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

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| 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 Auction | ) | GN Docket No. 12-268 |

# REPLY COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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## SUMMARY

TIA appreciates the Commission's tireless efforts as it continues its steady progress towards implementing the first-of-its-kind voluntary incentive auction. Ensuring that eventual licensees have predictable and reliable access to their spectrum without the prospect of harmful interference is an essential precondition to conducting a successful auction.

Unfortunately, the initial comments – including new testing data – clearly confirm that the Commission's proposed technical rules for unlicensed white space devices would result in significant harmful interference to licensed commercial mobile radio services. What little data has been submitted to the contrary is based on flawed assumptions that do not reflect the practical realities of how 600 MHz band deployments – whether licensed or unlicensed – would actually work in practice. Regardless, in an environment of technical uncertainty the Commission must move very cautiously and conservatively before allowing millions of unlicensed devices to flood the marketplace. In doing so, the Commission must be guided above all by its long-standing principle, specifically reinforced by the Spectrum Act, that unlicensed operations may not cause harmful interference to licensed services – and that if they do, they must cease operations.

In these Reply Comments, TIA proposes several solutions the Commission should adopt if it decides to permit operations at limits beyond those that testing has clearly indicated would be safe. These requirements would help ensure that any unlicensed devices operating in the 600 MHz band are capable of avoiding interference to licensees under real-world scenarios after actual testing is conducted in the band. TIA's proposed approach could also potentially further the Commission's long-term goal of promoting greater spectrum use efficiency, even as caution is needed at the outset.

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The Telecommunications Industry Association ("TIA")[1] hereby submits reply comments to the Federal Communications Commission ("Commission") in the above-captioned proceeding. TIA appreciates the Commission's efforts to move ahead with the voluntary incentive auction, but the initial comments in this proceeding confirm TIA's concerns that the Commission's technical proposals regarding unlicensed devices in the 600 MHz band need significant revision.

As described below, several parties have submitted new testing data illustrating that allowing unlicensed devices to operate under the proposed rules would result in significant

[1] TIA is the leading trade association for the information and communications technology ("ICT") industry, representing companies that manufacture or supply the products and services used in global communications across all technology platforms. TIA represents its members on the full range of policy issues affecting the ICT industry and forges consensus on industry standards.

harmful interference to licensees, undercutting the basic purpose of the incentive auction. Moreover, both the Spectrum Act and longstanding principles underlying Part 15 each require the Commission to avoid shifting the burden of avoiding harmful interference from unlicensed devices onto licensees. To achieve this goal, TIA offers some proposed solutions the Commission could adopt at the outset to help provide all stakeholders – including the Commission itself – with sufficient flexibility to make policy changes as appropriate future testing warrants.

## I. The Comments Confirm That the Commission's Technical Assumptions Need Revision.

In the *Notice*, the Commission urged parties to be "as specific as possible" regarding its proposals, including "detailed technical analysis to support their positions as appropriate" rather than relying on any comments filed earlier.[2] New data from V-COMM (submitted by CTIA) and Qualcomm, among others, has been offered in response to this request. When considering issues involving potential interference from unlicensed operations to licensees, there is a stringent requirement for the Commission to offer a "reasoned explanation" for its final rules that "grapples with" data in the record, particularly when that "empirical data … was submitted at its invitation."[3]

### A. CTIA and Qualcomm Have Submitted Fresh Data That Illustrates the Need for Caution and Identifies Gaps in the Commission's Analysis.

In our opening comments, TIA identified a series of technical assumptions the Commission used to calculate its predicted seven-meter interference distance, including the following:

[2] NPRM ¶ 13.

[3] *Am. Radio Relay League v. FCC*, 524 F.3d 227, 241 (D.C. Cir. 2008).

- -97 dBm floor for LTE receiver sensitivity based on the 3GPP specification, and an adjacent channel selectivity of 33 dB.

- Assumption of 25 dB *additional* loss over any path loss, including:

    - Additional 10dB for adjacent channel selectivity based on the assumption that LTE devices will *exceed* 3GPP minimum requirements, plus

    - Additional 15 dB of loss "due to a combination of obstructions, body loss and antenna polarization mismatch, etc."

- 7 dB of pass band filter attenuation due to the proposed minimum 3 MHz frequency separation between white space devices and LTE receivers.

- Maximum white space device power (EIRP) of 40 mW and antenna height of 3 meters.

- 1.5 meter LTE handset height.[4]

TIA then illustrated why several of the assumptions above were flawed.[5] Moreover, TIA noted that in any event, even a seven-meter separation distance, i.e., 23 feet, was impractical given the realities of probable home and office use.[6]

New testing data and analysis submitted by other parties in their initial comments confirms that TIA's concerns were well-founded. First, testing by V-COMM found that more stringent out-of-band emission (OOBE) limits are needed vs. what was proposed, and that operations at the Commission's proposed power levels would result in interference at a distance of approx. 20 meters, not seven.[7] Second, Qualcomm has conducted new testing of actual devices showing 29 meters of interference, or (alternatively) that maximum transmit power

[4] TIA Comments at 9-10.

[5] *See id.* at 10-13.

[6] *See id.* at 5-8.

[7] CTIA Comments at 4.

levels for unlicensed devices should be 25 to 45 dB lower than that proposed by the Commission.[8]

Moreover, these commenters also agree that the Commission's assumptions were flawed. CTIA and Qualcomm both agree, for example, that the Commission's assumption of 25 dB of path loss incorrectly relies upon a 10 dB "fudge factor" for adjacent channel selectivity that inappropriately exceeds the 3GPP specification, and that the assumption of 15 dB for additional path loss is inappropriately drawn from a 2008 study without explanation.[9] Instead, the V-COMM testing uses more realistic assumptions for body loss, antenna polarization, etc. that correspond closely with those suggested by TIA in our initial comments.[10]

### B. Broadcom's Analysis Includes Assumptions That Do Not Reflect the Reality of Projected Operations in the Band.

Although various commenters either support the proposed limits for unlicensed operations or would like them to be further relaxed, the only original analysis submitted from white space device interests comes from Broadcom. Other commenters rely heavily on Broadcom's data, but do not offer any data themselves to rebut the new data from CTIA, Qualcomm, and others suggesting that harmful interference will occur.[11]

Meanwhile, Broadcom's assumptions are either flawed or not clearly explained. Consider, for example, the following Broadcom assumptions:

- Antenna Polarization Mismatch Loss 3 dB
- Shadowing Loss 3 dB
- LTE Antenna Gain -6 dBi
- LTE Body Loss 3 dB

[8] Qualcomm Comments at 10-11.

[9] *See* CTIA Comments at 28-29; Qualcomm Comments at 12.

[10] *Compare* CTIA Comments at 9-10 *with* TIA Comments at 10-13.

[11] *See, e.g.*, Google Comments at 5-16; Microsoft Comments at 5-8.

Broadcom uses these assumptions to buttress the FCC's conclusion that there will be 15 dB of additional path loss.[12] However, TIA is concerned that Broadcom may be double-counting antenna polarization mismatch loss, since this should already be encapsulated within their LTE antenna gain assumption. Moreover, there is neither shadowing loss nor body loss for a client device.

### C. The Ability of White Space Devices to Operate Without Causing Harmful Interference Remains Speculative.

To some extent, the debate regarding which assumptions and models submitted by various parties are "more correct" in assessing minimum interference separation distance may be an unresolvable academic exercise. Actual devices manufactured for the 600 MHz band – and tested under realistic conditions – do not yet exist. Therefore, calculations are to an extent simply educated guesses, with a corresponding margin of error. This is not a sound basis for establishing hard and fast rules that may eventually prove too lenient and thereby result in harmful interference to licensees.

For now, the record requires the Commission to properly address and resolve conflicting data that is often based on different underlying assumptions. While TIA firmly believes that V-COMM and Qualcomm's analyses better reflect emerging technical and operational realities than Broadcom's, there is simply no way to *entirely* predict the likelihood of harmful interference since 600 MHz operations have not yet begun. Moreover, any testing cannot account for issues such as aggregate interference once a large ecosystem of devices – potentially both licensed and unlicensed – has been deployed.

[12] Broadcom Comments at 5.

## II. The Burden of Proof to Avoid Harmful Interference Must Rest With White Space Devices and Database Operators.

For the reasons described above, TIA is concerned about the potential for harmful interference if white space devices are permitted to operate at higher power levels – or at looser OOBE limits – than those specified by V-COMM. However, if the Commission nevertheless permits white space devices to operate under less stringent conditions, then the burden of proof regarding harmful interference must lie squarely with white space device operators. Adopting this structure would help avoid a situation whereby licensees' expectations – and those of their customers – are frustrated. Moreover, the Commission is legally obligated to ensure that licensees do not receive harmful interference – an obligation that stems both from longstanding practice under Part 15 as well as the specific provisions of the Spectrum Act.

### A. The Commission Must Move Cautiously To Avoid Creating a Marketplace Disaster.

The Commission is confronted with a situation in which technical realities are uncertain, and where assumptions are subject to significant error. Yet the agency is now being asked to give a green light to an entire ecosystem of unlicensed devices that (currently) have no ability to measure, detect, or enforce any required minimum separation distances from licensed mobile devices. These are the hard realities, and the Commission should not set rules which are dependent on high accuracy in those assumptions. It must instead set rules which have enough flexibility and/or margin to account for the ambiguities, and allow for changing course later if required.

From a marketplace perspective, under longstanding practice the burden of avoiding harmful interference is not a shared responsibility between licensees and Part 15 devices. Rather, unlicensed devices are permitted to use *free* spectrum on the condition that they avoid

interference to licensees. Against that backdrop, any explicit or implied requirement that licensees – and their consumers – must perform to a higher standard, or simply accept harmful interference in the presence of unlicensed devices, is effectively a *subsidy* funded by licensees and their customers.

It is simply bad policy to impose subsidies on a successful licensed ecosystem for the sole purpose of aiding a new white space device ecosystem whose success and value to consumers remains in question. The success or failure of a white space device ecosystem should be determined solely by the market, not regulatory favoritism. This is particularly true in the 600 MHz band since unlicensed operations in the duplex gap and guard band would rely on what is inherently "supplementary" spectrum, even as agile unlicensed devices have various other spectrum options they can utilize.

Meanwhile, the technical uncertainties also mean that the Commission should not prematurely allow millions of unlicensed devices to be released into public distribution with no way to control them if unexpected interference issues arise later. As the Commission is well aware, once millions of devices are deployed to consumers, facilitating any post-facto changes or even device swap-outs would be extremely difficult and costly for all concerned, including the unlicensed ecosystem itself. To avoid this, the Commission must ensure that its rules preserve a method to make changes in the future if circumstances warrant.

Failure to do so would result in major uncertainty for bidders in the incentive auction since the inherent technical capacity of the spectrum would remain uncertain, dependent both upon technical realities which have not yet been determined as well as the number and nature of unlicensed operations at any particular time and place. This would reduce the value of the

spectrum in the auction, or even worse, potentially render the spectrum difficult to use for licensees and consumers.

### B. The Commission Must Incorporate the Traditional Cease-Operations Principle to Avoid Actual Interference to Licensees.

As a matter of law, the Commission must ensure that any rules adopted to allow unlicensed operations in the 600 MHz band incorporate protections to address any *actual* harmful interference that may result to licensees, notwithstanding the Commission's best intentions and technical rules at the outset. At the core of these protections, the Commission must reaffirm the fundamental structure of Part 15 by requiring unlicensed devices to cease operations if actual harmful interference results.

Section 301 of the Communications Act categorically prohibits radio transmissions without a license.[13] However Section 302 allows the Commission to, "consistent with the public interest, … make reasonable regulations … governing the interference potential of devices which … are capable of emitting radio frequency energy … in sufficient degree to cause harmful interference to radio communications."[14] Using this authority, the Commission has created Part 15 to permit "relatively low-level" unlicensed operations without a license.[15] As the Commission has recently recognized, such operations are permitted so long as the unlicensed devices "cause[] no harmful interference to licensed services ***and*** the devices do not generate emissions or field strength levels greater than a specified limit."[16]

This reflects the long-standing recognition that licensees are protected from interference by two independent sets of protections. *First*, all Part 15 devices are prohibited from

[13] 47 U.S.C. § 301.

[14] 47 U.S.C. § 302a(a)(1).

[15] Notice of Apparent Liability, *Towerstream Corporation*, FCC 13-109 (Aug. 5, 2013), at ¶ 2.

[16] *Id.*

"generat[ing] emissions of field strength levels greater than a specified limit."[17] Indeed, the Commission has periodically established various limits for various types of unlicensed devices, based on empirical data and technical judgments, that the agency has pre-determined will not result in harmful interference to licensees. Part 15 includes general limits for unintentional and intentional radiators,[18] as well as more specific rules for a multitude of devices – everything from cordless telephones to cable locating equipment to ultra-wideband operations.[19]

*Second*, and regardless of compliance with any specified limits, unlicensed devices may not cause any *actual* harmful interference to licensed services.[20] If such interference results, then the unlicensed device must cease operations, and such operations may not resume until the interference can be resolved.[21] This two-fold protection scheme – combining *ex ante* numerical limits with an *ex post* cease-operations rule – addresses the inherent uncertainty and variability of radio propagation by combining pre-set thresholds that are *believed* to eliminate harmful interference with a cease-operations backstop in case *actual* interference results.

The Commission should not conflate these two independent requirements by simply defining the problem away, that is, by declaring at the outset that any emissions below its specified thresholds simply do not constitute harmful interference. To the contrary, "harmful interference" is explicitly defined in qualitative terms, *i.e.*, interference that "seriously degrades,

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[17] *Id.*

[18] *See* 47 C.F.R. §§ 15.109 (general limits for unintentional radiators), 15.209 (general limits for intentional radiators).

[19] *See, e.g.*, 47 C.F.R. §§ 15.213 (cable locating equipment), 15.214 (cordless telephones), 15.501 *et seq.* (ultra-wideband operations).

[20] 47 C.F.R. § 15.5(b).

[21] 47 C.F.R. § 15.5(c).

obstructs, or repeatedly interrupts" a licensed service,[22] regardless of whether a device complies with numerical limits or not. And in this particular situation, Congress has explicitly prohibited *any* unlicensed operations "that the Commission determines would cause harmful interference to licensed services."[23] At the very least, the Spectrum Act adds significant interpretive gloss to the Commission's general practice of allowing unlicensed operations in some circumstances consistent with "the public interest," if not prohibiting such public interest balancing in the 600 MHz band entirely.[24]

Undoubtedly, the cease-operations rule may create uncertainty for potential unlicensed operations in the 600 MHz band since eventual deployments by licensees may require reduction or even complete cessation of unlicensed operations. However, that is the inherent tradeoff of relying upon *free* unlicensed spectrum under Part 15. Moreover, the Commission warns potential Part 15 operators that they "shall not be deemed to have any vested or recognizable right to continued use of any given frequency by virtue of prior registration or certification of

[22] 47 CFR § 15.3(m).

[23] Middle Class Tax Relief and Job Creation Act of 2012, Title VI, Pub. L. 112-96, 126 Stat. 156, 201 ("Spectrum Act") at § 6407(e).

[24] The Communications Act holding of *Am. Radio Relay League v. FCC*, 524 F.3d at 234-35, is easily distinguishable. In that case, the court rejected a Section 301 challenge to the Part 15 Access Broadband over Power Line (Access BPL) rules despite a concession that harmful interference to licensees would sometimes occur, ruling that the Commission was permissibly acting in the public interest when considering interference potential under Section 302. However, the 2012 Spectrum Act's text and purpose flatly prohibit unlicensed operations in the 600 MHz band if *any* harmful interference would result, overriding whatever public interest balancing the agency might otherwise engage in. Moreover, the *ARRL* court relied approvingly on the Commission's decision to require Access BPL operators to notch their power levels in cases where harmful interference was reported – something not proposed in the *Notice*. Finally, both the Commission and the *ARRL* court relied heavily upon the ability of mobile amateur operators to move away from interfering power lines – something impossible here with 600 MHz licensed and unlicensed devices likely to be in the same home or office just a few feet apart.

equipment."[25] The Spectrum Act reinforces this understanding by casting potential unlicensed usage in explicitly conditional terms – while the Commission "may" permit unlicensed uses, it "may not permit any use" if harmful interference would result.[26]

In sum, Congress' clear intent in the Spectrum Act was to maximize licensed usage of the 600 MHz band, free from the prospect of any harmful interference. Against that backdrop, the Commission cannot undermine one of the core tenets of Part 15, and must reaffirm its robust cease-operations rule in the event of *actual* interference.

## III. If the Commission Permits Operations Beyond the V-COMM Limits, It Should Require Safeguards to Constrain Devices to Those Limits If Necessary.

While TIA has concerns about any potential operations above the levels proposed by V-COMM, there are potential steps the Commission could take now to reduce the possibility for harmful interference if it decides to permit operations at higher levels. These steps would potentially yield useful alternatives to a simple cease-operations rule – a rule that, standing alone, is a blunt tool. They would provide the Commission, unlicensed device operators, and licensees with sufficient flexibility to make future changes should circumstances warrant – including changes that would potentially prove beneficial for unlicensed device operators. TIA therefore proposes some commonsense rules for any unlicensed device operations within the 600 MHz band that may be authorized above the V-COMM limits.

### A. The Commission Should Require Unlicensed Devices to Incorporate Technical Features to Reduce the Possibility of Harmful Interference.

The Commission's proposed approach currently relies upon setting a maximum power level at a fixed frequency separation as the sole means of addressing interference issues. Although TIA does not typically endorse particular technological solutions for complying with

[25] 47 CFR § 15.5(a).

[26] Spectrum Act § 6407(a), (e).

regulatory standards, we are mindful that existing television white space devices typically have database control and inherent cognitive abilities. For this reason, requiring the technical features suggested below could prove to be a win-win for all concerned, and the proposals below should not pose an unreasonable barrier to eventual development of an unlicensed ecosystem that can provide meaningful services to consumers while still avoiding the possibility of harmful interference to licensees.

*Stricter OOBE Limits.* Any devices operating in the 600 MHz band should be capable, at least initially, of operating subject to the -89 dBm / 100 kHz out-of-band emission limit into the 600 MHz downlink spectrum, as described by V-COMM's testing.[27] TIA appreciates that at present, this requirement may initially limit the type of unlicensed devices that can permissibly operate in the bands due to battery or other constraints. However, some unlicensed devices and types of operations would be capable of meeting this standard.[28] If later testing indicates that a less stringent limit is acceptable, devices using that less stringent limit could be enabled through the database system.

*Notching Power Levels.* Unlicensed devices should be capable, at least initially, of notching their transmit power levels to the degree called for in V-COMM's testing. To be sure, many white space device advocates have insisted that 40 mW is the lowest acceptable maximum power level for useful communications – even as some insist that a much *higher* threshold is necessary. However, this is a fuzzy number devoid of statistically meaningful operational proof points. Instead, since the burden of proof rests upon unlicensed device operators, any Part 15 device operating in the 600 MHz guard band must be capable of reducing its maximum power

[27] CTIA Comments at 13-14.

[28] CTIA Comments at 14-15.

down to the 5 mW (6.6 dBm) level identified in V-COMM's testing.[29] While the goal may continue to be 40 mW maximum power, a much lower starting point is necessary in order to ease into appropriate power levels from the bottom-up.

*Notching Channel Width.* The Commission need not, and should not, assume that a 6 MHz channel width for unlicensed operations is absolutely necessary to enable a viable unlicensed ecosystem. Instead, we propose that devices have the capability, in conjunction with the database, of operating on channels of widths from 1 MHz to 6 MHz, perhaps adjustable in 0.5 MHz increments. Actual channel widths may vary with location – *e.g.*, dense urban areas may have higher interference instances – and would be set by the database. Such a requirement may ultimately help unlicensed operators since it may eventually allow for transmissions at higher power levels than those initially contemplated, and/or give rise to low-bandwidth unlicensed operations that may prove useful for emerging Internet-of-Things applications. If 6 MHz channel widths do eventually prove viable following actual testing, this proposal accommodates that outcome, while also recognizing that legitimate analysis and data in the record from multiple parties indicates that smaller channel widths may be necessary to reduce interference.

*Low-Level Default Mode.* To reduce the risk of harmful interference, the Commission should require that unlicensed devices operate under the stricter parameters described above as their default mode, *i.e.*, whenever a device is out of contact with a database. Higher-level operations should be permitted only if the database affirmatively authorizes such operations based on the database's superior access to information regarding constraints and potential interference to nearby licensees.

[29] CTIA Comments at 24-25.

### B. The Commission Should Adopt a Bottom-Up, "Safety-First" Approach to Allowing Unlicensed Operations.

With actual 600 MHz band testing being difficult or impossible at this stage, the Commission should begin conservatively. TIA proposes that unlicensed operations in any geographic area begin with strict OOBE limits, low power levels, and restricted channel widths – all using the device features proposed above. Following a period of testing and confirmed non-interference with licensees, the initial constraints could then be relaxed through the database. Over time, this may include either increases or decreases to the power level and channel width, as utilization and proximity in a given geographic area changes.

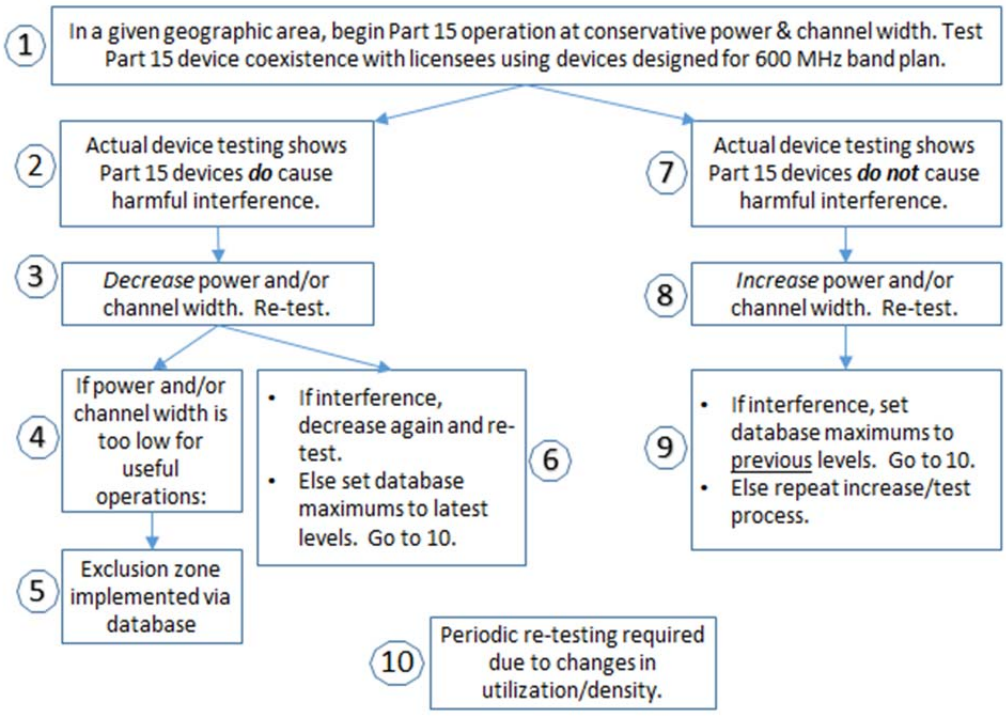
This "bottom-up" approach – *i.e.*, beginning operations at low levels, rather than a "top-down" approach that begins at the maximum proposed power level and channel width, corresponds well to the legal obligation for Part 15 devices to avoid causing harmful interference. Moreover, it also allows Part 15 devices to prove their way into a market-driven and data-driven outcome. In contrast, a top-down approach would be driven by regulatory speculation in advance of market outcomes, based on numerous unknowable assumptions and models. There is simply no good reason to use a top-down approach in this instance, and every reason not to. Both approaches could *possibly* reach the same end result, but the bottom-up approach would appropriately address any unintended and/or undesired outcomes while the top-down approach would not.

*Re-Testing.* Since user density and activity can change over time, power limits should also be subject to periodic re-testing requirements. It would be inappropriate to set fixed rules that may not result in interference initially, but that could result in harmful interference as subscriber growth continues in the future. The basic requirement that Part 15 devices not cause harmful interference to licensees remains true over time, and the rules recognize that unlicensed

operators do not have any "vested or recognizable right" to keep using spectrum simply because their devices have previously been deployed.[30] In sum, the rules must contain provisions which recognize that interference levels can change over time.

*Flowchart.* TIA's proposal is illustrated in the flowchart below. In a bottom-up approach to Part 15 market introduction, unlicensed devices would begin at conservatively low levels and, contingent on test results, either remain at the conservative levels, increase levels as justified by tested results, or cease operations. Under this approach, licensees would not bear the responsibility (and associated costs) for demonstrating harmful interference. Instead, the burden of proof that there is no harmful interference to licensees would rest squarely with the unlicensed ecosystem, as contemplated by the Spectrum Act and the basic nature of Part 15.

**Part 15 Devices in 600 MHz Band: A Bottom-Up Approach**




[30] 47 CFR §15.5(a).

*Geographic Exclusion Zones.* In the worst case, testing may reveal that in some geographic areas, Part 15 devices may require such large reductions in power and/or channel width that operation becomes impractical. Such areas would then become exclusion zones, whether based upon license boundaries (as TIA strongly prefers) or upon the operational footprint of base stations (*e.g.*, the Commission's polygon approach). The rules for unlicensed devices operating in the duplex gap and/or guard band – in conjunction with the database – must therefore define requirements for setting prohibitions on *all* unlicensed operations in a particular area.

This ban would only be lifted when an unlicensed device is outside the prohibited area. Moreover, the rules should include a margin – *i.e.*, a buffer zone around the exclusion zone – to account for the +/- 50 meter location error margin of white space devices. Unlicensed devices should also be capable of immediately switching to a non-600 MHz channel when they enter a prohibited geographic area – or must switch off if a non-600 MHz channel is not available. Meanwhile, any unlicensed devices *without* embedded location capability would need to be subject to strict prohibitions in order to guarantee they never stray into prohibited geographic areas. There is simply no good reason not to include this fail-safe level of interference protection in the final rules.

### C. The Bottom-Up Approach Would Serve the Commission's Larger Goal of Promoting Spectrum Efficiency.

TIA does not believe it is appropriate for the Commission to try and squeeze out every last drop of 600 MHz spectrum for unlicensed operations. This is reinforced by the design of the Spectrum Act, the need to provide certainty for licensees and consumers, and the already-very-complex voluntary incentive auction. Of course, the Commission has other plausible near-term options for interference mitigation beyond those described above, including simply requiring

white space devices to operate as receive-only devices when operating within the 600 MHz band plan.

However, making higher-power white space device operations contingent upon adoption of the various technical mitigation methods described above – and upon actual testing – could give rise to new technical solutions that would provide all stakeholders, including the Commission, greater flexibility to permit more efficient operations in the future should circumstances warrant. The Commission could, for example, potentially allow white space devices to avoid several of the proposed requirements above if they were equipped with accurate (and proven) sensing capabilities to detect separation distances to licensed mobile devices.

## IV. Conclusion

The initial comments, including new data, confirm that proposed rules in the Part 15 *Notice* would potentially frustrate the primary goal established by Congress of repurposing the 600 MHz band for licensed mobile broadband services. TIA urges the Commission to revise its assumptions accordingly, and to otherwise adopt policies consistent with the recommendations above.

Respectfully submitted,

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