

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

In the Matter of

TerreStar Corporation Request	)	
for Temporary Waiver of	)	
Substantial Service Requirements	)	WT Docket No. 16-290
for 1.4 GHz Licenses	)	

To: The Mobility Division, Wireless Telecommunications Bureau

**PETITION FOR RECONSIDERATION OF  
THE AMERICAN SOCIETY FOR HEALTHCARE ENGINEERING OF  
THE AMERICAN HOSPITAL ASSOCIATION**

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## TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY.....	1
II.	ADDITIONAL PROTECTED SPECTRUM IS NEEDED TO MEET GROWING DEMAND FOR WIRELESS MEDICAL TELEMETRY SERVICE.....	3
A.	<i>TERRESTAR’S EFFORTS TO AVOID CAUSING INTERFERENCE TO WIRELESS MEDICAL TELEMETRY SERVICES SERVE THE PUBLIC INTEREST.</i> .....	4
B.	<i>MAKING ADDITIONAL WMTS SPECTRUM AVAILABLE IN THE ADJACENT 1.4 GHZ BAND WILL SERVE THE PUBLIC INTEREST.</i> .....	7
III.	UNIQUE CIRCUMSTANCES JUSTIFY THE REQUESTED WAIVER.....	9
IV.	CONCLUSION.....	10

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THE AMERICAN HOSPITAL ASSOCIATION**

The American Society for Healthcare Engineering (“ASHE”) of the American Hospital Association (“AHA”), pursuant to Section 1.106 of the FCC’s rules,<sup>1</sup> files this petition for reconsideration of the *Order* issued by the Chief, Mobility Division, Wireless Telecommunications Bureau (“Division”) on October 10, 2017.<sup>2</sup> The *Order* denied the waiver request filed by TerreStar Corporation (“TerreStar”) that would allow its licenses in the paired 1392-1395 MHz and 1432-1435 MHz bands and unpaired 1390-1392 MHz band (collectively, the “1.4 GHz band”) to be used for wireless medical telemetry services compatible with, and complementary to, licensed Part 95 Wireless Medical Telemetry Service (“WMTS”) operations in the adjacent 1395-1400 MHz and 1427-1432 MHz bands.

**I. INTRODUCTION AND SUMMARY.**

ASHE participated in this proceeding as the WMTS database manager and as a representative of the hospital community that seeks additional spectrum for wireless medical

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<sup>1</sup> 47 C.F.R. § 1.106.

<sup>2</sup> TerreStar Corporation Request for Temporary Waiver of Substantial Service Requirements, WT Docket No. 16-290, DA 17-995 (Oct. 10, 2017) (“Order”).

telemetry services that are protected from harmful interference. The Division should reconsider its denial because it erroneously concluded that there is insufficient support in the record to determine that additional spectrum is necessary to meet the WMTS needs of hospitals and that TerreStar's earlier plans to operate a WiMAX Smart Grid service would cause harmful interference to WMTS. In addition, the Division failed to appropriately consider the substantial public interest benefits of granting the waiver and allowing the TerreStar spectrum to be used to expand the amount of spectrum available for wireless medical telemetry services. ASHE had discussed in multiple filings that additional protected spectrum for WMTS is needed to meet the growing demands of hospitals,<sup>3</sup> as did the major providers of WMTS.<sup>4</sup> The TerreStar spectrum is a unique opportunity because it is adjacent to existing Part 95 WMTS spectrum in the 1.4 GHz band, thereby potentially providing a larger continuous block of spectrum available for wireless medical telemetry. This larger block would allow hospitals to support the growing demand for encryption security while maintaining range and/or the number of devices supported. For example, hospitals could increase the power of their systems slightly without interfering with adjacent bands because of the larger continuous block. This increased capability potentially would lower costs for hospitals. Still another benefit of spectrum adjacency is that existing WMTS equipment more easily could be tuned to use the TerreStar spectrum, in order to facilitate rapid build-out.

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<sup>3</sup> Letter from Timothy J. Cooney and Patrick R. Halley, Counsel to American Society for Healthcare Engineering, to Chairman Ajit Pai, Federal Communications Commission, WT Docket No. 16-290 (filed July 14, 2017) ("July 2017 ASHE Letter"); Comments of American Society for Healthcare Engineering, GN Docket No. 16-46 (filed May 24, 2017) ("ASHE Connect2Health Comments"); *see also* Ex Parte Letter of Steward Health Care, WT Docket No. 16-290, at 2 (filed July 12, 2017).

<sup>4</sup> *See* Letter from Matt Pekarske and Neal Seidl, GE Healthcare, to Chairman Ajit Pai, FCC, WT Docket No. 16-190, at 2 (filed Aug. 4, 2017) ("August 2017 GE Letter"); Letter from Delroy Smith, Philips Healthcare, to Chairman Ajit Pai, FCC, WT Docket No. 16-290, at 2 (filed Aug. 21, 2017) ("August 2017 Philips Letter").

In addition to articulating the need for additional spectrum for WMTS, such providers also explained why WMTS would be susceptible to interference from a WiMAX Smart Grid service operating in the adjacent band because low-power wireless medical telemetry operations are susceptible to interference from higher power adjacent band operations.<sup>5</sup>

The *Order* should therefore be reconsidered because it fails to take into consideration the need for additional spectrum from hospitals for WMTS and the significant benefits that will result from greater contiguous WMTS capacity for patients, benefits that could be achieved rapidly since existing WMTS equipment could be tuned to use the spectrum in the adjacent band. A waiver is also justified because TerreStar appropriately modified its business plans, after learning new information about WMTS susceptibility to interference not previously known,<sup>6</sup> in order to avoid causing significant harmful interference to WMTS and threatening the benefits that licensed WMTS operations have brought to the nation's health care system, including to Veterans Administration ("VA") and Department of Defense ("DOD") hospitals.

## **II. ADDITIONAL PROTECTED SPECTRUM IS NEEDED TO MEET GROWING DEMAND FOR WIRELESS MEDICAL TELEMETRY SERVICE.**

The Commission's policies to enable WMTS have been a massive success, enabling near interference-free operation of life-protecting services in hospitals across the country. However, the spectrum available for WMTS is limited, and the Commission has previously indicated that it does not anticipate any new allocations in other spectrum bands for medical telemetry devices.<sup>7</sup> More recently, the Commission has taken steps to allow shared use of WMTS spectrum at 608-

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<sup>5</sup> See August 2017 GE Letter; *see also* August 2017 Philips Letter.

<sup>6</sup> TerreStar Corporation Request for Temporary Waiver of Substantial Service Requirements, at 1 (filed Aug. 12, 2016) ("TerreStar Waiver"); Supplemental Comments of TerreStar, WT Docket No. 16-290, at 16 (filed June 7, 2017) ("Supplemental Comments of TerreStar").

<sup>7</sup> *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, Report and Order, 15 FCC Rcd 11206, 11210 ¶¶ 10-11 (2000) ("WMTS Report and Order").

614 MHz (Channel 37) with unlicensed devices,<sup>8</sup> causing concerns within the hospital community over potential interference to WMTS service in that band. Thus, while WMTS use is on the rise,<sup>9</sup> the Commission has not taken any steps to address the WMTS spectrum shortfall. In addition to adding more users, hospitals will also demand greater capabilities and security functions (*i.e.* encryption) that will further constrain the number of patients that can be served by the existing spectrum allocation. Allowing hospitals to augment their current capabilities through the use of adjacent spectrum in the 1.4 GHz band would be a major benefit to hospitals and patient monitoring.

A. *TERRESTAR'S EFFORTS TO AVOID CAUSING INTERFERENCE TO WIRELESS MEDICAL TELEMETRY SERVICES SERVE THE PUBLIC INTEREST.*

Wireless biomedical telemetry devices are used in hospitals to transmit waveforms and other physiological data from patient measurement devices to a nearby receiver's antenna in order to provide early detection of life-threatening physiologic developments so that appropriate intervention can be rendered in a timely manner. WMTS devices monitor electrocardiogram ("ECG"), oxygen saturation, blood pressure, respiration, and a variety of other characteristics, while providing patients with mobility and comfort as they are being monitored for adverse symptoms, as well as for monitoring fetal heart rate, ECG and uterine activity prior to and during the birthing process.<sup>10</sup> Mobility is particularly important for the recovery of cardiac patients, and WMTS allows patients to ambulate earlier in their recovery while still being monitored. In addition, WMTS allows many patients to be monitored from a central location, improving efficiency and at the same time increasing the ability for health care workers to quickly respond

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<sup>8</sup> *Expanding the Economic and Innovation Opportunities of Spectrum through Incentive Auctions*, Report and Order, 29 FCC Rcd 6567 (2014) ("*Incentive Auction Order*").

<sup>9</sup> *See infra* at 7.

<sup>10</sup> *See* ASHE Connect2Health Comments at 2.

to physiological events and capture physiological information. The odds of surviving an in-hospital cardiac arrest are twice as high for monitored hospital patients, as compared to unmonitored patients.<sup>11</sup>

Prior to the creation of the WMTS in 2000, wireless medical telemetry systems could be operated only on an unlicensed basis (on vacant television channels) or on a secondary basis to Private Land Mobile Radio (“PLMR”) operations under Part 90 of the FCC’s rules (in the 450-470 MHz band). However, with the re-channelization of the 450-470 MHz bands, plus rule changes allowing for higher powered PLMR systems, incidents of interference to wireless medical telemetry systems increased. The Commission temporarily froze acceptance of applications for higher powered PLMR licenses to mitigate the problem.<sup>12</sup> Additionally, as the transition from analog to digital television (“DTV”) was initiated and television stations began testing their DTV transmissions on previously unused channels, a broadcast station in Dallas, Texas commencing operations on its new channel caused harmful interference to wireless medical telemetry systems operating at the Baylor Medical Center.<sup>13</sup> These circumstances highlighted the need for the Commission to consider an allocation of spectrum in which wireless telemetry systems would be accorded primary status and could operate without objectionable interference.

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<sup>11</sup> See *id.* at 2 (citing William Brady, Kelly Gurka, et al., In-hospital cardiac arrest: Impact of monitoring and witnessed event on patient survival and neurologic status at hospital discharge (Mar. 2011)).

<sup>12</sup> See Public Notice, Freeze on the Filing of High Power Applications for 12.5 kHz Offset Channels in the 450-470 MHz Band, PR Docket 92-235, 10 FCC Rcd 9995 (1995).

<sup>13</sup> See *Amendment of Parts 2 and 95 of the Commission’s Rules to Create a Wireless Medical Telemetry Service*, Notice of Proposed Rulemaking, 14 FCC Rcd 16719 (1999) (citing *Joint Statement of the Federal Communications Commission and the Food and Drug Administration Regarding Avoidance of Interference between Digital Television and Medical Telemetry Devices*, released March 25, 1998 and *Office of Engineering and Technology Fact Sheet, Sharing of Analog and Digital Television Spectrum by Medical Telemetry Devices*, dated March 1998) (“WMTS NPRM”).

Working cooperatively with the FCC and the Food and Drug Administration, the AHA created a task force of hospitals, clinics and other users of wireless medical telemetry systems, manufacturers of wireless medical telemetry devices, and trade associations involved in the development of medical devices and the delivery of health care services to identify likely spectrum requirements for wireless medical telemetry in the reasonably foreseeable future and suitable alternatives for satisfying those needs.

The result of the AHA task force efforts was a proposal that the Commission create the WMTS. In 1999 the Commission initiated a rulemaking,<sup>14</sup> and in June 2000 the Commission established the WMTS as a new licensed radio service under Part 95 of the Rules.<sup>15</sup> Licensed WMTS systems operate in one of two frequency bands, the 608-614 MHz band (TV Channel 37) and the 1.4 GHz band (1395-1400 MHz and 1427-1432 MHz). In order to expedite the implementation of WMTS systems while maintaining an efficient licensing scheme, the FCC provided for “licensing by rule,” requiring only a health care facility’s registration of its deployments in a WMTS database maintained by a third party administrator. In 2001 the Commission assigned ASHE the responsibility to create and maintain a database of WMTS licensees and deployments as the primary source of information concerning each licensee’s location and technical parameters.<sup>16</sup> ASHE has acted as the WMTS database administrator ever since, while also serving as the principal advocate before the FCC for hospitals and other health care facilities that are WMTS licensees.

In creating WMTS, the Commission stated that its objectives included “allow[ing] potentially life-critical medical telemetry equipment to operate on an interference-protected

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<sup>14</sup> See generally *WMTS NPRM*.

<sup>15</sup> *WMTS Report and Order* at 11210 ¶¶ 10-11.

<sup>16</sup> *Amendment of Parts 2 and 95 of the Commission’s Rules to Create a Wireless Medical Telemetry Service*, Order, 16 FCC Rcd 4543 (2001).



basis” and to “improve the reliability of this service.”<sup>17</sup> Those needs have not changed, and grant of TerreStar’s waiver request would directly support these objectives. Even a small level of interference could result in the failure of the WMTS system to monitor critical care patients for some period of time, placing those patients at significant health risk. And if interference occurs on a relatively regular basis, or if it cannot be resolved relatively quickly, confidence in the WMTS system erodes, significantly burdening the health care infrastructure in terms of the hospital’s ability to remotely monitor patients. Due to this reality, ASHE appreciated the recognition by TerreStar that its proposed WiMAX Smart Grid service would cause unacceptable levels of interference to WMTS and its commitment to finding an alternative solution that will directly benefit hospitals.

*B. MAKING ADDITIONAL WMTS SPECTRUM AVAILABLE IN THE ADJACENT 1.4 GHZ BAND WILL SERVE THE PUBLIC INTEREST.*

WMTS operations in the 1.4 GHz band have proven to be a great success, both in terms of usage and technical innovations, including bi-directional communications. The total number of deployments in the 1.4 GHz band has increased about 20 percent per year since 2013 with a total of 321,259 transmitters/access points at 2,025 hospitals, as of September 30, 2017. Just since May 1, 2017, there has been an increase of 46 hospitals and 12,200 transmitters/access points. Continued growth at this pace raises the issue of WMTS saturation due to a lack of Part 95 1.4 GHz spectrum. Indeed, 130 hospitals have registered more than 500 transmitters/access points in the 1.4 GHz band; and nineteen hospitals have registered more than 1,000 transmitters/access points.

Due to this continued growth, ASHE welcomed the request of TerreStar for a temporary waiver of the FCC’s substantial service deadline for TerreStar’s commercial wireless licenses in

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<sup>17</sup> *WMTS Report and Order* at 11206 ¶ 1.

the 1.4 GHz band adjacent to WMTS in order to expand wireless medical telemetry capacity. Specifically, TerreStar's proposal would increase wireless medical telemetry capacity in the 1.4 GHz band by approximately 67 percent and permit use of licensed medical telemetry service outside of major healthcare facilities and in ambulances. The additional channel capacity would allow health care facilities to increase the number of patients and the types of patient metrics that may be monitored. To the extent that federal facilities such as VA and DOD hospitals are required to implement cybersecurity encryption methodologies that require additional channel bandwidth,<sup>18</sup> the TerreStar spectrum would provide relief so that the number of patients being monitored does not need to be reduced through this transition. ASHE understands through discussions with WMTS manufacturers that the need for enhanced security capabilities (*i.e.* encryption) is driving the need for increased bandwidth because encryption requires more bandwidth per device. With increased security, each access point is able to handle fewer transmitters, which requires greater density of access points and greater spectrum availability. ASHE understands that encryption requirements can reduce system capacity by about 50 percent. While this issue is apparently directly affecting VA and DOD hospitals today, it also is an issue that more broadly will affect hospitals across the country, particularly as concerns about cybersecurity and demands for increased IT security continue to rise.

While providing any new spectrum for WMTS would be helpful because it provides additional means to navigate around congestion, the TerreStar spectrum is a unique opportunity because it is adjacent to existing Part 95 WMTS spectrum in the 1.4 GHz band. Providing a larger continuous block of spectrum available for wireless medical telemetry would allow hospitals to slightly increase the power of their systems without interfering with adjacent bands.

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<sup>18</sup> See Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 10 n. 23 (filed Sept. 20, 2017).

This would allow hospitals to support the growing demand for encryption security while maintaining range and/or the number of devices supported, and at lower cost.

### **III. UNIQUE CIRCUMSTANCES JUSTIFY THE REQUESTED WAIVER.**

“The FCC has authority to waive its rules if there is ‘good cause’ to do so.”<sup>19</sup> A waiver is appropriate if “special circumstances warrant a deviation from the general rule” and “such deviation will serve the public interest.”<sup>20</sup> Further, under Section 1.925(b)(3) of its rules, the Commission may waive specific requirements of its rules if application of the rule would be “inequitable, unduly burdensome or contrary to the public interest.”<sup>21</sup> In this case, special circumstances do warrant deviation from the general rule; and such deviation will serve the public interest by preventing harmful interference to Part 95 licensed WMTS operations and allowing health care entities prompt access to additional spectrum for wireless medical telemetry services.

Specifically, the public interest was served when TerreStar proactively investigated whether deploying a high-power 802.16 WiMAX network for Smart Grid applications on its spectrum adjacent to Part 95 WMTS would likely cause harmful interference to hospitals. ASHE can attest that TerreStar representatives contacted it and WMTS manufacturers in 2014 to discuss how it intended to use its spectrum and, upon learning of the likely interference to WMTS, worked cooperatively with ASHE and the manufacturers to find potential solutions. The fact that it took some time to develop workable solutions that would avoid interference to WMTS operations while complying with TerreStar’s licensing obligations should not be fatal to TerreStar’s request. The susceptibility of WMTS 1.4 GHz systems to adjacent band interference

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<sup>19</sup> *Ne. Cellular Tel. Co., L.P. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) (quoting 47 C.F.R. § 1.3).

<sup>20</sup> *Id.*

<sup>21</sup> 47 C.F.R. § 1.925(b)(3).

is a unique circumstance; and TerreStar should be credited with recognizing this and for taking the time to develop a workable solution with the WMTS industry.

The additional public interest benefit of expanding the availability of spectrum that can be used for wireless medical telemetry applications without harmful interference is substantial. WMTS operations in TV Channel 37 are subject to ongoing rulemaking proceedings that raise significant issues whether that spectrum can remain protected from interference from in-band unlicensed TV White Space devices. Additionally, at the same time that the FCC recognized that the demand for WMTS spectrum likely will grow, it signaled that no new spectrum likely will be exclusively designated for WMTS:

Medical telemetry devices can reduce health care costs by helping to speed the patient recovery time and reduce the duration of hospital stays. Advances in medical technology will allow monitoring of an increasing number of patient parameters, which will increase spectrum requirements. We also note that demand is likely to be influenced by the growing population of elderly people in the United States. . . [nevertheless] we do not anticipate any further allocations for medical telemetry devices.<sup>22</sup>

Grant of the TerreStar waiver does not require the FCC to consider any further allocations exclusively for medical telemetry devices, yet it provides additional and needed capacity. More spectrum allows more patients in hospitals to be monitored, allows more metrics to be monitored, and more innovation to be developed, including cybersecurity encryption, without decreasing the number of patients monitored.

#### **IV. CONCLUSION.**

In sum, the *Order* failed to appropriately account for the numerous filings in the record demonstrating that additional spectrum is necessary to meet the WMTS needs of hospitals and that TerreStar's earlier plans to operate a WiMAX Smart Grid service would have caused

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<sup>22</sup> *WMTS Report and Order* at 11210 ¶¶ 10-11.

harmful interference to WMTS. Further, the *Order* does not sufficiently recognize the substantial public interest benefits to hospitals and patients in granting the TerreStar waiver request. The Division should reconsider its decision and grant the requested waiver with conditions to ensure prompt deployment of wireless medical telemetry facilities in its spectrum.

Respectfully submitted,

**The American Society for Healthcare  
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