

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

In the Matter of )  
 )  
Comment Deadlines Established Regarding the ) IB Docket No. 11-109  
LightSquared Technical Working Group Report )

**COMMENTS OF VERIZON WIRELESS**

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Verizon Wireless cooperated extensively in the testing that led to the final report submitted by the Technical Working Group<sup>1</sup> and devoted significant resources to the testing efforts. As the Commission recognizes in its Public Notice here,<sup>2</sup> the results of that testing confirm that LightSquared’s proposed operations in the upper 10 MHz band of its spectrum would cause significant interference with existing GPS operations, including those used by wireless carriers to provide critical emergency 911 services. Accordingly, LightSquared has not met the conditions established by the Commission to operate in that band. The test results for the lower 10 MHz band of its spectrum, on the other hand, were mixed and inconclusive. Also, the testing conducted for lower band operations was limited due to timing constraints and to changes in LightSquared’s proposed operations. Given the potential harm to E911 services that rely on GPS devices, further lower band testing is needed, as recommended by the National Association of State 9-1-1 Administrators (“NASNA”). In addition, the Commission should

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<sup>1</sup> Final Report of the Technical Working Group (June 30, 2011) (“Final Report”), attached to Letter from Henry Goldberg, Counsel for LightSquared Subsidiary LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, IB Docket No. 11-109 (June 30, 2011) (“LightSquared June 30 Letter”).

<sup>2</sup> *Comment Deadlines Established Regarding the LightSquared Technical Working Group Report*, Public Notice, DA 11-1133, (rel. June 30, 2011) (“Public Notice”).

confirm that, consistent with its long standing rules, it remains LightSquared's obligation to protect against any interference to GPS from its operations.

## **I. INTRODUCTION AND SUMMARY**

Verizon Wireless participated cooperatively in the testing process both as a member of the Technical Working Group, and as a member of the Cellular Subgroup, which was tasked with testing the impact of LightSquared's operations on devices used by wireless providers. The company voluntarily devoted literally hundreds of person hours to participating in the testing, analysis, and reporting of the results, including the time of its senior technical personnel.

Verizon Wireless's participation was driven by the concern that operations in spectrum so close to the GPS band could interfere with the GPS receivers that are installed in every one of its nearly 90 million mobile devices which are in the hands of consumers, public safety organizations, government agencies and others. GPS receiver-based technologies are the most accurate system available today to provide wireless E911 location data. Those GPS receivers are the core of Verizon Wireless's E911 service – without a functioning GPS receiver, the device will not be able to provide the most precise latitude and longitude data to public safety answering points ("PSAPs") when the caller dials "911". In addition, because the same GPS technology is used to provide location based services, interference to GPS receivers would impede customers' ability to use and benefit from those location services.

The Commission has made improving wireless E911 location accuracy a priority. Through a series of Orders released over the last few years, the Commission has aggressively enforced E-911 Phase II handset requirements,<sup>3</sup> and moved to impose new, more stringent

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<sup>3</sup> See *Alltel Corporation*, Notice of Apparent Liability for Forfeiture, 22 FCC Rcd 16432, ¶ 15 (2007) (proposing \$1,000,000 forfeiture); *Sprint Nextel Corporation*, Notice of Apparent Liability for Forfeiture, 22 FCC Rcd 16414, ¶ 17 (2007) (proposing \$1,325,000 forfeiture).

location accuracy and reliability standards for CMRS providers.<sup>4</sup> In particular, due in large part to wireless carriers' uniform migration toward GPS-based technologies, the Commission has twice in the past year imposed more stringent E911 location accuracy requirements on wireless carriers in order to enable "emergency responders ... to reach the site of an emergency more quickly and efficiently."<sup>5</sup> These Commission actions reflect a dual policy of (1) moving industry toward more rigorous accuracy requirements over time, and (2) ensuring that as many consumers as reasonably possible will have access to highly accurate Phase II service.

Given the importance the Commission has placed on providing the public with the most accurate possible wireless E911 services – and the fact that GPS receiver-based technologies are the most accurate way to provide those services – adequate testing is critical to determining the effect of LightSquared's proposed operations on GPS receiver-based wireless E911 services. Otherwise, any interference that results from LightSquared's operations could disrupt the Commission's efforts to improve the availability and accuracy of wireless E911 services.

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<sup>4</sup> See, e.g., *Wireless E911 Location Accuracy Requirements; Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; Association of Public-Safety Communications Officials-International, Inc. Request for Declaratory Ruling; 911 Requirements for IP-Enabled Service Providers*, Report and Order, 22 FCC Rcd 20105 (2007) (requiring Phase II location accuracy to be measured at the PSAP level), *Rural Cellular Ass'n v. FCC*, No. 08-1069, slip op. at 1 (D.C. Cir. Sept. 17, 2008) (per curiam), (remanding this decision to the FCC for further consideration); *Applications of Cellco Partnership d/b/a Verizon Wireless and Atlantis Holdings LLC*, Memorandum Opinion and Order and Declaratory Ruling, 23 FCC Rcd 17444, ¶¶ 198-201 (2008); *Sprint Nextel Corporation and Clearwire Corporation*, Memorandum Opinion and Order, 23 FCC Rcd 17570, ¶¶ 109-112 (2008) (requiring Verizon Wireless and Sprint Nextel to measure location accuracy at a granular county-level basis using a consensus-based approach developed by industry and public safety).

<sup>5</sup> *Wireless E911 Location Accuracy Requirements*, Second Report and Order, 25 FCC Rcd 18909, ¶¶ 1, 44-47 (2010); see also *Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commissions' Rules, Wireless E911 Location Accuracy Requirements; E911 Requirements for IP-Enabled Service Providers*, GN Docket No. 11-117, PS Docket No. 07-114, WC Docket No. 05-196, Notice of Proposed Rulemaking, Third Report and Order, and Second Further Notice of Proposed Rulemaking, FCC 11-107, ¶¶ 17-19 (rel. July 13, 2011).

The Technical Working Group’s Final Report demonstrates that the operations proposed by LightSquared in the upper 10 MHz of its authorized L-Band downlink spectrum (1545.2 – 1555.2 MHz) would interfere with GPS receivers and thus could harm E911 location accuracy, undermining this critical public safety objective. As the Commission stated in the Public Notice, the “technical working group effort identified significant technical issues related to potential LightSquared operations in the upper portion of the L-Band, which is most proximate to the band used by GPS.”<sup>6</sup>

In addition, while some of the Technical Working Group tests showed that there was less of an interference concern in the lower 10 MHz of LightSquared’s authorized L-Band downlink spectrum (1526 – 1536 MHz) and the Cellular Subgroup noted that operations in that band “may be possible,” other tests identified “some interference issues” in certain situations.<sup>7</sup> Further, while much effort was expended by the Technical Working Group to complete its work, the testing that has been conducted to date of LightSquared’s proposed lower band operation has been limited due to a combination of the short timeframe allotted, and LightSquared’s change in deployment plans after the start of the testing process.

For these reasons, the Commission should take the following actions:

- Confirm that LightSquared has failed to meet the conditions established by the Commission to operate terrestrially in its upper 10 MHz channel and suspend indefinitely its authority to operate in that channel.

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<sup>6</sup> Public Notice at 2.

<sup>7</sup> *Id.*

- Require additional testing of LightSquared’s currently proposed operations in the lower 10 MHz channel to determine whether LightSquared’s operations will cause harmful interference to existing GPS operations, as recommended by NASNA and others.
- Confirm that, under well-settled FCC precedent as well as specific rules, it is LightSquared’s obligation to protect GPS receivers from harmful interference from LightSquared’s operations.

**II. THE FCC SHOULD CONFIRM THAT LIGHTSQUARED HAS FAILED TO MEET THE CONDITIONS IMPOSED BY THE COMMISSION FOR INITIATING TERRESTRIAL OPERATIONS IN ITS UPPER 10 MHZ CHANNEL.**

As the Commission stated in the Public Notice, “[t]he overall conclusion of the testing is that transmissions in the upper 10 MHz channel – the channel nearest to the 1559-1610 MHz GPS band – will adversely affect the performance of a significant number of legacy GPS receivers.”<sup>8</sup> Accordingly, LightSquared has not satisfied the conditions imposed upon it in the *LightSquared Modification Order*<sup>9</sup> and should be prohibited from commencing service in its upper channel indefinitely.

When the Commission granted LightSquared’s waiver of the ATC “integrated service” rule, it conditioned this authorization on the completion of a process addressing interference concerns regarding LightSquared’s proposed operations and GPS.<sup>10</sup> The Commission stated that this process would not be complete until the Commission, after consultation with NTIA,

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

<sup>9</sup> See *LightSquared Subsidiary LLC Request for Modification of its Authority for an Ancillary Terrestrial Component*, Order and Authorization, 26 FCC Rcd 566 (2011) (“*LightSquared Modification Order*”).

<sup>10</sup> See *id.*, ¶ 41.

concludes that the harmful interference concerns have been resolved.<sup>11</sup> Only upon the completion of this effort is LightSquared authorized to commence commercial operation on its L-band MSS frequencies.<sup>12</sup>

The Technical Working Group concluded, however, that LightSquared's proposed operations in its upper 10 MHz band pose a substantial threat of interference to GPS receivers, and that there currently is no available path forward that has been identified that would mitigate this interference. Multiple subgroup reports reached the same conclusion, as outlined below.

First, the Cellular Subgroup tested a "limited but representative sample of cellular devices sent by four US operators (AT&T, Sprint, US Cellular, and Verizon Wireless) to determine the effects of LightSquared signals on GPS receivers embedded in these devices."<sup>13</sup> The Cellular Subgroup tested 41 wireless devices in a lab and eight different models<sup>14</sup> in the field and found that "[e]nough test data was available to demonstrate that LightSquared signals in the higher 5 MHz and 10 MHz band (1545.2 to 1555.2 MHz) caused GPS failure for a significant number of the tested devices."<sup>15</sup> Specifically, the Cellular Subgroup's lab testing showed that 58 percent of the tested cellular devices experienced degradation if the received power level of LightSquared operations in the higher band or higher and lower band signal exceeded -30dBm.<sup>16</sup>

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<sup>11</sup> See *id.* at ¶ 43.

<sup>12</sup> See *id.* at ¶ 41.

<sup>13</sup> Final Report at 16.

<sup>14</sup> The Cellular Subgroup tested 29 devices in the field but only eight different models.

<sup>15</sup> Final Report at 16-17.

<sup>16</sup> *Id.* at 81.



Second, the Technical Working Group as a whole “tested more than 130 representative devices in seven different receiver categories, in a number of different test environments,” and found that “[t]he tests demonstrated potentially significant interference between LightSquared operations in the upper portion of the band and various GPS receivers.”<sup>17</sup> Specifically, the Aviation Subgroup concluded that “all three phases of the currently proposed LightSquared deployment plan are incompatible with aviation GPS operations absent significant mitigation, and would result in complete loss of GPS operations below 2000 feet above ground level over a large radius from the metro deployment center.”<sup>18</sup> The GPS Industry representatives on the General Location/Navigation and High Precision, Timing, and Networks Subgroups reached similar conclusions.<sup>19</sup> In addition, NASA—as part of the Space Based Receivers Subgroup—concluded that “the interference to space-based GPS receivers used for [Radiooccultation] would be severely disruptive to NASA’s science missions based on the test and analysis conducted in the TWG.”<sup>20</sup>

Finally, NTIA submitted a report on potential LightSquared GPS interference, based on testing conducted by the National Space-Based Positioning, Navigation, and Timing Systems

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<sup>17</sup> Public Notice at 2.

<sup>18</sup> Final Report at 15.

<sup>19</sup> *Id.* at 18 (“The General Location/Navigation sub-team has concluded that all phases of the LightSquared deployment plan will result in widespread harmful interference to GPS signals and service and that mitigation is not possible.”); *id.* at 22 (“The LightSquared Base Station 4G LTE signals harmfully interfere with High Precision, Timing, and Network GPS receivers over long ranges. . . . The LightSquared Base Station signals cause harmful co-channel interference with FCC licensed StarFire and OmniSTAR augmentation systems. . . . LightSquared handsets, when operated close to a GPS receiver, harmfully interfere with it.”).

<sup>20</sup> *Id.* at 25.

Engineering Forum (“NPEF”).<sup>21</sup> NPEF recommended that LightSquared should not commence commercial service due to harmful interference to GPS operations, and recommended that the U.S. government conduct additional testing.<sup>22</sup> NPEF found that its test results “have demonstrated there are significant detrimental impacts to all GPS applications assessed as part of this NPEF effort” and that “[t]hese impacts encompassed both US Government and commercial GPS applications.”<sup>23</sup>

In its Recommendation, LightSquared indicates that “GPS device manufacturers must begin the process of improving their equipment by adding the appropriate filtering and other technology necessary to reject signals that operate outside the GPS frequencies.”<sup>24</sup> The Technical Working Group, however, did not identify any viable solution that is available today that would mitigate the interference caused by LightSquared terrestrial operations in the upper band to wireless handsets. Presuming the development of these technologies is even possible – which has not yet been shown – it will take years to develop, test, and incorporate them into GPS devices. Further, if these technologies are developed ultimately, it would take even longer to replace the GPS receivers in legacy wireless devices.<sup>25</sup>

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<sup>21</sup> National Space-Based Positioning, Navigation, and Timing Systems Engineering Forum, *Assessment of Effects on GPS Receivers and GPS-dependent Applications* (June 1, 2011) (“NPEF Report”), attached to Letter from Lawrence E. Strickling, Assistant Secretary, National Telecommunications & Information Administration, to Julius Genachowski, Chairman, Federal Communications Commission, IB Docket No. 11-109 (filed July 6, 2011) (“July 6 NTIA Letter”).

<sup>22</sup> See NPEF Report at i-ii.

<sup>23</sup> *Id.* at i.

<sup>24</sup> Recommendation of LightSquared Subsidiary LLC, at 26 (June 30, 2011) (“LightSquared Recommendation”), attached to LightSquared June 30 Letter.

<sup>25</sup> For example, it took the wireless industry at least five years from the time handset-based solution requirements were adopted to ensure that 95% of wireless customers had devices

Therefore, while the LightSquared Recommendation acknowledges the significant problems with operating terrestrially in the upper band, LightSquared's proposal that the FCC, NTIA, and itself explore options for the terrestrial use of this band six months from now while GPS manufacturers begin adding filtering to their equipment today is completely unrealistic and is contradicted by the record. The interference issue highlighted by the Commission in the *LightSquared Modification Order* therefore has not been resolved, and consistent with that Order (as well as past Commission precedent suspending ATC authority where waiver conditions have not been met), LightSquared has failed to meet the conditions to commence terrestrial operations in its upper 10 MHz channel. The FCC should suspend indefinitely LightSquared's ATC authority to operate in the upper 10 MHz channel.<sup>26</sup>

### **III. ADDITIONAL TESTING IS NECESSARY TO DETERMINE THE INTERFERENCE IMPACT OF OPERATIONS IN LIGHTSQUARED'S LOWER 10 MHZ CHANNEL.**

As noted above, while the Cellular Subgroup found that "operations in the lower bands ... may be possible without harmful interference to existing cellular GPS devices,"<sup>27</sup> the testing to date has been limited, and the results have been mixed and inconclusive. Moreover, given the

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capable of providing Phase II E911 location accuracy. To get to this level of penetration, the industry had to perform extensive marketing and promotional activities as well as significant consumer education and outreach. Even then, some carriers were not able to reach this level of penetration within the allowed timeframe.

<sup>26</sup> This action would be consistent with the Commission's decision in 2010 to suspend Globalstar's ATC authority on the basis that it had failed to satisfy conditions imposed by the Commission in connection with Globalstar's waiver. *Globalstar Licensee LLC Application for Modification of License to Extend Dates for Coming into Compliance with Ancillary Terrestrial Component Rules; Open Range Request for Special Temporary Authority*, Order, 25 FCC Rcd 13114, ¶ 1 (2010). Just as Globalstar failed to satisfy the conditions of its waiver, LightSquared has not satisfied the Commission's requirement that it complete an interference resolution effort to the Commission's satisfaction.

<sup>27</sup> Final Report at 17 (emphasis added).

critical importance of E911 services, it is particularly important that adequate testing be performed to determine the effect that LightSquared's operations in the lower band will have on those services prior to initiating operations. The testing performed to date does not provide the requisite level of certainty, however, and additional testing is needed.

Handset-based GPS technologies such as those deployed by Verizon Wireless are the best available solution for wireless E911 and will remain so for the foreseeable future.<sup>28</sup> Specifically, Verizon Wireless has deployed an assisted GPS ("A-GPS") E911 location accuracy solution that achieves the FCC-mandated Phase II accuracy requirements using GPS when at least four satellites have line-of-site visibility to the E911 caller's handset. When less than four satellites are visible, the system may combine GPS satellite signals with "time difference of arrival" ("TDOA") measurements to provide a medium-level location fix. If no GPS signals are available to the handset, providing a location will require assistance from less accurate, network-based solutions to derive a location. Verizon Wireless is continuously working with its GPS chipset vendor (Qualcomm) to develop chipsets with increasingly sensitive GPS receivers, and regularly reviews and tests accuracy solutions.<sup>29</sup>

To the extent LightSquared's operations in the lower band interfere with wireless carriers' GPS operations, they would disrupt critical location-based services employed by wireless networks and wireless users. Indeed, any degradation in E911 location accuracy caused by interference to GPS – even degradation that does not rise to the level of non-compliance with E911 requirements – would impact the first responders who provide essential public safety services to wireless users calling 911.

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<sup>28</sup> See Comments of Verizon and Verizon Wireless, PS Docket No. 07-114, WC Docket No. 05-196, at 4-7 (filed Jan. 19, 2011).

<sup>29</sup> *Id.* at 5.

Given the essential role GPS receivers play in providing the public with E911 services, it is critical that they not be subject to harmful interference. While the Cellular Subgroup concluded that “operations in the lower bands (1526 to 1536 MHz) may be possible without harmful interference to existing cellular GPS devices,” the Subgroup’s testing did not demonstrate a complete absence of problems with the lower band.<sup>30</sup> Specifically, the Cellular Subgroup’s lab testing showed that most of the tested devices exhibited more resilience to the lower band 10MHz operation as they were able to tolerate receiving a LightSquared lower band signal power level of more than -10dBm. There were, however, six cellular devices (one CDMA and five UMTS) that experienced degradation if the power level exceeded -20dBm, three of which (one CDMA and two UMTS) experienced degradation if the power level exceeded -30dBm.<sup>31</sup> Other Subgroups similarly showed problems with LightSquared operations in the lower band.<sup>32</sup>

Further, due to time constraints and LightSquared’s change in deployment plans after the testing process began, there were a number of limitations in the Cellular Subgroup’s testing that led to incomplete results. As an initial matter, the cellular field testing did not test LightSquared’s currently planned deployment. Instead, the Technical Working Group tested LightSquared terrestrial operations using only the lowest 5 MHz that is the furthest from existing

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<sup>30</sup> Final Report at 17.

<sup>31</sup> *See id.* at 81.

<sup>32</sup> *See id.* at 19 (“Lab testing revealed that many [general location and navigation] devices suffered from harmful interference from the lower 10 MHz channel; specifically, 20 out of 29 devices experienced harmful interference.”); *see also id.* at 22 (“We know of nothing feasible that can be done to make currently fielded wide band High Precision, Timing, and Network receivers and augmentation systems operate properly when in the vicinity of a LightSquared base station, with respect to either GPS or augmentation systems, under LightSquared’s Phase 0, 1 or 2 rollout plans, or the recently announced 10 MHz Low Band rollout plan.”).

GPS operations, and not the full lower 10 MHz that LightSquared now proposes to operate on.<sup>33</sup>

In addition, the field testing that was performed by the Technical Working Group was unduly limited in the following ways:

- The field testing took place on short notice, allowing insufficient time for participants to review and provide comment on the test plans, identify and train test resources on procedures for 911 static handset testing, obtain and configure necessary equipment, and perform baseline testing of necessary equipment.
- The field testing was conducted over a relatively brief period.
- The field testing tested only eight different models of devices.<sup>34</sup>
- The field testing precluded cold-start GPS positioning testing.
- The field tests did not “accurately depict a real world environment,” as observed by Clearwire, because they were intermittent and with inadequate site density.<sup>35</sup>
- The 15 minute on/off test intervals used in the field testing proved inadequate for gathering sufficient test points to make a valid accuracy determination. Since each test call must remain active for at least the 30 seconds as required by the Commission’s OET Bulletin No. 71 (April 2000), each 15 minute period only allowed for the gathering of

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<sup>33</sup> See LightSquared Recommendation at 28 (inaccurately claiming that the field testing was performed on the lower 10 MHz).

<sup>34</sup> See *id.* at 28 (misleadingly stating that 29 mobile phones were tested even though only eight different models of mobile phones were tested).

<sup>35</sup> GPS Interference Report of Clearwire Corporation, IB Docket No. 11-109, at 1 (filed July 14, 2011) (“Clearwire Report”). See also Letter from Richard Taylor, National Association of State 9-1-1 Administrators, to Julius Genachowski, Federal Communications Commission, IB Docket No. 11-109, at 1 (filed July 20, 2011) (“NASNA Letter”) (“Live Sky testing should be done using multiple towers configured at the same density as LightSquared plans to deploy. This is important in order to see the cumulative effect of multiple towers as in any urban environment.”).

approximately 20 test samples (*i.e.*, not a large enough number to yield a statistically valid sample).

- No formal testing of E911 accuracy (*i.e.*, testing that compares the location provided during test 911 calls to actual location) was performed. Instead, the Technical Working Group only tested GPS positioning accuracy of other location-based service applications.

For these reasons, Verizon Wireless agrees with NASNA and NTIA that additional testing must be performed,<sup>36</sup> and believes that the critical nature of the services being interfered with necessitates further review of the technical impact of operations in the lower channel.

When additional testing is performed, moreover, the Commission should ensure that it meet the following parameters to ensure the integrity and accuracy of the results. Specifically:

- Formal E911 testing that compares location information provided during test 911 calls to the actual handset location should be performed.
- A wider variety of devices should be tested, including not only a larger number of wireless handsets but also femtocells, repeaters, home-based devices that rely on wireless carriers' cellular networks (*e.g.*, Verizon Wireless's Home Phone Connect), GPS receivers in switching centers, and other devices or equipment that may use GPS.

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<sup>36</sup> NASNA Letter at 1 (“NASNA strongly urges further testing that includes both rural and urban settings. [While] LightSquared has discussed modifying its plans by deploying at the lower channel of its allotted spectrum . . . additional testing at the levels and channels proposed must be conducted.”); July 6 NTIA Letter at 1 (“[Since t]he NPEF based its test plan on LightSquared's planned deployment, and thus . . . [did not consider LightSquared's proposed] modification to its planned deployment [that would allow for terrestrial operations only in LightSquared's lower 10 MHz channel] . . . NTIA supports the EXCOM's recommendation that additional tests be performed and recommends that the FCC continue to withhold authorization for LightSquared to commence commercial operations until all the available test data can be analyzed and all valid concerns have been resolved.”).

- A wider variety of locations, including places where it is more difficult to obtain a GPS fix such as urban canyons and heavily forested areas, should be tested. This will allow participants to determine whether any interference from LightSquared's operations has a greater impact on locations where it is already difficult to obtain a GPS fix or location accuracy is already degraded.
- Test equipment should be analyzed prior to the initiation of tests to ensure accurate test results.
- Testing should occur at pre-surveyed locations so baseline testing is not required at the time the actual tests are performed.
- A larger number of test samples – at least 100 – should be collected for both on and off conditions at each test point, thereby ensuring a statistically valid sample with anomalies not related to interference eliminated.
- The on/off test intervals should be longer than 15 minutes to allow for sufficient testing of a variety of scenarios.
- The test data should provide an analysis of the length of time it takes systems and devices to recover from LightSquared interference.

Until this testing is complete, the Commission cannot conclude that LightSquared operations will not cause harmful interference to GPS receivers.



#### **IV. ANCILLARY TERRESTRIAL OPERATIONS ARE REQUIRED TO PROTECT GPS RECEIVERS.**

In its Recommendation to the Commission, LightSquared suggested that interference between its proposed operations and GPS is caused by improperly-designed GPS receivers and that the interference is the fault of the commercial GPS industry.<sup>37</sup> This assertion is factually incorrect and is also inconsistent with the Commission's past findings and current rules.<sup>38</sup> In fact, ancillary terrestrial operations are required by law (and have always been required) to protect GPS receivers and all other primary services from interference.

As an initial matter, LightSquared's assertion that GPS manufacturers could have altered receiver design beginning in 2003 ignores the fact that the Commission's MSS ATC rules and precedent have consistently stated that ATC services must be ancillary to primary, satellite services provided by MSS. GPS manufacturers therefore could not have anticipated that the Commission would reverse course by allowing LightSquared to build what is basically a terrestrial network, thereby undercutting the premise of ATC altogether.

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<sup>37</sup> See LightSquared Recommendation at 17-18 (arguing that GPS manufacturers could have made decisions beginning in 2003 that would have avoided the receiver overload problem and that "[b]y failing to build receivers resistant to lawful transmissions in an adjacent band, GPS manufacturers have effectively appropriated LightSquared's L-band spectrum").

<sup>38</sup> LightSquared relies on a recent FCC order for its claim that GPS receivers must protect themselves against interference from LightSquared's ATC operations. See *Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, Report and Order, 26 FCC Rcd 5710 (2011) ("Report and Order"). That reliance is improper for the reasons detailed in CTIA's Petition for Clarification and/or Reconsideration and the U.S. GPS Industry Council's Petition for Reconsideration of that Order. See Petition for Clarification and/or Reconsideration of CTIA – The Wireless Association®, ET Docket No. 10-142 (filed June 30, 2011); Petition for Reconsideration of the U.S. GPS Industry Council, ET Docket No. 10-142 (filed June 30, 2011). Indeed, if this *Report and Order* is interpreted as proposed by LightSquared to require a primary service (GPS) to protect itself against an ancillary service (LightSquared's terrestrial operations), then it directly conflicts with the Commission's long-standing ATC rules and policies, as detailed herein, and is therefore incorrect.

Indeed, the Commission has made clear since it first proposed to add a terrestrial component to MSS that the terrestrial operations would be ancillary to and fully integrated with MSS operations. As the Commission put it in its 2001 rulemaking notice: “[W]e intend the term ‘ancillary’ terrestrial services to refer strictly to services provided by MSS operators that are integrated with the satellite network, use assigned MSS frequencies, and are provided for the purpose of augmenting signals in areas where the principal service signal, the satellite signal, is attenuated. We expect the character of such services to remain the same whether provided by satellite or terrestrially.”<sup>39</sup> Further, the Commission quoted extensively from a Petition for Rulemaking filed by Motient Services, Inc. (LightSquared’s predecessor-in-interest) that described its proposed ATC service as “integrated with the satellite network” and enabling “co-channel reuse of the satellite service link frequencies in adjacent satellite antenna beams to provide coverage areas where the satellite signal is attenuated by foliage or terrain and to provide in-building coverage.”<sup>40</sup>

Likewise, when the Commission adopted rules for MSS ATC operations in the L-Band frequencies, it again stressed that “[w]e will authorize MSS ATC subject to conditions that ensure that the added terrestrial component remains ancillary to the principal MSS offering. We do not intend, nor will we permit, the terrestrial component to become a stand-alone service.”<sup>41</sup>

The Commission also strongly cautioned that “[w]e intend to authorize ATC *only* as an ancillary

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<sup>39</sup> *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band*, Notice of Proposed Rulemaking, 16 FCC Rcd 15532, ¶ 30 (2001) (“*MSS ATC NPRM*”).

<sup>40</sup> *Id.* at ¶ 15.

<sup>41</sup> *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Band*, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962, ¶ 1 (2003).

service to the provision of the principal service, MSS,” that it was establishing gating requirements to ensure that ATC may operate only in this fashion, and that it would not allow “gaming” of these gating criteria.<sup>42</sup>

In short, the Commission historically emphasized that any terrestrial operations would be ancillary to and integrated with their satellite operations – precedent broken by the *LightSquared Modification Order*. Contrary to LightSquared’s claim, therefore, there was no reason that GPS manufacturers should have assumed otherwise. Indeed, the *LightSquared Modification Order* marked the first time that the Commission permitted a stand-alone terrestrial service in MSS spectrum.<sup>43</sup>

In addition, the FCC’s rules and precedent make clear that ancillary terrestrial operations are required to protect GPS receivers from interference, and have been clear on this point for eight years. In its *MSS ATC NPRM*, the Commission contemplated that “[u]nwanted emissions from terrestrial stations in the MSS will have to be carefully controlled in order to avoid interfering with GPS receivers.”<sup>44</sup> The Commission’s rules require that ATC applicants in the L-band must coordinate with terrestrial CMRS operators prior to initiating transmissions when co-

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<sup>42</sup> *Id.* at n. 5 (emphasis in original).

<sup>43</sup> *LightSquared Modification Order* at ¶ 24 (finding that LightSquared failed to satisfy the integrated service rule, noting that LightSquared contemplated that its customers may offer ATC-only subscriptions to customers). While the Commission’s 2010 *SkyTerra/Harbinger Order* granted an application that would enable “a build-out schedule of [Harbinger’s] 4G terrestrial network that will provide coverage in the United States to at least 100 million people by December 31, 2012, at least 145 million people by December 31, 2013, and at least 260 million people by December 31, 2015,” that Order did not contemplate a terrestrial-only service and was released less than one year prior to the grant of the *LightSquared Modification Order*. *SkyTerra Communications, Inc. and Harbinger Capital Partners Funds; Applications for Transfer of Control of SkyTerra Subsidiary, LLC*, Memorandum Opinion and Order and Declaratory Ruling, 25 FCC Rcd 3059, ¶ 56 (2010).

<sup>44</sup> *MSS ATC NPRM* at ¶ 68.

locating base stations with CMRS stations that use GPS receivers.<sup>45</sup> And Section 25.255 of the rules explicitly states that “[i]f harmful interference is caused to other services by ancillary MSS ATC operations, either from ATC base stations or mobile terminals, *the MSS ATC operator must resolve any such interference.*”<sup>46</sup>

The GPS industry has therefore properly relied upon well-established Commission rules and precedent stating that ancillary terrestrial services are required to protect GPS receivers from interference. LightSquared’s argument that its interference to GPS receivers is the responsibility or fault of the GPS industry is completely unfounded. The Commission should confirm that it is LightSquared that bears the responsibility to resolve any interference that results from LightSquared’s terrestrial operations.

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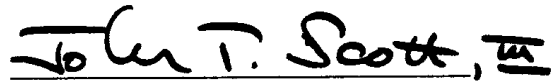
<sup>45</sup> See 47 C.F.R. § 25.253(c)(2).

<sup>46</sup> 47 C.F.R. § 25.255 (emphasis added).

**V. CONCLUSION**

For all the forgoing reasons, the Commission should confirm that LightSquared has not satisfied the conditions to operate in the upper band of its spectrum at this time, require additional testing to determine the interference impact to GPS caused by lower band operations, and confirm that LightSquared is obligated to protect against any interference to GPS services that is caused by its operations.

Respectfully submitted,



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