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Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

One Financial Center
Boston, Massachusetts 02111
Telephone: 617/542-6000
Fax: 617/542-2241

Telephone: 202/434-7300
Fax: 202/434-7400
www.mintz.com

Michelle Mundt

Direct Dial Number
202/434-7371
Internet Address
mmundt@mintz.com

July 13, 2001

HAND DELIVERY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Ex Parte Presentation

Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems

CC Docket No. 94-102

Dear Ms. Salas:

Today we sent the attached letter to Thomas Sugrue, Chief of the Wireless Telecommunications Bureau. Pursuant to section 1.1206(b)(1) of the Commission's rules, four copies of this letter and attachment are being filed with the Office of the Secretary.

Sincerely,

Michelle M. Mundt

Michelle Mundt

cc: Thomas Sugrue
Kris Monteith
Blaise Scinto
Jim Schlichting
Jennifer Tomchin

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AT&T Wireless

Douglas I. Brandon
Vice President -
External Affairs & Law

Fourth Floor
1150 Connecticut Avenue, NW
Washington, DC 20036
202 223-9222
FAX 202 223-9095
WIRELESS 202 255-5011
doug.brandon@attws.com

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Chief, Wireless Telecommunications Bureau
Federal Communications Commission
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Washington, D.C. 20554

Re: Ex Parte Presentation

Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems

CC Docket No. 94-102

Dear Mr. Sugrue:

On June 8, 2001, SigmaOne Communications Corporation ("SigmaOne"), a vendor of location determination technology, filed an ex parte asking the Commission to deny AT&T Wireless Services, Inc.'s ("AWS's") request for a waiver of the Phase II E-911 rules for its TDMA network.[1/] In its filing, SigmaOne attempts to discredit Mobile-Assisted Network Location System ("MNLS"), the Phase II E-911 technology solution AWS has selected for its TDMA air interface. As a self-interested party seeking to promote its own TDOA/AOA Phase II solution, SigmaOne's criticisms of MNLS lack credibility. Even putting aside SigmaOne's obvious bias, its arguments are without merit:

- SigmaOne's predictions regarding the accuracy of MNLS are based on fundamental misunderstandings about how MNLS technology operates, rendering the predictions themselves useless.

- SigmaOne ignores the many compelling benefits of MNLS, including rapid deployment, system-wide availability, and reliability that is vastly superior to the kind of network-based solution proposed by Sigma One.

- Based on AWS's field trials of TDOA/AOA technology, SigmaOne's own solution will not fully satisfy the Commission's Phase II E-911 rules.

1/ Letter from Mark Licht, President, SigmaOne Communications Corporation, to Magalie Roman Salas (June 8, 2001) ("SigmaOne ex parte").

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For the reasons set forth herein, the Commission should reject SigmaOne's challenge to AWS's waiver request.

I. SigmaOne's Predictions Regarding the Accuracy of MNLS Are Inaccurate

SigmaOne claims that MNLS will not provide the level of accuracy promised by AWS because the "sample simulations" that SigmaOne conducted produced accuracy results of 922 meters for 67 percent of all calls and 2,112 meters for 95 percent of all calls.[2/] SigmaOne's wildly inaccurate predictions about the performance of MNLS should be disregarded because they are based on fundamental misunderstandings about how MNLS specifically, and CMRS networks generally, operate.

A. SigmaOne Fundamentally Does Not Understand How MNLS Technology Operates

First, SigmaOne confuses relative signal strength -- the concept upon which MNLS is based -- with absolute signal strength. This confusion is evidenced by SigmaOne's references to "erratic" signal strength measurements.[3/] While the absolute signal strength of channels does vary significantly, the relative amplitude between channels on the mobile-assisted handoff list remains predictable.[4/] In other words, any error in received signal strength indication ("RSSI") remains fairly constant across all measurements. In fact, the constancy of relative signal strength is shown in the "observed power graphs" in Exhibit C of SigmaOne's filing, in which the relative relationship between channels remains steady, despite the somewhat erratic movement in the absolute signal strength of the channels themselves.[5/] MNLS is based upon the highly accurate relative measurement, not the less accurate absolute signal strength.

Second, SigmaOne derives its results using only poor quality predicted data, despite the fact that one of the key benefits of MNLS is its ability to use both predicted

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2/ Id. at Exh. A, p. 4 and Exh. C, pp. 5, 34. See also id. at Exh. A, p. 4 and Exh. C, pp. 9-33, 39 (describing "sample simulation," "theoretical analysis," and "numerical computer predictions" that SigmaOne's conclusions are based upon). AWS, like all CMRS carriers, conducts extensive simulations of new technologies during its initial investigations. While such simulations are valuable in their proper context, they are in no way representative of how technology will actually work in an RF environment.

3/ Id. at Exh. C, p. 3.

4/ See discussion regarding mobile-assisted handoff infra at 3.

5/ Id. at Exh. C, p. 10.

and measured data.[6/] As AWS has explained, it will use predictive data initially so that it can deploy MNLS as quickly as possible, supplementing the database with measured data as it is gathered over time.[7/] As measured data acquired through routine wireless system maintenance and optimization efforts is added to the database, accuracy will only improve. Even the use of predictive data, however, will provide accuracy levels much greater than those estimated by SigmaOne because SigmaOne did not take into account the standard use of RF propagation optimization tools by CMRS carriers.[8/]

Finally, SigmaOne clearly does not understand how MNLS utilizes the existing MAHO functionality of TDMA systems. TDMA networks currently use an automated mechanism for managing handoffs from one cell site to another, which is referred to as "mobile assisted handoff" or "MAHO." In MAHO, the TDMA network asks the handset for information about its current situation to determine when a handoff to the next cell site must occur. The serving cell site broadcasts a list of up to 24 neighboring cell site control channels. The handset makes signal strength measurements on the serving channel and these MAHO "neighbor list" channels and sends them to the mobile switching center ("MSC") continually during a call. The MSC uses these measurements to determine when to handoff the call to the next cell site. MNLS is based on this existing functionality of TDMA systems, and uses an average of three to five MAHO measurements to determine a caller's location.[9/] By contrast, SigmaOne used a single absolute measurement in its simulation.

B. SigmaOne Fundamentally Does Not Understand How TDMA Networks Operate

SigmaOne has made a series of fundamental errors regarding the normal operation of TDMA networks. The most significant of these errors is SigmaOne's inaccurate use of 11.8 dB as the standard deviation for the propagation model, when the standard deviation used by TDMA carriers like AWS is actually 8 dB or less.[10/] This error leads directly to less accurate location estimates because the tighter the standard deviation, the more accurate the results will always be. By analogy, a ruler that is accurate to plus or minus three inches (3±) will always more accurate than a ruler that is plus or minus ten inches (10±).

6/ See Supplemental Response of AT&T Wireless Services, Inc. to Order of the Wireless Telecommunications Bureau at 6 (filed June 12, 2001) ("AT&T June 12 filing").

7/ Id.

8/ See discussion infra at 4 (regarding use of bias correction factors).

9/ See Letter from Doug Brandon, Vice President - External Affairs, AT&T Wireless Services, Inc. to Magalie Roman Salas (June 14, 2001) ("AT&T June 14 ex parte").

10/ See SigmaOne ex parte at Exh. C, pp. 5, 8.

Another key misunderstanding underlying SigmaOne's accuracy predictions is SigmaOne's use of the Hata-Okumarura propagation model exclusively to estimate the propagation path loss between the transmitter and the receiver, without any sort of filtering or smoothing. Standard operating practice for CMRS carriers, upon which the reliable operation of their networks depends, includes the routine use of bias correction factors in order to correct for terrain, clutter, seasonal changes in foliage, and other similar factors. No TDMA carrier would operate a wireless network without using such bias correction factors in their prediction models. In this regard, among others, SigmaOne's simulation does not replicate the standard operation of a TDMA network.

C. SigmaOne's Predictions About the Accuracy of MNLS Are Based on These Fundamental Misunderstandings, Rendering the Predictions Useless

SigmaOne's arguments about the deficiencies of radio signal strength indicators are based on these fundamental misunderstandings about MNLS. For example, SigmaOne argues that "the presence of signal fading, which is inherent to all cellular and PCS environments, limits the ability to associate signal power with range."[11/] But SigmaOne also admits that "over many averages and many positions, the mean signal strength has some degree of repeatability."[12/] In fact, MNLS minimizes the effect of signal fading by using the same continuous and averaged signal strength measurements the handset uses to perform mobile-assisted handoffs, as described above. And SigmaOne's argument that RSSI location mapping is impractical fails to take into account the ability of MNLS to use both predicted and measured data.[13/]

SigmaOne makes similar arguments about a wide range of other variables that it claims will affect the RSSI measurements performed by the handsets, including multipath, interference, handset antenna directionality, mobility, path loss, the limitations of handset RSSI measurement capabilities,[14/] and shadowing.[15/] All are either irrelevant,

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11/ Id. at Exh. A, p. 5.

12/ Id.

13/ Id. at Exh. A, p. 6. SigmaOne's statement regarding three-dimensional mapping is irrelevant and misleading because TDOA/AOA systems also lack this ability and it is not required under the Commission's rules.

14/ Id. at Exh. A, pp. 5-6.

15/ See id. at Exh. C, p. 4. In Exhibit C, SigmaOne lists four factors that allegedly prevent handset-based measurement of RSSI from being used for position determination. Three of these factors -- multipath, handset RSSI, and handset antenna directionality -- are identical to those listed in Exhibit A. The fourth, shadowing, is addressed above. SigmaOne also discusses "handset bias," which is removed by MNLS's use of relative

because they result from SigmaOne's failure to understand the distinction between the use of absolute and relative received signal strength, or their effect is minimized or overcome completely through the use of measured data, measurements from multiple base stations, or the use of the more powerful downlink measurements.[16/]

Multipath. The same continuous and averaged MAHO signal strength measurements that minimize the effect of signal fading also minimize the effect of multipath. In addition, MNLS has the ability to use measured data to derive location measurements, which incorporate the multipath characteristics of the particular environment where the caller is located.

Interference. Interference concerns are also reduced through the use of MAHO signal strength reporting, which is the critical mechanism used in handing off calls from one cell site to the next. Any discernable interference that affects these MAHO measurements would also affect handoff performance and would lead to dropped calls, and therefore would be addressed quickly by local network performance engineers.[17/]

Handset Antenna Directionality. Handset antenna directionality is not an issue because, as noted above, MNLS uses relative rather than absolute signal strength measurements. For this reason, the orientation of the handset has only a very minor effect on the relative signal strength measurements between channels.

Mobility. AWS has demonstrated that mobility does not affect the accuracy of MNLS in its Redmond, Bellevue and Denver trials, which utilized mobile drive-tests specifically to address any concerns about the ability of MNLS to located callers while they are in motion. As previously reported, all three field trials yielded results in the range of 250 meters for 67 percent of calls and 750 meters for 95 percent of calls.

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received signal strength measurements from multiple channels to determine location. Id. at Exh. C, p. 7.

16/ In addition, SigmaOne uses extremely gross estimates of distance from the handset, which appear to have been averaged in hundreds of meters. Id. at Exh. C, p. 10 (top table showing all estimates as even hundreds). Use of such gross distance estimates would lead to equally grossly exaggerated accuracy estimates. SigmaOne also conducted its tests in extremely small areas and weighted its tests heavily towards indoor areas, which can be expected to result in less accurate results when predictive data is used exclusively.

17/ This prompt correction of interference concerns demonstrates again the benefits of the integration of MNLS into the core functionality of AWS's overall network. See infra at 8. Interference is likely to be a much greater issue for systems, like TDOA/AOA, that are not integrated into the network.

Path Loss. It is ironic that SigmaOne mentions path loss as a variable that could affect the accuracy of MNLS,[18/] because path loss is one of the most difficult challenges for TDOA/AOA systems. MNLS has a distinct advantage over TDOA/AOA systems in this regard because it uses the more powerful downlink measurements rather than the power-limited uplink measurements used by TDOA/AOA. In addition, MNLS can operate effectively with RSSI levels much lower than those required for TDOA, because the radio signal does not need to be demodulated. MNLS does not calculate location based on path loss, but rather by pattern matching relative MAHO measurements. Therefore, SigmaOne's comment regarding path loss is irrelevant.

Handset RSSI Measurements. SigmaOne's confusion about absolute versus relative signal strength is again evident in the claim it makes about the limitations of handset RSSI measurement capabilities. SigmaOne's claim about variations in absolute signal strength are not relevant to TDMA systems, which utilize relative signal strength measurements to determine the timing and location of handoffs. As noted before and as demonstrated in SigmaOne's own filing,[19/] TDMA handsets must make accurate and repeatable location calculations based on the relative signal strengths of available radio channels in order to accomplish successful handoffs between cell sites.

Shadowing. MNLS is a pattern matching technique as opposed to a distance calculation system, which helps reduce any errors due to shadowing because the grid database includes shadowing components through either measured or predictive techniques. Moreover, AWS will populate its MNLS database with predictive and measured data on a 50-meter grid pattern, which allows AWS to compensate for localized shadowing effects.

In its technical appendix, SigmaOne repeats its argument that a "multitude of parameters affect the received signal strength at the handset."[20/] All of these factors can be completely or partially overcome through the use of relative rather than absolute received signal strength and measured as well as predictive data. In those rare cases where measured data is not available, these factors can be mitigated through the use of modeling. SigmaOne incorrectly asserts that several of these factors cannot be known or modeled, again as a result of its failure to understand that MNLS uses relative signal

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18/ SigmaOne ex parte at Exh. A, p. 5, and Exh. C, p. 3.

19/ See id. at Exh. C, p. 10.

20/ Id. at Exh. C, p. 8 (listing factors of cell site transmitted power, cell site transmit antenna three dimensional radiation pattern, cell site transmit antenna orientation, cell site transmit antenna height above ground, handset antenna three dimensional radiation pattern, handset antenna, orientation/polarization, handset antenna height above ground, multipath and fading, co-channel interference, and path loss).

strength measurements and measured data.[21/] In particular, the "receive antenna three dimensional radiation pattern," the "receive antenna orientation," and the "receive antenna height above ground" are all components that are well-known and routinely used in industry-wide propagation tools.[22/] The effects of "multi-path and fading" and "co-channel interference" are overcome by using multiple MAHO measurements for each location determination, while "path loss" is mitigated through AWS's routine, system-wide use of bias correction tools in order to correct for terrain, clutter, seasonal changes in foliage, and other similar factors.[23/]

II. MNLS Provides a Unique Combination of Benefits that Make it the Best Solution for AWS's TDMA Customers

SigmaOne argues that none of the benefits that AWS claims will be provided by MNLS are unique to that technology.[24/] AWS agrees that certain of the advantages of MNLS are shared by all network-based Phase II E911 solutions.[25/] Other benefits of MNLS, however, are not provided by SigmaOne's location system or any other network-

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21/ Id. at Exh. C, p. 9 (listing factors of receive antenna three dimensional radiation pattern, receive antenna orientation, receive antenna height above ground, multipath and fading, co-channel interference, and path loss).

22/ With respect to the receive antenna height above ground, moreover, determining the height where a caller is located is not currently required under the Commission's Phase II E-911 rules.

23/ SigmaOne raises a number of other points that are irrelevant to an assessment of MNLS. RF propagation issues, for instance, affect any technology that utilizes RF. See id. at Exh. C, p. 34. While MNLS technology is not immune to these RF issues, neither are SigmaOne's technology or any other network-based Phase II E911 technology. SigmaOne also provides the mathematical basis for position determination, see id. at Exh. C, pp. 36-39, which is basic information that could be obtained from any RF theory textbook.

24/ Id. at Exh. A, p. 11.

25/ As SigmaOne points out, all network-based solutions can be provided without new handsets; they can provide updated location information during the duration of an emergency call; and they can provide service to roamers and non-initialized callers. Id. These benefits are not, however, shared by certain of the handset-based solutions that AWS was considering for its TDMA network, including E-OTD, which is why it was necessary for AWS to address them in its waiver request. AWS also agrees that MNLS is not the only Phase I solution that is standards-compliant. Id. at Exh. A, p. 13. AWS is pleased to see that SigmaOne, echoing the statements of vendors of other network-based technologies, claims to have achieved significant improvements in accuracy over time. AWS fully expects to experience similar improvements over time with MNLS and has addressed its plans to make such improvements in its filings with the Commission. Id.

based technology. AWS believes that it is this unique combination of benefits that make MNLS the best solution for AWS's TDMA customers.

Rapid Deployment. Nothing in SigmaOne's filing contradicts AWS's claim that, because there is no need to locate additional antennas or base station equipment, MNLS can be deployed far more quickly than any competing technology. In its waiver petition, AWS detailed the lengthy processes associated with even limited trials of network-overlay solutions such as that being promoted by SigmaOne.[26/] Only self-interest can explain SigmaOne's opposition to AWS's proposed use of a technology that would accelerate the implementation of Phase II E911 for TDMA customers.

Reliability. It is ironic that SigmaOne describes the "reliability and maintainability of major system elements"[27/] as key to the rapid deployment of network-based location systems. As AWS has explained, these goals are best served by a "mainstreamed" solution like MNLS rather than the network overlay advocated by SigmaOne.[28/] Based on AWS's evaluations of both solutions, its technical experts concluded that reliability is significantly enhanced by reducing points of failure and complexity. Network-overlay systems, like that promoted by SigmaOne, add points of failure and complexity to the network, resulting in reduced reliability overall.

SigmaOne claims that AWS has not provided "a detailed roadmap to full and timely compliance with the FCC's E-911 accuracy requirements"[29/] because it has not provided a firm date by which it will have transitioned all of its customers from the TDMA to the GSM air interface. The lack of a firm transition date, however, is not necessary because MNLS is not, as SigmaOne characterizes it, a "second-class" solution. On the contrary, MNLS has an accuracy range comparable to that of the other network-based solutions AWS investigated, including TDOA/AOA, but provides these other benefits as well.[30/]

III. SigmaOne's Own Technology Will Not Satisfy the Commission's Rules

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26/ AT&T Wireless Services, Inc. Request for Waiver of the E911 Phase II Location Technology Implementation Rules at 12-13 (filed April 4, 2001) ("AT&T waiver request"); see also infra at 10.

27/ SigmaOne ex parte at Exh. A, p. 14.

28/ See, e.g., AT&T June 12 filing at 5.

29/ SigmaOne ex parte at 2 and Exh. A, p. 10.

30/ Despite SigmaOne's denigration of MNLS as a "low budget" alternative, id. at Exh. A, p. 3, the relative costs of TDOA/AOA and MNLS are irrelevant to consideration of AWS's waiver request.

SigmaOne argues that AWS's waiver should be denied because "viable options exist which meet the FCC's requirements for accuracy."[31/] SigmaOne also disputes AWS's claim that MNLS is comparable to the expected performance of other network-based technologies, because SigmaOne's field trial results allegedly demonstrate that its technology currently satisfies the Commission's accuracy requirements for network technologies.[32/] As the party with ultimate responsibility for compliance with the Commission's Phase II rules, however, AWS must rely on its own technical analyses, not those of self-interested vendors. AWS stands by the results of its real-world field trials of network-based solutions, which demonstrated that none of the currently available solutions will be able to fully satisfy the Commission's accuracy requirements by the deadline.[33/]

As AWS explained in its original waiver request, in July 1999, AWS contracted with Lockheed-Martin Corporation ("Lockheed-Martin") to conduct a comprehensive assessment and analysis of all potential location service providers.[34/] Lockheed-Martin concluded that another vendor that utilized the same approach as SigmaOne was "well ahead" of SigmaOne in developing its location technology and that vendor's "wireless telecom equipment development and manufacturing experience puts them ahead of all other network based vendors."[35/] Given the time pressures associated with the Commission's Phase II rules, AWS and other carriers simply could not conduct endless trials with unlimited numbers of vendors. Based on Lockheed-Martin's detailed and rigorous analysis, AWS chose to conduct field trials of the TDOA/AOA solutions being developed by two vendors other than SigmaOne.

Those field trials, which have been filed with the Commission, demonstrated that TDOA/AOA technology would not meet the FCC's Phase II accuracy requirements,[36/]

31/ Id. at Exh. A, p. 6.

32/ Id. at 3.

33/ See also Cingular Wireless LLC Petition for Limited Waiver of Sections 20.18(e)-(h) at 3 (filed July 6, 2001) ("There is, however, *no* solution available that would fully satisfy the Commission's accuracy requirements for TDMA and GSM networks.").

34/ AT&T waiver request at 7.

35/ Id. at Exh. B, p. 19 (Confidential Lockheed-Martin Geolocation Vendor Assessment - November 8, 1999).

36/ On May 30, 2001, TruePosition filed an ex parte that acknowledged the "challenging" nature of the Redmond terrain and the fact that TDMA is the most difficult air interface on which to conduct location determination. Notably, TruePosition did not dispute the results of the AWS-True Position field trial. See Letter from Philip L. Verveer, Willkie, Farr & Gallagher, to Thomas Sugrue (May 30, 2001) ("TruePosition ex parte") and AWS response thereto, Letter from Doug Brandon, Vice President - External Affairs, AT&T Wireless Services, Inc. to Thomas Sugrue (July 2, 2001).

and there is no reason to believe that SigmaOne's TDOA/AOA technology would have performed any differently than its competitors'. AWS's trials of MNLS used the same footprints, not simulations or predictions, and provide ample support for the finding that the accuracy of MNLS is comparable to that of the other network-overlay solutions tested by AWS.

Moreover, SigmaOne's comments regarding the "minimal" and "negligible" zoning impacts associated with the use of its AOA antennas only underscore its lack of familiarity with the realities of operating a CMRS network.[37/] Regardless of whether antennas are as large as those tested during AWS's Denver TDOA/AOA technology trial (4 feet x 4 feet) or slightly smaller as SigmaOne proposes (approximately 3 feet by 9.5 inches), adding antennas to existing towers typically requires re-zoning, lease approval, and in certain cases even redesign of towers due to the additional weight of the antenna and associated cabling.[38/] SigmaOne attempts to diminish these obstacles by noting that AWS has successfully deployed "more than 10,000 cell sites throughout the United States,"[39/] without any acknowledgement that it has taken AWS over fifteen years to do so. In light of the widespread community opposition to wireless antenna placement nationwide, SigmaOne's failure to acknowledge the challenges associated with AOA antenna placement results in an unrealistic assessment of TDOA/AOA deployment. One of AWS's goals is to deploy Phase II E-911 services to customers and public safety as quickly as possible, a goal that would be jeopardized by the controversy and delay associated with the need to install numerous new antennas.

Finally, SigmaOne's argument that AWS should be expected to deploy SigmaOne's technology on its GSM air interface barely merits a response.[40/] E-OTD is without question the best Phase II solution available for the GSM air interface, as evidenced by its selection by most, if not all, GSM carriers in the United States and the Commission's approval of a conditional waiver to allow VoiceStream to use E-OTD in its GSM network. AWS knows of no field trials of the TDOA/AOA technology for the GSM air interface and vigorously disputes SigmaOne's claim that its solution could be utilized on both air interfaces with only "minimal" software changes.[41/] The fact that there have been no trials of the TDOA/AOA technology on the GSM air interface means that this technology simply cannot be deployed in time to satisfy the Commission's timetable for providing Phase II services. By making this specious argument, SigmaOne is clearly placing its financial self-interest above carriers' need to comply with the Commission's rules and wireless subscribers' and public safety officials' need to receive Phase II service in a timely manner.

37/ SigmaOne ex parte at 4 and Exh. A, p. 9.

38/ See AT&T waiver request at 9-10.

39/ SigmaOne ex parte at Exh. A, p. 9.

40/ Id. at 3 and Exh. A, p. 12.

41/ Id. at 3.

IV. SigmaOne's Other Arguments Provide No Basis for the Commission to Deny AWS's Waiver Request

SigmaOne raises a number of other arguments against AWS's waiver request. None justify denial of the request.

AWS Trial Results. SigmaOne's argument that AWS's MNLS trial results have not been made public is obviously moot.[42/] Subsequent to SigmaOne's ex parte, AWS filed the results from its Redmond, Bellevue, and Denver MNLS trials.[43/]

Other Trial Results. SigmaOne exaggerates the importance of the documentation from the MNLS trials mentioned in Exhibit H of AWS's waiver request, and without any basis attributes devious motives to AWS's failure to submit trial reports from three of them to the Commission.[44/] In fact, there are reasonable explanations why AWS could not submit documentation for each of these trials. The 1997 trial in Kirkland, Washington was a proof-of-concept trial for which documentation was not maintained in a form adequate for filing, primarily due to staff changes over time. AWS was unable to obtain fileable data from the vendor for the 1998 trial by Nortel Networks, and it could not file documentation regarding the 2000 trial by Ericsson in Stockholm because Ericsson was unable to obtain permission to release the data from the European carrier with which the trial was conducted.

The fact that AWS does not have the ability to file documentation regarding these trials does not mean, as SigmaOne alleges, that AWS had no "technical foundation" for its decision to use MNLS when it filed its waiver request.[45/] AWS's technical team gained knowledge from the proof of concept trial in 1997 and worked closely with Ericsson and Nortel to determine whether MNLS was a feasible solution for providing Phase II service on the TDMA air interface. In addition to reviewing the results of those two trials, however, AWS subjected MNLS to its own rigorous field trials in the same markets where it had tested other network-based location technologies. As set forth above, AWS has filed the results of those trials with the Commission.

AWS's FCC Filings. SigmaOne attempts to find meaning in the fact that AWS did not mention MNLS in its FCC filings until April 4, 2001, and speculates that AWS must have decided to use MNLS "with the goal of reducing deployment costs for what

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42/ Id. at 2.

43/ See AT&T June 12 filing at Exhibit C and D; Letter from Doug Brandon, Vice President - External Affairs, AT&T Wireless Services, Inc. to Magalie Roman Salas (July 10, 2001) ("AT&T July 10 filing").

44/ SigmaOne ex parte at Exh. A, p. 3.

45/ Id. at Exh. A, p. 2.

SigmaOne believes is a dramatic and unnecessary degradation in performance."[46/] SigmaOne's speculations are wholly without merit. In fact, there had been no reason for AWS to propose MNLS prior to April 2000. First, until AWS completed its field trials, it did not know how TDOA and TDOA/AOA would perform in the real world. Given the earlier representations of the vendors, AWS had hoped that these technologies would be viable solutions. Second, after AWS announced its strategic alliance with NTT DoCoMo and its transition to a GSM air interface in November 2000, AWS's technical teams were faced with the additional challenge of designing Phase II systems for two air interfaces. Finally, until AWS received the results of the feasibility study performed by Cambridge Positioning Systems, AWS was hoping to use a single solution (E-OTD) across both air interfaces.[47/] Not until the results of that study were received were the inadequacies of E-OTD for the TDMA air interface recognized.[48/]

Standards. SigmaOne is incorrect regarding the standards work of TR45.2.[49/] MNLS has been fully accepted into the baseline of J-STD-036-ADDENDUM 2.

Vendor Support. SigmaOne has no basis for the statements it has made regarding the willingness of AWS's infrastructure vendors Lucent, Nortel and Ericsson to support MNLS.[50/] AWS has secured support from all three vendors.[51/]

Analog Subscribers. SigmaOne claims that AWS's waiver should be denied because the "systems proposed by AT&T do not include Phase II solutions for wireless subscribers placing calls in the AMPS mode."[52/] As AWS has already explained, it did not develop an analog-only Phase II location technology solution because it is an industry leader in the migration of subscribers from analog to digital service and reasonably believes that it will have no analog-only customers by the end of 2001, except for a relative handful of customers who are highly-resistant to any efforts by AWS to encourage them to migrate to digital service.[53/]

46/ Id. at Exh. A, p. 3.

47/ See AT&T Wireless Services Inc. Amended Phase II Report at 4 (filed Dec. 6, 2000).

48/ AT&T waiver request at 11-12.

49/ SigmaOne ex parte at Exh. A, pp. 10-11.

50/ Id. at Exh. A, p. 11.

51/ See, e.g., Comments of Ericsson on AT&T Waiver Request (filed May 7, 2000).

52/ SigmaOne ex parte at 4.

53/ Partial Response of AT&T Wireless Services, Inc. to Order of the Wireless Telecommunications Bureau at 3 (filed May 30, 2001) ("AT&T May 30 filing").

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Rural Areas. Finally, SigmaOne argues that MNLS "will also be limited in its ability to deliver usable location information in difficult rural settings."[54/] On the contrary, as AWS has demonstrated to the Commission,[55/] unlike other network-based technologies MNLS is able to locate callers even in situations where only an isolated AWS cell site is available. Such locates are possible because MNLS is a pattern-matching technology rather than a triangulation technology. However, situations in which a handset would be required to use an isolated base station to locate a caller would be extremely rare, because MNLS utilizes the stronger down-link (base station to handset) signals, rather than the weaker uplink (handset to base station) signals and is also able to use AWS's competitors' cell sites through the MAHO "neighbor list" (the mechanism that TDMA systems use for managing mobile-assisted hand-offs from one cell site to another). Not only does MNLS perform well in rural areas, but it does so significantly better than systems like TDOA/AOA.

Pursuant to section 1.1206(b)(1) of the Commission's rules, two copies of this letter are being filed with the Office of the Secretary. Copies of the letter are also being served on the Commission personnel listed below.

Sincerely,

Douglas I. Brandon/mm

Douglas I. Brandon

cc: Kris Monteith
Blaise Scinto
Jim Schlichting
Jennifer Tomchin

54/ SigmaOne ex parte at Exh. A, p. 4.

55/ See AT&T June 14 ex parte at 9.