

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of

Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and

ET Docket No. 14-165

Amendment of Part 74 of the Commission's Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap

Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions

GN Docket No. 12-268

**GOOGLE INC. OPPOSITION TO PETITIONS FOR RECONSIDERATION**

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## I. INTRODUCTION AND SUMMARY.

The Commission should reject the petitions for reconsideration filed by GE Healthcare (“GEHC”), WMTS Coalition, and the National Association of Broadcasters (“NAB”).

Dissatisfied with the well-supported determinations the Commission made in the *Part 15 Order*,<sup>1</sup> these petitioners principally repeat arguments that the Commission already has considered and rejected. For instance, they rehash old positions regarding separation distances between unlicensed devices and Wireless Medical Telemetry Service (“WMTS”) operations, and database re-check requirements. In the few instances where these petitioners raise new issues—suggesting, for instance, that the Commission should establish an Institutional Review Board (“IRB”) or adopt burdensome and unnecessary location rules—their arguments are made too late. Such arguments must be timely presented so the Commission and other parties will have a full opportunity to comment or act on them. These newly raised arguments, moreover, lack substantive merit.

GEHC and WMTS Coalition continue to argue, in particular, that the Commission chose the wrong separation distances between WMTS operations and unlicensed white space devices in Channel 37. Not only is reiterating these arguments procedurally infirm, but GEHC and WMTS Coalition are also substantively wrong. The record shows that the separation distances adopted by the Commission, as well as the test deployment and waiver process, actually *overprotect* WMTS.

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<sup>1</sup> See *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and Amendment of Part 74 of the Commission’s Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 30 FCC Rcd. 9551 (2015) (“Part 15 Order”).

For its part, NAB maintains that the FCC should adopt a 20-minute database recheck requirement notwithstanding the Commission's finding that doing so would unnecessarily burden unlicensed device users and database operators. NAB also restates arguments it previously raised in opposing 40 mW fixed operations on adjacent television channels, even though they pose no greater threat to broadcasters than existing 40 mW personal/portable operations.

NAB introduces for the first time a variety of proposals on location accuracy and database operations. Raising these arguments now, despite ample opportunity to raise them at the appropriate time, is improper. These proposals also would not serve the public interest, but rather would impose unnecessary new burdens on device manufacturers, database operators, and users.

Finally, GEHC, WMTS Coalition, and NAB raise unfounded concerns regarding the security and reliability of the white space databases. These claims should have been raised in the docket that the Commission established expressly for that purpose, rather than in petitions for reconsideration of the *Part 15 Order*. The Commission should decline to consider them as part of this proceeding.

## **II. THE COMMISSION PROPERLY ADDRESSED THE CONCERNS OF WMTS COALITION AND GEHC REGARDING COEXISTENCE BETWEEN WMTS AND UNLICENSED DEVICES.**

### **A. The Commission Properly Analyzed Interference.**

WMTS Coalition and GEHC challenge the method used by the Commission in analyzing the potential for unlicensed devices to cause harmful interference to WMTS licensees. The vast majority of these arguments are procedurally defective because the Commission has already

considered and rejected them, or because they are being raised for the first time.<sup>2</sup> Furthermore, the WMTS Coalition and GEHC positions are substantively incorrect. The Commission properly conducted its unlicensed/WMTS interference analysis.

*The Commission correctly accounted for antenna aggregation gain.* WMTS Coalition argues that the Commission should have assumed an additional antenna aggregation gain of 3 dB (or a total antenna aggregation gain of 6 dB) to account for the possibility of multiple antennas receiving a WMTS signal.<sup>3</sup> When WMTS Coalition and GEHC previously raised these same arguments,<sup>4</sup> however, the Commission fully considered and rejected them.<sup>5</sup> The Commission should not reconsider them here.

Consistent with GEHC's own analysis, the Commission assumed an antenna aggregation gain of 3 dB to account for the possibility of multiple antennas receiving a WMTS signal.<sup>6</sup> This 3 dB assumption is overly conservative, as it is extremely unlikely that multiple WMTS receive antennas would all receive multiple unlicensed signals at exactly the same time. This would

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<sup>2</sup> Not only are arguments raised in the petitions procedurally defective for the reasons set forth in more detail below, but the petitions themselves vastly exceed the page limits prescribed by the Commission's rules. *Compare* Petition for Reconsideration of the WMTS Coalition ("WMTS Coalition Petition") (consisting of 38 double-spaced pages) and Petition for Reconsideration of GE Healthcare ("GEHC Petition") (consisting of 46 double-spaced pages) with 47 C.F.R. § 1.429(d) (setting a limit of 25 double-spaced pages on petitions for reconsideration). Unless otherwise noted, all citations herein to petitions for reconsideration are to petitions filed on Dec. 23, 2015 in ET Docket No. 14-165 and GN Docket No. 12-268. The Commission could reject both petitions outright solely on this basis.

<sup>3</sup> WMTS Coalition Petition at 11.

<sup>4</sup> Comments of GE Healthcare at 24-25 ("GEHC Comments"); Initial Comments of the WMTS Coalition at 15-17 ("WMTS Coalition Comments"). Unless otherwise noted, all comment citations herein are to comments filed on February 4, 2015 in ET Docket No. 14-165 and GN Docket No. 12-268.

<sup>5</sup> Part 15 Order at 9637-38 ¶ 209.

<sup>6</sup> *Id.* (citing Petition for Reconsideration of GE Healthcare at 14, GN Docket No. 12-268 (filed Sept. 15, 2014)).

“require near-perfect alignment across a variety of devices and receivers and perfectly harmonized transmissions from TVWS devices across [multiple WMTS] device/receiver pairs.”<sup>7</sup> Moreover, it would “require all unlicensed devices to operate without the use of polite protocols, even though polite protocols are a component of two common industry standards developed for this band.”<sup>8</sup> Consequently, the Commission correctly determined that it would not be appropriate to add an additional antenna aggregation gain of 3 dB to its highly conservative interference analysis assumptions.

*The Commission correctly assumed a personal/portable device height of 3 meters.*

WMTS Coalition and GEHC also argue, for the first time on reconsideration, that the Commission incorrectly assumed that personal/portable devices will operate at a height of 3 meters.<sup>9</sup> The Commission proposed unlicensed/WMTS separation distances for personal/portable devices at a height above average terrain (“HAAT”) of less than 3 meters in the Notice of Proposed Rulemaking (“NPRM”).<sup>10</sup> Because WMTS Coalition and GEHC failed to raise any concerns about this personal/portable device height assumption prior to their petitions for reconsideration, the Commission should disregard this late argument.<sup>11</sup>

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<sup>7</sup> Letter from Aparna Sridhar, Counsel, Google Inc., to Marlene H. Dortch, Secretary, FCC, at 10-11, GN Docket No. 12-268; ET Docket No. 14-165 (filed May 22, 2015) (“Google May 22 Ex Parte”).

<sup>8</sup> *Id.*

<sup>9</sup> WMTS Coalition Petition at 33; GEHC Petition at 19-21.

<sup>10</sup> *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and Amendment of Part 74 of the Commission’s Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 29 FCC Rcd. 12,248, 12,282 ¶ 112 (2014) (“Part 15 NPRM”).

<sup>11</sup> See 47 C.F.R. § 1.429(b). GEHC’s footnote in reply comments stating that “propagation conditions will depend on the vertical position of unlicensed devices, as well as the horizontal position” did not provide the Commission with sufficient notice that GEHC

The Commission, moreover, was right to assume a personal/portable device height of no more than 3 meters. Personal/portable devices are intended to be handheld mobile devices that a person can carry. It is reasonable to assume they will be used below the height of a person, unless the user is in a multi-story building. The vast majority of the time, though, such use will take place indoors, where walls, windows, and other obstructions will attenuate signals from the device.<sup>12</sup> Rather than base its WMTS/unlicensed separation distances on extreme corner cases like use of a device (i) outdoors (ii) on a rooftop or balcony of (iii) a multi-story building that (iv) directly faces a hospital, the Commission correctly assumed a personal/portable device height of 3 meters. This commonsense approach is consistent with the Commission's assumption of a personal/portable device height of 3 meters when establishing its unlicensed/LTE and unlicensed/DTV separation distances in this proceeding,<sup>13</sup> as well as its past practice in setting separation distances between unlicensed operations and licensees.<sup>14</sup>

*The Commission should not restrict unlicensed device operations based on extremely unlikely, hypothetical scenarios.* Relatedly, WMTS Coalition argues on reconsideration that the Commission should require initial Channel 37 unlicensed deployments to test “the most

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objected to the use of a 3 meter height assumption for personal/portable devices. *See* Reply Comments of GE Healthcare at 15 n.50 (“GEHC Reply Comments”). Unless otherwise noted, all citations to reply comments herein are to replies filed in ET Docket No. 14-165 and GN Docket No. 12-268 on February 25, 2015.

<sup>12</sup> Comments of Google Inc. at 21 (“Google Comments”); Google May 22 Ex Parte at 10.

<sup>13</sup> Part 15 Order at 9578 ¶¶ 63-64, 9624-25 ¶¶ 175-76.

<sup>14</sup> *See Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd. 16,807, 16,886 ¶ 229 (2008); *see also* 47 C.F.R. § 15.712(a)(2) (2012) (“Personal/portable TVBDs operating in Mode II must comply with the separation distances specified for an unlicensed device with an antenna height of less than 3 meters.”).

vulnerable locations” in and around the selected hospital facilities.<sup>15</sup> The Commission, though, has adopted very conservative rules that already account for reasonably expected vulnerabilities. For instance, the Commission assumed building loss of 0 dB, even though it acknowledges that there will always be some building loss, even for antennas installed near clear windows.<sup>16</sup> It also adopted a model that, the Commission admitted, may “overstate the interference potential somewhat because it does not account for terrain features, buildings, and land cover” or multipath effects.<sup>17</sup> Layering on even more conservatism, the Commission further assumed a low WMTS receiver sensitivity level and wide signal bandwidth to build in additional protection for WMTS.<sup>18</sup>

In light of the extra safeguards for WMTS built into these assumptions, the Commission properly refused also to base its interference analysis on extreme and unlikely scenarios.<sup>19</sup> The Commission should hold to this approach and follow its own precedent establishing the importance of using realistic scenarios when evaluating the potential for harmful interference.<sup>20</sup>

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<sup>15</sup> WMTS Coalition Petition at 27.

<sup>16</sup> Part 15 Order at 9636 ¶ 205.

<sup>17</sup> *Id.* at 9636 ¶ 206.

<sup>18</sup> *Id.* at 9637 ¶¶ 207-08.

<sup>19</sup> *See, e.g.*, Part 15 Order at 9634-35 ¶ 203 (rejecting GEHC’s assertion that the Commission should use a free space propagation model rather than TM-91-1 because free space propagation better represented a “realistic worst-case line-of-sight” scenario), 9637 ¶ 208 (finding that the testing conducted by WMTS proponents “over estimates the potential for interference” because it “represents the worst possible scenario” and declining to “set protection limits based on the worst possible scenario presented by GE Healthcare, which we do not believe to be likely in actual deployments”).

<sup>20</sup> *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd. 3959, 4045-46 ¶ 288 (2015) (“We believe it is possible to balance the protection of incumbent FSS sites and greater Citizens Broadband Radio Service spectrum utilization instead of relying on a one-size-fits-all approach to protecting incumbent FSS sites using worst-case interference assumptions.”) (“3.5 GHz Order”); *Amendment of the Commission’s*

It should not, therefore, target test deployments disproportionately at the “most vulnerable locations,” but rather should seek to ensure that the locations selected for Channel 37 unlicensed test deployments will be representative of the networks that white space operators actually are likely to deploy. Likewise, to “set protection limits based on the worst possible scenario[s]” that are not “likely in actual deployments” would, as the Commission has found, “vastly over protect a large number of facilities to the detriment of efficient spectrum usage.”<sup>21</sup>

*Separation distances between unlicensed devices and DTV or LTE service are irrelevant to the appropriate separation distances between unlicensed devices and WMTS.* GEHC and WMTS Coalition make much of the fact that the separation distances the Commission imposed for unlicensed devices operating near DTV and LTE are larger than the separation distances the Commission adopted to protect WMTS from unlicensed operations.<sup>22</sup> Because DTV and LTE receivers have very different characteristics than WMTS receivers, though, these two separation distances are unrelated.

DTV and LTE receivers are designed to receive relatively weaker signals over very long distances outdoors, while WMTS signals travel relatively shorter distances inside a hospital. It is

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*Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Notice of Proposed Rulemaking and Order on Reconsideration, 28 FCC Rcd. 11,479, 11,505 ¶ 58 (2013) (relying in the AWS-3 NPRM on an NTIA working group report that “more accurately depict[ed] real world operation of LTE networks and their interaction with incumbent systems,” thereby allowing a significant reduction of the potential interference range); *Service Rules for Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, Report and Order, 28 FCC Rcd. 9483, 9494 ¶ 23, 9526-27 ¶ 111 (2013) (noting that when the relationship between interferer and target is variable, it is essential to avoid “overly conservative” assumptions; instead the Commission should account for the “low probability of . . . interference actually occurring”).

<sup>21</sup> Part 15 Order at 9637 ¶ 208.

<sup>22</sup> WMTS Coalition Petition at 15-16; GEHC Petition at 12-14.

unsurprising that the long-range, outdoor operations of DTV and LTE would require larger separation distances (especially at the margins, where signals are the weakest) than a shorter-range, indoor service like WMTS. Moreover, WMTS receivers must operate exclusively “within a health care facility,”<sup>23</sup> and hospitals are often constructed of commercial-grade materials that shield radio signals more than average walls and windows.<sup>24</sup> As a result, WMTS receivers enjoy more protection by virtue of their location than LTE or DTV receivers, whose receive antennas are frequently outdoors (including DTV antennas on rooftops) or in residential buildings. Consequently, it is reasonable to set separation distances for DTV and LTE that are larger than the separation distances for WMTS.

**B. The Commission Has Established Appropriate Emission Limits for Channels 36, 38, and Non-Adjacent Channels.**

WMTS proponents disagree with the Commission’s decision to remove the unnecessarily stringent out-of-band emission (“OOBE”) limits for unlicensed devices operating on Channels 36 and 38, and instead protect WMTS licensees through the use of adjacent-channel separation distances.<sup>25</sup> WMTS Coalition previously argued that the Commission should use the same separation distances for co-channel operations on Channel 37 as for adjacent-channel operations.<sup>26</sup> The Commission fully considered this view before properly concluding—with ample record support<sup>27</sup>—that the establishment of smaller adjacent-channel separation distances

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<sup>23</sup> 47 C.F.R. § 95.1107

<sup>24</sup> See Google May 22 Ex Parte at 12-13.

<sup>25</sup> WMTS Coalition Petition at 15-16; GEHC Petition at 14-16.

<sup>26</sup> WMTS Coalition Comments at 25-28.

<sup>27</sup> See Letter from Paul Margie, Counsel to Broadcom Corp., Harris, Wiltshire & Grannis LLP, to Marlene H. Dortch, Secretary, FCC, Attachment at 12, GN Docket No. 12-268 (filed July 22, 2014); Comments of Broadcom Corporation at 21; Comments of Microsoft Corporation

for unlicensed operations on Channels 36 and 38 will adequately protect WMTS licensees from harmful interference without the need for a stringent OOB limit.<sup>28</sup>

WMTS proponents raise concerns for the first time on reconsideration that unlicensed operations on second-adjacent channels 35 and 39 will cause harmful interference to WMTS operations in Channel 37.<sup>29</sup> The petitioners should have raised the matter earlier in this proceeding. The NPRM clearly set forth the Commission’s proposal to remove the OOB limit for Channels 36 and 38 in order to “mak[e] channels 35, 36, 37, 38 and 39 useable by white space devices,”<sup>30</sup> yet neither GEHC nor WMTS Coalition timely raised any concern. Because these entities could have raised their arguments previously, the arguments should be dismissed without action.<sup>31</sup>

Furthermore, the petitioners fail to provide any technical support suggesting that second-adjacent channel unlicensed operations—which as a practical matter have at least a full six megahertz guard band separating those operations from Channel 37—could cause harmful interference to WMTS operations.

**C. Neither the Database Registration Requirement nor the Option to Seek a Waiver Improperly Burdens WMTS Licensees.**

The Commission considered and properly rejected WMTS Coalition’s arguments regarding the supposed burden on WMTS licensees of registering the perimeter of their facilities

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at 29, 31-33; Comments of Wi-Fi Alliance at 33 (“Wi-Fi Alliance Comments”); Comments of the Wireless Internet Service Providers Association at 6-7 (“WISPA Comments”).

<sup>28</sup> Part 15 Order at 9649-50 ¶¶ 235-37, 9640 ¶ 212.

<sup>29</sup> WMTS Coalition Petition at 15-16; GEHC Petition at 14-16.

<sup>30</sup> Part 15 NPRM at 12,286 ¶¶ 126-28.

<sup>31</sup> 47 C.F.R. § 1.429(b)(1)-(2).

in the white space databases.<sup>32</sup> These arguments are therefore not properly before the Commission on reconsideration and should be dismissed.<sup>33</sup>

These arguments also lack merit. The Commission often requires licensees to provide registration information to the Commission, a frequency coordinator, or a database in order to facilitate sharing by other users, including unlicensed devices.<sup>34</sup> This is a sensible approach, given that licensees are in the best position to provide information about their own facilities. Moreover, the registration requirement here will not excessively burden WMTS licensees. Attached to these comments, Google provides instructions that WMTS licensees can follow to define the perimeter of their facilities using Google Earth in a manner that could be communicated to a database operator. Using these simple instructions, WMTS licensees can determine the perimeter of their facilities in less than 10 minutes, without charge. Other free, online mapping services appear to be suitable for this purpose as well.<sup>35</sup>

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<sup>32</sup> Cf. Part 15 Order at 9641-42 ¶ 216, 9643 ¶ 218, 9653-54 ¶¶ 246-48; *see also* Reply Comments of the WMTS Coalition at 7-11 (“WMTS Coalition Reply Comments”).

<sup>33</sup> 47 C.F.R. § 1.429(1)(3).

<sup>34</sup> *See, e.g., Revisions to Rules Authorizing Operation of Low Power Auxiliary Stations in the 698-806 MHz Band; Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition; Amendment of Parts 15, 74 and 90 of the Commission’s Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones*, Second Report and Order, 29 FCC Rcd. 6103, 6105 ¶ 3 (2014) (providing that licensed wireless microphones “may receive protection from TVWS devices by registering in the TV bands database”); 3.5 GHz Order at 4046 ¶ 290, 4076-77 ¶¶ 401-03 (requiring fixed satellite service licensees to register their earth stations annually or upon making changes to specified operating parameters in order to obtain interference protection and providing that registered operations of grandfathered Part 90 users will receive interference protection from GAA users during a transition period); 47 C.F.R. § 101.1523(b)(2) (requiring Part 101 licensees in the 70/80/90 GHz bands to register their non-exclusive links and demonstrate that such links “will neither cause harmful interference to, nor receive harmful interference from, any previously registered non-government link”).

<sup>35</sup> *See, e.g., Polygon KML Creator, MAPMASH*, <http://www.mapmash.in/kmlpolygon.html> (2016); *Polyline Coordinates, KEENE STATE COLLEGE*,

The Commission’s decision to consider additional protections for specific facilities through a waiver process also does not, as WMTS Coalition suggests,<sup>36</sup> unfairly burden WMTS licensees.<sup>37</sup> In the *Part 15 Order*, the Commission established unlicensed/WMTS separation distances based on very conservative assumptions and correctly concluded that those separation distances alone provide sufficient protection to WMTS licensees.<sup>38</sup> Thus, the rules adopted will protect WMTS operations at the vast majority of hospitals, if not all of them. Nevertheless, acting on suggestions from a variety of commenters—including WMTS proponent GEHC<sup>39</sup>—in favor of a more nuanced approach to separation, the Commission committed to expeditiously consider waiver requests seeking larger or smaller separation distances at particular sites.<sup>40</sup> Providing WMTS licensees additional flexibility to seek larger separation distances in exceptional cases does not impose any additional burden on WMTS licensees as a whole; it simply allows outlier facilities to gain special protections beyond the conservative separation distances already established. This is a benefit for WMTS interests, not a disadvantage to them.

**D. The Commission Should Not Establish an IRB to Oversee Unlicensed Device Test Deployments.**

Both WMTS Coalition and GEHC suggest that the Commission should establish an IRB to oversee unlicensed device test deployments.<sup>41</sup> Both entities had ample opportunity to suggest an IRB earlier in the proceeding and failed to do so. Moreover, if either entity established an

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<http://www.keene.edu/campus/maps/tool/> (2016); click2shp: the browser-based shapefile creation tool, UCLA, <http://gis.ucla.edu/apps/click2shp/> (2016).

<sup>36</sup> WMTS Coalition Petition at 22-25.

<sup>37</sup> See Part 15 Order at 9642 ¶ 217.

<sup>38</sup> *Id.* at 9634-42 ¶¶ 200-216.

<sup>39</sup> GEHC Reply Comments at 15.

<sup>40</sup> Part 15 Order at 9642 ¶ 217.

<sup>41</sup> GEHC Petition at 43-44; WMTS Coalition Petition at 29.

IRB or other independent review mechanism for *their own* WMTS/unlicensed device coexistence testing, they failed to mention such measures on the record.<sup>42</sup> Given that WMTS proponents did not raise this idea in a timely fashion and apparently found such measures unnecessary for their own tests, the Commission should not establish an IRB to oversee unlicensed device test deployments.

The Commission also should avoid taking the unprecedented step of ceding its authority in spectrum policy matters to an IRB or other independent review committee that lacks expertise in radiofrequency interference issues. As the expert agency in matters of spectrum policy—to which Congress has specifically delegated authority over radiofrequency matters<sup>43</sup>—the Commission is best positioned to ensure that unlicensed device test deployments protect WMTS systems from harmful interference. Never in the past has the Commission found it necessary to establish an IRB, and this type of routine test deployment does not call for upending the Office of Engineering and Technology’s (“OET”) processes and precedent with this unwieldy and inefficient approach.

### **III. THE COMMISSION PROPERLY CONSIDERED AND ADDRESSED ISSUES REGARDING TELEVISION BROADCAST AND WIRELESS MICROPHONE COEXISTENCE WITH UNLICENSED DEVICES.**

The Commission should dismiss the arguments NAB advances on reconsideration as procedurally improper, either because NAB previously raised these issues and the Commission

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<sup>42</sup> See generally GE Healthcare Comments & Appendices A & B; Letter from Lawrence J. Movshin and Timothy J. Cooney, Counsel to WMTS Coalition, to Marlene H. Dortch, Secretary, FCC, and attachments (filed July 20, 2015).

<sup>43</sup> 47 U.S.C. § 303(c)-(d), (r), (y); *National Ass’n of Regulatory Util. Comm’rs v. FCC*, 525 F.2d 630, 636 (D.C. Cir. 1976) (noting that spectrum management decisions are “precisely the sort that Congress intended to leave to the broad discretion of the Commission, by imposing a broad public convenience, interest, or necessity standard”); see also *Cellco P’ship v. FCC*, 700 F.3d 534, 541-42 (D.C. Cir. 2012).

fully considered and rejected them, or because NAB waited until reconsideration to introduce for the first time new claims that it could have raised previously. Moreover, for reasons largely already articulated by the Commission and commenters, these arguments lack substantive merit. They would unduly burden unlicensed users and are not necessary to protect licensed broadcast and wireless microphone operations from harmful interference.

**A. The Commission Has Already Fully Considered and Properly Rejected the 20-Minute Database Re-Check Proposal Favored by NAB.**

NAB disagrees with the Commission’s decision to adopt a push notification requirement to protect wireless microphone use in breaking news events. It continues to urge a 20-minute database recheck proposal<sup>44</sup> that the Commission has already fully considered and rejected.<sup>45</sup> The Commission need not reconsider its rejection of the 20-minute recheck requirement because NAB’s argument is procedurally improper.<sup>46</sup> Moreover, the Commission correctly concluded in the *Part 15 Order* that requiring unlicensed devices to query the database every 20 minutes “would unnecessarily burden the white space databases, drive up costs for database management and white space devices users, and is overly-broad in satisfying the objective of the original proposal, *i.e.*, to ensure that white space devices clear a channel needed for licensed wireless microphone users for late-breaking events in a specific area.”<sup>47</sup>

While NAB’s arguments in favor of a 20-minute recheck requirement are misplaced, the push notification rule the Commission ultimately adopted as an alternative to a 20-minute

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<sup>44</sup> Petition for Reconsideration of the National Association of Broadcasters at 4-7 (“NAB Petition”).

<sup>45</sup> Part 15 Order at 9662-64 ¶¶ 273-77.

<sup>46</sup> 47 C.F.R. § 1.429(1)(3).

<sup>47</sup> Part 15 Order at 9663-64 ¶ 277.

recheck requirement is unworkable.<sup>48</sup> Requiring a database to “push” notifications to unlicensed devices imposes virtually the same burden on devices and database operators as requiring such devices to “pull” information frequently from the database. Implementing push notifications requires near real-time polling of a database by an unlicensed device or the maintenance of a persistent open connection to the database, which will drive up database operation costs and drain device battery life.<sup>49</sup> Thus, this rule does not achieve the Commission’s objective of protecting wireless microphones used in breaking news events while avoiding unnecessary burdens on unlicensed devices and database operators. Instead, as explained in Google’s reconsideration petition, the Commission should adopt a 20-minute recheck rule for only two “fast-polling” channels. This approach recognizes wireless microphone users’ need for protection during breaking news events while still providing unlicensed channels that do not require frequent and burdensome database queries.

Notably, Google’s request that the Commission reconsider its “push” notification requirement is procedurally proper, while NAB’s request that the Commission adopt the 20-minute recheck requirement is not. As Google noted in its petition, the Commission did not discuss implementing a “push” requirement in the NPRM, and it was raised as a suggestion only very briefly in two sets of comments without any discussion of how the proposal might work in practice.<sup>50</sup> Interested parties could not, through the exercise of ordinary diligence, have known that the Commission was considering adopting a “push” requirement until the *Part 15 Order* issued.<sup>51</sup> It is also in the public interest for the Commission to give commenters an opportunity

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<sup>48</sup> Google Inc. Petition for Reconsideration at 1-8 (“Google Petition”).

<sup>49</sup> *Id.* at 4.

<sup>50</sup> *Id.* at 7-8.

<sup>51</sup> *See* 47 C.F.R. § 1.429(b)(2).

to react to this proposal about which there exists such scant discussion on the record.<sup>52</sup> By contrast, NAB asks that the Commission reconsider its decision not to adopt the 20-minute recheck requirement, which the Commission specifically proposed in the NPRM and which was thoroughly vetted and discussed on the record.

**B. The Commission Correctly Concluded that Low-Power Fixed Unlicensed Devices Can Operate on Adjacent Channels Within a TV Station’s Protected Contour Without Causing Harmful Interference.**

NAB has repeatedly groused about the prospect of 40 mW fixed operations on adjacent channels within a TV station’s contour.<sup>53</sup> In deciding that it could authorize such operations without risk of harmful interference to broadcasters, however, the Commission specifically concluded that NAB’s arguments lack merit.<sup>54</sup> Because the Commission fully considered and properly rejected NAB’s current contentions, they are not appropriate for action on reconsideration.<sup>55</sup>

As the Commission noted, this rule merely “allow[s] fixed devices to operate on adjacent channels at a much lower power level than [the 4 W power level] the Commission previously considered, specifically, the same 40 milliwatt power level that the Commission previously determined could be used by personal/portable devices operating adjacent to occupied TV channels without causing harmful interference.”<sup>56</sup> Moreover, the Commission acted with strong

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<sup>52</sup> *See id.* § 1.429(b)(3).

<sup>53</sup> Comments of the National Association of Broadcasters at 4-7 (“NAB Comments”); Reply Comments of the National Association of Broadcasters at 3, 5-6 (“NAB Reply Comments”); Letter from Patrick McFadden, Vice President Spectrum Policy, Legal and Regulatory Affairs, National Association of Broadcasters, to Marlene H. Dortch, Secretary, FCC, at 1 & Attachment at 5-11, RM-11745 and ET Docket No. 14-165 (filed June 30, 2015).

<sup>54</sup> Part 15 Order at 9562-64 ¶¶ 28-31.

<sup>55</sup> 47 C.F.R. § 1.429(1)(3).

<sup>56</sup> Part 15 Order at 9563 ¶ 30.

record support.<sup>57</sup> In particular, real-world network trials demonstrate that fixed unlicensed operations transmitting at *significantly higher* power levels on adjacent channels do not cause harmful interference to TV operations.<sup>58</sup> The Commission therefore correctly decided to authorize fixed, 40 mW unlicensed operations on adjacent channels within a TV station's contour.

**C. The Commission Should Not Adopt NAB's Late-Raised Location Accuracy Proposals.**

NAB's reconsideration petition introduces, for the first time, a variety of proposals related to location accuracy. Because NAB could have raised these suggestions earlier in the proceeding and has not alleged changed circumstances or lack of knowledge, these proposals are procedurally infirm. The Commission should decline to consider them at the reconsideration stage.<sup>59</sup> Furthermore, these proposals lack merit, as they are not necessary to protect licensees from harmful interference.

First, NAB argues that the Commission should limit the degree of permissible location uncertainty for unlicensed devices to  $\pm 100$  meters in order to protect licensees from harmful interference.<sup>60</sup> NAB expresses concern that unlicensed devices may be permitted to register a location "somewhere in Kansas," for example, which it argues would make it difficult to identify the source of any harmful interference to broadcasters.<sup>61</sup>

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<sup>57</sup> Reply Comments of the Alarm Industry Communications Committee at 5; Comments of Adaptrum, Inc. at 7; Google Comments at 43-44; Comments of Motorola Solutions, Inc. at 5; Comments of WhiteSpace Alliance at 16; Wi-Fi Alliance Comments at 13-14; WISPA Comments at 8.

<sup>58</sup> Google Comments at 44.

<sup>59</sup> 47 C.F.R. § 1.429(b)(1)-(2).

<sup>60</sup> NAB Petition at 8-9.

<sup>61</sup> *Id.* at 8.

In practice, though, no unlicensed device would make such a request. If a device queried a database using that level of location uncertainty, the spectrum database could permit operation only on channels that would be available throughout that entire “Kansas-sized” area. As the margin of location uncertainty increases, spectrum availability decreases because a database has to account for a wide range of possible locations, each with its own set of occupied channels that must be protected.

Unlicensed devices therefore have a strong incentive to be as certain as possible about their location, and the Commission need not define a maximum level of permitted location uncertainty. Allowing devices flexibility in their level of location accuracy will protect licensees while preserving incentives for unlicensed device manufacturers to develop increasingly accurate location determination methods.<sup>62</sup> An unlicensed device will operate on channels that a database has determined can accommodate unlicensed operations without causing harmful interference to incumbents. Allowing unlicensed devices more flexibility regarding the certainty of their location may reduce the number of channels available to particular devices at particular locations, but will in no way affect the accuracy of the channels the database returns as available, or interference protection for licensees.

Second, NAB contends that the full Commission should adopt specific equipment certification test procedures for location accuracy.<sup>63</sup> But the Commission has delegated matters relating to equipment certification and testing to OET,<sup>64</sup> and NAB provides no persuasive reason why the Commission should depart from its standard approach and adopt—on reconsideration

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<sup>62</sup> Google Comments at 39-43.

<sup>63</sup> NAB Petition at 8.

<sup>64</sup> 47 C.F.R. § 0.241(b).

and without notice and comment—specific location accuracy test procedures for unlicensed devices.

**D. The Commission Should Not Adopt NAB’s Proposal to Require Unlicensed Devices to Report to the Database Their Actual Operating Channels and Power Levels.**

NAB also suggests, for the first time on reconsideration, that the Commission should require unlicensed devices to communicate their actual operating channels and power levels back to their database after receiving a list of available channels for operation.<sup>65</sup> The Commission should reject this argument, both because NAB could have raised it previously but failed to do so,<sup>66</sup> and because such a requirement would create additional and unnecessary burdens on unlicensed devices and database operators.

This increase in messaging would negatively impact the battery life of consumers’ devices, and drive up bandwidth consumption better devoted to end-user communications. Depending upon when and how often unlicensed devices would be required to report back to the database, it could also significantly increase the burden on white space database operators, which would be required to receive, process, and store such operational information for potentially millions of unlicensed devices. Database operators would also need to develop a method to provide unlicensed device operational data to inquiring parties (for instance, the Commission) while safeguarding consumer privacy. NAB fails adequately to explain why such a burden is necessary to protect licensees, or why the benefits would exceed the costs to unlicensed users and database operators. Given its longstanding campaign to block unlicensed use of available TV-band spectrum, moreover, NAB’s views on this subject could not be credited in any event.

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<sup>65</sup> NAB Petition at 15.

<sup>66</sup> See 47 C.F.R. § 1.429(b)(1)-(2).

**IV. THE REMAINING ARGUMENTS RAISED BY GEHC, WMTS COALITION, AND NAB ARE PROCEDURALLY INFIRM AND SHOULD BE DISREGARDED ON RECONSIDERATION.**

The remaining arguments raised by GEHC, WMTS Coalition, and NAB on reconsideration are procedurally defective under Rule 1.429 because they “have been fully considered and rejected by the Commission”<sup>67</sup> in this proceeding, or they could have been but were not previously presented to the Commission,<sup>68</sup> or they raise issues outside the scope of this proceeding.<sup>69</sup>

*Propagation model.* GEHC and WMTS Coalition argue that the Commission improperly used the TM-91-1 propagation model to evaluate the potential for interference from unlicensed to WMTS in Channel 37.<sup>70</sup> Those parties have raised this same argument multiple times throughout this proceeding<sup>71</sup> and the Commission has fully considered and rejected it.<sup>72</sup> GEHC and WMTS Coalition also continue to argue that the Commission improperly used median signal strength to model interference between unlicensed devices and WMTS.<sup>73</sup> GEHC previously raised this argument in this proceeding,<sup>74</sup> and the Commission fully considered and properly rejected it in the *Part 15 Order*.<sup>75</sup>

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<sup>67</sup> *Id.* § 1.429(1)(3).

<sup>68</sup> *Id.* § 1.429(b).

<sup>69</sup> *Id.* § 1.429(1)(5).

<sup>70</sup> WMTS Coalition Petition at 8-10; GEHC Petition at 21-27.

<sup>71</sup> *See, e.g.*, GEHC Comments at 14-21; WMTS Coalition Comments at 15-16; GEHC Reply Comments at 4-5.

<sup>72</sup> Part 15 Order at 9634-36 ¶¶ 203-06.

<sup>73</sup> WMTS Coalition Petition at 8 & n.17; GEHC Petition at 16-19.

<sup>74</sup> GEHC Comments at 15.

<sup>75</sup> Part 15 Order at 9634-35 ¶ 203, 9636-37 ¶¶ 206-07 & n.524.

*HAAT.* The Commission has also fully considered and properly rejected<sup>76</sup> arguments previously raised by WMTS proponents<sup>77</sup>—and merely reiterated on reconsideration<sup>78</sup>—that the Commission erred in assuming an antenna height for WMTS transmitters of 10 meters above ground and in using HAAT when calculating separation distances between unlicensed and WMTS operations.

*Personal/portable operation on Channel 37.* WMTS Coalition and GEHC have argued from the outset in this proceeding that the Commission should not allow personal/portable unlicensed devices to operate on Channel 37.<sup>79</sup> The Commission correctly concluded in the *Part 15 Order* that these arguments lack merit,<sup>80</sup> and it is improper for WMTS Coalition to attempt to revive them on reconsideration.<sup>81</sup>

*Interpretation of interference tests.* GEHC also argues in its petition that the Commission misinterpreted the WMTS/unlicensed coexistence test results submitted by WMTS proponents.<sup>82</sup> But both GEHC and WMTS Coalition had ample opportunity to discuss their tests on the record, and the *Part 15 Order* reflects that the Commission thoroughly considered the test reports and accompanying filings when drawing its own conclusions.<sup>83</sup> To the extent that GEHC raises new

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<sup>76</sup> *Id.* at 9638-39 ¶ 210 & n.535.

<sup>77</sup> GEHC Comments at 22-24 (discussing HAAT), 21-22 (discussing WMTS antenna height); WMTS Coalition Comments at 14 (discussing WMTS antenna height); GEHC Reply Comments at 5 (discussing HAAT);

<sup>78</sup> WMTS Coalition Petition at 11-13 (discussing WMTS antenna height), 13-14 (discussing HAAT); GEHC Petition at 7-8 (discussing WMTS antenna height), 8-12 (discussing HAAT).

<sup>79</sup> WMTS Coalition Comments at 9-13; GEHC Comments at 28-30; WMTS Coalition Reply Comments at 12-13.

<sup>80</sup> Part 15 Order at 9633 ¶¶ 196-98, 9639 ¶ 211.

<sup>81</sup> WMTS Coalition Petition at 31-34.

<sup>82</sup> GEHC Petition at 27-36.

<sup>83</sup> Part 15 Order at 9635 ¶ 204, 9636 ¶ 206, 9637 ¶ 208.

arguments regarding the interpretation of WMTS/unlicensed coexistence test results, these arguments are also procedurally improper because GEHC could have raised these arguments previously and has not alleged a lack of knowledge or changed circumstances that might render them appropriate on reconsideration.<sup>84</sup>

*Unlicensed device-database contact interval.* NAB argues on reconsideration that the Commission should eliminate the rule that allows unlicensed devices that cannot establish contact with a database to continue to operate until 11:59 PM the following day.<sup>85</sup> The Commission already considered and properly rejected NAB's contentions, concluding that the needs of wireless microphone users to ensure available channels for breaking news events could be accommodated in other ways.<sup>86</sup> The Commission should therefore dismiss this argument.<sup>87</sup>

*Database reliability.* GEHC, WMTS Coalition, and NAB argue on reconsideration that the white space databases are unreliable.<sup>88</sup> The Commission established a separate docket to solicit comment specifically on these issues,<sup>89</sup> and has now issued a Notice of Proposed Rulemaking in that docket addressing potential revisions to database requirements for fixed

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<sup>84</sup> 47 C.F.R. § 1.429(b)(1)-(2).

<sup>85</sup> NAB Petition at 15-17; *see also* NAB Comments at 13.

<sup>86</sup> Part 15 Order at 9661-62 ¶ 272, 9662-63 ¶ 275, 9664 ¶ 278.

<sup>87</sup> 47 C.F.R. § 1.429(1)(3). Note that even if the Commission ultimately decides to adopt Google's fast-polling channel proposal rather than the burdensome "push" notification rule it adopted in the *Part 15 Order*, this proposal would similarly ensure available channels for wireless microphone use during breaking news events without requiring the elimination of Section 15.711(b)(3)(iii) of the rules (allowing unlicensed devices to continue to operate until 11:59 PM the following day after losing contact with the database).

<sup>88</sup> GEHC Petition at 36-42; NAB Petition at 2-4; WMTS Coalition Petition at 31-33.

<sup>89</sup> *See generally* Docket No. RM-11745.

devices (“Geolocation NPRM”).<sup>90</sup> The Commission did not seek comment on database security or reliability in this proceeding—and, in fact, expressly declined to act on these issues in the *Part 15 Order*, given its intent to begin a separate proceeding<sup>91</sup>—rendering these arguments inappropriate for petitions for reconsideration of the *Part 15 Order* because they are beyond the scope of this proceeding. As Section 1.429(l)(5) of the Commission’s rules notes, if arguments raised in petitions for reconsideration “[r]elate to matters outside the scope of the order for which reconsideration is sought,” they “plainly do not warrant consideration by the Commission” and the Commission may dismiss them.<sup>92</sup>

The Geolocation NPRM proposes to “adopt many of the recommendations” made jointly by NAB and several unlicensed device manufacturers, including “eliminat[ing] the current option for a professional installer to determine and enter the geographic coordinates for a fixed white space device,” and requiring database administrators to verify the contact information provided for each registered fixed white space device before providing service.<sup>93</sup> For the reasons that Google has already articulated in Docket No. RM-11745, the Commission should continue to allow fixed device users to rely on a professional installer to determine the geolocation coordinates of a fixed device that does not have automated geolocation capability.<sup>94</sup> This approach allows for a more diverse pool of unlicensed devices, furthering broadband access.<sup>95</sup>

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<sup>90</sup> See generally *Amendment of Part 15 of the Commission’s Rules for Unlicensed Devices*, Notice of Proposed Rulemaking and Order, ET Docket No. 16-56, RM-11745 (rel. Feb. 26, 2016) (“Geolocation NPRM”).

<sup>91</sup> Part 15 Order at 9560 ¶ 21 n.37.

<sup>92</sup> See 47 C.F.R. § 1.429(l)(5).

<sup>93</sup> Geolocation NPRM ¶ 18.

<sup>94</sup> Opposition of Google Inc. at 6-7, Docket No. RM-11745 (filed May 1, 2015).

<sup>95</sup> *Id.*

The Commission also should not impose burdensome contact verification requirements on database operators. The process by which databases receive and update contact information is largely automated; inserting a manual review and confirmation procedure would “create new risks of delay and error,” and would “make it more difficult for database providers to offer their services at reasonable rates.”<sup>96</sup>

GEHC also argues that because unlicensed devices may use open source or commercial-off-the-shelf software, and because they may be “low-cost consumer-grade devices,” such devices could be subject to manipulation by third parties or device owners.<sup>97</sup> WMTS Coalition repeats these concerns.<sup>98</sup> However, neither of these parties cites to any examples of harmful interference to any licensees or end users from existing unlicensed operations as a result of software or hardware tampering. The Commission’s rules explicitly state that unlicensed devices “shall incorporate adequate security measures . . . to ensure that unauthorized parties cannot modify the device or configure its control features to operate in a manner inconsistent with the rules and protection criteria set forth in” the rules.<sup>99</sup> The Commission therefore correctly stated in its *Part 15 Order* that its current rules provide adequate security for white space access systems.<sup>100</sup>

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<sup>96</sup> *Id.* at 8-9.

<sup>97</sup> GEHC Petition at 37-38.

<sup>98</sup> WMTS Coalition Petition at 32-33.

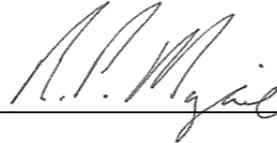
<sup>99</sup> 47 C.F.R. § 15.709(f); *see also id.* § 15.711(j), 15.713(a), and 15.713(l).

<sup>100</sup> Part 15 Order at 9631-32 ¶ 194 n.490. The Commission’s brief treatment of security issues in a single footnote in the *Part 15 Order* does not bring the security issues raised by petitioners within the scope of this proceeding, as security issues did not form part of the Commission’s NPRM and are not a logical outgrowth therefrom. *See Public Serv. Comm’n of D.C. v. FCC*, 906 F.2d 713, 717 (D.C. Cir. 1990).

**V. CONCLUSION.**

For the foregoing reasons, the Commission should dismiss or otherwise reject the petitions for reconsideration filed by GEHC, WMTS Coalition, and NAB.

Respectfully submitted,



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February 29, 2016

**APPENDIX A:  
INSTRUCTIONS FOR DEFINING A WMTS  
PERIMETER POLYGON USING GOOGLE EARTH**

1. Download and install a free copy of Google Earth from <http://www.google.com/earth/download/ge/agree.html>
2. Open Google Earth.
3. Locate the facility by typing its address in the “Search” field in the upper left hand corner of the screen and clicking the “Search” button.
4. Click the “Add Polygon” button ().
5. Enter a descriptive name for the facility in the “New Polygon” window that appears.
6. Click once on each corner of the facility perimeter to create a polygon.
7. Click “OK” in the “New Polygon” window.
8. An entry for the polygon you have just defined will appear in the “My Places” list in the “Places” pane on the left hand side of the window. Right click that entry and choose “Save Place As...”
9. Enter a suitable filename and click “Save.” Following this process will generate a standard map file that is suitable for sharing with database operators in order to identify the coordinates of the protected polygon surrounding a WMTS facility.
10. Repeat 3-9 to define the perimeters of additional facilities.

**CERTIFICATE OF SERVICE**

I, Jill Warnock, certify that on this 29th day of February 2016, I have caused a true and correct copy of the foregoing Opposition to Petitions for Reconsideration to be served via first class mail, postage paid, upon:

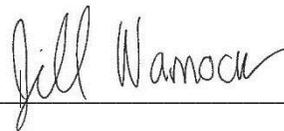
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