrestrial use prevent bidirectional operation in this spectrum and severely restrict the EIRP of transmitters, due to concerns over coexistence with satellite systems.

CBNL believe the desire of the MVDDS Coalition—of which CBNL are not members, for clarity—and others to liberalize the technical rules governing terrestrial fixed service operations in the 12GHz band[4] is logical. If opened to two-way FDD operations, CBNL would envisage the band offering very affordable, Gbps-class point-to-multipoint connectivity across coverage areas of 10—15 miles radius. We base this view on many years' successful deployment of similar equipment around the world.

Yours faithfully

/s/ John Naylon
Dr John Naylon
CTO
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[3] RECOMMENDATION ITU-R F.2005 *Radio-frequency channel and block arrangements for fixed wireless systems operating in the 42 GHz (40.5 to 43.5 GHz) band,* March 2012.
[4] MVDDS Coalition, *Petition of MVDDS 5G Coalition for Rulemaking*, Docket RM-11768.