

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

In the Matter of	)	
	)	
Request For Declaratory Ruling By	)	WTB Docket No. 07-121
Wireless Strategies Inc. Regarding	)	
Coordination of Microwave Links Under	)	
Part 101 of the Commission's Rules	)	

**REPLY COMMENTS OF WIRELESS STRATEGIES INC.**

Wireless Strategies Inc.  
P.O. Box 2500  
Carmel Valley, CA 93924

August 20, 2007

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## Summary

- Smart antennas with DREs must and do meet the RPE of Part 101.115 as Antenna Standards Table of Part 101.115 of the Rules states: .”Minimum radiation suppression angle in degrees from the center line of the main beam in decibels.” This is an electrical specification there are no physical distance requirements in this specification.
- Because smart antennas with DREs comply with Part 101.115 and that Part 101.103 of the Rules and the methods for calculating the interference level as given in TSB10 apply to all types of antennas that meet Part 101.115 of the Rules, they also apply to antennas with DREs (unlike a “dumb” antenna system, a “smart” antenna system knows the level of the coordinated interference “I” at the input of any victim receiver and ensures that the interference level from any DRE appearing at the input of any victim receiver “I<sub>DRE</sub>” always appears at a different time and is always less than “I” or 6dB below the victim receiver noise level and the coordinated interference “I” originates from the point about which the antenna gain is measured and the interference level “I” is calculated using the methods of TIA/EIA Telecommunications Bulletin TSB10, “I<sub>DRE</sub>” is coordinated at the same time (concurrently) with “I.” Because “I<sub>DRE</sub>” is always less than “I” or 6dB below the noise level of any victim receiver a licensee can reuse the licensed spectrum multiple times without causing additional interference).
- Those filing comments against and stating DREs cannot meet the RPE of Part 101.115 of the Rules base there arguments on the belief that Part 101.115 has a physical component. This is not so, therefore no credible evidence was presented to support their claims.
- Having failed to produce credible evidence, those filing comments against turned to arguments that are not part of this proceeding, such as arguments related to licensing and applications. Even here their arguments were flawed as they were either based on the false assumption that Rule 101.115 specifies physical antenna characteristics or on application using ‘dumb’ antenna systems to draw conclusions related to “smart” antenna application. So, again no credible evidence was presented.

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Wireless Strategies Inc. (WSI) submits these reply comments in the above-referenced proceeding.

**I. Introduction**

The arguments filed by those asking the Commission to reject WSI's Request for a Declaratory Ruling (RDR) fall into two general categories. In the first are those premised on ignoring conditions in the RDR, or on issues and assumptions that are not part of the RDR. In the second are arguments premised on a "business as usual" attitude and a theme of extreme caution that might be summarized as "we have not done it before so don't do it now." As to the first category, no evidence was presented to refute WSI's assertion that when the conditions in the RDR are met, a licensee can increase the effective use of spectrum by reusing the licensed frequency under the existing rules without causing harmful interference. As to the second category, this hide-bound attitude smacks of the type of command and control regulation that was favored in the past but which we now know comes at the unacceptable cost of thwarting innovation, competition and the development of better consumer choices at lower prices.

In reviewing the comments submitted in this proceeding, we found the commenters in apparent opposition to one or more of the Commission's primary stated goals in spectrum management. Two of the 21 best practices adopted by the Commission for spectrum regulation in its "Best Practices for National Spectrum Management" are apropos:

"Minimizing unnecessary regulations" and

"Encouraging radiocommunication policies that lead to flexible spectrum use, to the extent practicable, so as to allow for the evolution of services and technologies using clearly-defined methods, i.e., (a) eliminating regulatory barriers and allocating frequencies in a manner to facilitate entry into the market of new competitors, (b) encouraging efficiency in the use of spectrum by reducing or removing unnecessary restrictions on spectrum use, thereby encouraging competition and bringing benefits to consumers, and (c) promoting innovation and the introduction of new radio applications and technologies."<sup>1</sup>

Consistent with this modern concept of responsible regulation, in 2002 the Commission's Spectrum Policy Task Force released its *Spectrum Policy Task Force Report*, which recommended allowing more flexible use of spectrum by licensees and other spectrum users, better defining licensees' and spectrum users' rights and responsibilities, enabling use of spectrum across various dimensions (frequency, space, and time), promoting the efficient use of spectrum, and providing for continued technological advances.<sup>2</sup>

WSI's RDR is consistent with these concepts and approaches, and we would hope that guided by these concepts and approaches the Commission would recognize the positive aspects of the RDR and would eschew those who make arguments designed to

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<sup>1</sup> This policy can be viewed at <http://www.fcc.gov/ib/sand/irb/bestpractices.html> (emphasis added).

<sup>2</sup> See generally Spectrum Policy Task Force, ET Docket No. 02-135, *Report* (rel. Nov. 2002) (*Spectrum Policy Task Force Report*) at pp. 4, 16-23. This report is available at <http://www.fcc.gov/sptf>.

guard their vested interests in the status quo. The concept of antenna systems involving software-controlled distributed radiating elements (DREs) oriented at and communicating with the main station's receiver<sup>3</sup> offers a significant increase in efficiency and presents the first major leap in antenna design in decades. Not a single commenter has shown that smart antenna systems with DREs inherently cause interference or do not conform with the existing Rules.

Therefore, WSI respectfully reiterates its request that the Commission issue a declaratory ruling confirming that a Fixed Service licensee is permitted to simultaneously coordinate multiple links whose transmitter elements collectively comply with the Commission's antenna standards and frequency coordination procedures, and that antennas with DREs are permitted under Part 101 of the Rules.

## **II. Specific Reply Comments**

### **(a) Introduction**

Unlike those who filed comments against the RDR but did not provide any evidence, WSI will in these reply comments submit evidence that Smart Antennas with DREs are compliant with Rule 101.115, that microwave paths that use Smart Antennas with DREs do comply with Rule 101.103, are frequency coordinated according to the methods of TIA/EIA Telecommunications Bulletin TSB10 and do not cause harmful interference.

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<sup>3</sup> It is important to recognize that DREs do not have their own, separate points of communications. Rather, each DRE of a station communicates with that station's designated receiver, as depicted in Figure 4 (page 6) of the RDR.

**(b) Evidence that a Smart Antenna with DREs Complies with Rule 101.115**

Nowhere in the regulations do the Rules specify an antenna's physical characteristics. The Antenna Standards Table of Rule 101.115 states:

“Minimum radiation suppression angle in degrees from the center line of the main beam in decibels.”

This is an electrical standard; there are no physical distance requirements in this specification. The location of pieces of the antenna (the radiating elements) are not specified. By specifying neither how an antenna is to be designed nor its physical dimensions, the Commission, in its wisdom, encourages industry to innovate. In summary any type of antenna that meets the electrical specification by definition meets the Rules.

**(c) Evidence that Paths using Smart Antennas with DREs Comply with Rule 101.103**

Unlike a “dumb” antenna system, a “smart” antenna system knows the level of the coordinated interference “I” at the input of any victim receiver and ensures that the interference level from any DRE appearing at the input of any victim receiver “ $I_{DRE}$ ” always appears at a different time and is always less than “I” or 6 dB below the victim receiver noise level. The coordinated interference “I” is considered to originate from the point about which the antenna gain is measured and the interference level “I” is calculated using the methods of TIA/EIA Telecommunications Bulletin TSB10. Because the methods for calculating the interference level as given in TSB10 apply to all types of antennas that meet Rule 101.115, they also apply to antennas with DREs.

**(d) Smart Antennas with DREs Are Not Expected to Cause Harmful Interference**

A microwave link using smart antennas with DREs which are compliant with the Rules and are coordinated as required by the Rules using the methodology given in TSB10 can reuse the frequency multiple times without causing harmful interference because the (now used) side lobe radiation was coordinated at the same time (concurrently coordinated) as the main lobe radiation.

Several commenters raised questions about the potential for harmful interference from “smart” antenna systems<sup>4</sup> with DREs. These questions, however, miss the point of the RDR. WSI is asking the Commission to confirm that such antenna systems are not inconsistent with the Rules. WSI is not asking the Commission to pass judgment upon whether any Particular distributed “smart” antenna system will function properly. No one can take serious issue with the fact that “smart” antenna technology is well understood and that it has been used by the US military for decades in mission critical situations and for over a decade in commercial application. So comments focused upon applications are irrelevant. A main premise of the RDR is that what is proposed must “collectively comply with the Commission's antenna standards (§101.115) and frequency coordination procedures (§101.103).”

As reiterated above, “smart” antenna systems with DREs are compliant with Rule 101.115 (as there are no physical [distance] requirements in this specification) and that as

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<sup>4</sup> For purposes of the RDR, we are defining a “smart” antenna as an antenna system that combines an antenna array with a digital-processing capability to transmit and receive in an adaptive spatially sensitive manner, which may or may not use distributed radiating elements.

the coordination methods given in TSB10 apply to any type of antenna that meets Rule 101.115, a microwave link using smart antennas with DREs which are compliant with the Rules and are coordinated as required by the Rules using the methodology given in TSB10 cannot have a higher probability of causing interference than any other coordinated link. “Fears of interference” can only arise by ignoring the foregoing.

This conclusion is amplified by analyzing the interference claims made by some of the commenters.

Verizon, for one, claims that “smart” antenna systems have a “high probability of interference to other fixed microwave users.”<sup>5</sup> Verizon attempts to illustrate this with a diagram, labeled “Figure 1.”<sup>6</sup> But Verizon’s Figure 1 proves nothing as it is based on “dumb” antennas. Links with dumb antennas have limited frequency reuse capability and trying to prove that a “smart” antenna system will not work by using a “dumb” antenna system is misleading at best.

This point can be properly illustrated by considering the same configuration but with a “smart” antenna system with DREs, as shown in the following cases:

Case 1.

Assume that the Verizon paths as shown in its Figure 1 already exist. Following standard prior coordination procedures, the interference (I) at the input of any of these existing path receivers from the proposed "WSI Main" path of the DREs does not cause harmful interference. The “Main” path prior coordination clears. Because the “smart” antenna knows all the prior coordinating factors and ensures that the interference from any "Radiating Element" ( $I_{DRE}$ ) occurs at a different time than the interference “I,” and is

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<sup>5</sup> Verizon Comments at 7, Section III heading.

<sup>6</sup> Verizon Comments at 8, Figure 1.

less than “I” or is 6 dB below the receiver’s noise level, then as “I” was prior coordinated in the conventional manner “I<sub>DRE</sub>” was concurrently coordinated with “I” and therefore, as with any other type of antenna, interference from the radiating element(s) has no effect.

Case 2.

Assume for purposes of this case that the “WSI Main” path is the existing path and the Verizon paths are the proposed paths, which is the reverse of Verizon’s Figure 1. If, following standard prior coordination procedures, the new Verizon paths cause harmful interference to the existing “WSI Main” path, the prior coordination will fail and the new paths could not be deployed as proposed.

Case 3.

Assume that the “WSI Main” path is the existing path and the Verizon paths are the proposed paths, which is the same assumption as in Case 2. If, following standard prior coordination procedures, the new Verizon paths do not cause harmful interference to the existing “WSI Main” path, and the proposed paths accept the interference level “I” from the existing “Main” path, then the new paths will successfully prior coordinate and the new paths can be deployed as proposed. Because the “smart” antenna knows all the prior coordinating factors, including the accepted interference level “I,” and ensures that the interference from any "Radiating Element" “I<sub>DRE</sub>” occurs at a different time than the interference “I” and is less than “I” or is 6 dB below the receiver’s noise level, then as “I” was prior coordinated in the conventional manner “I<sub>DRE</sub>” was concurrently coordinated with “I” and therefore, as with any other type of antenna, interference from the radiating element(s) has no effect.

Therefore, in answer to all issues and concerns regarding interference: If the coordinated interference “I” from a smart antenna with DREs (which must by the conditions of the RDR meet either Category A or B, and be coordinated per Rule 101.103 using the methods of TIA/EIA Telecommunications Bulletin TSB10) arriving at the input of any victim receiver is always greater than “ $I_{DRE}$ ,” the interference arriving at any victim receiver from any DRE, and arriving at a different time than “I” or if “ $I_{DRE}$ ” is less than the victim receiver’s noise level, then the interference can be no different than any other type of antenna meeting the same Category A or Category B antenna requirements.

The Society of Broadcast Engineers (SBE) suggests that interference may result because WSI assumes some “headroom” between the actual main antenna side lobe amplitudes and the antenna manufacturer’s published RPE, while in reality there will be at least one side lobe that has the same or nearly the same amplitude as the manufacturer’s published RPE.<sup>7</sup> This makes no sense. The manufacturer’s published RPE must include all design and manufacturing tolerances such that no side lobes exceed the published RPE. SBE also offers that manufacturer’s published RPEs have built-in tolerances so that differences between any two of the same antennas resulting from imprecision in the manufacturing process are accommodated. Of course, the manufacturer’s published RPE must include all design and manufacturing tolerances so that “...imprecision in the manufacturing process are accommodated...” such that no side lobes exceed the published RPE. The RPE determined by the manufacturer’s antenna pattern for all antennas of a particular model is the worst case performance and is what is

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<sup>7</sup> SBE Comments at 5.

used for frequency coordination. The actual performance of any particular antenna that will be used in the station would give equal or better results.

SBE also is concerned that dynamically-programmable phased-array antennas would be “difficult to verify” as they operate with changing parameters.<sup>8</sup> Once again, this is an issue outside of the scope of the RDR, as it concerns implementation. But to respond, SBE offers no basis for its conclusion, which seems to reflect an unscientifically based fear. In fact SBE states, “SBE prefers to call it a ‘dumb and honest’ antenna.”<sup>9</sup> Obviously a dumb antenna is made of pieces of metal which are neither honest nor dishonest, therefore what scientific point were they trying to make? To imply that existing proven technology will not work is hard to rationalize.

MSV and Terrestrial make a similar argument in their joint comments, saying that it “is not possible to adequately assess the potential interference of new links based upon assumptions regarding an existing link.”<sup>10</sup> Of course it is possible. As shown above, “smart” antenna systems with DREs are compliant with Rule 101.115 (as there are no physical [distance] requirements in this specification) and that as the coordination methods given in TSB10 apply to any type of antenna that meets Rule 101.115, a microwave link using smart antennas with DREs which are compliant with the Rules can be coordinated using the methodology given in TSB10 (thereby adequately assessing the potential interference).

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<sup>8</sup> SBE Comments at 2.

<sup>9</sup> SBE Comments at 2.

<sup>10</sup> MSV and Terrestrial Comments at 3.

SBE suggests that actual measurement of the power domain summation of a DRE system would be needed to determine the RPE of any DRE system.<sup>11</sup> But, this has the system backwards. It is the antenna's RPE which is specified in Rule 101.115 not pieces of the antenna. The Rules do not specify the RPE of a dipole or a parabolic dish antenna, only the RPE of the antenna itself. This applies to any type of antenna or antenna radiating element (or elements). Again, SBE assumes existing regulations are not adequate, but that is not the case. As stated in Section II (b) above: "By specifying neither how an antenna is to be designed nor its physical dimensions, the Commission, in its wisdom, encourages industry to innovate."

The National Spectrum Managers Association (NSMA) disputes WSI's claim that third party stations cannot be established in the side lobes of the main antenna.<sup>12</sup> This is incorrect. Rule 101.103 and TSB10 require coordination 360 degrees around a site from a distance of zero to 400km within plus/minus 5 degrees about the main beam and from zero to 200km for the remaining 350 degrees -- this is because of imperfections in directional antenna radiation patterns, which means that signals are transmitted from, and can be received from, the antenna at all angles. They also require that no proposed (third party) station can cause harmful interference anywhere within the above quoted distances and angles. WSI stated the obvious, that there are locations outside of the main lobe where proposed paths will not clear a prior coordination.

Finally, MSV and Terrestrial complain that WSI proposes to add links based upon the "maximum" allowed power RPE rather than the "actual" RPE.<sup>13</sup> This is an

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<sup>11</sup> SBE Comments at 2.

<sup>12</sup> NSMA Comments at 4.

<sup>13</sup> MSV and Terrestrial Comments at 4.

application matter that should be handled at the application stage and not as part of this proceeding. It is pointed out that Rule 101.113 requires "...the average power delivered to an antenna in this service must be the minimum amount of power necessary to carry out the communications desired." In addition it is a fact that market forces drive progressive companies to seek innovative ways to lower transmitter power requirements and therefore it is reasonable to expect that the lowest operational EIRP will be used.

**(e) Consistency of DREs with Coordination Requirements**

Several commenters state that the concurrent coordination of unspecified DREs is not in compliance with the coordination requirements set forth in Rule 101.103. This is an unsubstantiated and incorrect statement, as explained above. The opposing comments do not show that Rule 101.115 specifies an antenna's physical design parameters (again, by the Commission not specifying an antenna's physical parameters the Commission encourages industry to innovate), therefore they have presented no evidence to refute the claim "smart" antenna systems with DREs are compliant with Rule 101.115 (as there are no physical [distance] requirements in this specification) and that as the coordination methods given in TSB10 apply to any type of antenna that meets Rule 101.115, a microwave link using smart antenna's with DREs is compliant with the Rules.

Several commenters express concern that concurrent coordination may not be sufficient. NSMA, for one, expresses concern that DRE receivers could receive interference and that DRE transmitters "have the potential to produce harmful interference and must be evaluated" but this evaluation cannot be done in a concurrent coordination process.<sup>14</sup> One can lay aside the concern with a DRE receiving interference,

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<sup>14</sup> NSMA Comments at 5-6.

because that is the right of the licensee. That limits the concern to the causing of interference. But, our conclusion is that there is no potential to cause interference. As discussed above,<sup>15</sup> in coordination, as shown above, no DRE will cause any additional interference that has not been coordinated. Consequently, coordinating discrete RPE's provides no benefit.

Verizon's, Alcatel's and David Popkin's comments that coordination notices must list all of the characteristic enumerated in Rule 101.103(d) is a mute point as the evidence given in Section II, (a) and (b) above shows that "smart" antenna systems with DREs comply with Rule 101.115 and Rule 101.103 and are coordinated according to the methods of TSB10. Moreover, coordination is a practical activity. The requirements for the circulation of station information in coordination notices is not rigid, but, to quote directly from the preface to the Rule 101.103(d)(2)(ii) list of specifications that may appear in a coordination notice, these specifications "should" appear in the notice "as appropriate...." We fail to see how the circulation of information on discrete DREs that operate within the coordination contour is something that is "appropriate" and "should" be done.

Comsearch, makes a series of arguments. First, it states that RPE's as defined in Rule 101.115 are not areas, so DREs must be separately coordinated. By stating that RPEs have no distance dimension Comsearch is agreeing with WSI's evidence given in Section II (a), (b) and (c) of this document and that DREs are coordinated as part of and at the same time (concurrently) as the antennas.

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<sup>15</sup> See Section II(c), on page 4.

Comsearch urges that the coordination of a third party's new station in the area might require the power of one or more DREs to be reduced. A third party's new station in the area must not cause interference and must accept interference. If the accepted interference level is "I" then, unlike a "dumb" antenna system, a "smart" antenna system knows the level of the coordinated interference "I" at the input of any victim receiver (existing or new) and ensures that the interference level from any DRE appearing at the input of any victim receiver " $I_{DRE}$ " always appears at a different time and is always less than "I" or 6dB below the victim receiver noise level.

**(f) Consistency of DREs with Other Technical Rules**

Several commenters appear convinced that Rule 101 of the Rules applies only to traditional, last century dumb antennas. Comsearch, for one, announces that "the rules" prohibit antenna elements from being widely distributed, but Comsearch does not identify these preclusive "rules." This omission serves to underscore the fact that, although traditionally, the antenna radiation pattern has been generated by a single transceiver and a parabolic dish antenna with a radiating element (feed horn or dipole) at the focal point of the dish, nothing in the Commission's Rules requires licensees to use a parabolic dish antenna. The radiation pattern could be generated by a phased array antenna with multiple transceivers and dipole radiators, "smart" antenna with multiple distributed transceivers and radiating elements, a transceiver with a multiple array flat panel, or anything else which complies with the Rules.

Comsearch also asserts that Fixed Service licensees are required to specify the antenna model and radiation pattern of the antenna they use, but Wireless Strategies has

not done so.<sup>16</sup> Wireless Strategies did specify an antenna model and radiation pattern, but again this applies solely at the application stage and not to this RDR.

Comsearch next attempts to rebut Wireless Strategies' observation that the Rules do not specify the location of the path's transceiver or the RPE of the radiating element. According to Comsearch, Rules 1.923(c), (d) and 101.21(e) require this specification in the application form.<sup>17</sup> The Rules apply to the antenna not pieces of the antenna. Comsearch does not reference a rule that states otherwise or to a rule that specifies the location of a transceiver. An antenna could be mounted at the top of a thousand foot tower and the transceiver at the top or the bottom. Moreover, an application is a means of collecting information. Certainly the main station antenna will be specified in compliance with the Rules. As there is no need to specify DRE locations, the omission of this information will not render the application incomplete. Indeed, whether an application is sufficiently complete is a question for the Bureau who will decide in accordance with Rule 1.934(d) and certainly on a practical basis.

Comsearch next asserts that individual DRE antenna elements "may not meet the §101.115 antenna pattern requirements" but provides no evidence. Again, the Rules apply to the antenna not pieces of the antenna. See Section II (b) for supporting evidence.

Verizon claims that the DRE plan is inconsistent with the rules because the rules define "Fixed Service" as a radio communication service between "specified" or "designated" points."<sup>18</sup> Again, as stated above, the Rules apply to the antenna not pieces of the antenna. For these antennas, it is important to note that Station A's DREs point to

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<sup>16</sup> Comsearch Comments at 7.

<sup>17</sup> Comsearch Comments at 9-10.

<sup>18</sup> Verizon Comments at 2-3, citing Rule 2.1 and Rule 101.3.

and communicate only with Station A's companion receiver. Moreover, this claim puts an emphasis on terms that appear to have more descriptive and distinguishing significance (differentiating, for example, from mobile or broadcast) than limiting significance, and in any event it is noteworthy that the definitions use the words "specified" and "designated" rather than "authorized" or "licensed." In fact, there are fixed services in which individual stations are not licensed, such as the LMDS service which, by definition in Rule 101.1, involves "fixed" stations.

Verizon also claims that each DRE must be separately licensed, but it cites to no rule that says this and once again the Rules apply to an antenna not pieces of the antenna.<sup>19</sup>

Comsearch states that each distributed antenna must be treated as a separate radiator for the off-axis antenna discrimination angles of Rule 101.115(b) to make sense.<sup>20</sup> But, Rules 101.115 and 101.103 and the coordination methods of TSB10 make perfect sense for dumb and "smart" antenna systems. What Comsearch is trying to do is view a "smart" antenna system as a "dumb" antenna system to make its point. This is invalid. Once again, unlike a "dumb" antenna system, a "smart" antenna system knows the level of the coordinated interference "I" at the input of any victim receiver (existing or new) and ensures that the interference level from any DRE appearing at the input of any victim receiver " $I_{DRE}$ " always appears at a different time and is always less than "I" or 6 dB below the victim receiver noise level.

Comsearch also speculates that it is possible that an antenna of another licensee might operate in the RPE of the distributed antenna system, making the antenna standards

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<sup>19</sup> See Section II (b) for supporting evidence.

<sup>20</sup> Comsearch Comments at 2.

Rule 101.115(b) meaningless. Comsearch is confused. Rule 101.115 defines an electrical requirement and has no physical parameters. To imply otherwise is wrong. Alcatel complains that the DRE concept would violate the Rule 101.115(a) requirement that an authorized station must use a directional antenna directed toward its companion receiver. Alcatel tries to make its argument by discussing pieces of an antenna (a DRE). This is invalid.<sup>21</sup> Moreover, all DREs of a given station point to and communicate only with that Station's companion receive, so the rule is met with respect to them.

Comsearch disputes the benefits of DREs, because separate paths can be formed to do the same thing which is why "the rules" prohibit antenna elements from being widely distributed.<sup>22</sup> It is notable that Comsearch does not cite any of "the rules." Further, Comsearch seems not to appreciate the cost and time burden involved in coordinating multiple links (perhaps because the operator's cost is Comsearch's revenue).

**(g) No Excessive EIRP**

Several commenters suggest that DREs will encourage applicants to request high powers than actually needed.<sup>23</sup> But, as stated repeatedly by WSI, application considerations are not part of the RDR as it is up to the license applicant to determine the minimum level of EIRP necessary to achieve the desired communications. This matter should be handled at the application processing stage and not in this proceeding. It is noted that those opposed are fixated on the way things were or the way things are instead of the way things will be. Market forces drive progressive companies to seek innovative ways to lower transmitter power requirements. In fact, emerging antenna technologies

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<sup>21</sup> See Section II (b) for supporting evidence.

<sup>22</sup> Comsearch Comments at 5.

<sup>23</sup> SBE Comments at 4, Verizon Comments at 7.

are expected to reduce the average EIRP for 6 GHz paths to below 60 dBm, that is lower than over ninety percent of the legacy paths EIRPs shown by Comsearch in Figure 1 of its comments.<sup>24</sup>

**(h) Smart Antenna Technology Is Not New and Is Well Understood**

Smart antennas have been used by the US military for decades in mission critical situations and for over a decade in commercial application, their design and performance characteristics are well understood. There is no justification for opponents to apply a restrictive view of what type of “smart” antenna can or cannot be used or to imply that “smart” antennas require a new rules. These comments are simply inconsistent with the modern approach to reliance upon technology and stepping out of the way of progress and inconsistent with the goals of the Commission to promote “innovation and the introduction of new radio applications and technologies.” and to enable the “use of spectrum across various dimensions (frequency, space, time), promoting the efficient use of spectrum, and providing for continued technological advances.”<sup>25</sup>

**(i) Efficient and Effective Use of Spectrum**

Some of those opposed to the RDR opine that smart antennas with DREs will make inefficient use of spectrum. Alcatel argues that DREs are inefficient as “[c]areful frequency coordination and proper selection of equipment allows very effective use of the areas inside a site’s radiation pattern envelop with no interference degradation.”<sup>26</sup>

Compared to what? Alcatel presents no evidence to support or quantify this assertion and

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<sup>24</sup> Comsearch Comments at 8.

<sup>25</sup> See generally Spectrum Policy Task Force Report. ET Docket No. 02-135, *Report* (rel. 2002) (*Spectrum Policy Task Force Report*) at pp. 4, 16-23. This report is available at <http://www.fcc.gov/sptf>.

<sup>26</sup> Alcatel Comments at 9.

it is pointed out that an RPE has electrical parameters not physical. Traditional antennas only use a frequency once on a given polarization whereas a licensee with a smart antenna system with DREs can reuse the frequency tens of times to provide the public with very low cost wide bandwidth without increasing the coordinated interference level above that of the main path. Alcatel also argues that WSI is attempting to stretch the technical rules to allow broadband services in an already congested band that should be reserved for point-to-point traffic. This statement misses the point. WSI's proposal would put to productive use side lobe radiation which point-to-point microwave paths using legacy equipment do not use and is therefore wasted. So, contrary to Alcatel's argument, WSI's proposal would relieve frequency congestion by reusing the same frequency.

**(j) A Point-to-Point License is not an Area License**

Several opponents of the RDR say that smart antennas are basically area licensing or that the requested ruling would create "exclusive-use geographic license area." That simply is not the case, as a matter of law or fact. An exclusive use area license is a license whose area is defined by the Commission (BTA etc). A point-to-point license has no FCC defined exclusive use area and it is only the end points (sites) that are protected from interference 360 degrees about those end points.

**(k) Spectrum is a Finite Resource Which DREs Preserve**

Verizon argues that there is no shortage of spectrum and that instead of reusing an existing licensed frequency to service the public need, a licensee should apply for an additional licensed frequency as there is "a considerable amount of spectrum ...."<sup>27</sup>

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<sup>27</sup> Verizon Comments at 6, footnote 16.

This is saying that today's point-to-point wireless services are adequate to meet today's and tomorrow's public need for broadband services. That simply is not the case.

Spectrum is finite and a precious national resource. WSI believes that a licensee who is given an exclusive use license should be encouraged to use innovative ways to reuse the spectrum to provide additional services rather than simply asking the Commission for additional frequencies because "spectrum is available and we have always done it that way." In addition, the high cost of today's equipment, the unnecessary coordination and application preparation costs and unacceptably large size of subscriber antennas means that legacy point-to-point equipment and networks leave large sections of the public without a wireless alternative to the Incumbent Local Exchange Carrier (ILEC) provided (or unavailable) broadband services.

WSI believes that the cost of providing wireless broadband services can be reduced by over ninety percent by deploying concurrently coordinated point-to-point networks using smart antennas with DREs.

While Verizon argues that there is no shortage of spectrum, NSMA argues the opposite. It urges that the concurrent coordination concept will clutter the microwave bands, making the relocation of 2.1 GHz incumbents displaced in the AWS auction more difficult.<sup>28</sup> NSMA sees this problem arising because the concurrent coordination will create "operational exclusion zones...." But that is not the case and that is not what Wireless Strategies has requested. Indeed, it is absurd to believe the truth of the necessary underpinning of this argument: that people would procure sites for, finance the construction of and bear the operating and maintenance costs of unnecessary links.

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<sup>28</sup> NSMA Comments at 7.

### **(I) Declaratory Ruling Is the Proper Procedure**

Several commenters attempt to stall this proceeding by arguing that the Administrative Procedures Act (APA) requires the Commission to consider the issues raised in the RDR within a notice and comment rule making proceeding in which a notice of proposed rule making is published in the Federal Register and final rules are adopted and published in the Federal Register.<sup>29</sup> Section 553 of the APA<sup>30</sup> requires rule making procedures for the adoption or repeal of rules. It does not require the labor of these procedures when the Commission is interpreting the reach of the rules.<sup>31</sup> All WSI has asked is an interpretation, so the RDR is the proper procedure.

### **III. Conclusion**

For the above reasons the Commission should approve Wireless Strategies' Request because it would:

- significantly increase the spectrum reuse capability,
- increase the effective use of spectrum,
- provide additional service without tying up additional spectrum,
- reduce provisioning times,
- increase competition for broadband delivery,
- put less demand on Commission licensing resources,
- dramatically lower the size and cost of concurrently coordinated subscriber links,

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<sup>29</sup> NSV and Terrestar Comments at 2-3; Alcatel Comments at 2-3.

<sup>30</sup> 5 USC 553.

<sup>31</sup> *Cellnet Communications, Inc. v. FCC*, 965 F.2d 1106 (D.C. Circuit 1992).

- generate additional subscriber revenue and increase the licensees return on investment and provide for lower user prices overall.
- Be consistent with statements in the FCC's Best Practices for National Spectrum Management:<sup>32</sup> "...promoting innovation and the introduction of new radio applications and technologies." and the FCC's Spectrum Policy Task Force Report: "...enabling use of spectrum across various dimensions (frequency, space, time), promoting the efficient use of spectrum, and providing for continued technological advances."<sup>33</sup>

Wireless Strategies therefore respectfully requests the Commission issue a declaratory ruling as requested in Wireless Strategies' Request for a Declaratory Ruling.

Respectfully Submitted  
Wireless Strategies Inc.



By: \_\_\_\_\_  
Michael Mulcay, Chairman  
Wireless Strategies Inc.  
P.O. Box 2500  
Carmel Valley, CA 93924

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<sup>32</sup> This policy can be viewed at <http://www.fcc.gov/ib/dans/irb/bestpractices.html>.

<sup>33</sup> See generally Spectrum Policy Task Force Report. ET Docket No. 02-135, *Report* (rel. 2002) (*Spectrum Policy Task Force Report*) at pp. 4, 16-23. This report is available at <http://www.fcc.gov/sptf>.