Before the

Federal Communications Commission

Washington D.C 20554

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| In the Matter of  Expanding Flexible Use of the 3.7 to 4.2 GHz Band  Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz  Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission’s Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band  Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service | **)**  **)**  **)**  **)**  **)**  **)**  **)**  **)**  **)**  **)**  **)**  **)**  )  )  )  )  ) | GN Docket No. 18-122  GN Docket No. 17-183  (Inquiry Terminated as to 3.7-4.2 GHz)  RM-11791  RM-11778 |

Comments of Thomas C. Smith

I would like to further express my objections to the proposed re-allocation of the 3.7 to 4.2 GHz band from the use of satellite to earth satellite transmission to use for terrestrial use for mobile and fixed 5G broadband services. I filed my objections in the previous comment period last May during the comment period when the Wireless Bureau asked for comments on using the C-Band satellite spectrum for wireless broadband use. In my filing I commented on the fact that the Commission did not have a real sense of the number and usage of C-Band receive stations because of the long removal of the requirement of registration of receive earth stations, the lack of suitable alternatives such a KU and KA satellite bands because of weather issues (rain and snow fade) and lack of reliable internet service in many areas. I also noted the cost effectiveness of C-Band satellite service for both broadcast stations and their program suppliers. I will add to these comments and discuss other issues that will affect the possible loss or sharing of the C-band satellite service.

The first issue that I wish to comment on is the proposal to only register and protect earth stations that were in existence as of April 17, 2018. By preventing any new or changed protection of new earth stations, entities that have to change locations will lose their protection and the usefulness of satellite program services. In broadcasting, radio and TV stations have to change locations for a number of reasons, including loss of leases, damage to facilities due to fire or weather events such as the recent hurricanes and flooding and consolidation of facilities because of ownership changes. Why should these stations have to put up with unreliable program delivery just from having to change location and not being able to re-register their earth station at their new location.

Another issue is the proposal to limit protection on time of usage and satellites and transponders received using database information much like that used for TV white space device protection. How well has that worked as there has been very little roll out of TV white space devices and because of the use of multiple database managers, that may be one reason for the slow roll out of these devices. It may also may be that the technology was over hyped. Also usage can vary greatly, as many times programs are resent due to issues with the program itself and uplink or reception issues. The loss of full arc protection is troublesome for much the same reason as trying protect earth station only during fixed times. TV and radio stations have to change which satellites they look at for a number of reasons, including the replacement of satellites due to end of life of the satellite that is carrying the program feeds, and the reception of occasional feeds which can be sent on different satellites at any time due to the changing availability of transponders.

Protecting satellite earth stations from terrestrial fixed and mobile use will be difficult under the best of circumstances. The difference in signal strength from a satellite and either a fixed base station or a mobile device is the first issue. The satellite signal is so faint and requires such high amplification compared to any terrestrial signal that interference is highly possible. A satellite dish may have a very narrow beam when looking at a satellite 23, 000 miles above earth, but signal from a broad beamwith terrestrial base station or a mobile device passing nearby will certainly at times strike the surface of a satellite dish and be reflected into the antenna input (feedhorn) overriding the faint satellite signal. One only has to remember the various efforts that early users of satellite earth stations have to take to prevent interference from terrestrial microwave links used by the telephone companies. Those issues were solved only by the transition by the phone companies to fiber links.

The Commission proposed that satellite delivery of programming could be moved to fiber or internet delivery. The issues with fiber and internet delivery is that the fiber needed for both data and internet service with the bandwidth needed for broadcasting, particularly for broadcast TV and Cable programming is not available in many areas. For stations outside of the limits of a incorporated municipality, it not even have a limited bandwidth DSL line available. Many areas with small populations also have limited fiber networks which can easily be interrupted by a construction accident. This last summer, a number of counties in central Wisconsin lost 9-11 service because of a cut fiber that had been dug up. A number of years ago, a cable company in Wisconsin lost its feed to a number of small communities by a weird accident, when a fiber cable on a pole was destroyed by a near-by garage fire. TV stations require a large amount of bandwidth as they have network feeds that are 24/7 and many daily syndicated program feeds. Cable has even larger bandwidth requirements as they may have several hundred programs feeds 24/7. Even in many large metro areas, the amount of bandwidth is not available over local Internet delivery systems and would be extremely expensive. There are also times when demand can reduce bandwidth to individual customers even with guaranteed bandwidth.

It has been stated in previous comments that Ku and Ka is not usable for 24/7 service. Both NBC and PBS use Ku band, but because of rain and snow issue, both have some C-band back-up. I have had experience with Ku and Ka fade outs due to weather, both with commercial down links and direct to home reception and know it is difficult to find any method to prevent these outages.

The wireless industry is constantly asking for more spectrum at the expense of all other spectrum users. There seems to always some new wireless technology that needs more spectrum, but are they delivering new technologies or is it just hype that is used as an excuse to get more spectrum. Broadcast television has given up 300 megahertz of which most has gone to the wireless industry with limited spectrum going to public safety and some spectrum to trunked land mobile. Broadcasters have also lost some spectrum in the 2 GHz remote pick-up band used for news gathering and the Commission is now looking at the 6/7 GHz band that is used for TV Studio to transmitter links and remote pick-up and recently started to be shared with broadband tower interconnects. Other fixed microwave bands have been reallocated for wireless broadband service. Before long there will be no spectrum available for long distance microwave interconnects which are needed in sparsely populated areas where fiber is not feasible due to distance or terrain.

I believe it is time for the time for the Commission to stop and analyze the future needs for spectrum for wireless with consideration for existing users of spectrum. I believe in a diversity of technologies, but it seems that the Commission is saying that only wireless broadband is the only technology that counts. By taking this route, the Commission is restricting any growth in other industries that use spectrum. Land mobile for the most part has been curtailed for decades. As I read past history of Commission actions, land mobile requests for spectrum has also seemed to come up when other spectrum is allocated for other uses and very little seems to be allocated for their use. Broadcast TV growth has been limited for the past 30 to 35 years because of the various freezes on new stations because of the DTV transition and the continuous TV spectrum transfers for wireless use. Rules that restricted TV translators and satellite TV station coverage has limited TV service in rural areas and the lost of TV spectrum to wireless may further restrict TV growth in rural areas by these services. This is when ATSC 3.0 could bring new services to broadcast television.

I have to ask if wireless spectrum is being efficiently managed by the wireless companies. I question this because the two largest companies A T & T and Verizon also run the two largest landline systems which as part of their management plans seem to continually reduce services and left many customers without services that had provided efficient tools for their businesses. It seems that they want to move most services to wireless even if it may not be the most efficient or reliable.

I also have questions about 5G technology, particularly in the lower spectrum bands. I have not been able for find much information on 5G technology. So far, all I have found is that the technology is based in MIMO antenna technology to create many small coverage sectors from a tower site or in other words, repeating the signal many times. That could be done with current transmission methods. Otherwise there is still a limit of how much data can be sent over a specific amount of spectrum and the lower bands have been divided in many small slices of spectrum which places limits on the amount of data they can deliver. It seems to me that 5G is better suited for the millimeter bands as the bandwidth is greater and the antennas are smaller. Because of the reduced coverage, it may be more suitable for urban areas. Possibly repacking the current wireless bands may also create larger continuous blocks better suited data transmission in rural areas without the constant need for more spectrum. One of the problems I see with past spectrum management is the use of many small slivers instead of larger continuous bands per wireless provider.

In summary, I believe that before more spectrum is reallocated for wireless use, other technologies need more consideration and the Commission needs to stop putting dissimilar technologies in the same band. Allocated services need to complement each other in a band and be similar in operation. Fixed point to point and mobile services are not compatible and each allocation should consider if the proposed operations are compatible. It is also time to take a long view of the future allocations of all services and avoid picking winners and losers, but foster the growth of both new and older technologies. The fact, that TV did not kill radio and movies shows that technologies can adopt if given a change. I found that most articles that claim a technology is dying is usually written by someone who is advocating for the new technology and trying to gain some kind of advantage by downplaying the older technology be declaring it dying.

Respectfully submitted

October 29,2018

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