Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183
	)	

COMMENTS OF THE
NORTH AMERICAN BROADCASTERS ASSOCIATION

The North American Broadcasters Association (**NABA**) is an association of broadcasters within the International Telecommunication Union Region 2 countries of Canada, Mexico and the United States. NABA[1] hereby submits its comments in response to the above-captioned Notice of Inquiry (hereinafter **NOI** or **Notice**) adopted by the FCC on August 3, 2017.[2] The Notice seeks detailed comment on providing flexible access – particularly for wireless broadband services – in three specific bands: 3.7–4.2 GHz, 5.925–6.425 GHz, and 6.425–7.125 GHz. The Commission should not permit additional terrestrial uses, and especially not mobile uses, in the band 3.7–4.2 GHz. Allowing widespread new terrestrial uses in the portion of the C-band used for satellite downlinks will cause significant harm to existing services using that band and to the consumers who rely on those services. While we support the efficient use of spectrum as a principle, we cannot support such use if it causes harmful interference to the incumbents.

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1 NABA members include: Ad-ID LLC; AT&T; Bell Media; CBC/Radio-Canada; CBS Broadcasting, Inc.; Corus Entertainment; Dejero Labs, Inc.; Disney/ABC Television Group; Dolby Laboratories, Inc.; Emmis Communications; Eutelsat America Corp.; Fox Entertainment Group, Inc.; Globecast; Grupo Televisa S.A.; Harmonic, Inc.; HERE Technologies; Imagine Communications; Inmarsat; Intelsat; National Association of Broadcasters; National Public Radio; NBCUniversal; Nautel; Panasonic; Pearl TV; Public Broadcasting Service; SES; Sinclair Broadcast Group; TimeWarner, Inc.; Turner Broadcasting System, Inc.; TV Azteca S.A. de C.V.; Univision Communications, Inc.; and Xperi.

2 *Notice of Inquiry*, FCC Rcd 17-104, In the Matter of Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz

A. 3.7–4.2 GHz is Used Extensively Throughout North America for Satellite Downlinks.

The Fixed Satellite Service (**FSS**) over C-band is extensively used to distribute television, radio, and other content in North America and around the world. NABA member organizations depend on FSS operating in the 3.7–4.2 GHz band for the distribution of their programming content to thousands of satellite receivers. The C-band is also used by the US Government's NOAA to distribute weather data through its NESDIS[3] system and to distribute emergency alerts as part of the US Emergency Alerting System.[4]

C-band delivery of content from owner to distributor is often used when a fiber link is either not available or not economical, which is often the situation in the rural communities that are critically dependent on it. Even in the case when fiber or satellite delivery in the higher frequency Ku band is the primary distribution means, FSS over C-band is a critical backup, since it is immune to physical disruption suffered by wired connections and more robust to rain fade than higher frequency satellite bands. In these cases, if the C-band signal sent to a distributor is lost, no content is received by their respective consumers, whether over cable, Direct-to-Home satellite, Over-the-Air, or Over-the-Top.

C-band earth stations are significantly deployed across North America. In the U.S., the NOI reports that there are approximately 4,700 C-band earth stations registered in the FCC database.[5] This figure significantly undercounts the number of C-band earth stations actually in use, however. Various estimates suggest that there are thousands of additional C-band earth stations that have never been registered at the FCC since there is no regulatory requirement or opportunity to do so. In the U.S., the FCC will generally not allow registration of C-band receive only antennas smaller than 4.5

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3 https://www.nesdis.noaa.gov/

4 http://www.prss.org/news/npr-labs-pilot-project-radio-emergency-alerts

5 NOI Para 14.

meters because such antennas cannot comply with the antenna gain mask of Sections 25.209(a) and (c) of FCC Rules.[6] Despite that requirement, many users obtain adequate performance with smaller antennas (such as 3.7-meter diameter antennas[7]) due to unique antenna geometries, improved channel and content coding, lower noise figures, and other factors. Even when antennas larger than 4.5 meters are in use, the FCC registration process is voluntary and the historical licensing of many thousands of terrestrial links in the band often made the necessary satellite frequency coordination impossible.

Many of these earth stations are used as intake head-ends by cable, satellite, and telecommunications service providers. There are many thousands of U.S. registered and unregistered earth station locations that rely on C-band, typically on a daily basis. At some of these locations there is one earth station but at most locations there are multiple – as many as 20 earth stations in some cases. These stations are distributed throughout North America. One of NABA's Mexican member organizations reports that over 1,800 C-band earth stations are in use to distribute TV services in Mexico. Similarly, a Canadian member organization reports using some 425 C-band earth stations for distributing content across Canada. The large number of C-band receive earth stations installed and operating throughout North America makes an introduction of a new service in the band challenging or impossible, depending on the yet unknown operational characteristics of these new services.

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6 https://transition.fcc.gov/ib/sd/se/s312reg.pdf
https://transition.fcc.gov/Bureaus/International/Notices/2000/fcc00435.txt (para 11)

7 https://vikingsatcom.com/products/?route=product/product&product_id=621

B. A New Wireless Broadband Service in 3.7–4.2 GHz Would be Impractical and Disruptive.

Deployment of terminals in this band as a part of a new wireless broadband service would be impractical for at least two reasons. First, the interference zones will be large. C-Band services transmitted from space satellites are very weak in power when they reach the earth station after propagating over 22,000 miles from satellites' orbit to the surface of the Earth. The earth stations must have high sensitivity in order to receive these weak signals. Any terrestrial signals in the same band would be stronger than the signals transmitted from space and would interfere with the downlink communication between space satellite and earth station. To protect the satellite signal, large separation zones (on the order of tens to hundreds of kilometers) would be required to protect C-band earth station receivers from in-band interfering devices. ITU-R Reports[8] and other research[9] confirm this requirement. Second, there is no complete database of receive-only C-band antennas in the U.S. because most of them are not registered. The unknown but clearly large number of operating earth station receivers distributed throughout North America combined with the large protection zones required around each one of these makes it difficult to understand how, where, or when devices deployed as a part of a newly-introduced service in the C-band could operate while not causing interference to FSS. It seems clear that ensuring interference protection of existing C-band earth stations would prevent new wireless broadband operations in this band over most of the populated regions of North America.

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[8] ITU-R S.2368, "Sharing studies between IMT-Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands"

[9] http://montreal.ieee.ca/files/2015/11/C-bandInterference_PRES.pdf

C. Users of 3.7–4.2 GHz Must Protect Existing Earth Stations Over Their Full Arc and Full Frequency Range.

As previously discussed, there are thousands of unregistered earth stations that provide critical functions. Because many terrestrial point-to-point links that formerly precluded frequency coordination have now ceased operation it may now be possible to register some of the existing unregistered earth stations. However, a large number of unregistered earth stations still cannot be registered because the antenna is too small to comply with the gain mask specified in the FCC Rules. [See 47 CFR §§25.209(a) and (c)] The FCC must nonetheless protect these earth stations either by registration or by inclusion in a database. Such a database does not presently exist.

Even if a complete database of C-band earth stations were created, in order to maintain robust and reliable reception of radio and television signals, earth stations must often change frequency or satellite, thus creating a multi-directional interference zone that covers the entire frequency band. Flexibility is a design requirement for all users of the C-band. Earth stations need to be agile in acquiring signals from multiple satellites. Most earth stations have been designed and manufactured to receive signals across the full C-band 3.4–4.2 GHz allocation, even though NABA member organizations primarily use the 3.7-4.2 GHz band for radio and television distribution. They are installed so that they may be pointed and re-pointed to different satellites in the geostationary arc. There is an operational need to reconfigure an earth station so that it can be pointed toward different satellites and tuned to different frequencies to receive signals from different transponders. One example of this operational need is a switch from a failed transponder to a backup either on the same satellite or on a different one. Another example is the need to switch satellite entirely if there is an in-orbit failure or "Sun Outage." Or, as another example, sometimes programming from a special event is distributed on a different channel through a transponder on an alternate satellite due to scheduling conflicts or other needs. Finally, inadvertent uplink illumination

or satellite positioning failures (*e.g.*, "ZombieSat") can jam intended transmissions that must be able to be quickly relocated to preserve service.

The current FCC licensing framework, which allows for an earth station to make use of its full dynamic capabilities during times of special events, or more importantly, during times of failure, is one of the several aspects of FSS C-band that makes the service so robust and critical to the broadcast industry infrastructure. The C-band is both adaptable and resilient to failure not only because the stations are re-configurable and the frequency band propagates well from space to Earth through precipitation, but also because the licensing framework is typically full-band, full-arc. The FCC must not convert the framework from full-band, full-arc to specific channel, specific look angle as suggested by the Fixed Wireless Coalition.[10] Such a change would result in the need for multiple instantiations of licenses for those earth stations that are registered. Multiple licenses lead to increased licensing fees, multiple frequency coordination studies, increased processing requirements, increased record keeping, and increased regulatory challenges.

Broadcasters' earth station facilities must continue to have the flexibility that full-band, full-arc licensing has provided to maintain programming to the public. Broadcast stations routinely need to access programming from different network feeds or other sources, which may be on almost any transponder or satellite.

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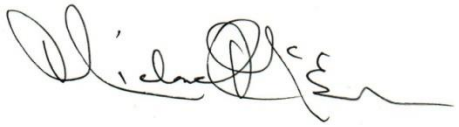
[10] *See*: Fixed Wireless Communications Coalition Inc., Request for Modified Coordination Procedures in Bands Shared Between the Fixed Service and the Fixed Satellite Service, RM 11778, Petition for Rulemaking (Oct. 11, 2016); Fixed Wireless Communications Coalition, Inc. Request for Modified Coordination Procedures in Bands Shared Between the Fixed Service and the Fixed Satellite Service, RM-11778, Public Notice, Consumer and Governmental Affairs Bureau Reference Information Center Petition for Rulemaking Filed, Report No. 3059 (CGB, Dec. 9, 2016).

D. Protection of C-Band Uplinks in the 5.925–6.425 GHz Band

Although our concerns about the great interference potential are not as significant in the case of the C-band uplinks in the 5.925–6.425 GHz band, we believe that band also requires continued, maximum protection. This is especially so because of the importance of satellite systems in the provision of safety-related applications. These applications require immediate accessibility to meet the system performance objectives. We believe that an indoor-use only restriction placed on a new wireless broadband service in this band would serve as an effective interference mitigation technique that may make coexistence possible. Previous analysis preformed in a recent ITU Report[11] has provided some evidence to support the effectiveness of indoor-only use. As we noted earlier in this response, we are committed to efficient spectrum use but this efficiency must not cause harmful interference to the incumbents whose business and operations depend on interference free C-Band spectrum.

Respectfully submitted,

North American Broadcasters Association



Michael McEwen
Director-General

September 29, 2017

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11 See Footnote 8, *supra*.