ASHE

American Society for Healthcare Engineering
of the American Hospital Association

July 21, 2015

By Email

Honorable Tom Wheeler
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, ET Docket No. 14-165

Dear Mr. Chairman:

On behalf of the Wireless Medical Telemetry Coalition (the "Coalition"), I am writing to seek a postponement of at least three months in the Commission's consideration of technical rules for the use of Channel 37 by unlicensed TV White Space ("TVWS") devices. The Commission's July 16, 2015 press release indicated your intent to consider those matters in a *Report and Order* in the above-referenced rulemaking (the "Part 15 Rulemaking") at the Commission's August 6, 2015, Open Meeting. As discussed in detail below, the requested delay will allow on-going work on an industry-led compromise to proceed and hopefully be completed.

As we have noted in the record in this proceeding, the Coalition has concluded through analysis and actual testing at three different hospitals that the protection distances proposed in the Commission's Part 15 NPRM will not protect most hospitals' Channel 37 WMTS systems from harmful interference. Still, the Coalition has been working on a framework for establishing criteria that might be adopted by the Commission in the Part 15 Rulemaking for when, where, and how unlicensed TVWS devices could operate on Channel 37 while minimizing potential interference to any safety of life WMTS systems. The Coalition has reached out to the unlicensed community to find a mutually acceptable method of determining (a) the appropriate protection zones necessary to assure all WMTS systems interference-free operations, and (b) when environmental and operating factors for a particular hospital would allow unlicensed devices to operate at specific locations inside the calculated protection zone without causing harmful interference. The Coalition believes we have made progress toward finding a mutually satisfactory solution, and we have already exchanged ideas with representatives of the unlicensed community. But the process for resolving these very complicated issues is still relatively nascent, and we will need more time to reach what the Coalition optimistically believes will be a successful conclusion. Postponing the vote on Channel 37 issues for at least three months will provide that time.

We have no doubt that an industry compromise is the best way to resolve the Channel 37 issues raised in the Part 15 Rulemaking – and avoid certain lengthy administrative and legal challenges, likely by both sides of the issue, of any action taken by the Commission in August. The three months requested will give the Coalition, the unlicensed community, the FCC and any other interested parties the time they need to work through their differences and hopefully reach a compromise solution. And since the Commission has announced that Channel 37 will be available for use by unlicensed devices, delay should not impact the timing or planning for the Broadcast Incentive Auction. Unlike other issues in the *Report and Order* involving the spectrum that may be available in the 600 MHz band plan for unlicensed devices, the availability of Channel 37 is apparently no longer at issue. In short, we think the benefits of allowing the industry to continue working on a compromise far outweigh any burdens on the Commission's incentive auction timetable.

By way of background, on May 22, 2015, Google, Inc. filed an *ex parte* letter that purported to justify protection distances similar to those initially proposed by the Commission in the Part 15 Rulemaking. Because the Coalition strongly opposed Google's proposal as grossly inadequate to protect a significant number of existing WMTS systems, the Coalition filed its own detailed *ex parte* proposal on June 12, 2015 (the "June 12 *Ex Parte*"). In the June 12 *Ex Parte*, we identified the serious shortcomings in Google's approach and outlined our basis for determining the appropriate protection distances around WMTS systems that were necessary to assure that no WMTS licensee suffered interference by reason of the use of Channel 37 by unlicensed TVWS devices.

Since this Part 15 Rulemaking was initiated, approximately 150 hospitals from across the nation, located in a variety of urban, suburban and rural areas, along with many individual nurse practitioners, have filed comments in this proceeding outlining their use of WMTS systems in serving critical care patients, as well as the substantial benefits that WMTS systems provide throughout the nation's healthcare infrastructure. These letters identified the significant problems that any interference from unlicensed devices would cause in the hospitals' ability to monitor patients and the long-term impact that interference would have on health care services generally. The Coalition and GE Healthcare have also filed the results of real-world testing at three different hospitals that demonstrates that interference to WMTS systems will be caused by a TVWS device operating at the power-levels and distances proposed by the Commission.[1] On this record, the Commission would fail to meet its public interest obligations if it adopts the protection distances approaching those it has proposed, which simply will not protect WMTS systems from interference.[2]

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[1] GE Healthcare filed the test report for Inova Mount Vernon Hospital with its initial comments in this proceeding on February 4, 2015. The WMTS Coalition filed the test reports for Froedtert Community Memorial Hospital and Wheaton Franciscan Healthcare – Franklin Hospital in two *ex parte* submissions filed July 20, 2015.

[2] As discussed below, the proposals in the Part 15 Rulemaking also failed to establish the necessary technical and regulatory framework to ensure that protection distances are effectively and reliably enforced.

Indeed, in recent meetings with the Commission's Office of Engineering and Technology, the Incentive Auctions Task Force and the Wireless Telecommunications Bureau, Google, an active proponent for unlicensed spectrum, has also acknowledged that "the Commission should establish conservative but reasonable protection areas for wireless medical telemetry users."[3] Google still believes (erroneously) that there is a "typical" hospital environment in which most WMTS systems are being operated with characteristics that Google believes would shield them from harmful interference from nearby unlicensed devices. Google therefore continues to argue that the Commission "should not allow protection contours for atypical sites to serve as the default for all sites."[4]

As the Coalition has demonstrated on the record, there is no "typical" hospital environment that can be characterized to assure WMTS systems will be shielded from interfering signals from a TVWS device, and thus there is no "atypical" environment either. For example, GE Healthcare and Comsearch have conducted tests at three working hospitals and demonstrated that interference would likely be suffered by the WMTS system at each site. These three hospitals had different building characteristics, different environmental factors and different man- made surroundings, yet none can be easily characterized as either "typical" or "atypical" for purposes of determining their need for protection from interference.

The Commission must acknowledge that its primary concern in adopting rules that will allow unlicensed use of Channel 37 must be to assure that such use will <u>not</u> result in harmful interference to <u>any</u> WMTS licensees who employ the band for patient critical applications.[5] By utilizing the June 12 *Ex Parte* calculation of appropriate protection distances, the building penetration characteristics that are likely to exist in some area of most hospitals, and characteristics (e.g. receiver sensitivity) of the WMTS system itself that exist in many hospitals, the resulting protection distances should satisfy that objective. The Coalition thus strongly stands behind and supports use of the analysis described in the June 12 *Ex Parte.* The larger protection distances that are established as the "starting point" in determining the appropriate distance between TVWS devices and a potentially impacted WMTS system are absolutely required to ensure that WMTS systems will not suffer harmful interference from a TVWS device.

Since filing the June 12 *Ex Parte*, however, and as suggested therein, the Coalition has continued to study means by which, even with these appropriately conservative protection distances, certain TVWS devices may be allowed to operate on Channel 37 at particular locations within the protection zones of a particular hospital, when a number of designated factors specific to the hospital and TVWS devices would provide the same level of protection

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[3] *See, e.g.,* letter from Aparna Sridhar, Google, to Marlene H. Dortch, FCC, ET Docket No. 14-165 and GN Docket No. 12-268, July 16, 2015.
[4] *Id.*
[5] Indeed, even if there were "atypical" hospital sites – and the Coalition vehemently disagrees with the notion that there is a "typical" environment that can be characterized for protection purposes – those sites too must be protected from interference.

from interfering signals as the larger protection zone. We believe that such an approach satisfies the interests of hospitals, by developing protection zones that will protect their most vulnerable WMTS installations. No less importantly, it should allow for expanded use of Channel 37 by unlicensed devices at locations where that use would not present as great a threat of interference to the hospital's WMTS system.

The Coalition would like to engage in further discussions with representatives of the unlicensed community to consider a proposal by which the FCC's Rules would create what we will refer to as "coordination zones" around each hospital, using the calculations presented by the Coalition in the June 12 *Ex Parte*.[6] The rules would *also* provide a mechanism by which certain characteristics of the WMTS system and the hospital's surrounding environment would be entered into the appropriate databases. With those characteristics accurately catalogued, and using an automated, to-be-determined coordination process, the TVWS database administrators could allow a TVWS device to operate on Channel 37 inside a hospital's "coordination zone" (*i.e.*, in closer proximity to a hospital).

The Coalition has identified a number of factors where, with accurate data input into a reliable and secure geolocation/database algorithm, TVWS devices may be able to operate within a hospital's "coordination zone":

- In calculating path loss, the WMTS coordination zones assume line-of-sight and free space path loss between the offending TVWS transmitter and the susceptible WMTS transmitter. While this is likely to be the case for many TVWS device locations, the Coalition recognizes that line-of-sight conditions will not occur from many other TVWS device locations. Where intervening terrain (considering the height of the hospital and the height of the TVWS antenna) can be accurately characterized, it could be factored into calculating whether and where a TVWS device can operate inside the coordination zone of a particular hospital without causing interference to its WMTS system.

- As the Commission has recognized, enforcing protection distances based solely on the WMTS system's location information in the ASHE database could be problematic, given the potential inaccuracy in many cases. Therefore the Coalition's proposed coordination zones were calculated by adding a factor of 300 meters for location inaccuracy and a factor for the broad area of a WMTS deployment. Google has suggested that a party should be able to accurately "map" the perimeter of every hospital in which a WMTS system is resident. With this information in the database, the coordination zone could be measured from that perimeter, thus eliminating any further adjustment for WMTS system location accuracy.

[6] Although the formula utilized to determine the Coalition's proposed Coordination Zone around a hospital assumed that WMTS receiver sensitivity (normalized to occupied bandwidth) would be -100 dBm/10 kHz, if a hospital's WMTS system was less sensitive to interference than these "default" values used in our calculation (as reflected in the receiver sensitivity and bandwidth registered in the ASHE database), then the WMTS system's values would be used to determine an appropriate coordination zone for that hospital.

- Google has also asserted that it should be relatively easy to characterize man-made structures around a hospital that also provide a level of protection to a WMTS system from a TVWS device operating within a hospital's coordination zone. The Coalition recognizes that a hospital's environment may well provide additional path loss protection for a WMTS system; the challenge, however, is accurately to characterize (and regularly update) the surrounding buildings and infrastructure into the appropriate database. To the extent that this can be accomplished, this information could also be factored in determining whether and where a TVWS device could operate within a hospital's coordination zone without creating harmful interference to that hospital's WMTS system.

There may be other characteristics of a hospital that can be objectively and accurately quantified and updated for each WMTS system licensee. If so, these too could also be stored in the appropriate database in order to allow individual TVWS devices to operate on Channel 37 even when they are operating at certain locations within a hospital's "coordination zone" without increasing the risk that harmful interference will be caused to the WMTS system.

However, in addition to identifying the appropriate characteristics of a WMTS licensee's operations and environment, the WMTS community, the WMTS database coordinator, the unlicensed device community, and the TVWS Database administrators must also develop a method of obtaining, validating, storing and updating these characteristics.[7] No less importantly, these parties need to work cooperatively with the Commission to agree on a mutually acceptable "coordination calculus" that could be applied to the applicable characteristics to allow TVWS devices to operate within each hospital's coordination zone, on a hospital-by-hospital basis. This work could generate an industry-wide resolution of otherwise strong differences of view as to how best to protect WMTS systems and also allow unlicensed devices to operate on a non-interference basis on Channel 37. But the industry needs time – significantly more time than is available before the scheduled August 6, 2015 Commission meeting -- to work through these complex issues to a fruitful conclusion.

There are other important issues to consider and resolve for a full industry compromise to be achieved. While the parties may agree on coordination zones and the rules for allowing closer operation without causing interference to WMTS systems, the Commission must still recognize the possibility that interference will occur nevertheless. Thus, technical and procedural mechanisms must be adopted that will eliminate as quickly as possible the risk to patient safety (and to health-care practitioners' confidence in their WMTS systems) by assuring that any interference that does occur is resolved with urgency and due speed.

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[7] These parties will also have to determine how to cover the costs that may be incurred by both the ASHE WMTS database and the TVWS database administrators in developing, maintaining and sharing this information. While WMTS licensees may appropriately be tasked with maintaining accurate registration information in the ASHE WMTS database, neither ASHE nor the nation's healthcare institutions should be required to pay for any other changes which are necessary to accommodate the use of Channel 37 by unlicensed users who wish to operate in closer proximity to hospitals than the coordination zones would permit

To that end, the Coalition has begun considering and discussing with advocates of unlicensed use of Channel 37, a number of proposals that would both mitigate the potential for, and provide prompt relief to, WMTS systems suffering from, interference:

- The rules for operation of unlicensed devices in the 600 MHz band should be modified to require that TVWS Database Operators will prioritize the recommendation of channels so that Channel 37 will be authorized only when it is the sole channel available for use by a TVWS device;

- A mechanism must be developed that allows a WMTS licensee experiencing interference to alert the WMTS Coordinator who, via the TVWS Databases, can temporarily disallow use of Channel 37 for certain TVWS devices and/or locations until the interference source has been identified. The rules would also need to provide a protocol for the appropriate database administrators (working with the WMTS Licensee) to determine which, if any, TVWS device(s) were causing the interference problem.[8]

While there are many details that need to be worked through, with creative thinking by all interested parties, and a good faith commitment by all sides to forge a workable compromise, a mutually satisfactory solution to this element of the rules can be developed. The Coalition welcomes the opportunity to work with the Commission Staff, Google, and others to find the solution that must accompany any decision to allow unlicensed devices to operate in Channel 37.[9]

Finally, there remains some disagreement between the WMTS community and the unlicensed device communities as to whether personal portables TWVS devices should be allowed to operate on Channel 37. As the Coalition has consistently urged, personal portable devices, given their ubiquity, itinerant and mobile nature, pose too much risk of interference to WMTS systems – interference which could not be easily traced or resolved, but would nevertheless be damaging. On the other hand, assuming geolocation/database technology will mature, there may be a time when personal portable devices can operate in Channel 37 without creating significantly more risk of interference. Therefore, the Coalition suggests a phasing-in process for the use of Channel 37 by unlicensed devices. For example, the Commission could

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[8] To that end, the rules for use of Channel 37 should make clear that unlicensed TVWS devices must honor changes to the database within minutes, not hours, where any type of interference to WMTS has been identified.

[9] The Coalition was pleased to see that Google, in a recent *ex parte* meetings with the FCC Staff also recognizes that allowing operation of unlicensed devices closer in proximity to hospitals than the distances recommended by the Coalition must come with "the establishment of a timely means for these users to expand protection in the event that they experience interference at a particular site." Letter from Aparna Sridhar, Google, to Marlene Dortch, ET Docket No. 14-165 (July 16, 2015). Google suggested, for example, an approach whereby when interference occurred, the geographic area in which Channel 37 could be used around a hospital would be expanded for a certain period of time, during which the hospital could work with the TVWS database administrators and the Commission staff to determine the source of the suspected interference and make any necessary adjustments to the protection area for a particular site.

authorize only fixed devices[10] for the first 36 month period after the rules have been adopted, but announce the effective date for the use of the band by personal portable devices upon adopting the rules. If the experience with the rules is good (*i.e.*, there have not been complaints of interference to WMTS systems), the effective date for the use of Channel 37 by personal portable devices could remain in place. If, however, there are a number of incidents of interference from fixed TVWS devices, the Commission could timely suspend or delay the effective date for the use of the band by personal portable devices until the problems were resolved. This cautious "walk-before-run" approach, along with other creative ideas, are on the table for discussion with the unlicensed community – if industry is given the time to work through them.

There should be little doubt that an industry consensus on these important issues will be far more effective, and far less open to criticism or appeal, than a Commission decision which is based on the partisan filings of the parties. I therefore ask you to remove consideration of the Channel 37 issues from the Report and Order in the Part 15 Rulemaking that will be considered at the Commission's August Open Meeting in order to give the stakeholders in the Channel 37 issue at least three more months to forge an industry compromise.

Thank you for your consideration of this information and request.

Sincerely,

The WMTS Coalition
By The American Society for Healthcare Engineering
of The American Hospital Association

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cc (by Email):
Commissioner Mignon Clyburn
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Commissioner Ajit Pai

[10] In order to be allowed to operate on Channel 37, fixed devices must be required to incorporate reliable secure and accurate geolocation technology, which is the foundation of ANY geolocation/database based approach to safely sharing Channel 37.

Commissioner Michael O'Rielly
Julius Knapp
Roger Sherman
Gary Epstein
ET Docket No. 14-165