

11. **REQUEST:**

Page 4 of the Rinne Declaration states, “The Qualcomm Spectrum will enable AT&T to expand capacity on its LTE network nationwide. AT&T will acquire the Lower 700 MHz D and E Blocks in major metropolitan areas – New York, Boston, Philadelphia, Los Angeles and San Francisco AT&T will be able to expand the LTE downlink capacity in such areas by as much as an additional 10 MHz, with the remaining 2 MHz available as guard band.” On page 5, the Rinne Declaration further states, “[i]n areas where Qualcomm holds only Lower 700 MHz D Block spectrum, AT&T will use up to 5 MHz of the spectrum to expand its LTE downlink capacity, with the remaining 1 MHz available as a guard band.” Explain these statements in detail and provide all documents discussing this issue.

RESPONSE:

The Lower 700 MHz D and E blocks each contain 6 MHz of spectrum. In areas where AT&T will acquire both the Lower 700 MHz D and E blocks, AT&T will have 12 MHz of D/E block spectrum. This will permit AT&T to create a nominal 10 MHz channel for LTE downlink where it holds both the Lower D and E block, and a nominal 5 MHz channel where it holds only the D block. AT&T has not yet decided on the size of the guard band it will deploy. [Begin
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[End

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AT&T will provide documents responsive to this request, if any, at a later date.

As part of the response, address the following:

- i. How AT&T plans to mitigate base station-to-base station interference from downlink Lower 700 MHz D or D and E Block transmissions to its own uplink transmissions in the Lower 700 MHz B and/or C Blocks. Address separately situations in which AT&T would hold only the D Block license and situations in which AT&T would hold both D and E Block licenses. Describe the following:**
 - a. The extent to which AT&T's B and C Block base stations and D and E Block base stations will be operating on different towers/buildings in the same geographic area or co-located at the same towers/buildings.**
 - b. For i.a above, calculations of the amount of isolation (in decibels - dB) required between base stations or other network equipment transmitting on the D or D and E Blocks and AT&T base stations or other network equipment receiving on the B and/or C Blocks. These calculations should include analyses of interference from out-of-band emissions, in-band blocking, and intermodulation, as well as a determination of the dominant interference mechanism, along with any other relevant data.**
 - c. Deployment practices that will achieve the required isolation, including required vertical, horizontal, and angular separation of antennas and other network equipment, filter performance on the B and C Blocks receive channels (at the base stations and other network equipment), level of reduction of out-of-band emissions from transmissions in the Lower 700 MHz D or D and E Blocks, and any other factors that may contribute to the required isolation.**
 - d. Any associated performance degradation, limitations, affects on capacity and/or additional costs related to the above solutions.**

RESPONSE:

AT&T is continuing to explore options to mitigate potential base station-to-base station interference, but it has not yet developed a plan to address such interference in situations where AT&T would hold the D block license or the D and E block licenses. Such plan will depend on the supplemental downlink specifications that are established for the bonding of the Qualcomm Spectrum with AT&T's spectrum. In the response to Request No. 13, AT&T notes that the supplemental downlink standard that will permit it to bond the D and E blocks with its 1900

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MHz spectrum will not be released until December 2012, and specifications for AWS and 850 MHz will follow that. Also, the actual base station equipment that will accommodate these spectrum bands is yet to be developed. AT&T has initiated discussions with vendors regarding potential D and E block base station designs, but AT&T has not yet designed its D and D/E block base stations.

AT&T notes that the solution to potential interference from D and/or E block transmissions will not be a simple matter of locating base stations on different buildings or towers. In some cases, it may be better to have two base stations co-located on the same tower if they are sufficiently separated than having them on separate buildings, *e.g.*, when D and/or E block antennas are pointing towards a B and/or C block base station across the street. Thus, the solution may vary, depending on the circumstances.

Because the D and E block standards and equipment are not yet in place, AT&T has not yet calculated the amount of isolation required between base stations on the D and D/E blocks and base stations on the B and/or C blocks, or established deployment practices. Similarly, AT&T has not yet conducted site planning to determine the extent to which AT&T's B and C block stations and D and E block stations will operate on different or the same towers or buildings. Because AT&T does not yet have plans to address the potential interference between base stations, it cannot calculate any performance degradation, limitations, effects on capacity, or other costs, if any, that will be attributable to its plans.

- ii. **How AT&T's deployment of Lower 700 MHz D Block or D and E Block base stations will affect base station deployments by other licensees in the Lower 700 MHz A, B, and C Blocks. Describe the following:**
- a. **The extent to which deployments by other licensees in the A, B, or C Blocks will need to be co-located on the same towers/buildings with, or on locations in the vicinity of, AT&T's Lower 700 MHz D or D and E Block base stations. Include descriptions of (1) how AT&T's deployment in the D or D and E Blocks will affect future deployments in the A, B, or C Blocks by other licensees, and (2) how existing deployments by other licensees will affect AT&T's deployment in the D or D and E Blocks. Describe in detail how AT&T will coordinate its D or E Block base station deployment with other Lower 700 MHz licensees in both of these cases, and describe any assumptions that AT&T is making about the technology, topology, or other characteristics of these deployments.**
 - b. **Any differences between the required base station isolation, or methodology to achieve it, as described in i.b and i.c above when considering interference to other Lower 700 MHz licensees.**
 - c. **Any associated performance degradation, limitations, affects on capacity, and/or additional costs related to the above solutions.**

RESPONSE:

As noted above in response to Request No. 11.i, AT&T is continuing to explore options to mitigate base station-to-base station interference, but has not yet developed a plan to address such interference in situations where AT&T would hold the D block license or the D and E block licenses. Thus, AT&T is not yet able to: (a) identify the extent to which deployments by other licensees in the A, B, or C blocks will need to be co-located on the same towers/buildings with, or on locations in the vicinity of, AT&T's Lower 700 MHz D or D and E Block base stations, (b) describe the differences, if any, between the required base station isolation described in Request No. 11.i when considering interference to other Lower 700 MHz licensees, or (c) describe any associated performance degradation, limitations, effects on capacity, and/or additional costs, if any, related to AT&T's plans.

AT&T's deployment of D and E block base stations should have little effect on future deployments of A, B, and C block base stations by AT&T or any other licensee. AT&T holds licenses for Lower 700 MHz B and C blocks, and, thus, has every incentive to mitigate interference from its D and E block base stations to other Lower 700 MHz base stations. AT&T expects that future deployments by A, B, and C licensees will use receiver input filtering similar to what AT&T will use for its Lower B or C block deployments, as a matter of good engineering practice.

AT&T also does not anticipate that its deployment of the D and D/E block base stations will impact existing deployments by other licensees. These licensees presumably already have designed their systems to address the interference from FLO-TV's higher-powered operations. As noted in Paragraph 18 of the Rinne Declaration, AT&T's base stations will operate at power levels much lower than those permitted under the Commission's rules for broadcast-type services. This substantial reduction in transmission power will mitigate interference with other Lower 700 MHz blocks.

In the event there are interference issues with other 700 MHz licensees, AT&T has not developed plans for how it will coordinate its D or E block base station deployment with current 700 MHz licensees or with future deployments by such licensees. However, AT&T will do so in accordance with FCC regulations,²¹ and may consider the options for voluntary coordination set forth by the Commission²² and standard wireless industry practices for interference coordination.

²¹ See 47 C.F.R. § 27.64.

²² *In re Reallocation & Serv. Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59)*, Report and Order, 17 FCC Rcd. 1022, 1065-66 ¶¶ 106, 110 and App. D ¶ 3 (2002) (declining to impose mandatory coordination on Lower 700 MHz licensees, but encouraging licensees to coordinate voluntarily and use means such as selective vertical antenna patterns, tilting antennas, improved filtering, and avoiding the use of spectrum at the edge of their authorized blocks).

- iii. **How AT&T plans to mitigate and/or otherwise address the possibility of mobile-to-mobile interference to user devices utilizing the Lower 700 MHz D or D and E Block transmissions on the Lower 700 MHz A, B, and C Blocks Describe the following:**
- a. **The minimum required isolation (in dBs) and corresponding separation distance between mobile devices receiving on the Lower 700 MHz D or D and E Block and those transmitting on the A, B, or C Blocks to ensure interference-free reception of supplemental downlink transmissions.**
 - b. **Any differences between how AT&T might mitigate the effects of interference caused by their own Band 17 devices versus that caused by Band 12 or Band 17 devices developed and deployed by other Lower 700 MHz licensees.**
 - c. **Any effects on cost and any possible limitations (*e.g.*, capacity, performance, commercial availability, etc.) on Lower 70 MHz user devices, including those operating in the Lower 700 MHz D or D and E Blocks, as well as those operating in Band 12 or Band 17.**

RESPONSE:

The minimum isolation and separation distance that will be required in devices is an issue that handset manufacturers will address. While AT&T consults with handset manufacturers, AT&T will not manufacture the equipment. It is AT&T's understanding that the design specifications for devices incorporating the Lower D and E blocks have not yet been established by manufacturers. In Paragraph 8 of her Declaration, Ms. Rinne stated that she did not expect such equipment to be ready for consumers until late 2014, at the earliest. Thus, at this time, AT&T does not know the minimum isolation and corresponding separation distance that is required for mobile devices receiving on the Lower 700 MHz D or D and E block and those transmitting on the A, B or C blocks.

AT&T does not expect that the inclusion of the Lower D and E blocks into its mobile devices will *cause* any additional mobile-to-mobile interference for the simple reason that those blocks will be used only for downlink. Further, as Ms. Rinne noted in her Declaration, AT&T

has no plans to bond the D and E blocks with the B and C blocks using supplemental downlink because such combination would create an unacceptable level of self-interference within a device if those spectrum bands are used simultaneously. **[Begin Confidential]**

[End Confidential]

As noted above, mobile devices incorporating the Lower D and E blocks have not been designed and developed. Thus, AT&T cannot now state with any certainty any effects of mobile-to-mobile interference on costs, or possible limitations on Lower 700 MHz devices. AT&T notes as a general matter that the incorporation of the D and E blocks into its devices will require modifications to a mobile device, including, for example, the installation of a filter, but it is premature to determine the cost of such device modifications until such devices are designed and ready to manufacture. Similarly, other carriers' Band 12 and Band 17 devices may interfere with the D and E blocks. It is possible the interference may impact performance, such as the speed of a customer's connection, but the extent of such an impact is mere speculation at this point since devices incorporating the D and E blocks have not yet been designed and tested.

AT&T will provide documents responsive to this request, if any, at a later date.

12. REQUEST:

Explain and provide all documents discussing the effect of the Proposed Transaction on interoperability of devices within the 700 MHz band and across other bands, including AWS, cellular, PCS, and Lower 700 MHz B and C Block spectrum. What combinations of spectrum bands do the Applicants anticipate being included in the design of mobile devices going forward, in light of or absent the Proposed Transaction?

RESPONSE:

AT&T's LTE service will use Lower 700 MHz B and C Block (Band 17) and AWS spectrum. In addition to adding Band 17 and AWS, AT&T will also add the Lower 700 MHz D and E Blocks to its devices after closing this transaction and once standards have been adopted and equipment and devices have been developed. AT&T's mobile devices will also interoperate on the following bands and technologies: 850 MHz cellular and 1900 MHz PCS bands domestically and the 900 and 1800 MHz GSM/EDGE bands and the 2100 MHz UMTS band for global roaming.

AT&T has no plans to use other bands, including the Upper 700 MHz band and the Lower 700 MHz A block. From time to time, AT&T will investigate bands used in other countries for international roaming purposes, but AT&T has no current plans to use any such bands. This transaction has no effect on those plans.

AT&T will provide documents responsive to this request, if any, at a later date.

13. REQUEST:

On page i of the Public Interest Statement, the Applicants state that AT&T "plans to promptly bond the Qualcomm Spectrum with paired spectrum in its LTE network as soon as the standards and equipment utilizing innovative supplemental downlink technology are available, which AT&T expects to occur by 2014." Further, page 3 of the Rinne Declaration estimates that "AT&T would be able to deploy handsets and equipment incorporating the Qualcomm Spectrum as early as 2014."

- i. Discuss in detail how the standards and equipment referenced in the statements above will be developed through 2014. In particular,**

identify each stage of the process for developing standards for this equipment, manufacturing this equipment, testing this equipment and making it available for commercial use.

- ii. Provide specific status and official target dates developed by the 3GPP and other standards organization on the completion of related standards to achieve spectrum aggregation and the frequency band specifications for LTE using the 700 MHz and AWS bands as well as other spectrum scenarios mentioned in the Public Interest Statement and the declarations.**

RESPONSE:

AT&T currently estimates that handsets and equipment incorporating the Qualcomm Spectrum will be available in the 2014-2015 time frame. AT&T describes below the standards that must be released before equipment is manufactured; the timeline for the design and manufacture of equipment; and the timeline for AT&T to test, certify and begin to deploy the equipment to its customers.

Based on information available at the time we prepared this filing, AT&T understands that the basic LTE technical specifications necessary for supplemental downlink are expected to be completed in June of this year with the completion of 3GPP LTE Release 10. The next release (Release 11) will address supplemental downlink in specific band combinations.

AT&T is one of a number of carriers that have requested a specification as part of Release 11. Specifically, with respect to the Qualcomm Spectrum, AT&T has requested a specification that will recognize the Qualcomm Spectrum as a new band class and permit the bonding of that spectrum with AT&T's 1900 MHz spectrum. This item is being considered for inclusion in Release 11 at the RAN Plenary meeting.

Due to the large number of carriers requesting specifications, the RAN working group has to consider prioritization of work under the various scenarios. Thus, there is a chance that not all requested specifications will be done by the same date. Additional operators might seek

specifications during the current RAN Plenary. AT&T has requested a completion date of March 2012 for the Qualcomm Spectrum/1900 MHz specification, and a completion date of June 2012 for the underlying protocol messaging testing of the specification. It is estimated that the 3GPP will release Release 11 in December 2012.

Located at Attachment 13 is a chart setting forth the estimated completion dates for other band combinations pending before the RAN as of May 30th.

At the time AT&T filed its Public Interest Statement, AT&T indicated it planned to bond the Qualcomm Spectrum initially with AT&T's AWS spectrum, but that it also could bond the spectrum with its 1900 MHz and 850 MHz spectrum. While AT&T is currently seeking a specification for the Qualcomm Spectrum/1900 MHz combination, AT&T still currently plans to obtain 3GPP specifications for the bonding of the Qualcomm Spectrum with the AWS and 850 MHz spectrum. After the filing of the Public Interest Statement and further refinement of its LTE network planning, AT&T concluded that it would be better to bond the Qualcomm Spectrum initially with its 1900 MHz spectrum since that spectrum would be more widely available throughout the LTE network footprint. Depending on available capacity and subscriber migration in a market as well as the availability of compatible hardware, software, and devices, AT&T may be able to clear a portion of its 850 MHz spectrum in a market for LTE in later deployment stages.

AT&T currently estimates that handset and base station manufacturers will commence product development upon the release of the Qualcomm/1900 MHz specification in December 2012, and that they will make equipment available for AT&T to test and certify roughly 18 months later -- or by mid-2014. AT&T estimates that it will take it approximately six months -- or until the end of 2014 -- to test and certify the new equipment. During this six-month period,

handsets and base station equipment will first be tested independently in the lab using test equipment emulators and other methods to simulate the respective other end of the link. In parallel with that activity, modifications can be made to the network, primarily to the base station equipment, which will consist of software updates and possibly some hardware modifications. When the lab testing and network modifications are complete, then actual network testing can commence with the actual base station equipment communicating over the air with actual handsets. Such testing will include making sure AT&T's network is compatible with the various new handsets incorporating the new spectrum blocks. Thus, AT&T estimates that it will begin to roll the equipment to its customers by roughly the end of 2014 or the beginning of 2015.

This timeframe is dependent on actions beyond AT&T's control, including how quickly the relevant 3GPP standards and specifications are released and how soon manufacturers make equipment available.

14. REQUEST:

With reference to page 7 of the Public Interest Statement, regarding AT&T's plans to promote "full and efficient utilization of the Qualcomm Spectrum," discuss in detail how this transaction would affect AT&T's service offerings and coverage and capacity in rural as well as urban and suburban areas for both mobile and fixed users. Provide the definition of "urban," "suburban," and "rural" used in answering this question.

RESPONSE:

In the AT&T/ T-Mobile USA proceeding, AT&T has committed to extend its deployment of LTE service to over 97 percent of the U.S. population, including residents of numerous rural and other smaller communities. In fact, a substantial number of the build-outs will be in non-urban areas. Moreover, AT&T will use the same LTE technology throughout the country, and, subject only to spectrum constraints, LTE subscribers in rural areas and small communities will experience the same benefits as subscribers in urban areas.

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Similarly, AT&T has no current plans to deploy the Qualcomm Spectrum on the LTE network in a manner that will result in services varying by geographic area. AT&T has no plans for new services as a result of the acquisition of the Qualcomm Spectrum, but customers will experience an improvement in LTE service as described in Request No. 5. AT&T also has no plans to use the Qualcomm Spectrum to expand its LTE coverage; the spectrum will be used to expand capacity on AT&T's then-existing LTE system. Thus, service or coverage will not depend on whether the LTE network is in a rural, urban or suburban area.

Similarly, AT&T will roll out the Qualcomm Spectrum first in those areas where it has an immediate need for additional capacity. Such areas may be in a rural, urban or suburban area. AT&T describes in its response to Request No. 11 how the Qualcomm Spectrum can be used to expand LTE downlink capacity. AT&T's current plans for utilization of the spectrum are not dependent on whether the spectrum is in a rural, urban or suburban area.

AT&T also has no current plans to utilize the Qualcomm Spectrum for fixed mobile services. However, how much spectrum is available and what AT&T can combine it with is going to vary from geographic area to geographic area. Thus, while AT&T is not currently planning service differences, the capacity available in an area may impact, for example, throughput speeds.

Because AT&T has no current plans that would distinguish its use of the Qualcomm Spectrum on a rural, urban or suburban basis, AT&T has not adopted definitions of "urban," "suburban" and "rural" for that purpose.

15. REQUEST

On pages ii and iii of the Joint Opposition, the Applicants state that “this transaction will stimulate competition, foster innovation, and advance the country’s position globally by providing AT&T additional spectrum capacity to compete with other carriers rolling out LTE mobile broadband services.” Explain this statement in detail, by providing all documents discussing this issue and by providing specifics as to how this transaction will stimulate competition among competing providers, foster innovation, and advance the interests of the United States globally, as compared with the circumstances absent the Proposed Transaction. Explain separately any incremental impact of the Proposed Transaction assuming that the proposed AT&T/Deutsche Telekom-T-Mobile merger has been approved. Provide all documents discussing these issues.

RESPONSE:

As AT&T has previously explained, AT&T intends to bond the Qualcomm Spectrum with paired spectrum in its LTE network as soon as the standards and equipment using innovative supplemental downlink technology are available, which AT&T expects to occur no earlier than late 2014. Once the LTE Advanced standards are completed, supplemental downlink technology will permit the bonding of noncontiguous spectrum, including unpaired spectrum, into a single wider channel. As a result, AT&T will be able to add downlink capacity to handle downloads on its LTE network by combining Qualcomm’s unpaired 700 MHz spectrum with paired spectrum that AT&T will use to deploy LTE.

The use of supplemental downlink technology will improve AT&T’s ability to accommodate its customers’ asymmetrical use of broadband data services. In today’s wireless broadband environment, consumers download far more information than they upload. The faster speeds of LTE networks are expected to make many data-intensive services more popular, including streaming video, gaming, and cloud computing, and many of these services inherently involve disproportionate data flows from the network to the consumer. For example, the growth of higher resolution displays in wireless handhelds and tablets results in higher download traffic to match the resolution of the display. Even many everyday wireless services, however, are

characterized by this same asymmetry. A consumer using simple web browsing usually downloads more information than he uploads. The same is true of email – one person may upload a large attachment, but often multiple recipients will open and download that same attachment. By adding the Qualcomm Spectrum to the LTE network, AT&T will be able to offer faster peak download speeds and a more seamless experience for these services that require the downloading of large amounts of data.

AT&T's acquisition of this spectrum for supplemental downlink uses will help increase competition. AT&T will use the spectrum to increase the downlink capacity of its LTE network, which will enable it to serve more customers and to provide better and faster services. The ability to provide these benefits will help make AT&T a stronger LTE competitor. Indeed, the principal effect of the transaction is to increase the capacity of AT&T's LTE network, which will permit AT&T to *increase output* – which is a pro-competitive outcome that should put downward pressure on prices throughout the industry. The transaction does not affect the spectrum holdings of any other wireless carrier, and as explained in AT&T's previous pleadings, in no instance will the acquisition of the Qualcomm Spectrum alone cause AT&T to exceed the Commission's current spectrum screen. While this transaction will help make AT&T a stronger competitor, AT&T's continuing ability to compete will depend on AT&T obtaining additional capacity as consumer demand for data-rich applications and services grow. This transaction will help in that regard, but it will not resolve AT&T's future capacity needs.

The transaction will also foster innovation. Innovation in the wireless industry is a complex, interdependent process that depends, at its core, on networks that have sufficient capacity to support new devices and services. Network operators compete to attract customers by offering the best combinations of speed, reliability, coverage, devices, applications, prices,

and packages, and they are constantly innovating to improve and upgrade their network platforms. These network improvements enable the development and deployment of new, more innovative devices and applications. As customers adopt new devices and applications, demand for wireless service increases, thus spurring network operators to improve their networks even further. This generates a “virtuous cycle” of innovation, because improved networks spur yet more improved devices and applications, which in turn spur yet more improved networks, and so on. Without increased industry output, performance of wireless networks will suffer, slowing the virtuous cycle. The increased efficiencies and outputs provided from AT&T’s use of this spectrum will stimulate the virtuous cycle.

AT&T plays an important role in that virtuous cycle of innovation. A major part of AT&T’s business strategy is to be at the leading edge of wireless technology. AT&T Labs is a world-class research institution with six labs in five states supporting 1,300 of the world’s best scientists and engineers. AT&T was awarded more than 1,000 patents in 2010, and AT&T ranked third on the Patent Board’s top 50 scorecard of technology leaders in the telecom and communications industry – the only wireless service provider in the top 10. AT&T also maintains sophisticated testing and product development and engineering centers, including facilities established to promote collaboration with developers and manufacturers. Through these initiatives and others, AT&T promotes innovation throughout the wireless ecosystem, and AT&T’s constant network improvements and broad efforts in research and collaborative outreach are an important part of that innovative process.

Given AT&T’s role in the innovative process, the transaction should foster additional innovation by expanding the marketplace opportunities and incentives to develop cutting-edge LTE services. By adding supplemental downlink technologies to AT&T’s network, AT&T will

be able to accommodate data-intensive services more easily and consumers will enjoy better, faster, and more seamless delivery of such services. This expanded capacity will increase AT&T's incentives to engage in research and collaborative efforts with other innovators throughout the ecosystem, because it can encourage the growth of such services with increased confidence that it will have the network capacity necessary to handle such services. By the same token, the increased downlink capacity on AT&T's network will increase incentives for device makers and applications developers to design more innovative services that will run on such networks – particularly more data-intensive services like streaming video, gaming, and cloud computing. And, past experience confirms that innovative successes will spur other carriers, device makers, and applications designers to redouble their efforts to respond with innovations of their own – with consumers as the chief beneficiaries.

For many of the same reasons, the transaction will advance the country's position globally. Qualcomm, a United States company, has developed an innovative supplemental downlink technology. AT&T, a United States company, will be among the first to deploy it commercially, which is a boost to U.S. wireless leadership.

By enhancing AT&T's ability to provide innovative services that require large downloads of data, the transaction enhances AT&T ability to remain a leader in the wireless industry both as a strong competitor and as an important driver of innovation. To the extent that the transaction maintains or enhances AT&T's incentives to engage in proactive collaboration with other innovators throughout the wireless ecosystem, that American-based leadership will be felt throughout the globe, as AT&T participates in international standards-setting bodies and collaborates with international device makers and software designers that offer their products and services across the world.

Finally, the Proposed Transaction has the potential for an even more beneficial incremental impact on competition and innovation if the AT&T's merger with T-Mobile USA is approved. The two transactions are entirely complementary. As AT&T has explained elsewhere, the merger with T-Mobile USA will facilitate substantial increases in network capacity that will allow the combined company to offer LTE services to an additional 55 million customers. Accordingly, the merger with T-Mobile USA should increase the scope of opportunities in which the Qualcomm Spectrum could potentially be bonded with AT&T's LTE spectrum, thus increasing the downlink capacity available to additional consumers. To the extent that the Qualcomm Spectrum can be used for supplemental downlink in additional markets, the benefits to competition and innovation described above would be further enhanced. However, the unpaired spectrum that is the subject of this transaction will not solve AT&T's total spectrum and capacity needs.

AT&T will provide documents responsive to this request, if any, at a later date.

16. REQUEST:

On page 6 of the Public Interest Statement, the Applicants state that "the market has shown that the Lower 700 MHz D and E blocks cannot and will not be put to full and efficient use as stand-alone one-way 6 MHz licenses." On page 7 of the Public Interest Statement, the Applicants state that "there is a risk that the unpaired Lower 700 MHz D and E blocks will remain under-utilized unless they can be used in conjunction with other paired spectrum to enhance broadband capacity." Provide all documents discussing how to make use of this spectrum and efforts by standard-setting organizations and equipment manufacturers to facilitate use, including documents discussing the efforts of existing licensees of the Lower 700 MHz Band, including D and E block licensees.

RESPONSE:

AT&T will provide documents responsive to this request, if any, at a later date.

17. REQUEST:

On page 30 of the Public Interest Statement, the Applicants assert that the market for wireless services is “robustly competitive, and that this transaction will not change that,” and that there is “no shortage of competition in advanced mobile broadband services.” In particular, with regard to spectrum holdings, the Applicants state on pages 30-33 that T-Mobile as well as the other two nationwide providers — have “sufficient spectrum to roll out 4G service.” The Applicants also assert on page 31 that T-Mobile “holds 50.4 MHz of spectrum on a nationwide average basis, which is proportionately more than AT&T given that T-Mobile supports a consumer base slightly more than one third of the size of AT&T’s.” The Applicants note as well on page 33 that T-Mobile “has announced plans to double the speed of its 4G network in order to bring speeds of up to 42 Mbps to 140 million people by the end of the year.” In light of those assertions:

- i. Explain, and provide all documents discussing how much spectrum is necessary to roll out competitive 4G services. Provide the definition of “4G” used in answering this question.
- ii. Explain, and provide all documents discussing whether some or all of the three other nationwide providers have the spectrum necessary to roll out competitive 4G services and networks in the timeframe specified in the Public Interest Statement. Provide the definition of “4G” used in answering this question.
- iii. Provide all documents discussing the competitive significance of each provider mentioned in your Public Interest Statement, on a provider-by-provider basis.

This information should be provided separately (a) for the baseline case (i.e., absent both the Proposed Transaction and the proposed AT&T/Deutsche Telekom-T-Mobile merger), (b) for circumstances as set forth in the Proposed Transaction (i.e., absent any AT&T/Deutsche Telekom-T-Mobile merger), and (c) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.

RESPONSE:

Three technologies offering speeds significantly faster than 3G have been deployed in the United States and labeled as 4G: LTE, WiMAX, and HSPA+ with enhanced backhaul. LTE and WiMAX will be competitive technologies for many years to come. HSPA+ is approaching the end of its development cycle and will be overtaken by competing technologies. LTE, for example, offers faster peak data speeds, greater spectral efficiency, and reduced latency.

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Spectrum requirements to roll out a competitive 4G offering depend on the size of a carrier's customer base, relative data usage levels, and service quality expectations. AT&T -- with its large customer base, industry leading smartphone penetration and correspondingly heavy data usage, and high service quality expectations -- has greater spectrum requirements than carriers not similarly situated.

The Proposed Transaction and the AT&T/ T-Mobile USA transaction will not affect Verizon's or Sprint's access to spectrum needed to roll out 4G offerings -- neither carrier was using, or had any publicly announced plans to use, any of the spectrum involved in these transactions for their 4G offerings. Both Verizon and Sprint are well positioned from a spectrum standpoint to respond to the improved AT&T service offerings that will be enabled by these transactions.

Verizon recently reaffirmed that it is "very happy in [its] current spectrum position."²³ As Verizon's CEO has said, Verizon is "extremely confident" that it has the "spectrum position" it needs. Verizon has a nationwide 22 MHz license in the Upper 700 MHz band, which will permit it to provide LTE service with a 10 MHz uplink and 10 MHz downlink.

Sprint, through its majority stake in Clearwire, has access to more spectrum (about 186 MHz)²⁴ than any other carrier -- including AT&T, even after the consummation of both this transaction and the T-Mobile USA transaction. To quote Sprint's CEO Dan Hesse, "When you combine Sprint's spectrum position with Clearwire's spectrum position it put[s] us in the

²³ Victor Godinez, *Verizon Exec Weighs in on AT&T/T-Mobile Deal, Spectrum Shortage*, Dallas News (May 22, 2011) <http://www.dallasnews.com/business/technology/headlines/20110522-verizon-exec-weighs-in-on-att-mobile-deal-spectrum-shortage.ece>.

²⁴ *In re Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, 25 FCC Rcd. 11,407, 11,568, ¶ 267, Table 26 (2010).

strongest place for the future.”²⁵ As Clearwire says on its website, Clearwire has “more spectrum than anyone.”²⁶ Clearwire is planning to deploy LTE in 40 MHz increments, with 20 MHz for the upload and 20 MHz for the download. Clearwire notes that this is “twice the size of other carriers” and is why its “download speeds are so much faster than theirs.”²⁷ As Clearwire explains: “It’s like the number of lanes on a freeway. We have more lanes, which means we can move more traffic at higher speeds.”²⁸ Clearwire’s WiMAX deployment has been similarly expansive. Making use of its “deep spectrum position”²⁹ Clearwire appears to deploy between three and six 10 MHz channels, depending on the market.³⁰ Clearwire describes its WiMAX offering as “super-fast,”³¹ and notes that its customer base has grown by 533% in the last year.³²

AT&T will provide documents responsive to this request, if any, at a later date.

²⁵ Andrew Munchbach, *Live from CTIA 2010’s Day Two Keynote with Sprint CEO*

Dan Hesse, BGR, <http://www.bgr.com/2010/03/24/live-from-ctia-2010%E2%80%99s-day-one-keynote-with-sprint%E2%80%99s-dan-hesse/> (Mar. 24, 2010).

²⁶ Clearwire, *Our Network*, <http://www.clearwire.com/company/our-network> (last visited June 2, 2011).

²⁷ Clearwire, *4G LTE Technology Trials*, <http://www.clearwire.com/company/featured-story> (last visited June 2, 2011).

²⁸ *Id.*

²⁹ Clearwire, *Our Company*, <http://www.clearwire.com/company/our-company> (last visited June 2, 2011).

³⁰ *AT&T: T-Mobile’s Spectrum Needed to Future-Proof 4G Networks*, Sidecut Reports, <http://www.sidecutreports.com/2011/03/22/att-t-mobiles-spectrum-needed-to-future-proof-4g-networks/> (Mar. 22, 2011); *Clearwire + T-Mobile?*, Dailywireless.org, <http://www.dailywireless.org/2010/09/02/clearwire-t-mobile/> (Sept. 2, 2010).

³¹ CLEAR, *What is CLEAR?*, <http://www.clear.com/discover> (last visited June 2, 2011).

³² CLEAR, *Hard Work Really Pays Off*, CLEAR Blog, <http://www.clear.com/blog/hard-work-really-pays-off/> (May 4, 2011).

18. REQUEST:

On pages 34-35 of the Public Interest Statement, the Applicants state that MetroPCS has already launched 4G LTE service in certain metropolitan areas, and that LightSquared is expected to begin rollout of LTE services beginning later this year. On page 35 of the Public Interest Statement, the Applicants state that “other regional providers have sufficient spectrum to provide mobile broadband services,” and pages 35-38 specifically mention Cricket (a subsidiary of Leap Wireless), U.S. Cellular, nTelos, Allied Wireless Communications, Cellular South, and Cox. With respect to those assertions, discuss in detail, with respect to each of these providers, how the provider would have sufficient spectrum to compete with AT&T in the provision of these mobile wireless services. This information should be provided separately (a) for circumstances as set forth in the Proposed Transaction (i.e., absent any AT&T/Deutsche Telekom-T-Mobile merger); and (b) for circumstances that assume the AT&T/Deutsche Telekom-T-Mobile merger has been approved.

RESPONSE:

We discuss below how MetroPCS, LightSquared, Cricket, U.S. Cellular, nTelos, Allied Wireless Communications, Cellular South and Cox have access to sufficient spectrum to compete with AT&T in the provision of 4G LTE services. Neither the Proposed Transaction nor the AT&T/ T-Mobile USA transaction will affect these carriers' access to spectrum -- none of these carriers was using, or had any publicly announced plans to use, any of the spectrum involved in either transaction for 4G LTE services.

MetroPCS says that it “introduced the first commercial 4G LTE service in the United States” in its Las Vegas and Dallas/Ft. Worth markets in September 2010.³³ *MetroPCS* currently offers what it describes as “[f]ull service talk and text, Web, email and multimedia at 4G speeds” in the following markets: Atlanta, Boston, Dallas/Ft. Worth, Detroit, North Florida/Jacksonville, Central Florida/Tampa and Orlando, South Florida, Las Vegas, Los Angeles/Bakersfield, New York, Philadelphia, Sacramento, and San Francisco.³⁴ *MetroPCS* is “deploying 4G LTE on PCS

³³ *MetroPCS Communications, Inc.*, Annual Report (Form 10-K) at 7 (Mar. 1, 2011).

³⁴ *MetroPCS*, Map of 4G LTE Coverage, <http://www.metropcs.com/4g/coverage/> (last visited June 2, 2011).

and AWS spectrum.”³⁵ MetroPCS’s current plan is “to reach approximately 100% coverage” across its existing footprint for its 4G LTE by the end of 2011.³⁶ The size of MetroPCS’s 4G LTE deployment depends on the availability of spectrum and ranges up to 20 MHz, with 10 MHz for the uplink and 10 MHz for the downlink. MetroPCS describes its spectrum portfolio as one of its “competitive strengths that distinguish[es] us from our principal wireless competitors.”³⁷ MetroPCS supplements its own spectrum portfolio with a roaming arrangement with Cricket. According to press reports, MetroPCS has been considering further strengthening its spectrum portfolio by purchasing out of bankruptcy TerreStar, which has significant holdings of MSS ATC spectrum.³⁸

LightSquared is building a 4G LTE network that will provide service for resale to others. It is “currently conducting technical testing which will run through 2011.”³⁹ The CEO of LightSquared said that the company “plans to offer wholesale nationwide 4G networks to wireless phone service providers, game makers and many others” in the second half of 2011,⁴⁰ and its “customers are expected to launch services in the first half [of] 2012.”⁴¹ LightSquared estimates that its nationwide network, consisting of 40,000 cellular base stations, “will cover

³⁵ MetroPCS Communications, Annual Report (Form 10-K) at 35 (Mar. 1, 2011).

³⁶ MetroPCS, Bank of America Credit Conference, Nov. 17, 2010, at 16, *available at* <http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NDA3MjY1fENoaWxkSUQ9NDE2NjIzZFR5cGU9MQ==&t=1>.

³⁷ MetroPCS Communications, Annual Report (Form 10-K), at 6 (Mar. 1, 2011).

³⁸ Phil Goldstein, Report: MetroPCS interested in TerreStar’s spectrum, *Fierce Wireless*, Dec. 16, 2010, <http://www.fiercewireless.com/story/report-metropcs-interested-bankrupt-terrestars-assets/2010-12-16>.

³⁹ LightSquared, Nationwide LTE Broadband Network, <http://www.lightsquared.com/what-we-do/network/> (last visited June 1, 2011).

⁴⁰ CNBC.com, LightSquared Plans to Offer 4G Nationwide: CEO (Mar. 23, 2011), <http://www.cnbc.com/id/42229328>.

⁴¹ LightSquared, Nationwide LTE Broadband Network, <http://www.lightsquared.com/what-we-do/network/> (last visited June 1, 2011).

92 percent of the U.S. population by 2015.”⁴² LightSquared intends to use “terrestrial and satellite technology” to ensure connectivity. LightSquared launched a satellite in November 2010⁴³ and obtained FCC approval to use its satellite to provide wireless service in January 2011.⁴⁴ Best Buy has signed a deal to become a mobile virtual network operator on LightSquared’s network.⁴⁵ LightSquared has entered 4G roaming agreements with Cellular South,⁴⁶ Cricket,⁴⁷ and SI Wireless (a partnership of rural independent telephone companies).⁴⁸ LightSquared has “59 MHz of nationwide ubiquitous spectrum in an advantageous frequency position.”⁴⁹ According to press reports, LightSquared and Sprint are close to entering into an arrangement in which LightSquared would pay \$2 billion a year for eight years for access to

⁴² *Id.*

⁴³ *Id.*

⁴⁴ Press Release, LightSquared, LightSquared Statement on the Federal Communications Commission Conditional Waiver of the Ancillary Terrestrial Component (ATC) Integrated Service Rule (Jan. 26, 2011), <http://www.lightsquared.com/press-room/press-releases/lightsquared-statement-on-the-federal-communications-commission-conditional-waiver-of-the-ancillary-terrestrial-component-atc-integrated-service-rule/>; Cecilia Kang, FCC grants LightSquared approval to use satellite airwaves for cell phones, Washington Post: Post Tech (Jan. 26, 2011), http://voices.washingtonpost.com/posttech/2011/01/the_federal_communications_com_9.html.

⁴⁵ Dan Jones, CTIA 2011: LightSquared Leaps Into Best Buy Deal, Light Reading Mobile (Mar. 23, 2011), http://www.lightreading.com/document.asp?doc_id=205971.

⁴⁶ Press Release, LightSquared, LightSquared and Cellular South Announce They Have Entered Into a Bilateral Roaming Agreement (Apr. 20, 2011), <http://www.lightsquared.com/press-room/press-releases/lightsquared-and-cellular-south-announce-they-have-entered-into-a-bilateral-roaming-agreement/>.

⁴⁷ Press Release, LightSquared, Cricket Enters into 4G Roaming Agreement with LightSquared (Mar. 22, 2011), <http://www.lightsquared.com/press-room/in-the-news/cricket-enters-into-4g-roaming-agreement-with-lightsquared/>.

⁴⁸ Press Release, LightSquared, LightSquared and SI Wireless Announce They Have Entered Into a Bilateral Roaming Agreement (Apr. 21, 2011), <http://www.lightsquared.com/press-room/press-releases/lightsquared-and-si-wireless-announce-they-have-entered-into-a-bilateral-roaming-agreement/>.

⁴⁹ LightSquared, Our Investors, <http://www.lightsquared.com/about-us/our-investor/> (last visited June 2, 2011).

Sprint cell sites where LightSquared would build out LTE using LightSquared's own spectrum.⁵⁰

LightSquared has not changed its timeframe for launching its 4G LTE network as a result of ongoing testing concerning interference between its system and GPS (Global Positioning System) receivers.⁵¹

Cricket has said that it "plan[s] to deploy next-generation LTE network technology over the next few years, with a commercial trial market to be launched in late 2011."⁵² Cricket's CEO said that it would roll out 4G in limited amounts in 2011 and increase coverage in 2012 and 2013.⁵³ He also said that Cricket does not plan to build an entire 4G network on its own.⁵⁴ In March 2011, Cricket entered into a 4G roaming agreement with LightSquared.⁵⁵ Cricket holds PCS and AWS spectrum, as described in Appendix B to the Public Interest Statement.

U.S. Cellular plans "to launch LTE in 24 markets by November [2011], which will cover 25% to 30%" of U.S. Cellular subscribers.⁵⁶ These 24 markets are concentrated in Iowa,

⁵⁰ Reuters, *LightSquared Near \$2 Billion A Year Sprint Deal: Sources* (June 1, 2011), available at <http://www.reuters.com/article/2011/06/01/us-sprint-lightsquared-idUSTRE7505GB20110601>; Phil Goldstein, *Report: Sprint, LightSquared Near \$2B/Year Network-Sharing Deal*, Fierce Wireless (June 2, 2011), available at <http://www.fiercewireless.com/story/report-sprint-lightsquared-near-2byear-network-sharing-deal/2011-06-02>.

⁵¹ Paul Kirby, *LightSquared Hasn't Changed Launch Date Due to GPS Interference Testing Process*, TR Daily (June 1, 2011), <http://www.tr.com/online/trd/2011/td060111/td060111-10.htm#TopOfPage>.

⁵² Leap Wireless International Inc., Annual Report (Form 10-K), at 3 (Feb. 25, 2011).

⁵³ *Leap CEO: We plan LTE 'Hotspots' Next Year*, FierceWireless (Dec. 8, 2010), <http://www.fiercewireless.com/story/leap-ceo-we-plan-lte-hotspots-next-year/2010-12-08>.

⁵⁴ *Id.*

⁵⁵ LightSquared, *Cricket Enters into 4G Roaming Agreement with LightSquared* (Mar. 22, 2011), <http://www.lightsquared.com/press-room/in-the-news/cricket-enters-into-4g-roaming-agreement-with-lightsquared/>.

⁵⁶ U.S. Cellular, Q1 2011 Telephone And Data Systems Inc Earnings Conference at 4 (May 6, 2011) (statement by Mike Irizarry, U.S. Cellular, EVP, CTO).

Wisconsin, eastern North Carolina, and Maine,⁵⁷ but the launch will also include markets in Texas and Oklahoma.⁵⁸ “The deployment will utilize 700 MHz spectrum and involve approximately 1,250 cell sites.”⁵⁹ U.S. Cellular plans to “expand the deployment of LTE in 2012 and beyond,”⁶⁰ but it has not identified the timing of this second wave of LTE deployment.⁶¹ U.S. Cellular began “technical trials of LTE” in late 2009 and “anticipates completing these trials in 2011.”⁶²

Cellular South announced in November 2010 that it will launch an LTE network in its footprint in the southeastern United States by the end of 2011.⁶³ Cellular South entered a 4G roaming agreement with LightSquared in April 2011.⁶⁴ Cellular South plans to implement its network with its 700 MHz spectrum.⁶⁵

⁵⁷ *Id.*

⁵⁸ Press Release, U.S. Cellular, U.S. Cellular to Launch 4G LTE Service and Devices in Time for the Holiday (May 6, 2011), <http://phx.corporate-ir.net/phoenix.zhtml?c=106793&p=irol-newsArticle&ID=1560901>.

⁵⁹ Mike Irizarry, Executive Vice President, Chief Technology Officer, U.S. Cellular, TDS and U.S. Cellular First Quarter Results Conference Call (May 6, 2011) (“*U.S. Cellular Q1 Call*”).

⁶⁰ United States Cellular Corp., Annual Report (Form 10-K) at 7 (Feb. 25, 2011) (“*U.S. Cellular 2011 10-K*”).

⁶¹ *U.S. Cellular Q1 Call* at 14-15.

⁶² *U.S. Cellular 2011 10-K* at 6.

⁶³ Kevin Fitchard, Cellular South launching LTE with Samsung, Connected Planet Unfiltered (Nov. 17, 2010), <http://blog.connectedplanetonline.com/unfiltered/2010/11/17/cellular-south-launching-lte-with-samsung/>.

⁶⁴ LightSquared, LightSquared and Cellular South Announce They Have Entered Into a Bilateral Roaming Agreement (Apr. 20, 2011), <http://www.lightsquared.com/press-room/press-releases/lightsquared-and-cellular-south-announce-they-have-entered-into-a-bilateral-roaming-agreement/>.

⁶⁵ Mike Dano, Verizon Blasts Cellular South’s LTE Plans, Argues Against Federal Oversight, The Motley Fool (Dec. 3, 2010), <http://www.fool.com/investing/general/2010/12/03/verizon-blasts-cellular-souths-lte-plans-argues-ag.aspx>.