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

In the Matter of	)	
	)	
AT&T Mobility Spectrum LLC and	)	
Qualcomm Incorporated Seek FCC	)	WT Docket No. 11-18
Consent to the Assignment of	)	
Lower 700 MHz Band Licenses	)	

REPLY COMMENTS OF VULCAN WIRELESS LLC

I. INTRODUCTION AND SUMMARY

Vulcan Wireless LLC ("Vulcan") submits the following Reply Comments in the above-captioned proceeding. As a Lower 700 MHz A Block licensee, Vulcan has significant concerns regarding the prospect of an unconditional grant by the Federal Communications Commission ("Commission") of the AT&T Mobility Spectrum LLC ("AT&T") and Qualcomm Incorporated ("Qualcomm") application to the assignment of six D Block and five E Block licenses in the Lower 700 MHz band from Qualcomm to AT&T.[1]

Absent conditions, this transaction will cause substantial harm to 700 MHz A Block licensees (including Vulcan) – and significantly threaten competition – by restricting interoperability in the Lower 700 MHz band. Therefore, Vulcan asks the Commission to condition any approval of the Application on: (1) holding AT&T to its statement of intent, made in the Application, not to pair its Lower 700 MHz B and C Block licenses with any newly acquired Lower 700 MHz D and E Block licenses, along with its other statements regarding

[1] Assignment Application, ULS File No. 0004566825 (filed Jan. 13, 2011; amended Feb. 9, 2011) ("*Application*"); *see also AT&T Mobility Spectrum LLC and Qualcomm Incorporated Seek FCC Consent to the Assignment of Lower 700 MHz Band Licenses*, WT Docket No. 11-18, Public Notice, DA 11-252 (Feb. 9, 2011).

future use of its 700 MHz licenses; and (2) requiring full interoperability in the Lower 700 MHz paired spectrum bands, which include the A, B and C Blocks, by the earlier of the roll-out of AT&T's LTE network or the initial 700 MHz build-out deadlines in 2013, for the reasons described below.

II. THE COMMISSION MUST ENSURE FUTURE NATIONWIDE INTEROPERABILITY IN THE 700 MHz BAND BY IMPOSING CONDITIONS AS PART OF ANY GRANT OF THE TRANSACTION

The Commission has consistently supported the goal of nationwide interoperability for mobile wireless services through numerous decisions and statements.[2] In addition, Petitioners in this proceeding, as well as parties who filed Comments in response to the Petition for Rulemaking Regarding the Need for 700 MHz Mobile Equipment to be Capable of Operating on All Paired Commercial 700 MHz Frequency Blocks,[3] have also fully documented the benefits of nationwide interoperability.

The Lower 700 MHz A Block licensees, including Vulcan, are acutely aware of the problems stemming from a lack of interoperability. For example, the Lower 700 MHz band is

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[2] *See e.g.*, *Cellular Communications Systems*, Report and Order, 86 F.C.C.2d 469 ¶ 26 (1981) ("With respect to mobile stations, all units must be capable of operating at least over the entire 40 MHz of spectrum (*i.e.*, 666 channels). This is necessary in order to insure full coverage in all markets and compatibility on a nationwide basis."); *Amendment of the Commission's Rules to Establish New Personal Communications Services*, Memorandum Opinion and Order, 9 FCC Rcd. 4957 ¶¶ 162, 165 (1994) ("[I]nteroperability for PCS is an important and beneficial goal. . . . If we find that the development of PCS technology is not proceeding in a manner that will accommodate roaming and interoperability, we may revisit this issue and consider what actions the Commission may take to facilitate the more rapid development of appropriate standards.").

[3] *See, e.g.*, Petition for Rulemaking Regarding the Need for 700 MHz Mobile Equipment to Be Capable of Operating on All Paired Commercial 700 MHz Frequency Blocks, 700 MHz Block A Good Faith Purchasers Alliance, RM Docket No. 11592 (filed Sept. 29, 2009) ("*Alliance Petition*"); Reply Comments filed by Vulcan Spectrum LLC, RM Docket No. 11592 (filed April 30, 2010) ("*Vulcan Reply Comments*"); *Ex Parte* filing by Vulcan Wireless LLC, RM Docket No. 11592, 3 (filed Mar. 23, 2011) ("*Vulcan Ex Parte*"); Petition to Deny, Rural Telecommunications Group, Inc., WT Docket No. 11-18, 22 (filed Mar. 11, 2011) ("*RTG Petition*"); Petition to Deny, Cellular South, Inc., WT Docket No. 11-18, 15-18 (filed Mar. 11, 2011) ("*Cellular South Petition*"); Petition to Deny, Rural Cellular Association, WT Docket No. 11-18, 5-8 (filed Mar. 11, 2011) ("*RCA Petition*").

unique in that it does not match other international spectrum allocations or standards body band class paradigms, so no global economies of scale can be leveraged to create a larger vendor marketplace. Lack of interoperability in the Lower 700 MHz band also makes it more difficult for smaller providers when one of the biggest U.S. holders of 700 MHz spectrum can use the standards body process to facilitate creating equipment that only works for its portions of the band, thus orphaning bands used by smaller wireless service providers. As a result, Lower 700 MHz A Block holders face far higher costs and time delays in bringing innovative wireless services to market than licensees in other spectrum bands.

Vulcan specifically urges the Commission to adopt the conditions described below to ensure full interoperability in the Lower 700 MHz paired bands, thereby allowing Lower 700 MHz A Block licensees and consumers to achieve the benefits of a more competitive marketplace. Moreover, contrary to the opposition arguments made by AT&T and Qualcomm,[4] these proposed conditions are specific to the threat posed by the proposed transaction. Indeed, AT&T's own declarations discuss its future plans with respect to block pairing.

A. The Commission Should Hold AT&T to its Own Statements and Prevent AT&T from Pairing its Lower 700 MHz B and C Block Licenses with any Newly Acquired D and E Block Licenses.

To preserve the prospect of future interoperability in the Lower 700 MHz paired bands and protect Lower 700 MHz A Block licenses from potential interference, the Commission should hold AT&T to its statements of intent regarding this transaction. Specifically, AT&T declared in the Application that it "has no plans to integrate the Qualcomm Spectrum with its Lower 700 MHz B and C block spectrum since such combination would create an unacceptable

[4] *See* Joint Opposition of AT&T Mobility Spectrum LLC and Qualcomm Incorporated to Petitions to Deny or to Condition Consent and Reply to Comments, WT Docket No. 11-18, 28-33 (filed Mar. 21, 2011) (arguing that the Commission should not consider claims that are not transaction specific).

level of self-interference within a device if used simultaneously."[5] The Commission should formalize this statement as a condition to the transaction and preclude AT&T from pairing its 700 MHz B and C Block licenses with any newly acquired D and E Block licenses. As stated by petitioner King Street Wireless, L.P., "AT&T must do what . . . [it] already told the Commission (under penalty of perjury) that AT&T would do – i.e., use any spectrum that is assigned pursuant to the subject proceeding as a supplement to its LTE operations that are being conducted in other, non-700 MHz bands."[6]

As explained below, such a pairing is technically feasible despite AT&T's stated concerns, but only through a configuration that would directly preclude Lower 700 MHz interoperability with the A Block. This pairing could also potentially cause interference to the A Block. Petitioner Rural Telecommunications Group, Inc. also states that it "believes AT&T will, or is already in the process of developing plans to, utilize devices and handsets that work only on the Lower 700 MHz B, C, D and E blocks and consciously exclude A block interoperability so that any data roaming mandate will be 'theoretically' but not practically possible."[7] Therefore, to prevent AT&T from creating a stranglehold in the Lower 700 MHz band by arguing that data

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[5] *Application*, Declaration of Kristin S. Rinne ¶ 16 (filed Jan. 13, 2011). The statement reads in full:

> AT&T has no plans to integrate the Qualcomm Spectrum with its Lower 700 MHz B and C block spectrum since such combination would create an unacceptable level of self-interference within a device if used simultaneously. For example, a customer using a handset would transmit signals using the Lower 700 MHz B and/or C blocks and receive signals using the Lower 700 MHz D and/or E blocks. Because these blocks are adjacent, there is not enough frequency separation between the uplink and downlink to prevent the mobile device transmitter from interfering with its own receiver. The receiver filter would not provide sufficient rejection of the transmitting signal. This signal would cause the receiver to saturate, resulting in gain compression and severe distortion. A guard band between the Lower C and D blocks is not a feasible solution.

Id.

[6] Petition to Condition Grant of Application, King Street Wireless, L.P., WT Docket No. 11-18, 3-4 (filed Mar. 11, 2011) ("*King Street Petition*").

[7] *RTG Petition* at 21.

roaming is technically infeasible and by incorporating only the Lower 700 MHz B, C, D, and E Blocks into its devices, the Commission should require AT&T to adhere to its own declaration and require such commitments as a condition to any approval of the transaction.

The current technical rules for the Lower 700 MHz bands (Blocks A, B, C, D, and E) provide licensees with the flexibility to select a duplex structure. Currently, the lower segment of the paired A, B, and C Blocks are configured within the Third Generation Partnership Project ("3GPP") standards body as downlink bands in Band Class 12.[8] The 3GPP standards body is now investigating the development of asymmetric pairing of these bands, which would enable the creation of uplink and downlink pairs that are not of the same bandwidth. Therefore, there is a potential for AT&T to either: (a) configure the D and E Blocks as a downlink or an uplink and combine these with Band Class 12 (see attached Case 1 – Figure (a)); (b) configure the D and E Blocks as an uplink and combine these with the B and C Blocks in Band Class 17 (see attached Case 2 – Figure (b)); or (c) configure the D and E Blocks as a downlink and combine these with the B and C Blocks in Band Class 17 (see attached Case 3 – Figure (c)).[9] *See* Exhibit A.

These types of spectrum pairings have never been technically possible before, which could result in unintended consequences to the Commission's spectrum policy. In the first case, such a combination would at best only provide a 1 MHz duplex spacing and thus would not be technically feasible. Therefore, a possible combination to provide interoperability between the A, B, and C Blocks is not technically feasible when the D and E Blocks are included (see attached Case 1 – Figure (a)).

[8] Band Class 12 includes a 13 MHz duplex spacing, which could provide for interoperability between A, B, and C Blocks if AT&T would support interoperable standards.

[9] The D and E Blocks could also be used with a time division duplex ("TDD") configuration that can create other interference challenges for the A Block.

In the second case, the configuration would be required to use the A Block to create a duplex spacing of 6 MHz. Therefore, this configuration would preclude any opportunity for interoperability with the A Block.[10] Thus, the D and E Blocks could be combined with the B and C Blocks while sacrificing interoperability with the A Block (see attached Case 2 – Figure (b)).

The combination depicted by the third case would be possible by utilizing the resource management flexibility of the LTE and LTE-Advanced standards. It is possible to temporarily create a half-duplex link to enable the desired large bandwidth downlink capacity. This is possible in areas where AT&T holds the B, C, D, and E Block licenses. In that case, interoperability with the A Block would not be possible because the A Block licenses would not be under the direct control of the AT&T resource manager for their B and C Blocks[11] (see attached Case 3 – Figure (c)).

Because it is technically possible for AT&T to pair its 700 MHz B and C Block licenses with any newly acquired D and E Block licenses, but only by precluding A Block interoperability and causing potential interference to A Block licensees, the Commission should hold AT&T to all of the statements in its declaration regarding its future use of the B, C, D and E Blocks. As noted by petitioner King Street, "It is not complex, or even difficult, to fashion a remedy that requires AT&T to adhere to its word."[12] Otherwise, AT&T may ultimately decide to pair these blocks, resulting in harms to nationwide interoperability goals, competition, consumers, and carriers.

[10] This may be technically difficult but it is a distinct possibility.

[11] The A Block resource management would need to be under the control of the B and C Block base station at all times (*e.g.,* even when not attempting to communicate with the B and C Block base station).

[12] *King Street Petition* at 4.

B. There is a Critical Need to Impose a Condition Ensuring Interoperability in the 700 MHz Band, as Widely Supported by Other Petitioners.

As noted previously, many other petitioners in this proceeding have cited the need for a condition on AT&T in this transaction to ensure nationwide interoperability in the 700 MHz band.[13] There is no question that device interoperability brings the benefits of economies of scale to consumers as well as carriers. And, without interoperability, carriers face a competitive time-to-market harm when they are denied access to new devices and delays in the development of standards, chip sets, and equipment.[14]

Second, interoperability is a prerequisite to effective implementation of data roaming, which may otherwise be technically infeasible.[15] If the Commission wishes to achieve the full benefits in the wireless marketplace of its planned data roaming order tentatively scheduled for its April 7th Open Meeting,[16] then it must take interoperability – and the threat posed to it in this transaction – into account.

Third, Vulcan is also concerned that without interoperability in the Lower 700 MHz band, it is possible that a 911 call could fail in certain situations. For example, in a geographic (likely rural) location only served by a 700 MHz footprint, it is entirely possible that a phone operating on the Lower 700 MHz A Block could only reach a Lower 700 MHz B and C Block-only tower but not be able to communicate due to differing standards or a lack of interoperability. As demonstrated by this example, concerns that have long plagued the public

[13] *See, e.g.*, *Cellular South Petition* at 14-18; *RCA Petition* at 12; Petition to Deny, Free Press, *et al.*, WT Docket No. 11-18, 18-19 (filed Mar. 11, 2011) ("*Free Press Petition*").

[14] *Vulcan Ex Parte* at 3.

[15] *Id.*; *see also RCA Petition* at 9-10.

[16] *FCC Announces Tentative Agenda for April 7th Open Meeting*, FCC Press Release (Mar. 7, 2011), *available at* http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0317/DOC-305256A1.pdf.

safety community because of the fractured nature of that marketplace could creep into the commercial marketplace.[17]

Interoperability is also a catalyst for numerous other public interest goals, including job creation and broadband deployment, especially in rural areas where smaller wireless carriers and new entrants bring jobs and other economic opportunities to their communities. Similarly, there will be less need for a Universal Service Fund subsidy in rural areas because Lower 700 MHz A Block licensees would be incentivized to serve rural customers without relying on subsidies. And ensuring interoperability will increase the amount of money generated and the number of small and diverse bidders at future spectrum auctions, thereby serving both fiscal and diversity goals.[18]

There is widespread support in this proceeding for protecting consumers and carriers by imposing on AT&T a specific condition ensuring interoperability in the 700 MHz band. Numerous petitioners ask the Commission to take steps to prevent AT&T from inflicting further competitive harms and thwarting device interoperability.[19] Vulcan concurs with these petititioners' concerns – and also supports the need for full interoperability across all of the paired 700 MHz blocks[20] – but only specifically asks the Commission to take the most important immediate step in this transaction: require full interoperability across the Lower 700 MHz paired A, B and C Blocks by the earlier of the roll-out of AT&T's LTE network or the initial 700 MHz build-out deadlines in 2013.

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[17] This is perhaps the most visceral reminder of the dangers of permitting carriers to fragment the marketplace and develop standards that do not require interoperability.

[18] *Vulcan Ex Parte* at 3.

[19] *See, e.g.*, *Cellular South Petition* at 2, 14-18; *RCA Petition* at 12; *Free Press Petition* at 18-23; *King Street Petition* at 5-6; *RTG Petition* at 19-25.

[20] *See Vulcan Reply Comments*.

Once this level of interoperability is assured, 700 MHz licensees, including smaller and rural A Block licensees, will have the flexibility to decide if they want to pursue commercial data roaming agreements, without worrying about technical infeasibility arguments based on whether AT&T deploys certain technical permutations on its Lower 700 MHz B, C, D and E Blocks. This remains a major reason why so many Petitioners have asked the Commission to require that all mobile devices be interoperable within the entire 700 MHz band.[21]

III. CONCLUSION

For the foregoing reasons, the Commission should take a critical positive step toward its nationwide interoperability goal and condition this transaction on holding AT&T to all of its statements regarding future use of its Lower 700 MHz licenses (particularly not to pair its Lower 700 MHz B and C Block licenses with any newly acquired D and E Block licenses) as well as requiring full interoperability within the Lower 700 MHz paired spectrum band.

Respectfully submitted,

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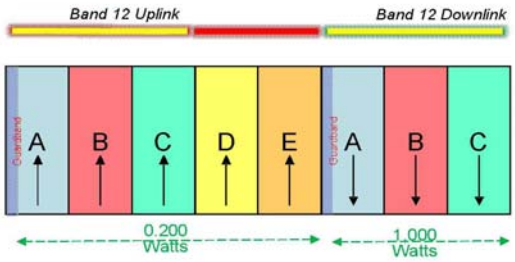
[21] *See, e.g., Cellular South Petition* at 2; *RCA Petition* at 12; *Free Press Petition* at 18-21; *King Street Petition* at 5-6; *RTG Petition* at 19-23.

Exhibit A

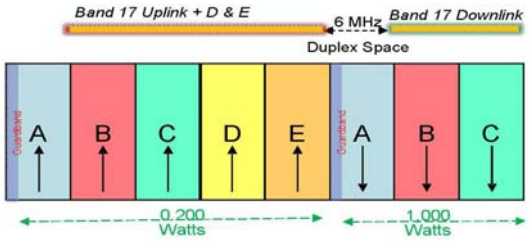
Case 1 - Figure (a)



(a) Pairing Band Class 12 + D and E Block for use as an uplink would eliminate all or most duplex spacing between the uplink and downlink channels.

This is pairing would make interoperability technically infeasible.

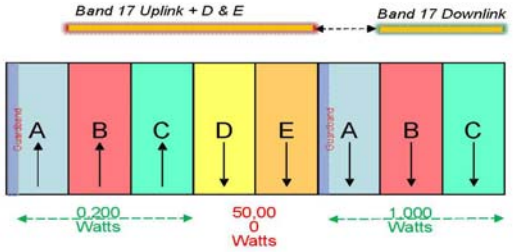
Case 2 - Figure (b)



(b) Pairing Band Class 17 + D and E Block for use as an uplink would leave only a 6 MHz duplex spacing between the uplink and downlink channels .

In this scenario, the A-Block could not be interoperable since it would be used to provide the duplex spacing.

Case 3 - Figure (c)



(c) Pairing Band Class 17 + D and E Block for use as a downlink is technically feasible within the current 3GPP LTE standards. Technically, it would be possible if Band 17 (without D & E Block) would operate with normal full duplex (simultaneous uplink and downlink). Since AT&T would control signaling for their B, C, D and E Blocks, B & C uplink channels could be temporarily suspended during B, C, D & E downlink operations (aka half duplex).

This configuration would not allow interoperability with the A-Block.