

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

PATRICK HENDRICKS, on behalf of
himself and all others similarly situated,

Plaintiff,

v.

AT&T MOBILITY LLC,

Defendant.

Case No. C11-00409

CLASS ACTION COMPLAINT

Declaration

of

COLIN B. WEIR

August 7, 2011

I, Colin B. Weir, declare as follows:

My name is Colin B. Weir. I am a Vice President at Economics and Technology, Inc. (“ETI”), One Washington Mall, 15th Floor, Boston, Massachusetts 02108. ETI is a research and consulting firm specializing in telecommunications, economics, regulation and public policy.

I. QUALIFICATIONS, BACKGROUND, AND EXPERIENCE

1. I hold a Masters of Business Administration, with honors, from the High Technology program at Northeastern University, Boston, Massachusetts. I hold a Bachelor of Arts degree cum laude in Business Economics from The College of Wooster, Wooster, Ohio. I have provided expert testimony before federal and state courts, the FCC, and state commissions, and have contributed research and analysis to numerous ETI publications and expert testimony at the state, federal, and international levels. My complete Statement of Qualifications, which outlines my professional experience, publications, and record of expert testimony, is annexed as Exhibit 1 hereto.

II. ENGAGEMENT

2. Mr. Bursor has requested that I provide a summary of the work necessary to substantiate the overbilling claims asserted in the Hendricks complaint, which was done prior to the filing of this lawsuit. ETI was originally retained by Law Offices of Scott A. Bursor to research available wireless data plans, to create a testing environment to monitor bandwidth usage, and to test the accuracy of carrier billing for various wireless devices and data plans. Additional work may be conducted as requested by counsel.

III. TESTING METHODOLOGY

3. AT&T's billing system for wireless data services is proprietary and is not available for public inspection or testing. For anyone other than AT&T employees working on the system, AT&T's billing mechanism is a black box: the output of the system is published to individual customers, but its internal machinations remain secret and hidden from view. Given that AT&T's system is opaque to outsiders, it is not possible to directly verify the accuracy of AT&T's billing system. Thus, in order to test the accuracy of the AT&T system, the output of AT&T's billing system must be compared to a parallel metering system.

4. AT&T provides relatively discrete billing records for its data products, providing both a cumulative tally of data used, as well as daily (if not more frequent) breakdowns of usage. Usage is reported unofficially on the AT&T website during the billing cycle, and officially in the full billing detail (also available on the AT&T website) after the billing cycle ends and a bill is rendered. These billing records allow for a comparison between the usage measured and billed by AT&T against other measures of usage, such as web server logs or packet captures.

5. While nearly all web servers collect very detailed usage logs, often including detailed information on data usage, obtaining access to such logs from third parties is virtually impossible. One cannot expect Google, Facebook, or any other commercial site to hand over the sensitive data contained in usage logs, even for scientific research. As such, I developed an "in-house" testing web server configured to host test files and record data usage.

6. I purchased a Dell PowerEdge T110 server to use as the test server. The server expressly did not come with an operating system ("OS") or other pre-installed software. I configured the server entirely from scratch. I installed Ubuntu version 10.04 Desktop, an installation of a Debian Linux OS. Ubuntu is a free OS available publicly from www.ubuntu.com. After configuring the server, I installed Apache version 2.2. Apache is the

most commonly deployed web server software, and is available publicly for free through www.apache.org.

7. I configured the Apache web server to serve files without compression (so that the entire file size would be sent to any requesting browser). Additionally, I configured the server to provide very detailed log information on every file served. The server logs record the file requested, the date and time of the request, the IP address of the party making the request, and detailed bandwidth usage metrics including the served file size, the size of the request for the file, and the amount of data actually served up to fulfill the request. These server logs allow for easy identification of traffic generated as part of the study, and to establish a baseline for the comparison with AT&T's billing records.

8. Internet traffic often includes substantive "overhead," or data traffic associated with the connection, but not actually containing the data being sent or requested. Because the web server logs do not necessarily capture such overhead usage, I installed another software tool to monitor usage, including overhead. This software, Wireshark version 1.2.7, is free and publicly available at www.wireshark.org. Wireshark is a network protocol analyzer, and provides "packet capture" functionality. A packet capture, among other things, shows each and every packet of data sent and received, who the sender and receiver are (identified by IP address), the protocols in use for the transmission, and the quantity of data sent and received during the packet capture. The packet capture measurement of the data transmitted should always be equal or greater to the bandwidth measured by the web server. This occurs because the packet capture measures all of the associated overhead traffic, including traffic not measured directly by the server. Each packet capture must be initiated manually. As such, it is easy to identify and associate each packet capture with traffic generated during the study.

9. The act of packet capturing does not in any way inflate or otherwise alter the flow or content of data traffic. As such, using packet captures as part of the study does not in any way pollute or change the traffic that would have occurred had the packet capture not been used.

10. I connected the server to the ETI network, and linked the server to a dedicated, public, static IP address. That address, 173.13.108.148, directs a web browser or other internet enabled software to the web server that I created. No other devices or servers use that dedicated IP address—all traffic requesting resources from that address is directed directly to the web server. Most web users are familiar with accessing web sites using a domain name, such as “google.com” or “econtech.com.” These domain names are actually pointers that take a user to a web server at a particular IP address. The web provides a transparent service called Domain Name System (“DNS”) that translates each domain name into its actual IP address. By using a web server with only an IP address, I eliminate all overhead traffic associated with the behind-the-scenes DNS service lookup and forwarding.

11. Each file hosted on the website is a randomly generated file of an exact size: 1 kilobyte (“KB”), 10 KB, 100 KB, 1 megabyte (“MB”), and 10 MB. From my own personal experience and research, files of any order of magnitude larger than 10 MB present difficulties for mobile browsers. For the sake of clarity, the following table provides a useful quantification of Bytes, KB and MB.

TABLE 1			
	Bytes	KB	MB
1 Byte	1	-	-
1 KB	1,024	1	-
1 MB	1,048,576	1,024	1

Although there is nothing magical about these round-number file sizes in terms of web hosting, these sizes were picked for use in our tests for ease and clarity in reporting our results. Each of these files contains exactly the number of bytes of data specified by the file size, but does not contain recognizable text or images; i.e., even though these files are served up and interpreted as standard HTML web files, and require data transfers of at least the file size, an end user viewing these files will not actually see a traditional “web page” after the file downloads.

12. Sometimes, unbeknownst to a user, a web browser stores or “caches” frequently downloaded files in order to speed the web experience of the user. In order to eliminate this potential distortion in data usage when downloading the same test file, I renamed each test file for each test, either by changing the file name, or the directory path to the file, thus forcing the web browser to download the complete file each and every time.

13. For each test, I downloaded one or more test files from the test server. For each test, I conducted a packet capture of each transfer and recorded each transfer on the web server logs. Subsequent to each download test, I monitored the usage reported on the AT&T website. AT&T disclaims that “[t]his usage information is only an estimate and, regardless of what is shown, your next invoice will be determined by the information contained in our billing system, not this usage information” At the end of the billing cycle, I captured the “official” usage records from the AT&T online billing detail. Comparing the actual server side usage records with the user side billing detail reported by AT&T allows for an evaluation of the accuracy of AT&T’s billing of data usage.

14. All of the official tests conducted during this project were completed on new, dedicated devices whose sole purpose, and only use was testing data usage charges. No personal, business or other use was conducted on these devices.

15. Before conducting tests for the purposes of this report, however, I used my personal iPhone 3G to confirm that the web server worked, that the phone was capable of downloading

the test files, and that it was possible to view the test usage online on AT&T's website. By conducting these pre-tests on a separate device, the usage reported on all of the official test devices was not polluted by these initial trials.

IV. TEST 1: IPHONE 4

16. The first device included in the study was an Apple iPhone 4 running iOS4 on the AT&T Mobility network. I purchased this device from an AT&T store in Boston on October 5, 2010. The telephone number associated with the phone is 617-470-2229. The device IMEI number is 012431003533869. The handset was activated at the time of purchase. I subscribed to the "Nation 450 Roll Unl M2M 5K N&W" plan for \$39.99 a month. This plan includes nationwide calling with a bucket of 450 minutes, AT&T's rollover feature, unlimited mobile to mobile calling, and 5,000 night and weekend minutes. I also purchased the Dataplus 200MB data plan, providing 200 MB of data usage for \$15/month. I did not subscribe to a text messaging (SMS/MMS) bundle. I paid a \$36 activation fee.

17. The device was kept securely in my office in a location where it had good signal quality (5 "bars" as reported by the device) on AT&T's 3G network. I was the only person to ever use the device after activation by Gary Medina, an AT&T employee at the AT&T Mobility store. I immediately ensured that no "push notifications" were active on the phone. Push notifications allow third parties to send data (e.g., new emails or status updates) to the phone as soon as they arrive, rather than when the user requests the data manually (or via regularly scheduled checks). I also turned off "location services" that allow applications to use data services to pinpoint the user's location. Location services use a mix of data transfers and GPS (depending upon the location of the phone). I also ensured that there was no email account configured on the phone, and that automatic checks for email were disabled. IOS 4 allows for

multiple applications to remain open at the same time. I closed all applications, so that nothing was running in the background.

18. My first test with the iPhone was to do absolutely nothing. I left the phone plugged in, powered on, and with good signal as described above. The phone sat untouched from October 5, 2010 until October 15, 2010. During this period there were approximately 35 data charges posted to the account, totaling at least 2,292 KB of usage.

19. I use the terms “approximately” and “at least” here because, even though I have an official bill from AT&T purporting to show individual usage charges with very precise time stamps, it is clear that AT&T’s billing is erroneous and contains time stamp errors. For example, it is easy to spot my first active test on the AT&T bill (the first test included more than 10 MB worth of usage). AT&T reports this usage as occurring early in the morning on October 14, 2010, whereas my actual test, as confirmed by actual time stamps on the server logs and packet captures, occurred late in the afternoon on October 15, 2010.

20. Over the course of the remaining days in the first and second billing cycles, I conducted eleven download tests with the iPhone. In the first three tests, I downloaded each of five files, each a different size (1 KB, 10 KB, 100 KB, 1 MB and 10 MB) at roughly 15 minute intervals. During my pre-tests with my personal iPhone 3GS, I was able to obtain individual billing detail for transactions at this time interval. In my tests with the iPhone 4, I did not receive that level of billing detail; my five-file tests were usually aggregated and reported in one or two transactions.

21. In the second set of tests, tests four through six, I also downloaded five files, but this time each file was the same size. I ran one test with five 1 KB files, a test with five 10 KB files, and a third with five 1 MB files. Given the lack of granularity in the billing detail, I ran this second set of tests “back to back” without a regular interval between downloads.

22. As with the file sizes, there is nothing magical about a 15-minute (or any other) interval between downloads. The data used for each download should be the same regardless of whether or not there was an interval. The initial use of intervals was purely for convenience in comparing usage records.

23. I conducted one final test during the first billing cycle. On the last day of the billing cycle, November 7, 2010, I downloaded fifteen 10 MB files. This usage brought the server side actual usage to just below the 200 MB threshold of the data plan. This usage should have pushed the AT&T reported usage over 200 MB, given the additional usage that was generated apart from the actual transmissions that I initiated.

24. The remaining four tests two single downloads of a 10MB file, a back to back download of five 100KB files, and a back to back download of two 10MB files.

25. A summary of each of the eleven tests is presented below in Table 2.

TABLE 2.		
Date	Time	Files Downloaded
10/15/2010	2:45-3:48 PM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
10/26/2010	10:21-11:57 AM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
10/29/2010	2:37-4:02 PM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
11/02/2010	5:00-5:01 PM	1 KB, 1 KB, 1 KB, 1 KB, 1 KB
11/03/2010	4:31-4:31 PM	10 KB, 10 KB, 10 KB, 10 KB, 10 KB
11/05/2010	5:13-5:16 PM	1 MB, 1 MB, 1 MB, 1 MB, 1 MB
11/07/2010	4:14-4:38 PM	15 x 10 MB = 150 MB
11/12/2010	3:15 PM	10 MB
11/15/2010	4:24 PM	10 MB
12/03/2010	5:06-5:07 PM	5 x 100 KB
12/07/2010	4:52-4:54 PM	2 x 10 MB

26. The first billing cycle closed on November 7, 2010. The official AT&T bill detail matched the usage that had been reported unofficially on the website exactly. I was able to identify usage charges associated with each of the first six tests. The seventh test did not post to the correct billing cycle. Even though the usage occurred on the last day of the billing cycle, and even though the AT&T website shows the traffic as having occurred on November 7, the charge for more than 150 MB worth of usage was rolled into the following billing period. I am aware that AT&T discloses that data usage may take several days to post to the bill. Despite this disclaimer, the practice of rolling usage from one billing cycle to another, without notice to the user at the time of actual use, presents an obvious problem for users wanting to make full use of their measured usage allotment. In fact, the user is effectively deprived of the expected usage

twice when this occurs. First, the user winds up with usage “left on the table.” In other words, the user is unable to use all of the data usage allotment that he has paid for. Second, usage intended for a current billing cycle that is rolled into the next period counts against the future expected available usage, thus reducing the available allotment in the subsequent period. Unlike its voice plans, AT&T does not offer a “rollover” feature on its data plans. The “rollover” feature, if offered, would overcome this particular issue.

27. The second billing cycle closed on December 7, 2010. The official AT&T bill detail matched the usage that had been reported unofficially on the website exactly. I was able to identify usage charges associated with the seventh test from the previous cycle, and each of the remaining four tests.

V. TEST 2: BLACKBERRY TORCH 9800

28. On October 14, 2010, I received authorization to begin testing two additional devices on the AT&T network. The second device I purchased was a Blackberry Torch 9800 on the AT&T Mobility network. I purchased this device at an AT&T store in Boston on October 14, 2010. The telephone number associated with the phone is 617-510-6776. The device IMEI number is 353490047746124. The handset was activated at the time of purchase. I subscribed to the “Nation 450 Roll Unl M2M 5K N&W” plan for \$39.99 a month. This plan includes nationwide calling with a bucket of 450 minutes per month, AT&T’s rollover feature, unlimited mobile to mobile calling, and 5,000 night and weekend minutes. I also purchased the Dataplan 200MB data plan, providing 200 MB of data usage for \$15/month. I did not subscribe to a text messaging (SMS/MMS) bundle. I paid a \$36 activation fee.

29. As with the iPhone the Blackberry Torch was kept securely in my office in a location where it had good signal quality on AT&T’s 3G network. I was the only person to ever use the device after activation by Eric Howlett, an AT&T employee at the store where I purchased the

phone. Similarly, I immediately disabled features that might generate automatic data transfers. I ensured that there was no email account configured on the phone, and that automatic checks for email were disabled. I closed all applications, so that nothing was running in the background.

30. I conducted the same do-nothing test with the Torch that I had done with the iPhone. I left the phone plugged in, powered on, and with good signal as described above. The phone sat untouched from October 14, 2010 until October 26, 2010.

31. Over the course of the remaining days in the first and second billing cycles, I conducted eight download tests with the Torch. In the first two tests, I downloaded each of five files, each a different size (1 KB, 10 KB, 100 KB, 1 MB and 10 MB) at roughly 15 minute intervals. In the second set of tests, tests three through six, I also downloaded five files, but this time each file was the same size. I ran one test with five 1 KB files, a test with five 10 KB files, a test with five 1 MB files, and a fourth with five 100 KB files. Given the lack of granularity in the billing detail, I ran this second set of tests “back to back” without a regular interval between downloads. I also conducted two tests with a different type of file. In test seven I downloaded a roughly 2 MB image file. In test eight, I downloaded a roughly 3.5 MB image file. These tests were conducted during the same sessions as the iPhone (and other) download tests.

32. A summary of each of the eight tests is presented below in Table 4.

TABLE 4.		
Date	Time	Files Downloaded
10/26/2010	10:31 AM-12:01 PM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
10/29/2010	2:39-4:05 PM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
11/02/2010	5:03-5:05 PM	1 KB, 1 KB, 1 KB, 1 KB, 1 KB
11/03/2010	4:33-4:35 PM	10 KB, 10 KB, 10 KB, 10 KB, 10 KB
11/05/2010	5:19-5:21 PM	1 MB, 1 MB, 1 MB, 1 MB, 1 MB
12/03/2010	5:10-5:12 PM	100 KB, 100 KB
12/09/2010	5:14 PM	2.01 MB jpeg image
12/13/2010	10:14 AM	3.47 MB jpeg image

33. Whereas the iPhone appears to conduct its own downloads directly, my research suggests that the Blackberry Torch (and presumably other Blackberry phones as well) download data from the web using a Blackberry proxy server. This proxy server conducts the download at the phone's request, re-formats the download, and sends a "compressed" version of the download to the phone. Indeed, studies cited by Research In Motion ("RIM") (the company that produces Blackberry phones) highlight this difference in operation. This process creates interesting distortions in the AT&T billing for data usage as compared with server side usage. On the one hand, very large files will realize substantial compression, and will result in AT&T billing below the actual size of the file. On the other hand, small files will actually be "grossed up" to a minimum size before transmission, and will result in AT&T overbilling (perhaps by a substantial amount) for the file. Small files might experience "inflation" of size because the RIM servers are not only compressing data, but are also reformatting the data into a special Blackberry browser format.

34. My research bears this out. First, the IP addresses that I collected on the server side from the Torch downloads are registered to RIM, not AT&T, confirming that it was RIM conducting the downloads, and not the phone itself. Similarly, while the server side logs show the complete download of each of the files, the AT&T billing records reflect compression of larger files, and inflation of smaller files.

VI. TEST 3: NOKIA 6350

35. At the same time that I purchased the Blackberry Torch, I also acquired a Nokia 6350, running on the AT&T Mobility network. I purchased this device from the same AT&T store in Boston on October 14, 2010. The telephone number associated with the phone is 617-513-5009. The device IMEI number is 352692044153664. The handset was activated at the time of purchase. I subscribed to the “Nation 450 Roll Unl M2M 5K N&W” plan for \$39.99 a month. This plan includes nationwide calling with a bucket of 450 minutes, AT&T’s rollover feature, unlimited mobile to mobile calling, and 5,000 night and weekend minutes. By default, I was enrolled in the data pay per use plan. This plan charges \$2/MB. I did not subscribe to a text messaging (SMS/MMS) bundle. I paid a \$36 activation fee.

36. As with the iPhone and Blackberry, the Nokia was kept securely in my office in a location where it had good signal quality on AT&T’s 3G network. I was the only person to ever use the device after activation by Eric Howlett, an AT&T employee. Unlike the iPhone and Blackberry which are smartphones, the Nokia feature phone does not have push notifications or location services. I left the device configured as it was activated at the AT&T store.

37. Once again, I began my testing by leaving the phone plugged in, powered on, and with good signal as described above, but otherwise not using the device. The phone sat untouched from October 14, 2010 until October 26, 2010. Unlike the iPhone and Blackberry, the Nokia did not generate any phantom traffic.

38. Over the course of the remaining days in the first and second billing cycles, I conducted eight download tests with the Nokia 6350. In the first two tests, I downloaded each of five files, each a different size (1 KB, 10 KB, 100 KB, 1 MB and 10 MB) at roughly 15 minute intervals. In the second set of tests, tests three through six, I also downloaded five files, but this time each file was the same size. I ran one test with five 1 KB files, a test with five 10 KB files, a test with five 1 MB files, and a fourth with five 100 KB files. Given the lack of granularity in the billing detail, I ran this second set of tests “back to back” without a regular interval between downloads. I also conducted two tests with a different type of file. In test seven I downloaded a roughly 2 MB image file. In test eight, I downloaded a roughly 3.5 MB image file. These tests were conducted during the same sessions as the iPhone (and other) download tests. I conducted one test, as discussed in more detail below, that involved launching the Nokia browser, but not actually downloading a file, or navigating to a website.

39. A summary of each of the five tests is presented below in Table 6.

TABLE 6.		
Date	Time	Files Downloaded
10/26/2010	10:42 AM-12:04 PM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
10/29/2010	2:41-4:08 PM	1 KB, 10 KB, 100 KB, 1 MB, 10 MB
11/02/2010	5:08-5:12 PM	1 KB, 1 KB, 1 KB, 1 KB, 1 KB
11/03/2010	4:39-4:43 PM	10 KB, 10 KB, 10 KB, 10 KB, 10 KB
11/05/2010	5:25-5:31 PM	1 MB, 1 MB, 1 MB, 1 MB, 1 MB
12/03/2010	5:15-5:18 PM	100 KB, 100 KB
12/09/2010	5:10-5:12 PM	2.01 MB jpeg image
12/13/2010	10:35-10:36 AM	3.47 MB jpeg image

40. The Nokia 6350 appears to conduct its downloads in a manner similar to the Blackberry, i.e., data transfers appear to be conducted through a proxy server. Unlike with the Blackberry, where it was clear that RIM was acting as the proxy, it is not immediately evident who is responsible for the proxy server, and just what compression scheme they are using. The IP address linked to the Nokia is registered to a company called Motricity. The Motricity website has a small case study claiming that AT&T is a customer, and that the Motricity mCore platform sits between the customer and their “off deck” (off of the AT&T network) internet experience. I am unfamiliar with the technical details of the mCore platform, but this is one possibility in terms of the proxy/compression scheme for the Nokia.

41. Another possibility arises from the particular browser used on the Nokia 6350. My webserver logs identify this browser as “Opera Mini.” Opera Software has developed web browsers since the mid-1990s, and recently launched the “Mini” version of its browser for mobile phones. As explained on the Opera website, “When you request a page in Opera Mini, the request is sent to the Opera Mini server that then downloads the page from the Internet. The server then packages your page up in a neat little compressed format [...] ready to send back to your phone at the speed of ninjas on jetpacks.” The Nokia 6350 is listed on Opera’s website as an Opera Mini compatible phone.

42. Whether through Motricity, Opera, or both, or something else, data sent to the Nokia 6350 on the AT&T network is being downloaded by a proxy server, compressed and reformatted, and passed back to the phone in a manner similar to the Blackberry.

43. My research finds similar results to the Blackberry: while the server side logs show the complete download of each of the files, the AT&T billing records reflect compression of larger files, and inflation of smaller files.

44. During the testing process, the Nokia 6350 made a second file request during each download, asking not only for the file that I had specified, but for a file called “favico.ico.” This

type of file, also called a favicon, is a very small image (16x16 or 32x32 pixels) that users might see displayed in the address bar of a standard web browser. This type of file is typically downloaded only once (or not at all) and stored for future use. In the case of the Nokia, I find the repetitive download surprising, as both the repetitive downloading is an odd behavior (and none of the other devices I tested ever attempted to download the file even once) and because, as I discuss below, the Nokia device does not have a typical address entry bar where such an icon could even regularly be displayed. I have conservatively included the favicon request and packet capture data in my analysis, even though I never actually requested this file myself.

VII. TEST 4: IPAD

45. On October 19, I added another device to the study—an Apple iPad. I acquired a 64 GB 3G iPad from an Apple store in Boston and activated data service on the AT&T Mobility network. The telephone number associated with the iPad is 617-784-4160. The device IMEI number is 012329003762092. The data service was activated at the time of purchase. I subscribed to a recurring monthly 250 MB data plan for \$14.99 a month.

46. As with the iPhone the iPad was kept securely in my office in a location where it had good signal quality on AT&T's 3G network. I was the only person to ever use the device after activation by an Apple employee. Similarly, I immediately disabled features that might generate automatic data transfers. I ensured that there was no email account configured on the phone, and that automatic checks for email were disabled. I closed all applications, so that nothing was running in the background.

47. Unlike all of the phones, the iPad data plan was not tied to a traditional voice account, even though the device has its own phone number. As such, AT&T's traditional billing system and online account access is not available to monitor use on the iPad. When I called Apple to inquire about how to check usage, I was instructed to use the iPad itself to check its own usage.

Apple employees were unsure whether I would be charged for this additional usage. On October 21, 2010, I called AT&T customer service to inquire about checking data usage. The customer service representative, Carla Johnson, suggested that there were no alternative methods of checking usage online yet, although AT&T was in the midst of building a portal to allow online access. In the meanwhile, she suggested checking usage with the iPad itself. Ms. Johnson confirmed that I would be billed for additional usage to check my usage if I connected via AT&T's network. No charge would apply if I used WiFi. Ms. Johnson estimated that the lookup would be roughly 8 KB per check.

48. I asked if I would receive a detailed data breakdown (similar to the standard bill on the iPhone) at the end of the month. Ms. Johnson reported that iPad users do not receive a detailed bill, and that all I would receive is an email notifying me of the new charge along with boilerplate language.

49. After further inquiry, I was provided with a link to a beta test of the online usage portal for the iPad. The address I was give was <http://www.att.com/ipadlanding>. I was told that the official version would be rolled out on October 28th. I have continued to check this website, which now appears to be the official online portal, but can only access cumulative usage data. I never logged on to the billing/usage system using the iPad, so as to avoid polluting the reported data usage.

50. I began my testing by leaving the iPad plugged in, powered on, and with good signal as described above, but otherwise not using the device. The iPad sat untouched from October 19, 2010 until November 3, 2010.

51. I conducted two download tests with the iPad. In the first two tests, I downloaded each of five files, each a different size (1 KB, 10 KB, 100 KB, 1 MB and 10 MB) at roughly 15 minute intervals.

VIII. RESULTS

52. Prior to the filing of this action, I reported to plaintiff's counsel the detailed results of each of these tests, including line-by-line breakdowns of all data transactions that were conducted by me as part of these tests, and in addition, all of the phantom charges that were posted by AT&T on the bill. I specifically reported to plaintiff's counsel the details of each data transaction measured in terms of the raw file size, the amount of data transmitted as reported by the webserver, and the amount of data transmitted as reported by the packet capture. Since we do not have access to AT&T's billing network, each of these measurements was necessary to substantiate the systematic overbilling on AT&T's network.

IX. COSTS

53. All of the work described above was completed to substantiate the claims that AT&T overbilled for wireless data services. Beginning with my initial research in September 2010, through January of 2011 when this action was filed, ETI billed and was paid \$74,179.11, included expenses to conduct this study of wireless billing.

54. The costs outlined above encompass only those associated with the pre-filing research and analysis that our firm was requested to undertake. During the pendency of an arbitration proceeding to address the persistent overbilling that we have identified, and based upon our previous experience with and involvement in an arbitration dealing with wireless early termination fees, we would expect to be called upon to perform a number of specific, proceeding-related tasks. These would include, although not necessarily be limited to, the following:

- (1) Conduct additional technical analysis and research to more precisely identify the specific instances of overbilling and to quantify the dollar amounts thereof;

- (2) Assist counsel with discovery including attendance at discovery depositions of AT&T Mobility employees responsible for the company's billing practices as well as depositions of persons most knowledgeable with respect to the specific details of data usage measurement and reporting for billing purposes;
- (3) Prepare an expert report describing the results of tasks (1) and (2) and providing specific quantitative estimates of the extent of overbilling inherent in the AT&T Mobility data usage metering and billing processes;
- (4) Respond to discovery, including providing deposition testimony, as propounded by defendant;
- (5) Review and analyze responsive expert and non-expert reports and/or testimony as proffered by defendant, including assistance with discovery thereon including attendance at deposition(s) of defendant's experts and other witnesses and, as required, preparation of a rebuttal report responsive to defendant's rebuttal evidence;
- (6) Attend arbitration hearings or proceedings as required, including standing for cross-examination by defendant
- (7) Provide such other research and analysis as may be requested by counsel.

55. From approximately December 2006 through April 2007, my firm was engaged by counsel for plaintiffs Patricia Brown *et al* in an arbitration proceeding (Case No. 11 494 01274 05) involving early termination fees (ETFs) being charged by Verizon Wireless. Beginning in March 2006, our firm was engaged by the same group of counsel to provide expert testimony and related expert services in connection with several other matters dealing with wireless early termination fees, including Federal Communications Commission ("FCC") Docket No. WT 05-194 (*I/M/O CTIA Petition for Expedited Declaratory Ruling on Early Termination Fees*), and several early termination fee cases in Superior Court for the County of Alameda, California.

Because all of these cases involved certain common issues, the incremental level of effort required for our work on the Brown et al arbitration was considerably less than it would have been had the synergies associated with these other concurrent matters not be available.

56. Billing for work that was specific to the Brown *et al* arbitration covered the period from and including December 2006 through and including March 2007. It involved the review of defendant's expert's December 2006 declaration; development of expert testimony describing an analytical framework for estimating, and providing a preliminary estimate of the amount by which the early termination fees collected by defendant Verizon Wireless exceeded any actual net expectancy loss attributable to its customers' early terminations; attendance and presentation of expert testimony at an arbitration hearing in January 2007; testifying at a deposition in February 2007, and preparation of a rebuttal report in March 2007. Our firm's total billing for this period amounted to \$58,763.68 including both fees and miscellaneous expenses (principally travel). As noted, ETI initially began work on the early termination fee issue in March 2006 but did not begin work specifically relating to the Brown *et al* arbitration until approximately December 2006. But for the synergy benefits derived from our work on these other matters, I estimate that our total billing for work on the Brown *et al* arbitration would have been at least in the range of \$100,000 to \$125,000. This estimate is conservative, as the Brown case settled prior to a full hearing on the merits. Had the Brown case gone all the way through the arbitration process, our efforts and billing would have been substantially greater.

57. Given our to-date expenditures on the instant matter simply to substantiate the underlying claims, and all of the likely tasks associated with ongoing arbitration, any individual claimant could expect to spend no less than the initial \$74,000 to substantiate her claim, plus no less than the nearly \$60,000 spent in the Brown case to prepare for arbitration—a total of nearly \$135,000. The claimant would likely spend substantially more to see the case all the way to completion of arbitration.

VERIFICATION

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief, and that this declaration was executed at Boston, Massachusetts, this 7th day of August, 2011.

A handwritten signature in black ink, appearing to read 'C. B. Weir', is written over a solid horizontal line.

Colin B. Weir

EXHIBIT 1

Statement of Qualifications

COLIN B. WEIR

Statement of Qualifications

COLIN B. WEIR

Colin B. Weir is a Vice President at Economics and Technology, Inc. Mr. Weir conducts economic, statistical, and regulatory research and analysis, with a primary focus on the telecommunications industry. Mr. Weir's work involves econometric and statistical analysis, multiple linear regression, statistical sampling, micro- and macroeconomic modeling and other economic analysis. Such analysis often involves analysis of databases, call detail records, and other voluminous business records. Mr. Weir is familiar with common statistical and econometric software packages such as STATA and SHAZAM. Mr. Weir assists with analysis of economic, statistical and other evidence; and preparation for depositions, trial and oral examinations. Mr. Weir has provided expert testimony before federal and state courts, the FCC, and state commissions, and has contributed research and analysis to numerous ETI publications and testimony at the state, federal, and international levels.

Mr. Weir's telecom experience includes work on a variety of issues, including: economic harm and damage calculation; Early Termination Fees (ETFs); wireless handset locking practices; determination of Federal Excise Tax burden; ISP-bound traffic studies; Area Code splits and numbering policy; Federal Universal Service; pricing and regulation of Unbundled Network Elements; analysis of special access rates-of-return and pricing trends, and development of a macroeconomic analysis quantifying the economic impact upon the US economy and job markets of overpricing special access services; wireless pricing; and wireline telecommunications tariff and contract pricing.

Mr. Weir has conducted research and analysis in numerous regulatory and litigation matters on behalf of carrier, government and individual clients, including AT&T, MTS Allstream (Canada), Broadview Networks, Cavalier Communications, Nuvox Inc., O1 Communications, Pac-West Telecomm, Inc., tw telecom inc., XO Communications, Western Wireless, The US Department of Justice, Office of the Attorney General of Illinois, Thomaset *et al* (class action litigation, Superior Court, County of Alameda), Ayyad *et al* (class action litigation, Superior Court, County of Alameda), and White *et al* (class action litigation, Superior Court, County of Alameda).

Mr. Weir has researched pricing and discount rates in enterprise voice and data services contracts, maintained an extensive database of such rates, and has contributed to network priceouts and rate benchmark analyses. Additionally, Mr. Weir is responsible for the maintenance of ETI's comprehensive databases of interstate and international interexchange carrier and local telephone company tariffs. He has substantial experience with industry data resources.

Mr. Weir holds an MBA with honors from Northeastern University. He also holds a Bachelor of Arts degree *cum laude* in Business Economics from The College of Wooster.

Publications and Testimony of Colin B. Weir

Mr. Weir has co-authored the following:

Regulation, Investment and Jobs: How Regulation of Wholesale Markets Can Stimulate Private Sector Broadband Investment and Create Jobs (with Lee L. Selwyn, Susan M. Gately, and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of Cbeyond, Inc., Covad Communications Company, Integra Telecom, Inc., PAETEC Holding Corp, and tw telecom inc., February 2010.

Revisiting Us Broadband Policy: How Re-regulation of Wholesale Services Will Encourage Investment and Stimulate Competition and Innovation in Enterprise Broadband Markets, (with Lee L. Selwyn, Susan M. Gately, and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of MTS Allstream, February 2010.

Longstanding Regulatory Tools Confirm BOC Market Power: A Defense of ARMIS (with Lee L. Selwyn, Susan M. Gately, and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of the AdHoc Telecommunications Users Committee, January 2010.

Choosing Broadband Competition over Unconstrained Incumbent Market Power: A Response to Bell and TELUS (with Lee L. Selwyn, Susan M. Gately, and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of MTS Allstream, April 2009.

The Role of Regulation in a Competitive Telecom Environment: How Smart Regulation of Essential Wholesale Facilities Stimulates Investment and Promotes Competition (with Lee L. Selwyn, Susan M. Gately, and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of MTS Allstream, March 2009.

Special Access Overpricing and the US Economy: How Unchecked RBOC Market Power is Costing US Jobs and Impairing US Competitiveness (with Lee L. Selwyn, Susan M. Gately, and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of the AdHoc Telecommunications Users Committee, August 2007.

The AWS Spectrum Auction: A One-Time Opportunity to Introduce Real Competition for Wireless Services in Canada (with Lee L. Selwyn and Helen E. Golding) Economics and Technology, Inc., prepared on behalf of MTS Allstream, June 2007.

Comparison of Wireless Service Price Levels in the US and Canada (with Lee L. Selwyn) Economics and Technology, Inc., prepared on behalf of MTS Allstream, May 2007.

Hold the Phone! Debunking the Myth of Intermodal Alternatives for Business Telecom Users In New York (with Susan M. Gately and Lee L. Selwyn) Economics and Technology, Inc., prepared for the UNE-L CLEC Coalition, August 2005.

Mr. Weir has submitted the following testimony:

Federal Communications Commission, *In the Matter of Applications of AT&T Inc. & Deutsche Telekom AG for Consent to Assign or Transfer Control of Licenses and Authorizations*, WT Docket No. 11-65, on behalf of Butch Watson, Declaration filed June 20, 2011.

California Public Utilities Commission, *Pacific Bell Telephone Company d/b/a AT&T California (U1001C) Complainant, vs. O1 Communication, Inc. (U 6065 C), Defendant*, Case No. C.08-03-001, on behalf of the O1 Communications, Inc., Reply Testimony filed November 6, 2009; Oral testimony and cross examination on November 16, 2009.

Superior Court of California, County of Alameda, *James Thomas, on behalf of themselves, the general public, and all those similarly situated, Plaintiffs, v. Global Vision Products, Inc., Anthony Imbriolo, Derrike Cope, David L. Gordon, Powertel Technologies, Inc., Craig Dix, Henry Edelson and Robert DeBenedictis, Defendants*, Case No. RG03-091195, on behalf of the Law Offices Of Scott A. Bursor, Oral testimony and cross examination on November 9, 2009.

United States District Court, District of New Jersey, *Judy Larson, Barry Hall, Joe Milliron, Tessie Robb, and Willie Davis, individually and on behalf of all others similarly situated, v. AT&T Mobility LLC f/k/a Cingular Wireless LLC and Sprint Nextel Corporation and Sprint Spectrum L.P. d/b/a Sprint Nextel and Nextel Finance Company, Civ. Act. No. 07-5325 (JLL)*, on behalf of PinilisHalpern, LLP and Law Offices of Scott A. Bursor, Declaration filed *under seal* October 19, 2009.

California Public Utilities Commission, *Pacific Bell Telephone Company d/b/a AT&T California (U1001C) Complainant, vs. Pac-West Telecomm, Inc. (U 5266 C), Defendant*, Case No. C.08-09-017, on behalf of the Pac-West Telecomm, Inc., Rebuttal Testimony filed May 1, 2009.

Illinois Commerce Commission, *Illinois Bell Telephone Company Annual Rate Filing for Non-Competitive Services Under an Alternative Form of Regulation*, Ill. C. C. Docket No. 08-0249, on behalf of the People of the State of Illinois, Declaration filed May 2, 2008.

Federal Communications Commission, *Qwest Petition for Forbearance Under 47 U.S.C. §160(c) From Title II and Computer Inquiry Rules with Respect to Broadband Services, Petition of AT&T Inc, For Forbearance Under 47 U.S.C. §160(c) From Title II and Computer Inquiry Rules with Respect to Broadband Services, Petition of BellSouth Corporation For Forbearance Under 47 U.S.C. §160(c) From Title II and Computer Inquiry Rules with Respect to Broadband Services, Petition of the Embarq Local Operating Companies for Forbearance Under 47 U.S.C. §160(c) From Application 06 Computer Inquiry and certain Title II Common Carriage Requirements; WC Docket Nos. 06-125 and 06-147*, on behalf of the AdHoc Telecommunications Users Committee, Declaration filed October 9, 2007.

Superior Court of California, County of Alameda, *James Thomas, on behalf of themselves, the general public, and all those similarly situated, Plaintiffs, v. Global Vision Products, Inc., Anthony Imbriolo, Derrike Cope, David L. Gordon, Powertel Technologies, Inc., Craig Dix, Henry Edelson and Robert DeBenedictis, Defendants*, Case No. RG03-091195, on behalf of the Law Offices Of Scott A. Bursor, Declaration filed January 5, 2007; Deposition on November 13, 2007; Oral testimony and cross-

Statement of Qualifications – Colin B. Weir

examination on December 19, 2007; Oral testimony on January 9, 2008.

Mr. Weir has contributed research and analysis to numerous additional ETI publications and testimony at the state, federal, and international levels.