



April 8, 2013

VIA ELECTRONIC FILING

Marlene H. Dortch, Esq.
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20054

**Re: *Applications of Sprint Nextel Corporation and SoftBank Corp.,
IB Docket No. 12-343***

Dear Ms. Dortch:

On January 28, 2013, Crest Financial Limited (“Crest”) filed its petition to deny (“Petition”) the Application of Sprint Nextel Corporation (“Sprint”), SoftBank Corporation (“SoftBank”), Starburst I, Inc., and Starburst II, Inc. (collectively, the “Applicants”) for consent to transfer control of licenses, authorizations, and spectrum leases held by Sprint and Clearwire Corporation (“Clearwire”). Applicants seek such consent to facilitate a proposed transaction (the “Proposed Transaction”) pursuant to which Sprint would merge with Clearwire after SoftBank acquires control of Sprint.

In its Petition, Crest explained that the Proposed Transaction is not in the public interest because it would hand over the entirety of Clearwire and its valuable spectrum to Sprint, which would prevent the public from realizing the true value of Clearwire’s spectrum. *Id.* at 11–16. Indeed, an independent Clearwire offers the best opportunity for a vibrant, new 4G network. Crest has also demonstrated that the Proposed Transaction seriously undervalues Clearwire’s spectrum, which would undermine the Commission’s efforts to unlock spectrum through incentive auctions. Crest explained that “Clearwire’s spectrum is in fact easily and demonstrably worth *at least* \$0.40 to \$0.70 per MHz pop—more than *two or three times* as much as the maximum value of Clearwire’s spectrum contemplated by the Proposed Transaction.” Reply of Crest Financial Limited in Support of Petition to Deny at 3, IB Docket No. 12-343 (Feb. 25, 2013). In support of that valuation, Crest submitted with its reply a report from Information Age Economics that detailed the value of Clearwire’s spectrum assets.

In addition, last month Crest submitted a study prepared by former FCC commissioner Dr. Harold Furchtgott-Roth and the Analysis Group, which concluded that Sprint's offer of just \$0.11 per Mhz pop was inadequate in light of recent spectrum prices for impaired spectrum having ranged from \$0.21–\$0.50 per Mhz pop, and prices for unimpaired spectrum having been at least \$0.55 per Mhz pop. Dr. Furchtgott-Roth also concluded that Clearwire and its spectrum is particularly valuable because it is well-positioned to pursue a profitable multiple customer case business model, a business path that Clearwire appears to be abandoning in the Proposed Transaction.

Although the Applicants have failed to present in this proceeding any evidence to contradict either of the two analyses that Crest submitted, Sprint has commissioned and publicized a study by Dr. Kostas Liopiros, "Value and Utility of the U.S. 2.5 GHz Spectrum Band" ("Liopiros Report"), that purports to justify the Proposed Transaction's purchase price and a low market price for Clearwire's spectrum.¹ Accordingly, Crest respectfully submits an additional report prepared by Dr. Furchtgott-Roth, which responds to the Sprint-sponsored Liopiros Report. See H. Furchtgott-Roth, "A Review of 'Value and Utility of the U.S. 2.5 GHz Spectrum Bank,'" April 8, 2013 (attached as Exhibit A).

In his report, Dr. Furchtgott-Roth explains that the Liopiros Report is unreliable and seriously flawed for at least three reasons. *First*, Dr. Furchtgott-Roth explains that the Liopiros Report attempts to compute a value for the 2.5 Ghz spectrum band using an unreliable "novel valuation equation, not widely used, if at all, among those who value spectrum." Dr. Furchtgott-Roth also explains that the calculations in the Liopiros Report fail to take into account several factors from recent spectrum transactions, each of which would counsel in favor of a higher value for the 2.5 Ghz spectrum band. *Second*, the Liopiros Report misstates the value of Sprint's offer for Clearwire. In particular, the Liopiros Report states that the value of Sprint's \$2.97 per share offer for Clearwire is \$0.21 per Mhz pop. But the actual value of that offer is closer to \$0.11 per Mhz pop. *Third*, Dr. Furchtgott-Roth explains that the Liopiros Report makes findings that are difficult to accept without doubting the integrity and reliability of the financial statements issued by Clearwire, which presumably were prepared with care.

In addition, Dr. Furchtgott-Roth responds to a criticism of his initial report that was recently published by D.A. Davidson in an institutional equity research report on Clearwire. Dr. Furchtgott-Roth explains, among other things, that the

¹ K. Liopiros, Sun Fire Group, February 27, 2013, available at http://newsroom.sprint.com/article_display.cfm?article_id=2528.

Davidson report improperly and unnecessarily questions the integrity of Clearwire's financial statements and incorrectly represents the calculation of enterprise value in the initial Furchtgott-Roth report.

* * *

For the reasons stated in Crest's Petition and Reply, the Commission should deny the Proposed Transaction or approve it only subject to the conditions proposed in Crest's previous filings.

This letter is filed pursuant to Section 1.1206 of the Commission's Rules.

Respectfully submitted,

/s/ Viet D. Dinh

Viet D. Dinh
Bancroft PLLC
1919 M Street, N.W.
Suite 470
Washington, D.C. 20036
vdinh@bancroftpllc.com

Encl.

cc: David Krech
Wayne McKee
Neil Dellar
Aaron Goldschmidt
Paul Murray
Christopher Sova
Kathleen Collins

Exhibit A

A Review of “Value and Utility of the U.S. 2.5 Ghz Spectrum Band”

Harold Furchtgott-Roth¹

April 2013

Summary

I have been asked by Crest Financial to review a recent paper by Dr. Kostas Liopiros, “Value and Utility of the U.S. 2.5 Ghz Spectrum Band”² (“The Liopiros Report”), which was commissioned by Sprint. I recently coauthored a report on a similar topic that examined, among other issues, the value of Clearwire spectrum in the 2.5 Ghz band.³ Based on my review of the Liopiros Report, I find the following:

- The Liopiros Report uses an unreliable equation to value spectrum in the 2.5 Ghz band;
- The Liopiros Report misstates the value of Sprint’s offer for Clearwire;
- The Liopiros Report findings are inconsistent with public representations of Clearwire officers; and
- The Liopiros Report findings are inconsistent with the publicly reported financial statements of Clearwire.

For each of these reasons, I find the results of the Liopiros Report unreliable.

I. The Liopiros Report uses on an unreliable equation to value spectrum in the 2.5 Ghz

The core of the valuation approach of the Liopiros Report is an equation. However, this is a formulaic approach that does not work for thin markets such as the market for spectrum. In fact, the valuation equation is not widely used, if at all, among those who value spectrum.

The equation is as follows:

¹ President, Furchtgott-Roth Economic Enterprises. I gratefully acknowledge a financial grant from Crest Financial. The views expressed in this paper are those of the author alone and do not necessarily represent the views of anyone else.

² K. Liopiros, Sun Fire Group, 27 February, 2013.

³ H. Furchtgott-Roth, D. Sosa, and E. Stone, “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire,” Analysis Group, March 12, 2013.

$$\text{Value} = \text{RB} \times \text{FC} \times \text{EV} \times \text{ET} \times \text{UV}^4$$

where

RB (reference band) = the value of a reference spectrum band in \$/MHz-pop

FC (frequency correction) = reduced area coverage at 2.6 GHz, the center frequency of the 2.5 GHz band

EV (EBS Availability) = average availability of leased EBS channels in a BTA

ET (EBS lease surtax) = 5 % capacity surtax for leased EBS licenses

UV (unpaired value) = relative value of unpaired spectrum based on encumbrances affecting the US 2.5 GHz band⁵

This equation has at least three broad flaws that render the results of the valuation analysis unreliable:

- False precision in comparisons across bands;
- Use of incorrect adjustment factors; and
- Omission of other adjustment factors that are likely more important.

Consideration of these factors substantially alters the results of the Liopiros Report.

A. False precision in comparisons across bands

The equation used in the Liopiros Report implies a false precision in translating the value of spectrum in one band with the value of spectrum in the 2.5 GHz band. In some instances with robust markets, comparisons can give relatively precise information. For example, one can go to any number of online sites and find price ranges for an automobile with specified features, mileage, and condition. These auto websites have a specific formula, not unlike the one in the Liopiros Report, that estimates the value of a car based on its characteristics. With millions of cars sold in the United States each year, it is possible to approximate price with the characteristics of a car. These web sites do not even point to specific comparable recent transactions; the car price information is based on a large number of transactions.

Similarly, one can visit other web sites to obtain information about the price of residential housing. As with cars, more than a million homes are sold every year, but homes are far more heterogeneous than cars. One can insert the characteristics of a house and lot, and the web site can respond with a list of a dozen comparable, but not identical, houses that have sold in nearby neighborhoods in recent months.

⁴ Liopiros Report, at 22.

⁵ Ibid., at 22-23.

These real estate websites have a specific formula, not unlike the one in the Liopiros Report, that estimates the value of a home based on its characteristics and comparable transactions.

Although it works well for robust markets for cars and residential real estate, the formulaic approach does not work nearly as well for thin markets such as spectrum. No web site is available for Clearwire or other spectrum holders to estimate the value of their spectrum based on comparable transactions within a specific band of spectrum, much less based on transactions in an entirely different band.

Even if a formulaic approach were proper (which it is not), it should be conducted with humility about the limitations of precision. The Liopiros Report suggests with its equation a precision of determining exactly the value of spectrum in one band with a transaction in another. This approach is fraught with potential errors including the following:

- The structure of the formula, including the variables included, might be wrong;
- Even if the formula were correct (which, in the case of Liopiros Report, it is not), the specific value of each parameter may be incorrect; and
- Combining an incorrect formula with incorrect parameter values can lead to substantial errors.

The Liopiros Report does not describe any of these potential errors of its equation and instead reports the results of the equation as if they were certain constants. This is false precision.

A better approach would be to present the value of spectrum transactions in various bands and then describe the various factors that might be considered in comparing values of different portfolios of spectrum licenses in different bands.⁶

B. Use of incorrect adjustment factors

To calculate the value of spectrum in the 2.5 Ghz band, the Liopiros Report compares transactions in other bands and uses four adjustment factors: FC, EV, ET, and UV. Each of these factors is incorrectly applied.

1. Frequency correction factor

The Liopiros Report adjusts the value of spectrum by the area that can be covered by a signal propagated in the spectrum. The specific adjustment factor is calculated in the report.⁷ The frequency correction factor has two shortcomings.

⁶ That is the approach taken in “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire.”

First, the Liopiros Report adjustment factor might make sense if all networks were configured to have the minimum number of cells to cover a geographic area. Some networks in rural areas have such a configuration. Many networks, particularly in urban areas, are designed differently with a dense structure. Thus, in New York City, for example, the wireless network density might be the same for a network operating at 600 Mhz as one operating at 2.5 Mhz mitigating any network density advantage for 600 Mhz.

Of course, in rural areas, where networks may be designed for sparse coverage, the 600 Mhz network may be more efficient than a 2.5 Mhz network. But spectrum is far more valuable in urban areas, where the 2.5 Mhz spectrum has little if any network density disadvantage. For purposes of assessing the value of 2.5 Ghz spectrum, it makes no sense to apply the frequency correction adjustment factor in urban areas or on a nationwide basis.

Second, if the frequency correction factor were correct, the Liopiros Report finds that spectrum at 700 Mhz should be *more than nine times* as valuable as AWS spectrum at 1.9 or 2.1 Ghz.⁸ Yet recent transactions for spectrum at 700 Mhz, while of greater value than AWS spectrum, has a factor closer to 2 than to 9.⁹ Consequently, the parameter values suggested in the Liopiros Report clearly do not accurately reflect market values.

Without a verifiable and robust parameter value, the frequency correction factor should be omitted.

2. EBS Availability factor

The Liopiros Report inappropriately applies a 50% percent discount, with a factor labeled “EV,” the availability factor to EBS licenses.¹⁰ Such a factor makes no sense in valuing spectrum that Clearwire has *already* leased. In its public statements and SEC filings about its spectrum holdings, Clearwire presumably includes only EBS spectrum channels that it has leased, not channels that are unavailable for lease. To apply a 50% discount factor to the megahertz pops that Clearwire is reporting is equivalent to assuming that Clearwire is misrepresenting its spectrum holdings in public documents. I have seen no evidence to suggest such a pejorative interpretation of the Clearwire statements. Indeed, the FCC

⁷ See Liopiros Report at 17-18.

⁸ *Ibid.*, at 18.

⁹ See, e.g., discussion of AWS and 700 Mhz transactions, “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire,” at 25-26.

¹⁰ Liopiros Report at 22-23.

assessments of Clearwire spectrum holdings are similar to those of Clearwire.¹¹ The FCC does not apply any discount factor to EBS spectrum, much less a 50% discount factor.

Another possible interpretation of the discount factor, although not clearly stated in the Liopiros Report, is that EBS spectrum is difficult to manage because EBS channels may differ across markets.¹² The preliminary portions of the Liopiros Report focus on the unique licensing characteristics in the United States of the 2.5 Ghz band.¹³ The same observation, however, could be made about each band of spectrum in the United States. No two bands of spectrum are licensed in exactly the same manner. Most bands of spectrum have some unique rules and practices.

The Liopiros Report also observes the extraordinary difficulty of leasing, aggregating, and managing 2.5 Ghz spectrum, particularly EBS leases.¹⁴ These observations might be valuable counsel today to a company seeking to aggregate for the first time licenses in the 2.5 Ghz band, or the counsel might have been valuable to Clearwire ten years ago, before it undertook the task of leasing, aggregating, and managing EBS licenses. But they make little sense applied to Clearwire today, a company that has succeeded in leasing, aggregating, and managing 2.5 Ghz spectrum and a 4G network.

For unexplained reasons, the Liopiros Report focuses on the difficulty of aggregating spectrum in one 6 Mhz (EBS C1) channel in Dallas, Texas and one 6 Mhz channel (EBS A1) in St. Louis, Mo.¹⁵ The discussion might be more compelling if it were not the case that Clearwire has an average of 160 Mhz of spectrum in the 100 largest U.S. markets, including Dallas and St. Louis.¹⁶

The Liopiros Report warnings pertain to challenges Clearwire long ago surmounted. Clearwire today has already succeeded in aggregating 2.5 Ghz licenses. It has succeeded to the extent of 47 billion Mhz pops of licenses, the majority of which are EBS licenses.¹⁷ In the 2.5 Ghz band, Clearwire already either has the license or the lease to the vast majority of available spectrum. As Clearwire proudly notes:

¹¹ See, e.g., FCC, *16th Annual Report*, Wireless Competition, released March 21, 2013, at 18.

¹² See Liopiros Report at 2.

¹³ “The 2.5 GHz band in the United States (U.S.), for historical and policy reasons, is different from other domestic spectrum bands that could be used to provide wireless broadband services. The 2.5 GHz band lacks uniformity in licensing and coverage...” Liopiros Report at 1, and 2-12.

¹⁴ “These limitations include the complexity and cost of managing leases of EBS channels as well as the risk that critical leases may not be able to be renegotiated at the end of the lease, thereby potentially disrupting broadband channel plans and network coverage.” Liopiros Report, at 2.

¹⁵ The discussion of Dallas, Texas is in the Liopiros Report at 9-10, and the discussion of St. Louis, MO is at 10-11.

¹⁶ Clearwire, Form 10-K for year ended December 31, 2012, released February 14, 2013, at 17.

¹⁷ *Ibid.*, at 18.

We hold approximately 140 Mhz of spectrum on average across our national spectrum footprint and approximately 160 Mhz of spectrum on average in the 100 largest markets in the United States. Our deep spectrum position in most of our markets enables us to offer our subscribers significant mobile data bandwidth, with potentially higher capacity than is currently available from other carriers.¹⁸

Because Clearwire has succeeded in aggregating the vast majority of 2.5 Ghz spectrum, no other carrier can begin to replicate Clearwire's 2.5 Ghz spectrum holdings. Clearwire holds more spectrum than any other carrier, a position it has held for many years.¹⁹ Ultimately, the complex license structure in the 2.5 Ghz band is not a competitive liability worthy of a discount factor for Clearwire but more likely a competitive asset.

The Liopiros Report applies a 50% discount for EBS licenses as "EBS availability factor." No such adjustment is warranted.

3. EBS Lease factor

The Liopiros Report repeatedly suggests that EBS leases should be valued both differently and less than BRS licenses.

Limitations in using leased EBS channels for wireless broadband reduce the value of leased EBS channels vis-à-vis owned BRS spectrum. These limitations include the complexity and cost of managing leases of EBS channels as well as the risk that critical leases may not be able to be renegotiated at the end of the lease, thereby potentially disrupting broadband channel plans and network coverage.²⁰

The Liopiros Report also suggests a lower value for EBS license because of the requirement to preserve *at least* five percent of leased EBS channel capacity for educational use.²¹

Yet there are many reasons not to have a lease factor to distinguish EBS from BRS licenses. Clearwire for years has valued all of its spectrum holdings, both BRS and EBS, as largely the same. Clearwire in its public documents has consistently maintained that its leased spectrum is quite valuable.²² In its public documents, Clearwire, in assessing the market value of its spectrum holdings, consistently does not distinguish leased from owned spectrum but instead values all of its spectrum in aggregate.

¹⁸ Ibid., at 17.

¹⁹ See, e.g., FCC, *16th Annual Report*, Wireless Competition, released March 21, 2013, at 18. The FCC credits Clearwire with an average of 131.5 MHz per Pop--still by far more spectrum than any other carrier-- rather than the 140 MHz Clearwire claims.

²⁰ Liopiros Report at 2.

²¹ Ibid., at 1.

²² Clearwire Form 10-K for year ended December 31, 2012, at 17-18.

Clearwire accounts for most of the available spectrum in those bands, and is the actual licensee for approximately 41% of its spectrum.²³ Its licenses are renewable. The remainder of the Clearwire spectrum (mostly EBS spectrum) is leased licenses primarily on 30-year leases with 25 years or more remaining on most leases.²⁴

Although valuations of spectrum tend to favor licenses that are directly titled to a licensee, the discount in the value of the leased Clearwire licenses should be relatively small for at least three reasons: (a) most of the leases have 25 years or more remaining on them;²⁵ (b) as Clearwire notes in its impairment analyses of intangible assets, it treats both its leased spectrum and its licensed spectrum as “intangible assets with indefinite lives;”²⁶ (c) because Clearwire has most of the EBS and BRS licenses, no other company can build a competing nationwide network exclusively in this band and bid up the lease prices of spectrum leases.

The Liopiros Report applies a 5% discount for EBS licenses as “EBS lease factor.” Although some capacity must be reserved in EBS Licenses for educational purposes, there is no compelling reason to treat EBS licenses in a manner different from the way Clearwire treats them.

4. Unpaired spectrum factor

In valuing the Clearwire spectrum, the Liopiros Report applies a 50% discount to the 2.5 Ghz band because it allegedly is primarily useful as unpaired spectrum for time-division duplex (“TDD”) technology.²⁷ As I will discuss below, the 2.5 Ghz spectrum could easily be applied to paired spectrum, and thus no adjustment factor is needed between paired and unpaired spectrum. Moreover, the comparisons to unpaired spectrum are not meaningful for the Clearwire spectrum.

The Liopiros Report, while recognizing the regulatory permissibility of paired spectrum for frequency division duplex (“FDD”) technology in the 2.5 Ghz band, incorrectly asserts that such a paired technology would be difficult to implement.²⁸ The claim might make sense if there were many competing carriers in the 2.5 Ghz band or if Clearwire had relatively small holdings. The Liopiros Report observation, however, makes little sense for a carrier with on average 140 Mhz across the United States in a band of

²³ Ibid.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid., at 62.

²⁷ Liopiros Report at 3.

²⁸ Ibid.

186 Mhz.²⁹ If Clearwire, or any potential buyer of the Clearwire spectrum, wanted to use it for FDD technology, it could be done. As the FCC itself noted in 2004:

Additionally, we conclude that in order to allow the spectrum to be technology-neutral to the maximum extent possible, channels utilized for FDD in this spectrum will not be paired by fixed channel assignments. Rather, upstream FDD operations will be permitted in the LBS, and paired with channels in the UBS for downstream communications by dynamic channel assignment (DCA).³⁰

The Liopiros Report implies that Clearwire has chosen an inferior TDD technology to use in the 2.5 Ghz band because of limitations in the licensing structure of the band that discourages use of FDD technology.³¹ Yet the TDD technology is not inferior to FDD technology.³² If it preferred to do so, a licensee with the spectrum density of Clearwire could easily deploy FDD with paired spectrum.

Even if there should be an adjustment factor between paired and unpaired spectrum in the 2.5 Ghz band, the adjustment factor developed in the Liopiros Report does not withstand scrutiny. The Liopiros Report suggests a 50% discount factor based largely on the European experience with auctions of 2.5 Ghz spectrum.³³ Much of this information is presented in a report prepared for Ofcom.³⁴ That report reviews various auctions in Europe and finds higher auction prices for paired than for unpaired spectrum at 2.6 Ghz. Those European auction results are not directly comparable to Clearwire for several reasons including:

- None of the auctions was for more than a small fraction of the 140 Mhz of spectrum controlled by Clearwire;
- Most if not all of the auctions involved multiple winners, not a single entity controlling all of the spectrum; and
- Many of the auction rules precluded participation by potentially willing participants.

The Liopiros Report applies a 50% discount for an “unpaired spectrum factor.” There is no compelling and verifiable reason for such a factor.

²⁹ Clearwire, Form 10-K for year ended December 31, 2012, at 17-18.

³⁰ FCC, *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 03-66, WT Docket No. 03-67, MM Docket No. 97-217, WT Docket No. 02-68, and WT Docket No. 00-230, released July 29, 2004, at paragraph 134.

³¹ Liopiros Report, at 3 and 20.

³² See “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire,” at 10-19.

³³ Liopiros Report at 14-16.

³⁴ DotEcon and Athea, prepared for Ofcom, “Spectrum Value of 800 Mhz, 1800 Mhz, and 2600 Mhz,” July 2012.

5. Conclusion

For the reasons stated above, the frequency correction factor, the EBS availability factor, the EBS lease factor, and the unpaired spectrum factor make no sense and should be excluded. To the extent they are included, they should be set to 1.

C. Omission of other adjustment factors that are likely more important

The Liopiros Report considers three recent transactions as base cases:³⁵

- Verizon-Spectrum Co. transactions for AWS-1 spectrum;³⁶
- AT&T-NextWave transaction for primarily WCS spectrum;³⁷ and
- DISH Network's acquisition of Mobile Satellite Spectrum from DBSD and TerreStar from bankruptcy court.³⁸

The Liopiros Report treats these three transactions equivalently, and yet each is quite different. At least two of these transactions warrant their own adjustment factors that are almost certainly more significant than those suggested in the Liopiros Report. I review just a few of these potential adjustment factors.

1. Spectrum for mobile-broadband-use adjustment factor

The 30 Mhz of WCS spectrum that AT&T acquired in 2012 was not entirely usable for mobile broadband services. Indeed, only 20 Mhz of spectrum was usable for mobile broadband services. The price stated in the Liopiros Report of \$0.21 per Mhz pop is based on the full 30 Mhz of WCS spectrum.³⁹ If one accounts only for the spectrum that could be used for mobile broadband services, the price is adjusted to \$0.32.⁴⁰ The Liopiros Report rather euphemistically states: "AT&T plans to restrict the use of the adjoining 5 Mhz C and D blocks of the WCS band to fixed (i.e. non-mobile) applications to mitigate possible interference with satellite radio services, which use the adjacent spectrum."⁴¹ The decision to use the C and D blocks for fixed rather than mobile services was a regulatory requirement rather than a voluntary business decision by AT&T.⁴²

³⁵ Among many other transactions, these three are discussed at length in "An Assessment of the Economic and Industry Reasonableness of Sprint's Offer for Clearwire," at 22-25.

³⁶ Liopiros Report at 23-24.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid., at 23.

⁴⁰ See also "An Assessment of the Economic and Industry Reasonableness of Sprint's Offer for Clearwire," at 23.

⁴¹ Liopiros Report at 23-24.

⁴² See new 47 CFR 27.50(a)(3). "(ii) Mobile and portable stations are not permitted to transmit in the 2315-2320 MHz and 2345-2350 MHz bands."

Thus, if it were sensible to include factors to adjust values across spectrum bands, it would be reasonable to include a factor adjusting for the portion of spectrum in which mobile broadband services can actually be offered.

2. Bankruptcy adjustment factor

DISH acquired the assets of DBSD and TerreStar out of bankruptcy court. Because of the high transaction costs and other factors in bankruptcy court, asset sale prices tend to be at lower levels than would obtain were the seller not in bankruptcy court. Unlike DBSD and TerreStar, Clearwire and its assets are not in bankruptcy. Thus, if it were sensible to include factors to adjust values across spectrum bands, it would be reasonable to include a bankruptcy adjustment factor greater than 1.0 to compare transactions that were in bankruptcy.

Moreover, in the case of DBSD and TerreStar, DISH was not merely a third-party buyer, but a shareholder and creditor as well. Although the exact value of DISH's investment in DBSD and TerreStar is difficult to calculate, it is almost certainly greater than the bankruptcy court amount.⁴³ Thus, if it were sensible to include factors to adjust values across spectrum bands, one might have an additional factor for buyers that were shareholders or creditors of the bankrupt entity.

3. Absence of FCC regulatory permission to offer mobile broadband services adjustment factor

For both the AT&T and the DISH transactions in the Liopiros Report, the FCC had not announced regulatory permission to use the spectrum for mobile broadband purposes. Consider the following timelines:

- AT&T- WCS: The transaction was announced in the summer of 2012,⁴⁴ but the regulatory authority to operate mobile broadband services in the WCS was not finally cleared until October 2012.⁴⁵
- DISH- DBSD/TerreStar: In bankruptcy proceedings in 2011, DISH acquired the equity of DBSD and the assets of TerreStar.⁴⁶ Regulatory approval for DISH to offer terrestrial broadband services in these satellite bands was not obtained until 2012 and 2013.⁴⁷

⁴³ See discussion in "An Assessment of the Economic and Industry Reasonableness of Sprint's Offer for Clearwire," at 22-23.

⁴⁴ "AT&T Agrees to Acquire NextWave Wireless, Inc.," AT&T News Release, August 2, 2012, at <http://www.att.com/gen/press-room?pid=23161&cdvn=news&newsarticleid=34976>.

⁴⁵ FCC, Order on Reconsideration, Docket 07-293, October 17, 2012.

⁴⁶ DISH 2011 10-K, p. 1, and pp. 5-6.

AT&T or another buyer would almost certainly have been willing to pay *more* for WCS spectrum after new service rules that permitted mobile broadband services were in place rather than purchasing the spectrum before those service rules were adopted. Similarly, DISH or another buyer would almost certainly have been willing to pay *more* for AWS-4 spectrum after those service rules permitting mobile broadband services were adopted. Thus, if it were sensible to include factors to adjust values across spectrum bands, one might have an additional factor reducing the value of spectrum in bands where transactions are negotiated and announced before service rules were available.

4. Contiguous block discount factors

With approximately 186 Mhz, the 2.5 Ghz band is the largest band of spectrum for mobile services, and EBS and BRS offer the largest blocks of contiguous spectrum for commercial applications. Clearwire accounts for the vast majority of EBS and BRS spectrum licenses. Other advantages of the EBS and BRS spectrum include relatively few restrictions on use, build out requirements largely met, relatively high power limits, little concern about out-of-band emissions in most of the band, little concern about interference from outside of the band,⁴⁸ and widely available equipment.⁴⁹

If it were sensible to include factors to adjust values across spectrum bands, one might have an additional factor for spectrum in large contiguous blocks, which would be more valuable than spectrum in smaller blocks.

D. Consideration of these factors substantially alters the results of the Liopiros Report

With the four factors that it considers, the Liopiros Report asserts that, based on AWS-4 spectrum that sold at \$0.24 per Mhz pop, BRS spectrum would sell for \$0.10 per Mhz pop and EBS spectrum would sell for \$0.05 per Mhz pop.⁵⁰ Similarly, the Liopiros Report finds that, based on AWS-1 spectrum that sold at \$0.69 per Mhz pop, BRS spectrum would sell for \$0.28 per Mhz pop and EBS spectrum would

⁴⁷ See FCC Docket 12-70, *Report and Order and Order of Proposed Modification*, December 17, 2012, *Order on Modification*, February 15, 2013.

⁴⁸ See discussion of guard bands for EBS and BRS, Clearwire, Form 10-K, for year ended 12/31/2011, released February 16, 2012, at 14.

⁴⁹ See H. Cochran, CFO of Clearwire, presentation at Deutsche Bank Media and Telecommunications Conference, February 28, 2012, slide 8.

⁵⁰ Liopiros Report at 24-25.

sell for \$0.13 per Mhz pop.⁵¹ The asserted values based on WCS spectrum are slightly above those for the AWS-4 spectrum.

As noted earlier, it is difficult to make a precise, formulaic comparison of the value of spectrum across spectrum bands. In my earlier study with the Analysis Group, we presented the values of recent transactions and explained reasons why some of those valuations (for impaired spectrum) might be lower than they would be without impairment. The Liopiros Report, in contrast, looks at specific transactions and purports to equate each transaction to a specific value of BRS spectrum and a specific value of EBS spectrum using an equation. But the equation is wrong and the precision is false. The review of the Liopiros factors above suggests that those factors should be omitted or set to one. Under those circumstances, the corresponding values of both BRS and EBS spectrum would range between \$0.22 and \$0.69 per Mhz pop.

Moreover, consideration of the four factors not included in the Liopiros Report and discussed above—capability of supporting mobile broadband services, bankruptcy, FCC rules in place, and contiguous blocks of spectrum—would result in *higher* values for the BRS and EBS spectrum. As I do not believe the equation approach leads to exactly quantifiable results, I do not estimate the values of these additional factors, but the direction of the effect of these factors on BRS and EBS values is unambiguously positive.

II. The Liopiros Report misstates the value of Sprint’s offer for Clearwire

The Liopiros Report states that the value of Sprint’s \$2.97 per share offer for Clearwire is \$0.21 per Mhz pop.⁵² As discussed elsewhere, the actual value is closer to \$0.11 per Mhz pop.⁵³

The mistaken valuation of the Sprint offer for Clearwire at \$0.21 per Mhz pop has been repeated elsewhere. For example, a recent investment analysis by DA Davidson reviewed “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire” but still makes the error of valuing the Sprint offer at \$0.21 or even \$0.22 per Mhz pop primarily by not excluding the value of other assets.⁵⁴ I review the Davidson analysis in the Appendix.

III. The Liopiros Report findings are inconsistent with public representations of Clearwire officers

⁵¹ Ibid.

⁵² Ibid., at i.

⁵³ See “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire.”

⁵⁴ See D. Jaegers, Institutional Equity Research, “Clearwire Corp,” DA Davidson, April 1, 2013.

The Liopiros Report asserts that the value of Clearwire BRS licenses is between \$0.10 and \$0.28 per Mhz pop, and the value of Clearwire EBS licenses is between \$0.05 and \$0.13 per Mhz pop.⁵⁵ The weighted average based on the AWS-1 spectrum is \$0.19 per Mhz pop, but the weighted average based on the AWS-4 spectrum or WCS spectrum is only \$0.07 per Mhz pop.⁵⁶ Clearwire officers in recent years have valued all Clearwire spectrum, both EBS and BRS licenses, at between \$0.25 and \$1.50 per Mhz pop.⁵⁷ The Liopiros Report is inconsistent with the public positions of Clearwire officers.

IV. The Liopiros Report findings are inconsistent with the publicly reported financial statements of Clearwire

Throughout the Liopiros Report are statements that implicitly call into question the integrity and reliability of the financial statements of Clearwire. The Liopiros Report states that the value of higher frequency spectrum is less than lower frequency spectrum; the Clearwire financial statements make no such adjustments. The Liopiros Report states that EBS spectrum is worth substantially less than BRS spectrum; the Clearwire financial statements do not treat its EBS and BRS spectrum differently. The Liopiros Report states that unpaired spectrum is worth substantially less than paired spectrum; the Clearwire financial reports make no such distinction or adjustment in value. An analysis of the Clearwire financial statements reveals a value of the Sprint offer of \$2.97 per share corresponds to a value of \$0.11 per Mhz pop.⁵⁸ The Liopiros Report states the value is \$0.21 per Mhz pop.

Finally, the Liopiros Report finds that EBS spectrum is worth as little as \$0.05 per Mhz pop and the blended average of Clearwire spectrum is worth as little as \$0.07 per Mhz pop. As of December 31, 2012, Clearwire carried on its balance sheet its spectrum, both directly owned licenses and leases, at \$4.25 billion.⁵⁹ This corresponds to a book value of \$0.09 per Mhz pop on licenses largely acquired by Clearwire many years ago. Each year, Clearwire conducts an impairment analysis to determine if its spectrum valuation should be reduced as a result of changes in market value. The findings of the Liopiros Report are that the implicit values of Clearwire spectrum based on AWS-4 spectrum transactions or WCS spectrum transactions were in the range of \$0.07 per Mhz pop. If these findings reflected the actual

⁵⁵ Liopiros Report at 24-25.

⁵⁶ I calculate these weighted averages based on 59% EBS and 41% BRS licenses.

⁵⁷ For a review of these statements, see “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire,” at 30-31.

⁵⁸ See “An Assessment of the Economic and Industry Reasonableness of Sprint’s Offer for Clearwire.”

⁵⁹ Clearwire, Form 10-K for year ending December 31, 2012, at 56.

market value of Clearwire spectrum, Clearwire should be taking impairment losses on it spectrum. But Clearwire states that it had no impairment losses.⁶⁰

It is difficult to accept the findings of the Liopiros Report without doubting the integrity and reliability of the financial statements issued by Clearwire. Given the presumable care with which the Clearwire financial statements were prepared by Clearwire staff, it would seem more reasonable to rely on those statements rather than Liopiros Report.

Conclusion

For each of the topics discussed in this paper, I find the Liopiros Report unreliable.

⁶⁰ Ibid., at 90.

Appendix

Review of Differences in the Calculation of Price per Mhz Pop associated with Sprint's Offer of \$2.97 per Share of Clearwire

DA Davidson ("Davidson") recently published an institutional equity research report on Clearwire.⁶¹ Among other topics, it reviews and critiques "An Assessment of the Economic and Industry Reasonableness of Sprint's Offer for Clearwire," which I prepared with colleagues from Analysis Group.⁶² I will refer to this document as "An Assessment."

Davidson focuses on different calculations of the implicit price per Mhz pop of the Sprint offer for Clearwire. Sprint claims that its \$2.97 per share corresponds to \$0.21 per Mhz pop; "An Assessment" finds the Sprint offer corresponds only to \$0.11 per Mhz pop. Davidson provides its own calculation of \$0.22 per Mhz pop. This appendix explains the differences in calculations.

"An Assessment" describes in some detail the calculation of enterprise value and spectrum prices per Mhz pop based on Clearwire information.⁶³ Davidson incorrectly represents the calculation of enterprise value in "An Assessment."

Table A-1 presents the information used in the calculation of enterprise value and price of spectrum per Mhz pop by Davidson and by "An Assessment" without including "lease obligations." Although Davidson has different assumptions about the number of diluted shares, the long-term debt, and the cash position of Clearwire, Davidson's assumptions yield an enterprise value of \$9.1 billion while "An Assessment" finds an enterprise value of \$8.4 billion. If all enterprise value were embodied just in spectrum, Davidson obtains a price per Mhz pop of \$0.19 while "An Assessment" obtains a price of \$0.18. Subtracting non-spectrum asset values from enterprise value yields a price per Mhz pop of \$0.12 for Davidson as opposed to \$0.11 for "An Assessment."

⁶¹ See D. Jaegers, Institutional Equity Research, "Clearwire Corp," DA Davidson, April 1, 2013.

⁶² H. Furchtgott-Roth, D. Sosa, and E. Stone, "An Assessment of the Economic and Industry Reasonableness of Sprint's Offer for Clearwire," Analysis Group, March 12, 2013.

⁶³ *Ibid.*, at 32-33.

Both because (1) the Clearwire information is public and submitted to the SEC and (2) the Davidson numbers and adjustments are undocumented, the numbers based on “Clearwire Information” are preferable to use. These numbers in Table A-1 are also consistent with those presented in “An Assessment.”

Table A-2 presents the same calculations, but includes, under the Davidson calculations, “lease obligations” in the construction of a measurement of corporate value that I will label “alternative enterprise value.” The Davidson calculation is not a pure measure of enterprise value because it includes some, but not all, contractual obligations and long-term liabilities of the company. I use the term “alternative enterprise value” because this is not the standard definition of enterprise value which typically measures market capitalization plus net long-term debt minus cash. The Davidson measure excludes a wide range of long-term contractual obligations such as office space leases and long-term employment contracts. To show a better documented measure of the “alternative enterprise value,” I show under “Clearwire Information” a version including all long-term liabilities from the Clearwire balance sheet.⁶⁴ The Davidson measure of “Alternative Enterprise Value” is \$10.625 billion, while the same measure based on Clearwire information is \$9.392 billion. Assuming that all enterprise value is embodied in spectrum, the Davidson price per Mhz pop is \$0.22 while the Clearwire information price per Mhz pop under the same assumptions is \$0.20. After subtracting the non-spectrum assets from “Alternative Enterprise Value,” the price per Mhz pop for the Davidson calculation is \$0.15 while the price with Clearwire information is \$0.13.

The “Alternative Enterprise Value” calculation in Table A-2 is less reliable than the “Enterprise Value” calculation in table A-1 for several reasons. Although some long-term liabilities may be included in enterprise value calculations, it is unusual to include all of them, certainly without clear explanation. The “lease obligations” included by Davidson are undocumented and not listed on the Clearwire balance sheet. Moreover, they *exceed* Clearwire’s stated long-term liabilities. While including *all* long-term liabilities in an enterprise value calculation is unusual and not warranted in this case, it would be even more unusual to include undocumented liabilities in excess of long-term liabilities.

Even using the “Alternative Enterprise Value” measure, it is impossible to reach Sprint’s claimed valuation of \$0.21 per Mhz pop except by assuming that all enterprise value is embodied in spectrum. Such an assumption of no value outside of spectrum is implausible and inconsistent with Clearwire’s publicly disclosed financial records.

⁶⁴ Clearwire 2012 Form 10-K, at 79.

Davidson observes:

What is the value of CLWR's non-spectrum assets? The FR study just subtracts CLWR's total assets less spectrum value which results in his \$3.4 billion valuation. However, CLWR's non spectrum assets consist of Net PP&E of \$2.26 billion on its Wi-Max network, which could be considered obsolete going forward since it is not generating enough cashflow to keep CLWR as a going concern.⁶⁵ We think there is some value in CLWR's network but it is minimal...

We think the snap-shot of CLWR's financials used by the FR study does not acknowledge that CLWR is currently losing money and will need another \$2- \$3billion to remain a going concern.⁶⁶

The Davidson observations are primarily a series of questions about the integrity of the Clearwire financial statements. Clearwire, consistent with relevant legal and accounting principles, states the value of its assets. Davidson may have its own opinions about the value of various Clearwire assets, but it seems to take a rather unsubstantiated and dim view of the accuracy of Clearwire's financial records and any report based upon them.

Clearwire reviews the value of its property, plant and equipment ("PP&E") quarterly and adjusts the value based on those reviews.⁶⁷ Clearwire conducts impairment analyses of its PP&E which should lead to restatements of the value of those assets should they decline.⁶⁸ The value of PP&E that Clearwire carries on its books has declined significantly in the past few years.⁶⁹ Davidson may view the value of the network as "minimal," but the \$2.26 billion valuation is one that Clearwire has reviewed and stated itself.

The Davidson Report raises questions about whether Clearwire is a going concern.⁷⁰ These are strong statements, again not reflected in Clearwire's financial statements. In Clearwire's Form 10-Q for the third quarter of 2012, there is no mention of "going concern" issues.⁷¹ "Going concern" issues arise in the 2012 Form 10-K only in the context of the following clause:

If the Merger Agreement terminates and we are unable to raise sufficient additional capital to meet our capital needs on acceptable terms in a timely manner, or we fail to generate sufficient revenue from our wholesale and retail businesses to meet our ongoing obligations beyond the next twelve months."⁷²

⁶⁵ Davidson at 3.

⁶⁶ Ibid.

⁶⁷ Clearwire 2012 Form 10-K, at 64.

⁶⁸ Ibid.

⁶⁹ Ibid., at 79.

⁷⁰ Davidson at 3.

⁷¹ Clearwire, 2012 Third Quarter 10-Q, released October 26, 2012.

⁷² Clearwire, 2012 Form 10-K, e.g., at 27.

Nothing in this clause isolates the valuation of Clearwire's PP&E as either the source or the remedy for any going concern issues for Clearwire.

Whether Clearwire is a going concern or not, it has a portfolio of assets on its balance sheet, and that portfolio consists of assets other than spectrum. Unless and until Clearwire has no assets but spectrum, any valuation of Clearwire's spectrum will necessarily be less than the valuation of the company as a whole. When the value of other assets is netted out of Clearwire's enterprise value, the resulting spectrum value is substantially less than \$0.21 per Mhz pop, most reasonably at \$0.11 per Mhz pop.

Table A1					
Calculation of price per Mhz Pop					
Without including lease obligations					
		Davidson		Clearwire	
		assumptions		information	
Equity price		2.97		2.97	
Number of diluted share		1,550,000		1,465,000	a
Market capitalization		4,603,500		4,351,050	
Long-term debt		4,470,000		4,271,357	b
Cash		-		193,445	b
Enterprise value		9,073,500		8,428,962	
Price per Mhz pop assuming all enterprise value is spectrum		0.19		0.18	c
Value of non-spectrum assets					
current assets		987,688		987,688	b
Property, plant and equipment		2,259,004		2,259,004	b
Other assets		169,476		169,476	b
Enterprise value minus non-spectrum assets		5,657,332		5,012,794	
Price per Mhz pop of residual value		0.12		0.11	
<p>a Clearwire itself only claims 1.399 billion diluted shares. See Clearwire, 2012 10-K. p. 121. Clearwire acknowledges, however, the presence of 123.5 million "potential common shares," but does not include these in its calculations. p. 121. Ycharts.com implicitly use a value of 1.465 billion diluted shares to calculate market capitalization and enterprise value. We use the same value.</p>					
<p>b Clearwire, 2012 10-K. p. 79.</p>					
<p>c Based on 47 billion Mhz pops. Clearwire, 2012 10-K. p. 18.</p>					
<p>All Davidson assumptions are from Davidson, Clearwire review, April 1, 2013, p. 3.</p>					

Table A2				
Calculation of price per Mhz Pop				
Under Measurement of "Alternative Enterprise Value" including various measures of long-term liabilities				
	Davidson		Clearwire	
	assumptions		information	
Equity price	2.97		2.97	
Number of diluted share	1,550,000		1,465,000	a
Market capitalization	4,603,500		4,351,050	
Long-term debt	4,470,000		4,271,357	b
Cash	-		193,445	b
Enterprise value	9,073,500		8,428,962	
NPV of \$1.608 billion in operating lease obligations	650,000			
NPV of \$6.6 billion in spectrum lease obligations	541,900			
Long-term liabilities			963,353	b
Alternative enterprise value	10,265,400.00		9,392,315.00	
Price per Mhz pop assuming all enterprise value is spectrum	0.22		0.20	c
Value of non-spectrum assets				
current assets	987,688		987,688	b
Property, plant and equipment	2,259,004		2,259,004	b
Other assets	169,476		169,476	b
Alternative Enterprise value minus non-spectrum assets	6,849,232		5,976,147	
Price per Mhz pop of residual value	0.15		0.13	
a	Clearwire itself only claims 1.399 billion diluted shares. See Clearwire, 2012 10-K. p. 121. Clearwire acknowledges, however, the presence of 123.5 million "potential common shares," but does not include these in its calculations. p. 121. Ycharts.com implicitly use a value of 1.465 billion diluted shares to calculate market capitalization and enterprise value. We use the same value.			
b	Clearwire, 2012 10-K. p. 79.			
c	Based on 47 billion Mhz pops. Clearwire, 2012 10-K. p. 18.			
	All Davidson assumptions are from Davidson, Clearwire review, April 1, 2013, p. 3.			