

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

In the Matter of

AT&T Mobility Spectrum LLC; BellSouth
Mobile Data, Inc.; New Cingular Wireless
PCS, LLC; and SBC Telecom Inc.

Petition for Rulemaking Amending
WCS Technical Standards Rules

WT Docket No. 14-__

ACCEPTED/FILED

AUG - 8 2014

Federal Communications Commission
Office of the Secretary

To: The Commission

PETITION FOR RULEMAKING

Pursuant to Section 1.401 of the Commission's rules,¹ AT&T Mobility Spectrum LLC; BellSouth Mobile Data, Inc.; New Cingular Wireless PCS, LLC; and SBC Telecom Inc. (together with their ultimate parent, AT&T Inc., and its other affiliates, "AT&T") hereby request that the Commission open a rulemaking proceeding to amend Part 27 of its rules governing the C and D Blocks of the Wireless Communications Services in the 2.3 GHz band ("WCS"). The proposed amendments will enable AT&T to use its C and D Block spectrum for the air-to-ground component of its planned LTE-based in-flight connectivity service for airlines and passengers.² To protect the operations and customers of Sirius XM Radio Inc. ("Sirius XM") from harmful interference, the proposed rules include restrictions on transmitter power levels, limits on out-of-band emissions ("OOBE"), and specific requirements for coordination with Sirius XM. Adopting this proposal will serve the public interest by permitting a robust,

¹ 47 C.F.R. § 1.401.

² See Press Release, AT&T Inc., Mobilizing the Sky: AT&T Building 4G LTE In-Flight Connectivity Service, *available at* http://about.att.com/story/mobilizing_the_sky_att_building_4g_lte_in_flight_connectivity_service.html (Apr. 28, 2014) ("*Mobilizing the Sky*").

No. of Copies rec'd 0+6
List ABCDE

WTB 14-19

nationwide deployment of AT&T's innovative in-flight connectivity service using currently fallow spectrum while at the same time preserving adequate interference protection to users of adjacent bands. Accordingly, the Commission should grant this petition expeditiously.³

Background

For 17 years, both WCS and Satellite Digital Audio Radio Service ("SDARS"), operating on adjacent frequency assignments, have shared the 2.3 GHz band. For most of that time, WCS and SDARS were burdened with technical limitations and regulatory uncertainty.⁴ Following a compromise fashioned by AT&T and Sirius XM,⁵ the Commission adopted the *Order on Reconsideration* in October 2012 to allow WCS licensees to exploit the most efficient new mobile broadband standards, including LTE, while limiting the potential interference to satellite radio reception to acceptable levels.⁶ Since that time, AT&T has moved forward with plans to use the WCS A and B Blocks in its mobile wireless LTE network. Nevertheless, AT&T has continued to struggle to develop uses for its WCS C and D Block spectrum given the strict transmission limits to protect adjacent band operations from harmful interference.

AT&T now has found a way to put the C and D Block spectrum to productive use without infringing upon its spectral neighbors. AT&T plans to launch a high-speed 4G LTE-based in-flight connectivity service for airlines and passengers in commercial, business, and

³ In the alternative, to enable this air-to-ground service, AT&T is filing a Petition for Limited Waiver of WCS Technical Standards and Service Rules attached to applications to modify each of its WCS C and D Block licenses. See ULS File Nos. ____ (filed concurrently).

⁴ The historical background of the FCC's efforts to draft technical rules enabling deployment of mobile broadband services in the 2.3 GHz WCS band is detailed in the FCC's 2010 Report & Order and 2012 Order on Reconsideration. *Amendment of Part 27 of the Comm'n's Rules to Govern the Operation of Wireless Commc'ns Servs. in the 2.3 GHz Band*, Report and Order and Second Report and Order, 25 FCC Rcd. 11,710, 11,714-23 ¶¶ 5-27 (2010); *id.*, Order on Reconsideration, 27 FCC Rcd. 13,651, 13,654-62 ¶¶ 6-19 (2012) ("*Order on Reconsideration*").

⁵ See *id.*, WT Dkt No. 07-293; *et al.*, Written Ex Parte Presentation of AT&T Inc. and Sirius XM Radio Inc. (filed June 15, 2012) ("AT&T & Sirius XM Joint Submission").

⁶ *Order on Reconsideration*, 27 FCC Rcd. at 13,652, 13,660-61 ¶¶ 2, 18.

general aviation.⁷ The service “will be capable of providing in-flight broadband for customers including fast, reliable Wi-Fi and onboard entertainment.”⁸ “[A]viation customers can also expect improved connectivity solutions such as cockpit communications, maintenance operations and crew services.”⁹ In essence, planes with this service will be flying hotspots, connecting to end-user devices via Wi-Fi. For the air-to-ground backhaul component, ground-to-air “Base Stations” will transmit over the D Block while air-to-ground “Avionics Stations” will transmit over the C Block. AT&T expects to begin offering this service as soon as late next year.¹⁰ From the time AT&T launches this service, it intends to provide coverage over the 48 contiguous states at a variety of altitudes.¹¹ In particular, AT&T plans to provide robust, uninterrupted service to all routes within the contiguous United States among 50 or more airports classified as large or medium hubs (as measured by the FAA’s Final Calendar Year 2012 passenger enplanement data).¹²

Not only will this in-flight connectivity service result in a robust, rapid, and nationwide deployment of facilities using the WCS C and D Blocks, it will avoid the interference problems

⁷ *Mobilizing the Sky*.

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

¹² FAA, Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports, CY 2012 Passenger Boarding and All-Cargo Data, http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/?year=2012 (last visited July 30, 2014). “Large” hubs are defined as airports that have passenger boardings equal to or greater than one percent of total annual passenger enplanements while “medium” hubs have at least 0.25 percent but less than one percent of the total annual passenger boardings. See 49 U.S.C. § 47102. This planned deployment would satisfy the substantial service safe harbor that the Commission has proposed for the 14.0-14.5 GHz air-ground mobile broadband service. See *Expanding Access to Broadband & Encouraging Innovation Through Establishment of an Air-Ground Mobile Broadband Secondary Serv. for Passengers Aboard Aircraft in the 14.0-14.5 GHz Band*, Notice of Proposed Rulemaking, 28 FCC Rcd. 6765, 6788-89 ¶ 77 & n.122 (2013).

that have bedeviled past efforts to use this spectrum intensively. Because base station antennas will tilt up, an air-to-ground service inherently will be less likely to interfere with Sirius XM receivers on the ground than a terrestrial application's downward-tilting base station antennas. For this reason, Sirius XM has expressed a decided preference that WCS spectrum be used for air-to-ground service instead of traditional terrestrial uses.¹³ Moreover, AT&T will be able to operate this particular air-to-ground service with technical parameters and coordination mechanisms that will protect Sirius XM's operations and customers from harmful interference, as defined in Section 27.64(d) of the rules¹⁴ (a definition jointly proposed by Sirius XM and AT&T;¹⁵ "Harmful Interference").

Proposed Amendments to the WCS Rules

Before it can launch this service, however, AT&T will need regulatory relief from the Commission because AT&T's proposed use of the C and D Blocks will not fit neatly within the literal words of the Commission's existing WCS rules. Thus, AT&T proposes the following amendments to Part 27:

- Add the following definition to Section 27.4:

Avionics station. A station installed on an aircraft that is part of a service using the 2305–2320 MHz and 2345–2360 MHz bands. A station may consist of multiple physical transceivers operating as a single system.

¹³ *Amendment of Part 27 of the Comm'n's Rules to Govern the Operation of Wireless Commc'ns Servs. in the 2.3 GHz Band*, WT Dkt No. 07-293; *et al.*, Written Ex Parte Presentation of Sirius XM Radio Inc, The Impact of WCS Downlink Interference at 1-2 (filed Apr. 17, 2012) (detailing how an air-to-ground architecture used in the WCS band would be less likely to cause interference than a typical terrestrial cellular system); *id.*, Notice of Oral Ex Parte Presentation of Sirius XM Radio Inc. at 1-2 (filed Jan. 23, 2012) ("Sirius XM . . . encouraged efforts to explore other uses of the WCS spectrum – such as the ground-to-air service recently proposed by GoGo, Inc. – that may be more compatible with adjacent band users.").

¹⁴ 47 C.F.R. § 27.64(d).

¹⁵ See AT&T & Sirius XM Joint Submission at 7.

- Add a Section 27.14(p)(3) to read as follows (and renumber the existing Sections 27.14(p)(3) to (p)(8)):

For air-to-ground systems using avionics stations, a licensee must construct and operate Base Stations that provide robust, uninterrupted service to all routes within the contiguous United States among 50 or more airports classified as large or medium hubs (as measured by the FAA's Final Calendar Year 2012 passenger enplanement data) by March 13, 2017. "Large" hubs are defined as airports that have passenger boardings equal to or greater than one percent of total annual passenger enplanements while "medium" hubs have at least 0.25 percent but less than one percent of the total annual passenger boardings. Routes between airports in the contiguous United States will not be counted to the extent they go outside this territory (*e.g.*, across the Gulf of Mexico).

- Revise Section 27.50(a)(1)(ii) to read as follows:

(A) For base and fixed stations transmitting in the 2315–2320 MHz band or the 2345–2350 MHz band, the peak EIRP must not exceed 2,000 watts, *except that* the peak EIRP of a base station transmitting in the 2345–2350 MHz band to avionics stations may exceed 2,000 watts, provided that the average EIRP of such base station shall not exceed 2,000 watts.

(B) The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

- Revise Section 27.50(a)(3)(i) to read as follows:

For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, except for avionics stations, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305–2315 MHz and 2350–2360 MHz bands. Mobile and portable stations, except for avionics stations, using FDD technology are restricted to transmitting in the 2305–2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

- Revise Section 27.50(a)(3)(ii) to read as follows:

Mobile and portable stations are not permitted to transmit in the 2315–2320 MHz and 2345–2350 MHz bands, *except that* avionics stations may transmit in the 2315–2320 MHz band. There may only be one avionics station on each aircraft.

- Add a Section 27.50(a)(3)(v) to read as follows:¹⁶

Avionics stations may operate at up to 8 watts average EIRP per transmitter, with total average EIRP per avionics station not to exceed 16 watts at 20,000 feet above ground level (“AGL”) and above, 8 watts at or above 10,000 feet AGL and below 20,000 feet AGL, 1 watt at or above 1,000 feet AGL and below 10,000 feet AGL, and 0.25 watt below 1,000 feet AGL and on the ground.

- Add a new Section 27.53(a)(5) to read as follows (and renumber the existing Section 27.53(a)(5) to Section 27.53(a)(6), which had been reserved):

For avionics stations in the 2315-2320 MHz band:

(i) By a factor of not less than $55+10\text{Log}P$ on all frequencies between 2320 and 2322 MHz and not less than $65+10\text{Log}P$ on all frequencies between 2322 and 2345 MHz.

(ii) To meet this attenuation requirement, licensees may use power control, resource block scheduling, or other applicable techniques.

- Revise Section 27.53(a)(10) to read as follows:

The out-of-band emissions limits in paragraphs (a)(1) through (a)(3) and (a)(5) of this section may be modified by the private contractual agreement of all affected licensees, who must maintain a copy of the agreement in their station files and disclose it to prospective assignees, transferees, or spectrum lessees and, upon request, to the Commission.

- Add a Section 27.72(f) to read as follows:

Special coordination requirements for air-to-ground systems using avionics stations.

For air-to-ground systems using avionics stations, the requirements of subsections (a)-(c) shall be replaced with the following coordination procedures.

(1) As early as practical in the process of a WCS licensee’s initial network planning and on an ongoing basis thereafter:

¹⁶ AT&T intends to engage in joint testing with Sirius XM, pursuant to a mutually agreeable test plan, of Avionics Station equipment while this Petition is pending. In the event that this testing reveals to either party that the technical requirements proposed above do not prevent Harmful Interference to Sirius XM’s satellite radio operations, AT&T will amend this Petition to provide for lower permitted EIRP levels for Avionics Stations.

(i) For a new base station, WCS licensees must provide SDARS licensees with the full technical RF transmission parameters for each such proposed site. The information supplied will include site locations and operational RF parameters necessary to predict the site emissions on the ground level.

(ii) For each type of avionics station, WCS licensees must provide SDARS licensees with the full technical RF transmission parameters for each proposed terminal type, as necessary to predict the emissions on the ground level.

(2) If, within 15 business days after receiving this information, an SDARS licensee identifies to a WCS licensee any base station or any type of avionics station that the SDARS licensee believes is likely to cause Harmful Interference to satellite radio service, the WCS licensee will work together with the SDARS licensee for an additional 15 calendar days to resolve the potential Harmful Interference. If no agreement can be reached, the WCS licensee will offer to arbitrate the dispute pursuant to procedures agreed upon by the two licensees. During such arbitration process, the WCS licensee will transmit in the WCS C and D Blocks over such base station or such type of avionics station only for the purpose of market trials and will not transition such base station or such type of avionics station to commercial service until the arbitration is completed or the licensees have mutually resolved the potential Harmful Interference concerns.

(3) Following the completion of construction of a base station, the WCS licensee will notify SDARS licensees and provide the base station's final emission parameters. If, within 15 business days of receiving this information, an SDARS licensee so requests, the WCS licensee temporarily will activate the base station to transmit at its maximum emission target for field testing purposes for a period of one week during the next month ("measurement period"), during which period the SDARS licensee will be able to verify that no harmful interference exists.

(4) If, within five business days after the end of such measurement period, any SDARS licensee notifies the WCS licensee of any harmful interference, the WCS licensee must meet one of the following conditions, from which the WCS licensee shall elect at its sole discretion, before commencing commercial operations with the transmitter under consideration:

(i) The WCS licensee will remedy any harmful interference that the SDARS licensee observed (the WCS licensee will have the sole responsibility to determine and implement the remedy);

(ii) The WCS licensee will reimburse the SDARS licensee's reasonable costs to construct satellite radio terrestrial repeater(s) (which may be collocated at an existing WCS licensee site or sites) that both licensees believe can remedy the harmful interference, up to a cost of \$100,000 per terrestrial repeater site. The SDARS licensee and the WCS licensee will

each bear 50 percent of the ongoing reasonable operating costs (*e.g.*, lease costs, utilities, etc.) of each such repeater; or

(iii) The WCS licensee will have offered to submit the dispute regarding the existence of the harmful interference claimed by the SDARS licensee to arbitration pursuant to procedures agreed upon by the two licensees and either the SDARS licensee will have declined the offer or the WCS licensee will have prevailed.

(5) If a WCS licensee seeks to modify a base station after commencing service, the WCS licensee will provide SDARS licensees with the new emission parameters within five business days after making such a change.

(6) If, after a WCS licensee begins operations at any base station, an SDARS licensee notifies the WCS licensee of any harmful interference to the SDARS licensee's operations and requests mitigation:

(i) The WCS licensee will have 15 business days to validate the harmful interference claim and, if validated, notify the SDARS licensee whether the WCS licensee will remedy the harmful interference or reimburse the SDARS licensee's reasonable costs to construct satellite radio terrestrial repeater(s) – up to a cost of \$100,000 per terrestrial repeater site – that both licensees believe can remedy the harmful interference;

(ii) The WCS licensee will implement the remedy in the shortest practical time after receiving notice from the SDARS licensee;

(iii) The WCS licensee may continue to operate the base station during the periods specified in subparagraphs (i)-(ii); provided, however, that if the two licensees reach no mutually satisfactory resolution during the period specified in subparagraph (i), the WCS licensee will reduce the base station's power in a reasonable amount requested by the SDARS licensee until a satisfactory resolution can be reached (including through an arbitration pursuant to procedures agreed upon by the two licensees);

(iv) If the WCS licensee does not validate the SDARS licensee's harmful interference claim, the WCS licensee will offer to submit the dispute regarding the existence of the claimed harmful interference to arbitration pursuant to procedures agreed upon by the two licensees; and

(v) The WCS licensee may continue to operate the base station pending validation of the SDARS licensee's harmful interference claim and implementation of any remedy.

Combined, these proposed technical restrictions and coordination requirements clearly provide adequate interference protection to adjacent band operations.¹⁷

Adopting the Proposed Rules Is in the Public Interest

Adopting these proposals will serve the public interest by putting the WCS C and D Blocks to use at long last, in support of an innovative service and without causing harmful interference to adjacent bands. Indeed, in its 2012 *Order on Reconsideration*, the Commission expressly contemplated that licensees' plans for using the WCS C and D Blocks – including a potential air-to-ground service – likely would require fitting a square peg into a round hole: “[G]iven the wide range of deployments and applications possible, we find that WCS licensees should seek guidance from the Wireless Telecommunications Bureau on a case-by-case basis in determining whether their service is permissible within the C and D Blocks, and which benchmarks apply.”¹⁸ Implicit in this statement is a recognition that licensees might need further relief to fulfill the public interest in using this spectrum for innovative services. Here, amending Part 27 of the rules as proposed above will permit the rapid, robust, nationwide deployment of innovative broadband services in the WCS band “while limiting their potential to cause harmful interference . . . to other adjacent bands [sic] services.”¹⁹ It would, therefore, serve the public interest for the Commission to grant this Petition for Rulemaking.

¹⁷ WCS operations in Canadian and Mexican border areas are subject to additional coordination and interference restrictions to provide protection to non-U.S. operations. See 47 C.F.R. § 27.57(a). AT&T's proposed service will respect and comply with these requirements, and AT&T is not proposing an amendment to this rule.

¹⁸ *Order on Reconsideration*, 27 FCC Rcd. at 13,702 ¶ 126 (“[W]e note that certain entities have sought guidance as to the specific performance requirements that would be applied to current or potential operations in the C and D Blocks that do not fall within the traditional mobile, point-to-multipoint, or point-to-point fixed models. For example, Gogo, Inc. seeks clarification as to whether ground-to-air uplinks could be deployed in the C and D Blocks, and what coverage requirements would apply.”).

¹⁹ *Id.* at 13,658 ¶ 11; see, e.g., *id.* at 13,652, 13,657-58 ¶¶ 2, 10, 12.

Respectfully submitted,



William L. Roughton, Jr.
Michael P. Goggin
Gary L. Phillips
Lori A. Fink
AT&T Services, Inc.
1120 Twentieth Street, N.W., Suite 1000
Washington, D.C. 20036
(202) 457-2040

Of Counsel:
Arnold & Porter LLP
555 Twelfth Street, N.W.
Washington, D.C. 20004
(202) 942-5634

Attorneys for AT&T Mobility Spectrum LLC; BellSouth
Mobile Data, Inc.; New Cingular Wireless PCS, LLC;
and SBC Telecom Inc.

Dated: August 8, 2014