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March 15, 2011

The Honorable Julius Genachowski
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Special Access Rates for Price Cap Local Exchange Carriers
WC Docket No. 05-25

Dear Chairman Genachowski:

Per our discussion, attached is an important new study on the macroeconomic impact of special access reform. As our country works to pull out of a recession and create new jobs for Americans, this study's conservative estimate is that special access reform would increase national output by as much as $37.7 billion and create as many as 176,000 new jobs.

These results confirm the results of past studies. AT&T itself issued a study just before it was acquired by SBC that found that special access reform would increase national output by $11.6 billion and create 64,000 new jobs. And a 2008 study by a group of the largest corporate users of broadband services in America found that inflated special access prices deprived the US economy of $17.2 billion in GDP and 95,000 jobs. As the National Broadband Plan found, the number and importance of high-capacity broadband lines has greatly increased recently, resulting in the higher impact reported in today's study.

Despite the importance of special access to the national economy, the FCC has continued to study this issue, without acting, for eight years. As far back as 2003, all reliable evidence demonstrated that the special access market was broken and that the Commission's earlier prediction that competition would somehow emerge was flat wrong. The special access market is still broken. Only FCC action—applying existing rules and using its well-established authority in this area—will normalize inflated special access prices and yield the billions of dollars in output and the surge in jobs our country needs.

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As a national leader in deployment of 4G mobile broadband services, Sprint is committed to leading the way to a competitive broadband market that will benefit consumers. Competition can thrive, however, only if competitors can purchase the necessary inputs for broadband service at just and reasonable prices. You can greatly assist the competitive market, and employers around the country, by accelerating the pace of this proceeding. None of us can afford to wait.

Sincerely,

cc: Commissioner Michael J. Copps
Commissioner Robert M. McDowell
Commissioner Mignon Clyburn
Commissioner Meredith Attwell

Economic Benefits of Special Access Price Reductions

By

Stephen E. Siwek

Economists Incorporated, Washington, D.C.

March 2011

Economists Incorporated, Washington, D.C.

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I. About the Author

This study was conducted by Economists Incorporated, ("EI") an economic consulting firm with offices in Washington D.C. and San Francisco. The study was directed by Stephen E. Siwek, a Principal at EI. Mr. Siwek has many years of experience in the analysis of rates, costs and regulatory policies for telecommunications carriers and users. He has testified as an expert witness in these areas on more than thirty occasions. Mr. Siwek has also directed a variety of studies that have made use of industry "multipliers" to estimate the full cost of particular market practices for the U.S. economy as a whole. For example, he has published studies of the gains in U.S. output, employment and earnings that would result from a substantial reduction in the global piracy of motion pictures and other "copyright" products. Mr. Siwek's CV is attached here as Attachment A.

II. Summary

In the United States, most special access services are provided by three large incumbent local exchange carriers ("ILECs") – AT&T, Verizon and Qwest. Purchasers of special access services have long argued that special access prices are well above competitive levels and that the ILECs have been earning excess rates of return for many years.

In this report, Economists Incorporated ("EI") quantifies the broad economic effects that excess special access prices have on the U.S. economy as a whole. Specifically, EI makes use of past studies of special access price levels and price elasticities to measure the economic benefits that would result from a significant reduction in special access prices. These benefits are measured using a standard set of economic "multipliers" that were purchased from the U.S. Bureau of Economic Analysis ("BEA"). BEA calculates individual multipliers by industry and by state using an input-output model known as RIMS II.

As set forth in this report, EI assumed a range of special access price reductions, a range of price elasticity coefficients and two different conventions for deriving average multipliers from the state-specific multipliers provided by BEA. The estimates were also brought forward from 2007 to 2010.[1] EI's Mid-Range Estimates are reproduced below. Under these mid–range assumptions, a 50% reduction in Special access prices would result in a $20-$22 billion increase in U.S. output, a $4.4-$4.8 billion increase in employee earnings, an increase of between 94,000 and 101,000 jobs and an increase in value added to the U.S. economy of between $11.8 - $12.4 billion.

[1] The year 2007 is the last year for which special access line counts by state are available from the FCC. In these calculations, the special access quantities stimulated by the price reductions are brought forward to 2010 using trend data for wireless communications during the years 2007 through 2010. See Schedule 1.

Mid-Range Estimates (50% price reduction and elasticity = -1.6)

	50 State Average[2]	Top 5 State Average
Increase in U.S. Output	$ 20.7 billion	$ 21.6 billion
Increase in U.S. Earnings	$ 4.4 billion	$4.8 billion
Increase in U.S. Employment	94, 109	100,996
Increase in U.S. Value Added	$ 11.8 billion	$ 12.4 billion

The results presented above reflect the mid-range estimates for the price reductions and price elasticity coefficients that are assumed in this analysis. Alternative estimates are reported below. The alternative price reductions shown in these schedules range from -40% to -60%. The alternative price elasticity coefficients considered in these schedules range from -1.50 to -1.70. See below.

Hi End Estimates (60% price reduction and elasticity = -1.7)

	50 State Average	Top 5 State Average
Increase in U.S. Output	$ 36.1 billion	$ 37.7 billion
Increase in U.S. Earnings	$ 7.6 billion	$8.3 billion
Increase in U.S. Employment	164,077	176,084
Increase in U.S. Value Added	$ 20.6 billion	$ 21.5 billion

Low End Estimates (40% price reduction and elasticity = -1.5)

	50 State Average	Top 5 State Average
Increase in U.S. Output	$ 11.7 billion	$ 12.2 billion
Increase in U.S. Earnings	$ 2.5 billion	$2.7 billion
Increase in U.S. Employment	53,101	56,987
Increase in U.S. Value Added	$ 6.7 billion	$ 7.0 billion

[2] The 50-state average is calculated on the basis of the average of all 50 state multipliers weighted by the number of special access lines in each state. The Top 5 state average is calculated as the simple average of the multipliers for the 5 most populous states.

III. Background and Study Approach

Introduction

Special access services are dedicated high-capacity transmission services used to transport voice and data traffic. They are "highly reliable" and "can be used to connect virtually any two points in the country, even in different regions served by different telecommunications providers."[3] Special access services provide point-to-point transport to carrier and end-user customers. These services are overwhelmingly provided by three large incumbent local exchange carriers ("ILECs"). These ILECs are AT&T, Verizon and Qwest. Historically, special access services were used to connect end-users to the "points-of-presence" once provided by interexchange carriers. Currently however, these services are often used to connect end users to competitive local exchange carriers ("CLECs") and to internet service providers ("ISPs"). Special access services are also heavily used by wireless carriers to make connections within their own networks. For example, a wireless carrier may require special access facilities to connect its cell towers to its mobile switch center or transport network. This form of special access usage is commonly referred to as "wireless backhaul."

Special access pricing has long been a contentious issue before the Federal Communications Commission. Over the last ten years, a variety of studies have concluded that special access services produce excess rates of return as high as 77.9%.[4] By contrast, the FCC's last authorized rate of return was 11.25%. In addition, prices for special access services are well in excess of the prices for unbundled network elements and fiber-based broadband services that offer similar speeds. In light of this significant disparity, a number of researchers have argued that special access rates should be significantly reduced. It is suggested that if special access rates were cut substantially, the beneficial effects of those reductions would be felt not only by the direct purchasers of special access but also by other businesses and their workers in other sectors of the U.S. economy.

Study Approach

In this analysis, Economists Incorporated ("EI") employed a publically available model of the U.S. economy that is maintained by the U.S. Bureau of Economic Analysis ("BEA"), the regional input-output modeling system ("RIMS II"), to estimate the economic effects of price reductions in the special access services provided by AT&T, Verizon and Qwest. In assessing these price reductions, EI also considered earlier studies that evaluated special access pricing and the rate of return earned by the three ILECs on special access services over time. EI also examined other studies that addressed special access price elasticity, market concentration, market power and competition. In addition to these studies, EI reviewed the Declaration of Bridger M. Mitchell that was prepared in January 2010. Dr. Mitchell's Declaration was

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[3] See Bluhm, P. and Loube, R., National Regulatory Research Institute, *Competitive Issues in Special Access Markets – Revised Edition,* First Issued January 21, 2009, page 4. (Hereinafter "NRRI Study").

[4] See, e.g., NRRI Study, pages 69-71; Rappaport, P., Taylor, L. Menko, A. and Brand, T., *Macroeconomic Benefits from a Reduction in Special Access Prices,* June 12, 2003 (Hereinafter "AT&T Study"), Appendix 3; Economics and Technology, Inc., "*Special Access Overpricing and the U.S. Economy,*" prepared for the Ad Hoc Telecommunications users Committee, August 2007, page 4. (Hereinafter "ETI Study").

filed as an attachment to the comments of Sprint Nextel Corporation in the FCC's ongoing special access rate proceeding.[5]

EI also reviewed studies and reports on special access pricing and competition that were prepared directly or sponsored by the ILECs. These included a July 2009 study prepared by for USTELECOM,[6] a 2009 publication by NERA [7] and the Reply Comments of Qwest and AT&T in the Commission's ongoing special access proceeding[8]. As a threshold matter, the non-ILEC studies supported and generally confirmed the reasonableness of the special access price reductions that are assumed in this analysis.

EI estimated the economic benefits to the U.S. economy that would likely occur in response to a significant reduction in special access prices to bring them in line with costs. These economic benefits would include increases in economic output, employee earnings, employment and value added to U.S. GDP. The benefits of special access price reductions are estimated using multipliers that were produced by the RIMS II model. The multipliers were specific to the U.S. telecommunications industry which is classified under the North American Industrial Classification System ("NAICS") as NAICS 517000 – Telecommunications. The multipliers for this industry were purchased from the U.S. Bureau of Economic Analysis for each of the fifty states. Since these multipliers reflect input-output relationships within individual states, the benefits measured in this analysis are inherently conservative. If this analysis had employed U.S. national multipliers, the resulting benefit estimates would have been considerably higher than the values reported here.[9]

IV. Special Access Trends

Special Access Lines

According to the 2006/2007 edition of the Statistics for Communications Common Carriers, the ILECs provided 302,426,590 digital special access lines in service in the United States during the year ended December 31, 2007.[10] These non-switched digital facilities were reported to the FCC in terms of voice grade equivalents ("VGEs"). Under this reporting convention, a DS-1 facility having the capability to carry 24 voice grade channels would appear in the FCC's statistics as 24 special access "lines". The states with the highest counts of digital special access lines in 2007 were New York (40,345,118),

[5] See Comments of Sprint Nextel Corporation, *Declaration of Bridger M. Mitchell,* Federal Communications Commission WC Docket No. 05-25 and RM-10593, In the Matter of Special Access Rates for Price Cap Local Exchange Carriers and AT&T Corp. Petition to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services. (Hereinafter, "Mitchell Declaration").
[6] Brogan, P. and Leo, E., USTelecom, *High Capacity Services: Abundant, Affordable, and Evolving,* July 2009.
[7] NERA Economic Consulting, *Is More Special Access Regulation Needed? Reactions to the NRRI Report on Special Access Competition,* March 2009.
[8] See Reply Comments of Qwest Communications International, Inc. WC Docket No. 05-25, RM-10593, February 2010 and Reply Comments of AT&T inc., WC Docket No. 05-25 and RM-10593.
[9] In prior years, the U.S. Bureau of Economic Analysis provided both national and state multipliers on an industry-specific basis. However, the BEA also cautioned against the use of national multipliers in regional economic analyses. Several years ago, the BEA dropped any reporting of national multipliers from the RIMS II model.
[10] Statistics of Communications Common Carriers, 2006/2007 Edition, available online at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301505A1.pdf. (Hereinafter "SOCC"). There were also 691,069 analog special access lines in service. See Table 2.4, page 113.

California (36,272,558), New Jersey (25,083,819), Florida (20,912,778) and Texas (20,085,229). It is our understanding that more recent special access line counts are not available because the FCC permitted the incumbent LECs to omit these data from their reporting requirements under the ARMIS accounting system.

In the years leading up to 2007, the number of special access lines in services (in voice grade equivalents) grew rapidly. The total number of special access lines in service rose from 75.1 million in 2000 to 303.1 million in 2007. For the single year 2006-2007, the total number of special access lines in the United States grew from 250.6 million to 303.1 million, an increase of nearly 21 percent.

The special access market in the United States has long been dominated by three incumbent local exchange carriers ("ILECs"). These ILECs are AT&T, Qwest and Verizon. In 2000, the three ILECS collectively owned about 70 million special access lines or approximately 93% of all ILEC special access lines in the United States. By 2007, the same three ILECS still controlled 270 million lines or about 89% of the total number of ILEC special access lines in service in the United States.[11]

In his Declaration, Dr. Mitchell cited additional data on the ILECs share of special access lines. He presented data on ILEC shares of DS-1 and DS-3 channel terminations and transport. Dr. Mitchell stated that in 2007, "the median percentage of total DS-1 channel terminations circuits purchased from incumbent LECs was 99%, and for DS-1 transport 98%. For DS-3 channel terminations, the median was 91%, but for DS-3 transport 67%."[12]

Special Access Revenues

Using data reported by the regional Bell Operating Companies for the years 2000 through 2007, it is possible to calculate the annual revenues earned by each of the three ILECs on the special access services that they provided within this time period. For example, in 2000, total special access revenues for the three ILECs were $9.3 billion. By 2007, total special access revenues for AT&T, Qwest and Verizon combined had grown to $18 billion. For the single year, 2006-2007, the three ILECs' special access revenues rose from $16.45 billion to $18.0 billion, an increase of 9.4%.[13]

Special Access Prices

In his Declaration, Dr. Mitchell stated that "Special access prices provide direct evidence of the incumbent LECs use of market power." [14] A seller is said to have market power "if it has the ability to profitably maintain prices above competitive levels for a significant period without significant customer loss and without attracting entry by competitors."[15]

In support of this conclusion, Dr. Mitchell referenced studies by the GAO and by NRRI. The authors of the NRRI study stated that, "We do conclude that ILECs still have strong market power in most

[11] Line counts by company were downloaded from www.fcc.gov/wcb/armis. The special access line counts were taken from ARMIS Report 43-08, Table III.
[12] Mitchell Declaration, Par. 61.
[13] SOCC, Table 2.8, *Special Access Revenues.*
[14] Mitchell Declaration, Par. 14.
[15] Mitchell Declaration, Par. 95.

geographic areas, particularly for channel terminations and particularly for DS-1 service."[16] While conceding that compact downtown areas might qualify as exceptions, the NRRI authors also found that "In the surrounding areas, which can be by far the majority of an MSA, the weight of the evidence says that ILECs retain strong market power, particularly for channel terminations."[17] Among other indicia, the NRRI authors noted the "high continuing market concentration" of formerly monopolistic markets.

Dr. Mitchell concluded that "In both price cap areas and price flexibility areas special access prices are consistently well above the available measures of forward-looking costs." [18]

Forward-looking cost information can be obtained by reviewing the rates set by state commissions for unbundled network elements ("UNE's"). These rates were set in either commercial negotiations between companies or in adjudicated proceedings at state commissions. In either case, the UNE rates in effect were set under FCC rules that required the use of forward looking costs. In 2004, Dr. Joseph Stith systematically compared special access rates for a three-year term with month-to-month UNE rates for the same basket of services. Dr. Stith's comparisons of Phase II pricing flexibility rates with month-to-month UNE rates produced the "staggering" result that the three year term rates range from 129% higher for Verizon and 171% higher for Ameritech." [19]

Special access prices have also been compared with ILEC retail rates for other high-bandwidth services. For example, ILECs provide digital subscriber line ("DSL") service and fiber-optic-based internet ("FIOS") services at speeds that are comparable to speeds provided by DS-1 and DS-3s. According to Dr. Mitchell, the average price paid by Sprint for DS-1s in 2009 was $390 per month. By contrast, Verizon's FIOS service was available at a stand-alone price of $54.99 per month.[20]

The rate comparisons cited by Dr. Mitchell have been criticized by the ILECs on several grounds. Significantly for this study however, nowhere do the ILECs present their own price comparisons for special access services. The ILECs basically assert that no other services are comparable to special access services. On the other hand, as described subsequently in this report, the ILECs also claim that numerous other services are substitutes for and vigorously compete with special access services. As a response to the numerous studies cited above, the ILECs "heads I win, tails you lose" assertions are simply not credible.

A variety of studies have also concluded that the ILEC's own figures demonstrate that special access services produce extremely high rates of return. For example, in a 2007 study of special access "overpricing," the firm of Economics and Technology, Inc. concluded that "….the average return on interstate special access services has been climbing steadily since 1996, such that in the most recent reporting period there were RBOCs whose earnings were more than *ten times* the 11.25% earnings level last approved by the FCC."[21] ETI also stated that "For 2006, the composite figure has skyrocketed to 77.9%."

[16] NRRI Study, page 79.
[17] NRRI Study, page 79.
[18] Mitchell Declaration, Par. 14.
[19] Mitchell Declaration, Par. 105. Ameritech was acquired by SBC Communications in 1999. SBC Communications subsequently acquired AT&T Corporation in 2006.
[20] Mitchell Declaration, Par. 111-112.
[21] ETI Study, page A-1.

In 2003, prior to its acquisition by SBC Communications, AT&T itself sponsored a study of special access pricing and the economic benefits that could be achieved if special access prices were substantially reduced. [22] The authors of that study concluded that "A reduction in special access prices of **42%,** commensurate with an 11.25% rate-of-return on total investment, would generate 64,000 new jobs and $11.6 billion in new economic activity in the first year alone."[23] Subsequently, in its 2007 study, ETI stated that "Since the AT&T Study was originally undertaken; RBOC special access rates of return have continued to mushroom and as of year-end 2006 were on average about 77.9%. A **53.3%** price reduction would be required to bring these returns back down to competitive level – i.e. in line with the FCC's last authorized rate of return (11.25%) – representing an $8.3 billion reduction in RBOC special access rates,"[24]

The special access rates of return estimated by ETI and other have been challenged by the ILECs who argue that accurate rates of return cannot be calculated from the accounting data that is compiled under the interstate separations process. Nevertheless, the authors of the NRRI study (2009) found that "Even after adjustment for separations problems, RBOC earnings on special access are well above the 11.25% rate most recently set by the FCC. In the case of AT&T and Qwest, earnings are about three times that rate."[25]

Whatever method of analysis is applied to special access prices, it is clear that they are well above any reasonable measure of costs. This paper therefore will assume, based on the record discussed above, that special access prices are about 50 percent above costs, and will model the effect of cutting prices by that amount. To determine the sensitivity of our results to different assumptions, the paper also includes an estimated range of price cuts around that figure.

Special Access Price Elasticity

The authors of the AT&T study in 2003 also analyzed the price elasticity of special access services. They developed demand models in which the special access quantity was specified as a function of price and other exogenous determinants. The AT&T Study authors derived the following elasticity coefficients for DS-0, DS-1 and DS-3 and above circuits: DS-0 = Not Significant; DS-1 = **1.31**; DS-3 and above = **-1.91**.[26] In their subsequent study of special access pricing, ETI concluded that "In the absence of any actual data to the contrary, the AT&T assumption, as an estimate, remains reasonable."[27]

For purposes of this study we are adopting an estimated elasticity of 1.6 from the middle of this range. To determine the sensitivity of our results to different measures of elasticity, we also present results using a range of elasticities around that point.

[22] AT&T Study. .
[23] AT&T Study, page 1.
[24] ETI Study, page 13.
[25] NRRI Study, page 80.
[26] AT&T Study, sections 3.1 through 3.4.
[27] ETI Study, page 13, f/n 21.

Intermodal Competition

Special access pricing has been contentious over the years in part because of disagreements as to whether these services face meaningful "intermodal" competition from other technologies and service providers. Fixed wireless services and high bandwidth services from cable operators are two of the most commonly cited technologies that are claimed to provide such competition for special access. However, with regard to cable television and fixed wireless competition, the NRRI authors concluded that "Overall, these competitors are still acting on the fringes of special access markets."[28] While they note that newer technologies may be poised to become major competitors and are increasingly constraining ILEC behavior, these technologies "have not yet grown beyond fringe competitors in most markets."[29]

Dr. Mitchell, in his Declaration, cited evidence in the FCC's special access proceeding to support his findings that "…intermodal substitutes are currently judged inferior to channel termination service from an incumbent LEC."[30] Cable modem service, for example, is supplied on a "best-efforts" basis and lacks the dedicated capacity required by wireless operators and others. Furthermore, it appears that cable companies do not typically offer high capacity transport services."[31]

As regards fixed wireless services, it is my understanding that equipment limitations and technical challenges have adversely affected the adoption of this technology as a substitute for special access.[32]

Low Density Areas

For wireless providers and other customers in low density areas, intermodal substitutes for special access are not available even as "fringe" competitors. Because wireless service carriers need to provide wide area coverage to their customers, a large percentage of their cell sites must be located in lower density areas of the Metropolitan Statistical Areas ("MSAs") that they serve.

Cell sites located in low density regions such as rural areas may be only marginally profitable. In such areas, wireless carriers must decide where to locate their own cell sites and where to rely on other solutions such as wireless "roaming." A wireless carrier in a rural area may choose to build cell sites along the major interstate highway that serves the area. However, for the towns located some distance from the interstate, the carrier cannot justify the additional investment to build a new site. If the costs of installing and operating cell sites were to decline, the economics of cell site location in these areas would change. All else equal, one would expect that new cell sites to be constructed and that the capacity of existing cell sites would be increased.

Dr. Mitchell notes that in low density areas, "there is low potential for competitive entry in the supply of channel terminations to CMRS providers and to other customers."[33]

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[28] NRRI Study, page 80.
[29] NRRI Study, page 80.
[30] Mitchell Declaration, Par. 68.
[31] Mitchell Declaration, Par. 68.
[32] See Attachment to Ex. Parte Letter from Paul Margie, Counsel for Sprint/Nextel to Marlene H. Dortch, Secretary, Federal Communications Commission, November 22, 2010 entitled *Special Access Reform, Delivering on the Promise of Broadband,* page 11.
[33] Mitchell Declaration, par. 58.

V. Applying the RIMS II Model

Description of the Model

There are many different circumstances in which investors and policy makers seek to understand the full economic effects of an initial change in a given industry and in a given region. For example, assume that a sports stadium is to be constructed in a particular county. Policy makers might want to know how many direct and indirect jobs will be created within the state where the stadium will be located and within the local region where the stadium will be built. They might also want o know how much economic output will be created, how much compensation will be provided to workers and how the project will affect value added in the state and regional economies. In order to address these kinds of questions, the U.S. Bureau of Economic Analysis ("BEA") maintains an economic model known as RIMS II.

Using RIMS II, the BEA prepares "multipliers" using state and local personal income data and national input-output data. RIMS II multipliers are used to study how changes in the production of one or more industries are likely to affect other industries in the study region. For example, RIMS II multipliers can be used to estimate how an increase in an industry's production will affect the production of other industries in the region. Impacts can also be estimated for employment, employee earnings and value added.

Multipliers are industry-specific. They can be ordered and interactively retrieved from the BEA web site. A fee is charged to cover the cost of preparing multipliers. In this project, multipliers were ordered from BEA that were specific to the U.S. telecommunications service industry (NAICS 51700).

RIMS II Multipliers

EI purchased six types of multipliers for the U.S. telecommunications industry. Four of the six were "Final Demand" multipliers while the remaining two were "Direct Effects" multipliers. In this analysis, all subsequent calculations were based solely on the four final demand multipliers. EI also purchased Type I and Type II variations of the six multiplier types. Type I multipliers capture direct and indirect affects only. Type II multipliers pick up direct, indirect and "induced" effects as well. Induced effects measure the additional gains that result from the spending decisions of employees whose income has risen as a result of increased direct and indirect economic activities. Because we wanted to compute the full effect of moving special access prices toward cost, in this analysis all multiplier calculations were based solely on the Type II multipliers provided by BEA.

The final demand multipliers used in this analysis were used to quantify the effects of an initial change in special access revenues on total U.S. output, employee earnings, employment and value added. Gross output consists of "sales, or receipts, and other operating income, plus commodity taxes and changes in inventory."[34] Output is the broadest measure of economic activity. An output multiplier quantifies the additional output stimulated by the assumed initial change in the market.

[34] http://www.bea.gov/glossary/glossary.cfm?letter=G

A reduction in special access rates would also stimulate increases in U.S. employment and in the total compensation paid to those U.S. employees. Employment multipliers quantify the number of additional jobs provided to workers who would be needed to produce the additional direct and indirect production that is under study. Earnings multipliers capture the additional wages, salaries and supplemental benefits paid to those additional workers.

Value added is the contribution of each industry's labor and capital to that industry's gross output. An industry's value added also represents that industry's contribution to U.S. Gross Domestic Product ("GDP").[35] In order to get from gross output to value added, one subtracts all intermediate inputs (i.e. goods and services purchased from other industries or imported) from gross output. Value added multipliers measure the increase in value added that results from the assumed initial change in the market.

Multipliers by State

As noted earlier in this report, each of the multipliers described above was provided by BEA on a state-by-state basis. State-based multipliers are generally lower than national multipliers because in state multipliers, interstate flows of inputs and outputs are not included in the development of the underlying multiplier. Because these interstate flows can be quite significant, the estimates presented subsequently in this report are inherently conservatively low.

VI. Economic Effects

Direct Effects of Price Reductions

In the analyses described in this report, the first methodological step is to estimate the direct effects of the assumed price reduction on the quantity to be sold in the market place. This part of the analysis begins with the 2007 special access lines in service for AT&T, Qwest and Verizon. The special access revenues earned by the three ILECs in 2007 are also used. The underlying calculations are repeated in Appendix Tables 1.0 through 3.2. In each Appendix Table, both an assumed price reduction and an assumed price elasticity coefficient are used to estimate the increase in special access lines and special access revenues that would result from the assumed decline in price. In each of the Appendix Tables, only the input assumptions change. The basic formula does not change in any of the Tables in the Appendix.

Consider, as an example, Appendix Table 1.0. In Appendix Table 1.0, it is assumed that special access prices decline by 40% and that the elasticity coefficient is -1.5. With these input assumptions, the resulting quantity increase is derived in the Table using the following formula: *quantity increase = (1 – price reduction) ^ (elasticity) – 1*. In Appendix Table 1.0, the quantity increase that results from a 40% price reduction and an elasticity coefficient of -1.5 is 115.2%. In terms of special access lines, this percentage increase would translate into 310,998,022 additional special access lines. Total special access lines would then equal the sum of existing lines (270,043,867 lines) plus additional lines (310,998,022) or 581,041,889 in total.

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[35] The sum of the value added contributions provided by all industries in the United States is equal to U.S. GDP.

As for revenues, the direct effect calculations in Appendix Table 1.0 must also take account of the fact that each special access line will now be sold at a 40% discount. In Appendix Table 1.0, the 40% price reduction is applied directly to the reported revenues per line for 2007. The reduced revenues per line are then applied to the new total line quantities described above. This calculation yields an estimate of the total revenues that would result from the price reduction and elasticity coefficient that are assumed in Appendix Table 1.0. This new total is $23.2 billion.

The next step in the direct effects methodology is to subtract the new estimate of total special access revenues ($23.2 billion) from the "old" special access revenues that were earned in 2007. As shown in the Appendix Table 1.0 that figure was $18.0 billion. When we subtract the new special access revenue total from the "old" special access revenue total, we get a net revenue increase of $5.2 billion as of 2007.

The last step in the direct effects calculation was to bring forward the calculated net revenue gains from 2007 to 2010. For this purpose we considered several different measures of the actual growth in wireless communications in the U.S. during the years 2008 – 2010. Wireless carriers use special access services extensively at cell sites. These carriers are particularly vulnerable to excess special access charges because cell sites are frequently located in remote areas with low traffic volumes. As noted by Dr. Mitchell, "A large proportion of a CMRS provider's cell sites are located in and throughout the lower-density areas of an MSA. In these portions of the MSA there is low potential for competitive entry in the supply of channel terminations to CMRS providers and to other customers in low density regions."[36] Because wireless carriers overwhelmingly used special access lines during these years,[37] it is reasonable to project special access growth over the period 2007-2010 as a function of growth in wireless services during the same time frame. Wireless industry trends in subscribers, revenues and cell sites for the years 2007 through 2010 are summarized in Schedule 1.

[36] Mitchell Declaration, Par. 57.

[37] According to the ETI report, "…special access services are used to connect more than 90% of all wireless transceiver (cell) sites to the wireless carriers' switches." See ETI Report, page 2.

Schedule 1 [38]

Wireless Industry Trends 2007-2010

Year	Estimated Total Subscriber Connections	12 Month Total Service Revenues in $000	Cell Sites
2007	243,428,202	$132,893,824	210,360
2008	262,720,165	$143,710,400	220,472
2009	276,610,580	$151,203,725	245,912
2010	292,847,098	$155,813,154	251,618

	% Changes	% Changes	% Changes
2007-2008	7.93%	8.14%	4.81%
2008-2009	5.29%	5.21%	11.54%
2009-2010	5.87%	3.05%	2.32%
2007-2010	**6.35%**	**5.45%**	**6.15%**

As shown in Schedule 1, the total number of wireless subscribers in the U.S. increased from 243 million in 2007 to 293 million in 2010. This increase reflected an average annual growth rate in wireless subscribers of 6.35% per year. Schedule 1 also provides annual data for the total service revenues (12 month totals) earned by the wireless carriers during the years 2007 through 2010. For the period 2007 through 2010, wireless service revenues increased from $132.9 billion to $155.8 billion, an annual growth rate of 5.45%. Finally, as shown in Schedule 1, the total number of wireless cell sites increased from 210,360 in 2007 to 251,618 in 2010. This increase reflected a compound annual growth rate for cell sites of 6.15% per year. Thus, for each of the three measures reported in Schedule 1, the compound annual growth rate for the period 2007 through 2010 is approximately 6.0%. For all of the analyses described subsequently in this report, an annual growth rate of 6.0% is used to translate revenue estimates for 2007 into comparable values for 2010.

[38] CTIA – The Wireless Association, *Annualized U.S. Survey Results – June 1985 to June 2010.*

For example, returning to Appendix Table 1.0, we observe that the estimated revenue increase of $5.234 billion in 2007 is now multiplied by a "2007-2010 growth factor" that equals 1.19. This factor is simply the result of compounding an annual growth rate of 6.0% over a three year time frame [39]. In Appendix Table 1.0, this calculation yields a revenue increase in 2010 of $6.228 billion.

The direct effects of reducing special access prices can now be estimated under different assumptions of price reduction and price elasticity. In Schedule 2, we present direct effect estimates for nine different combinations of assumptions.

Schedule 2

Increase In Direct ILEC Revenues 2010

	Price Reduction		
	40%	50%	60%
Elasticity			
-1.5	$6,228,550,236	$8,865,976,628	$12,438,905,322
-1.6	$7,676,785,012	$11,038,583,574	$15,686,445,135
-1.7	$9,200,921,453	$13,367,126,042	$19,245,613,109

Source: Appendix Tables 1.0, 1.1, 1.2, 2.0, 2.1, 2.2, 3.0, 3.1, & 3.2.

As shown in Schedule 2, a 40% special access price reduction will yield increased direct revenues within a range of $6.2 billion to $9.2 billion. With a 60% price reduction, the estimated direct revenue increase would now lie between $12.4 billion to $19.2 billion. The mid-range estimate of direct revenues shown in Schedule 1 is $11.0 billion. This estimate assumes a special access price reduction of 50% and a price elasticity coefficient of -1.6.

Weighting Multipliers for 50 States

The direct increases in revenue shown in Schedule 2 serve as inputs that allow us to estimate the broader direct and indirect effects of a special access rate reduction for the U.S. economy as a whole. These estimates are used in conjunction with industry multipliers from RIMS II to measure the full benefits of the price reductions as they flow through the economy as a whole. However, the industry multipliers from the RIMS II model are provided on a state-by-state basis. Before they can be used in this analysis, the state multipliers must be averaged in order to generate reasonable estimates for the U.S. economy as a whole. In this analysis two separate averaging conventions are used for this purpose. It is intended that the average multipliers derived here will reasonably reflect the industrial profile of telecommunications services for the U.S. as a whole.

As noted earlier in this report, the Federal Communications Commission historically published annual special access line counts for the U.S. and for each individual state. Special access line counts for

[39] 1.06 times 1.06 times 1.06 equals 1.191.

2007 are the most recent figures available. The FCC's special access line counts by state for 2007 are reproduced in Schedule 3.

Schedule 3

Input-Output Multipliers by State

State	2007 Special Access Lines	Final-demand Output (dollars)	Final-demand Earnings (dollars)	Final-demand Employment (number of jobs)	Final-demand Value-added (dollars)
AL	3,630,420	1.7277	0.3687	9.5306	0.971
AZ	1,936,537	1.7659	0.3897	9.2828	1.0168
AR	1,186,818	1.6602	0.3387	7.477	0.928
CA	36,299,969	2.0968	0.4795	9.4317	1.1958
CO	2,090,093	2.0234	0.4602	9.5406	1.158
CT	2,079,599	1.8003	0.3707	6.9785	1.0254
DE	2,077,774	1.5847	0.2646	6.164	0.9012
DC	5,915,531	1.4194	0.0561	1.0253	0.803
FL	20,955,125	1.8384	0.4114	10.2612	1.0602
GA	12,005,463	2.0166	0.4494	9.7825	1.1529
HI	306,612	1.7765	0.3833	8.9097	1.017
ID	371,012	1.5152	0.3151	8.7448	0.8565
IL	7,637,143	1.9743	0.4375	9.1097	1.1223
IN	2,950,935	1.6878	0.3509	8.8975	0.9446
IA	773,675	1.4963	0.2972	7.8325	0.8394
KS	1,401,841	1.6472	0.2864	6.1557	0.925
KY	1,617,423	1.6719	0.3349	8.9808	0.9365
LA	3,013,204	1.6602	0.3582	9.3813	0.9406
ME	1,387,973	1.6619	0.3597	9.5091	0.9445
MD	9,139,924	1.8743	0.3857	8.2959	1.0742
MA	12,532,948	1.8457	0.3885	7.4784	1.0556
MI	4,647,340	1.7566	0.3912	9.3365	0.9983
MN	1,358,811	1.7611	0.3824	8.7715	0.9975
MS	1,420,716	1.5492	0.3134	8.8335	0.8664
MO	4,208,758	1.8569	0.3488	8.3091	1.0491
MT	181,509	1.5783	0.3305	9.357	0.8944
NE	421,910	1.4749	0.292	7.2138	0.8285
NV	9,857,892	1.6076	0.3354	7.8915	0.9209
NH	2,176,044	1.731	0.3508	7.7846	0.9878
NJ	25,093,861	1.9681	0.4109	7.9416	1.1249
NM	544,580	1.6692	0.3553	10.0132	0.9487
NY	40,375,012	1.7981	0.3529	6.4792	1.0313
NC	10,938,657	1.7978	0.3901	9.8848	1.0179
ND	142,362	1.4507	0.273	6.9089	0.814
OH	6,197,910	1.8208	0.3888	9.5548	1.0254
OK	1,767,711	1.7967	0.3882	10.4352	1.0141
OR	1,010,727	1.7031	0.355	8.8372	0.9687
PA	12,595,292	1.928	0.408	8.9128	1.0896
RI	1,110,659	1.6552	0.2846	6.6392	0.9417
SC	1,838,246	1.7648	0.3736	10.3533	1.0011
SD	134,327	1.4771	0.2924	7.2822	0.8292
TN	5,241,559	1.8812	0.3977	10.1429	1.0677
TX	20,216,659	2.088	0.4736	10.4648	1.1856
UT	837,729	1.8601	0.4196	12.0077	1.06
VT	162,440	1.5974	0.3215	8.0322	0.9043
VA	15,041,530	1.8873	0.3725	7.9036	1.0734
WA	2,834,044	1.8612	0.3984	8.4622	1.0605
WV	810,794	1.5601	0.3004	7.9607	0.8767
WI	2,109,440	1.6587	0.3547	8.9571	0.9331
WY	160,776	1.4044	0.2743	6.885	0.7925
Average of Multipliers for all States Weighted by Lines		**1.8736**	**0.3941**	**8.5254**	**1.0679**
Simple Average of Multipliers for CA, TX, NY, FL, and IL		**1.9591**	**0.4310**	**9.1493**	**1.1190**

Source: Federal Communications Commission, Statistics of Communications Common Carriers, 2006/2007 Edition; Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis -- Multipliers based on the 2002 Benchmark Input-Output Table for the Nation and 2007 regional data.

The state-by-state multipliers that were obtained for this project from BEA are also shown in Schedule 3. Four types of “final demand” multipliers are provided. These are multipliers for output, employee earnings, employment and value added. In Schedule 3, each multiplier for each state is weighted by the special access line counts reported for the same state. For example, under this procedure, the state multipliers for California with 36 million lines would be more heavily weighted in the national average than the state multipliers for Oregon with 1 million lines. The weighted average multipliers that result from this 50 state averaging convention are also shown in Schedule 3. These national estimates are shown immediately below the state-by-state totals.

As reported in Schedule 3, the weighted average multipliers calculated under this procedure were: **Output = <u>1.8736</u>, Earnings = <u>0.3941</u>, Employment = <u>8.5254</u> and Value Added = <u>1.0679.</u>**

Simple Average Multipliers for Top Five States

The process of weighting state multipliers on the basis of state access line counts seems both logical and straightforward. The procedure basically assumes that if special access rates declined significantly, the demand for new special access lines would be greatest in those states where demand had been greatest in the past. Conversely, if special access prices fall, the demand for new special access lines would be lowest in the states where demand for such services had been lowest in the past.

While this procedure seems quite reasonable, other averaging conventions can also be considered. One such alternative is to calculate the simple average of the reported multipliers for the five most populous states. This method would forgo any weighting on the basis of special access line counts by state. By population, the five largest states in the United States are California, Texas, New York, Florida and Illinois. Each of these states is large both geographically and by population. By comparison with other states, the top five states would appear to more closely resemble the United States as a whole. For this reason, the average multipliers derived from these five states alone would arguably provide reasonable proxy values for the U.S. as a whole[40].

The simple average multipliers for the top five U.S. states are also shown in Schedule 3. These values were: **Output = <u>1.9591</u>, Earnings = <u>0.4310</u>, Employment = <u>9.1493</u> and Value Added = <u>1.1190.</u>**

Economic Benefits of Lower Special Access Prices

The average multipliers described above can now be combined with the direct revenue increases that were summarized in Schedule 2. The economic effects of using the line- weighted average multipliers from the fifty states are reported in Schedule 4.

[40] The five largest states have both large populations and large land areas. These characteristics also describe the U.S. as a whole. The five largest states generally differ from highly populated smaller states and from sparsely populated large states.

Schedule 4

Economic Effects using Average of Multipliers for 50 States Weighted by Special Access Lines 2010

Increase in Output

output multiplier = 1.8736

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	$11,669,935,009	$16,611,469,303	$23,305,779,226
-1.6	$14,383,376,352	$20,682,108,680	$29,390,434,101
-1.7	$17,239,028,556	$25,044,911,940	$36,058,961,667

Increase in Earnings

earnings multiplier = 0.3941

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	$2,454,783,591	$3,494,240,734	$4,902,396,147
-1.6	$3,025,558,945	$4,350,504,179	$6,182,309,954
-1.7	$3,626,248,509	$5,268,224,615	$7,585,042,020

Increase in Employment

employment multiplier = 8.5254

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	53,101	75,586	106,047
-1.6	65,448	94,109	133,734
-1.7	78,442	113,961	164,077

Increase in Value-Added

value-added multiplier = 1.0679

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	$6,651,370,704	$9,467,836,812	$13,283,311,094
-1.6	$8,197,917,813	$11,787,929,553	$16,751,307,715
-1.7	$9,825,519,115	$14,274,543,383	$20,552,087,142

As shown in Schedule 4, the consequences of a significant special access price reduction include increases in total U.S. output, total employee earnings, total employment and total value added to GDP. Using the average of the multipliers for the 50 states, we observe that with a 50% price reduction, total economic output in 2010 would likely increase by between $16.6 billion and $25.0 billion. The same 50% price reduction would stimulate between 75,000 and 114,000 new jobs. These workers would earn between $3.5 billion and $5.3 billion in employee compensation. Finally, the price decrease would stimulate additional value added to the U.S. economy of between $9.5 billion and $14.3 billion.

Assuming a 60% price reduction, U.S. economic output could increase by as much as $36.1 billion while total employment grew by as much as 164,000 jobs. Even assuming price elasticity of only -1.5 (rather than -1.7), a 60% price decrease would add $23.3 billion in output and 106,000 jobs.

Schedule 5

Economic Effects using Average of Multipliers for California, Texas, New York, Florida, and Illinois 2010

Increase in Output

output multiplier = 1.9591

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	$12,202,477,337	$17,369,512,132	$24,369,308,194
-1.6	$15,039,743,052	$21,625,909,851	$30,731,628,393
-1.7	$18,025,709,236	$26,187,803,971	$37,704,465,554

Increase in Earnings

earnings multiplier = 0.4310

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	$2,684,380,581	$3,821,058,607	$5,360,919,416
-1.6	$3,308,540,804	$4,757,408,749	$6,760,544,124
-1.7	$3,965,413,128	$5,760,963,982	$8,294,474,338

Increase in Employment

employment multiplier = 9.1493

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	56,987	81,118	113,808
-1.6	70,237	100,996	143,520
-1.7	84,182	122,300	176,084

Increase in Value-Added

value-added multiplier = 1.1190

	Price Reduction		
Elasticity	40%	50%	60%
-1.5	$6,969,996,856	$9,921,382,486	$13,919,632,611
-1.6	$8,590,629,499	$12,352,616,562	$17,553,759,564
-1.7	$10,296,199,142	$14,958,348,726	$21,536,610,893

The economic effects of a substantial special access price reduction using the top five state multipliers are reported in Schedule 5. With a 50% price reduction, total economic output, as shown in Schedule 5, would likely increase by between $17.4 billion and $26.2 billion. The same 50% price reduction would now stimulate between 81,000 and 122,000 new jobs. These workers would earn between $3.8 billion and $5.8 billion in employee compensation. Finally, the price decrease would stimulate additional value added to the U.S. economy of between $9.9 billion and $15.0 billion.

Using the top five state multipliers with an assumed price reduction of 60%, total U.S. output could grow by as much as $37.7 billion while employment would grew by as much as 176,000 jobs. Even if we again assume price elasticity of only -1.5 (rather than -1.7), a 60% price decrease would add $24.4 billion in output and 114,000 jobs.

The mid-range estimates (50% price reduction and elasticity = -1.6) under both the 50 state average multipliers and the top five state average multipliers are highlighted below.

Mid-Range Estimates (50% price reduction and elasticity = -1.6)

	50 State Average	Top 5 State Average
Increase in U.S. Output	$ 20.7 billion	$ 21.6 billion
Increase in U.S. Earnings	$ 4.4 billion	$4.8 billion
Increase in U.S. Employment	94,109	100,996
Increase in U.S. Value Added	$ 11.8 billion	$ 12.4 billion

Alternative “Hi-End” and “Low-End” estimates are reported below.

Hi End Estimates (60% price reduction and elasticity = -1.7)

	50 State Average	Top 5 State Average
Increase in U.S. Output	$ 36.1 billion	$ 37.7 billion
Increase in U.S. Earnings	$ 7.6 billion	$8.3 billion
Increase in U.S. Employment	164,077	176,084
Increase in U.S. Value Added	$ 20.6 billion	$ 21.5 billion

Low End Estimates (40% price reduction and elasticity = -1.5)

	50 State Average	Top 5 State Average
Increase in U.S. Output	**$ 11.7 billion**	**$ 12.2 billion**
Increase in U.S. Earnings	**$ 2.5 billion**	**$2.7 billion**
Increase in U.S. Employment	**53,101**	**56,987**
Increase in U.S. Value Added	**$ 6.7 billion**	**$ 7.0 billion**

Appendix

Appendix Table 1.0

Calculation of Increase in Special Access Revenues from Price Decrease

Assumptions:

price reduction =	40%
elasticity* =	-1.5
quantity increase* =	115.2%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	121,079,495	226,214,489
Qwest	10,586,569	12,192,101	22,778,670
Verizon	154,322,304	177,726,426	332,048,730
	270,043,867	310,998,022	581,041,889

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$47.50	$10,745,632,315
Qwest	$2,598,247,000	$245.43	$147.26	$3,354,322,453
Verizon	$7,065,080,000	$45.78	$27.47	$9,120,979,060
	$17,986,858,000			$23,220,933,828
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$5,234,075,828
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$6,228,550,236

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Appendix Table 1.1

Calculation of Increase in Special Access Revenues from Price Decrease

Assumptions:

price reduction =	40%
elasticity* =	-1.6
quantity increase* =	126.4%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	132,935,347	238,070,341
Qwest	10,586,569	13,385,926	23,972,495
Verizon	154,322,304	195,129,026	349,451,330
	270,043,867	341,450,299	611,494,166

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$47.50	$11,308,808,531
Qwest	$2,598,247,000	$245.43	$147.26	$3,530,121,752
Verizon	$7,065,080,000	$45.78	$27.47	$9,599,007,558
	$17,986,858,000			$24,437,937,842
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$6,451,079,842
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$7,676,785,012

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Appendix Table 1.2

Calculation of Increase in Special Access Revenues from Price Decrease

<u>Assumptions:</u>

price reduction =	40%
elasticity* =	-1.7
quantity increase* =	138.3%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	145,412,561	250,547,555
Qwest	10,586,569	14,642,319	25,228,888
Verizon	154,322,304	213,443,693	367,765,997
	270,043,867	373,498,573	643,542,440

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$47.50	$11,901,500,689
Qwest	$2,598,247,000	$245.43	$147.26	$3,715,134,654
Verizon	$7,065,080,000	$45.78	$27.47	$10,102,089,424
	$17,986,858,000			$25,718,724,767
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$7,731,866,767
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$9,200,921,453

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.
Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.
This may be re-written $Q = AP^e$, where A represents the other variables.
Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.
The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$
$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$
The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Appendix Table 2.0

Calculation of Increase in Special Access Revenues from Price Decrease

Assumptions:

price reduction =	50%
elasticity* =	-1.5
quantity increase* =	182.8%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	192,231,675	297,366,669
Qwest	10,586,569	19,356,770	29,943,339
Verizon	154,322,304	282,167,087	436,489,391
	270,043,867	493,755,531	763,799,398

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$39.58	$11,771,250,427
Qwest	$2,598,247,000	$245.43	$122.71	$3,674,476,146
Verizon	$7,065,080,000	$45.78	$22.89	$9,991,531,955
	$17,986,858,000			$25,437,258,528
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$7,450,400,528
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$8,865,976,628

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Appendix Table 2.1

Calculation of Increase in Special Access Revenues from Price Decrease

<u>Assumptions:</u>

price reduction =	50%
elasticity* =	-1.6
quantity increase* =	203.1%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	213,574,710	318,709,704
Qwest	10,586,569	21,505,907	32,092,476
Verizon	154,322,304	313,495,442	467,817,746
	270,043,867	548,576,059	818,619,926

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$39.58	$12,616,113,829
Qwest	$2,598,247,000	$245.43	$122.71	$3,938,206,022
Verizon	$7,065,080,000	$45.78	$22.89	$10,708,658,800
	$17,986,858,000			$27,262,978,650
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$9,276,120,650
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$11,038,583,574

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Appendix Table 2.2

Calculation of Increase in Special Access Revenues from Price Decrease

<u>Assumptions:</u>

price reduction = 50%
elasticity* = -1.7
quantity increase* = 224.9%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	236,449,609	341,584,603
Qwest	10,586,569	23,809,295	34,395,864
Verizon	154,322,304	347,072,341	501,394,645
	270,043,867	607,331,245	877,375,112

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$39.58	$13,521,616,002
Qwest	$2,598,247,000	$245.43	$122.71	$4,220,864,704
Verizon	$7,065,080,000	$45.78	$22.89	$11,477,256,321
	$17,986,858,000			$29,219,737,027
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$11,232,879,027
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$13,367,126,042

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.
Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.
This may be re-written $Q = AP^e$, where A represents the other variables.
Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.
The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$
$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$
The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.
annual growth rate = 6%
3-year growth factor = 1.19

Appendix Table 3.0

Calculation of Increase in Special Access Revenues from Price Decrease

Assumptions:

price reduction =	60%
elasticity* =	-1.5
quantity increase* =	295.3%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	310,447,560	415,582,554
Qwest	10,586,569	31,260,519	41,847,088
Verizon	154,322,304	455,690,164	610,012,468
	270,043,867	797,398,243	1,067,442,110

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$31.67	$13,160,658,068
Qwest	$2,598,247,000	$245.43	$98.17	$4,108,189,222
Verizon	$7,065,080,000	$45.78	$18.31	$11,170,872,326
	$17,986,858,000			$28,439,719,615
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$10,452,861,615
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$12,438,905,322

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Appendix Table 3.1

Calculation of Increase in Special Access Revenues from Price Decrease

Assumptions:

price reduction =	60%
elasticity* =	-1.6
quantity increase* =	333.2%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	350,326,124	455,461,118
Qwest	10,586,569	35,276,092	45,862,661
Verizon	154,322,304	514,225,879	668,548,183
	270,043,867	899,828,094	1,169,871,961

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$31.67	$14,423,531,474
Qwest	$2,598,247,000	$245.43	$98.17	$4,502,403,773
Verizon	$7,065,080,000	$45.78	$18.31	$12,242,809,421
	$17,986,858,000			$31,168,744,668
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$13,181,886,668
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$15,686,445,135

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate = 6%

3-year growth factor = 1.19

Appendix Table 3.2

Calculation of Increase in Special Access Revenues from Price Decrease

<u>Assumptions:</u>

price reduction =	60%
elasticity* =	-1.7
quantity increase* =	374.8%

	2007 Special Access Lines	Line Increase	New Total Lines
AT&T	105,134,994	394,031,365	499,166,359
Qwest	10,586,569	39,676,991	50,263,560
Verizon	154,322,304	578,378,576	732,700,880
	270,043,867	1,012,086,933	1,282,130,800

Note: access lines counts use DS0 equivalents.

	2007 Special Access Revenues	Revenues per Line	New Revenues per Line (after price reduction)	New Revenues
AT&T	$8,323,531,000	$79.17	$31.67	$15,807,587,972
Qwest	$2,598,247,000	$245.43	$98.17	$4,934,446,454
Verizon	$7,065,080,000	$45.78	$18.31	$13,417,607,699
	$17,986,858,000			$34,159,642,125
			Old Revenue	$17,986,858,000
			Revenue Increase as of 2007	$16,172,784,125
			2007-2010 Growth Factor**	1.19
			Revenue Increase as of 2010	$19,245,613,109

*This elasticity is based on those computed by Rappoport et al. They found an elasticity of -1.31 for DS-1 and -1.91 for DS-3 and higher.

Their model is: $\ln Q = e \ln P$ + other variables, where Q is quantity, e is elasticity, and P is price.

This may be re-written $Q = AP^e$, where A represents the other variables.

Suppose $P_1 = (1-k)P_0$, where k is the percentage price reduction.

The percentage increase in Q is: $(Q_1 - Q_0)/Q_0 = Q_1/Q_0 - 1$

$Q_1/Q_0 = A(P_1)^e/A(P_0)^e = (P_1/P_0)^e = [(1-k)P_0/P_0]^e = (1-k)^e$

The percentage increase in Q is: $(1-k)^e - 1$

**Growth Factor based on annual growth rate in Schedule 1.

annual growth rate =	6%
3-year growth factor =	1.19

Attachment A

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Economic analysis of international trade issues relating to media and copyright industries.

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COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
U.S. District Court for Eastern District of Virginia, Alexandria Division	Eden Hannon & Co. v. Sumitomo Trust & Banking Co. (USA) Civil Action No. 89-0312A	Analysis of Financial Models, Cash Flow Analysis
Circuit Court for Pinella County, Florida	Home Shopping Network Inc. v. GTE, GTE FLA., Inc. and GTE Communications Corp. CT. Civ. 87-014199-7	Relevance of Planning & Budgeting Reports to the Analysis of Damages
U.S. District Court for Western District of Oklahoma	Banner Industries, Inc. v. Pepsico, Inc. CIV-85-449-R	Financial Plans Financial Viability (Deposition Testimony Only)
Circuit Court for Baltimore City	Pulse One Communications Inc. v. Bell Atlantic Mobile Systems Inc. Case No. 90108057/CC112199	Damages (Deposition Testimony Only)
Supreme Court of the State of New York County of New York	Scandinavian Gourmet Provisions, d/b/a Fredricksen & Johannesen v. Jurgela, aka Al Jurgela, aka Constantine Jurgela, aka C.R. Jurgela, Valco Equities Ltd. Charles Earle, Valco Development Corp., Chase Manhattan Bank, Clinton Barrow, Franklin Investors and Harold L. Goerlich Index No. 22891/90	Damages

COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
Chancery Court of Davidson County, Tennessee	MCI Telecommunications Corp. v. Dudley W. Taylor etc. et al. No. 88-1227-III	Tax Treatment of Telephone Access Charges
Superior Court of the District of Columbia Civil Division	Robert H. Kressin, General Partner, Cellular Phone Stores Limited Partnership v. Bell Atlantic Mobile Systems, Inc. Civil Action No. 02258-91	Damages, Cellular Telephone Industry
Court of Common Pleas First Judicial District of Pennsylvania	Shared Communications Service of 1800-80 JFK Boulevard Inc. v. Bell Atlantic Properties, Inc. et al. September Term 1900, No. 775	Damages, Telecommunications Industry
United States District Court for the Northern District of Illinois	JamSports and Entertainment, LLC, Plaintiff v. ParadamaProductions, Inc., et al. Case No. 02C 2298	Damages
Superior Court of New Jersey, Law Division, Essex County	Bell Atlantic Network Services, Inc. v. P.M. Video Corp., Docket No. L-6602-91	Damages (Deposition Testimony Only)
U.S. District Court for the District of Columbia	FreBon International Corp. v. Bell Atlantic Corp. et al. Civil Action No. 94-324	Damages (Deposition Testimony Only)
U.S. District Court for the Eastern District of New York	Universal Contact Communications Inc. v. PageMart Inc.	Damages (Deposition Testimony Only)

COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
U.S. District Court for District of Maryland	Integrated Consulting Services, Inc. v. LDDS	Damages (Deposition Testimony Only)
U.S. District Court Eastern District of Virginia, Alexandria Division	Mexinox, S.A. et al. v. Acerinox	Antitrust Damages (Deposition Testimony Only)
U.S. District Court Eastern District of North Carolina	Broad Band Technologies, Inc. v. General Instrument Corp.	Patent Damages (Deposition Testimony Only)
International Chamber of Commerce International Court of Arbitration	WorldSpan L.P. v. Abacus Distribution Systems Pte Ltd. And Other Case No. 9833/FMS	Damages and License Valuation
U.S. District Court for Western District of Washington at Seattle Case No. C97-10732	Arbitration between Electric Lightwave, Inc., Plaintiff v. USWest Inc., Defendant	Damages
U.S. District Court for District of Maryland Civil Case No. PJM 03-307	Final Analysis Communication Services, Inc. v. General Dynamics Corp., et al.	Damages (Rebuttal Only)
U.S. District Court for the Western District of Oklahoma	Eateries, Inc. and Fiesta Restaurant, Inc. v. J.R. Simplot Company No. CIV-99-1330-C	Damages (Deposition Testimony Only)
American Arbitration Association	Arbitration Between Avecia Inc., Claimant v. Mareva Poscines Et Filtrations, S.A. Respondent	Allocation of FIFRA Data Costs

COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
American Arbitration Association	Arbitration Massillon Cable TV, Inc., Claimant v. Fox Sports Net Ohio LLC	Licensing Fees For Regional Sports Programming
Commonwealth of Massachusetts, Middlesex Superior Court	Netrix, Inc and Proteon, Inc. v. Digital Equipment Corp. and Cabletron Systems, Inc. CIV No. MICX 98-01533	Valuation of Software License
Circuit Court for the City of Richmond, VA	Interactive Return Service, Inc. v. Virginia Polytechnic Institute and State University Case No LM 870-3	Damages (Deposition and Testimony before Judge Only)
State of Connecticut Superior Court Complex Litigation Docket	Alan M. Glazer et al. v. The Dress Barn, Inc. Case No. (X02) CV-01-0169075 S	Damages
Circuit Court of the County of St. Louis, State of Missouri	Biomedical Systems Corp. v. Mead Johnson & Company Cause No. 01CC-003428	Damages (Deposition Testimony only)
Private Arbitration	Dennis M. Donovan v. Raytheon Company	Valuation of Pension Benefits
World Trade Center, Victims Compensation Fund	Raymond Murphy	(Oral Testimony and Report)
World Trade Center Victims Compensation Fund	Dennis McHugh	(Oral Testimony and Report)
World Trade Center Victims Compensation Fund	Robert Crawford	(Oral Testimony and Report)

COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
World Trade Center Victims Compensation Fund	James Corrigan	(Report)
World Trade Center Victims Compensation Fund	John Moran	(Report)
World Trade Center Victims Compensation Fund	Nathaniel Webb	(Report)
U.S. District Court for the Northern District of Illinois, Eastern Division, No. 01-C 0067	ChoiceParts, LLC v. General Motors Corporation et al.	(Deposition and Report)
Commonwealth of Massachusetts, Middlesex, ss. Superior Court, Civil Action No. 01-2590	DataSafe, Inc. and David F. Muller v. Federal Express Corporation et al.	(Deposition and Report)
United States District Court Southern District Of Texas	Enron Creditors Recovery Corp. v. St. Paul Fire & Marine Insurance Company, Federal Insurance Company, The Greater American Insurance Company	(Deposition and Report)

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
Arizona	U-3021-96-448 et al.	Cost of Local Service
Utah	94-999-01	Investigation into collocation and expanded interconnection
Connecticut	96-02-22	Cost of Local Service
Wyoming	70000-TR-96-323	US WEST Phase II Price Regulation Plan

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
Pennsylvania	1-00960066	Financial Analysis
Pennsylvania	A-310203 F0002 et al.	Cost of Local Service
West Virginia	96-1516-T-PC et al.	Cost of Local Service
Minnesota	P-442, 5321 et al.	Generic Investigation of US WEST's Communications Cost
Iowa	RPU-96-9	Generic Investigation of US WEST's Communications Costs
Illinois	80-0511	Rate Base, Expenses, Forecasting
Maryland	7222	Power Plant Certificate Issues
District of Columbia*	777	Telephone Advertising and Parent Company Transactions
Illinois	82-0082	Gas Rate Design
Pennsylvania	M-810294	Energy Costs and Rate Design
Pennsylvania	R-822169	Nuclear Plant Economics
New Jersey	8011-827	Water and Sewerage Forecast
District of Columbia	798	Telephone Price Elasticity, Centralized Costs, Working Capital
California	83-06-65	Telephone Access Charges
Illinois	83-0142	Telephone Access Charges
U.S. International Trade Commission	731-TA-457	Handtools from People's Republic of China

* Prefiled but not sworn. Case Settled April, 1982.

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
U.S. Postal Rate Commission	R 83-1	Financial Viability for Electronic Mail Service
U.S. Postal Rate Commission	R 84-1	Class Revenue Requirement, Demand Projections
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Maryland	6807, Phase I	Utility Forecasting
New Jersey	762-194	Utility Forecasting
District of Columbia	685	Utility Forecasting
District of Columbia	827	Econometric Demand Modeling for Coin Telephone Service
Maryland	7149	Utility Forecasting & Promotional Activities
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District of Columbia	737	Utility Forecasting
Maryland	7305	Telephone Advertising
Maryland	7163	Service Terminations
Maryland	7070	Utility Promotional Activities

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
District of Columbia	729	Telephone Advertising & Parent Company Transactions
Maryland	6807, Phase II	Utility Emergency Procedures
Maryland	7467	Telephone Advertising, Parent Company Transactions
Maryland	7466	Gas Utility Advertising
New Hampshire	79-18	Industrial Conservation
Maryland	7236	Utility Promotional Activities
District of Columbia	834	Electric Utility Load Management Evaluation
California	85-01-034	Telephone Rate Design, Cost of Service
Massachusetts	86-213	Paging Company; Financial Viability, Pricing Analysis
District of Columbia	869	Fuel Price and Electric Demand Forecasts
Louisiana	U-17949 B	Customer Owned Coin Operated Telephones
New Jersey	TO92030358	Yellow Pages/Directory Services
Delaware	41	Development of Rules for the Implementation of Price Cap Regulation
Utah	94-999-01	Cost of Local Service
Connecticut	97-04-01	Cost of Local Service
New Mexico	97-35-TC	Cost of Local Service

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
Maine	97-505	Cost of Local Service
Vermont	5713	Cost of Local Service
New York	94-C-0095	Access Charges/Financial Analysis
New Jersey	TX95120631	Access Charges/Financial Analysis
New Hampshire	DE97-171	Cost of Local Service
Colorado	97F-175T	Access Charges/Financial Analysis
Utah	97-049-08	Access Charges/Financial Analysis
Connecticut	98-04-03	Joint and Common Costs
Rhode Island	2681	Cost of Local Service
Arkansas	99-015-U	Arbitration of Interconnection Rates
Connecticut	00-01-02	Non-recurring and Recurring Costs

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
U.S. District Court of Southern District of New York	In Re "Apollo" Air Passenger Computer Reservation System (CRS) MDL DKT. No. 760-M-21-49-MP	Liquidated Damages, Actual Damages
Supreme Court of the Republic of Palau	Orion Telecommunications, Ltd. v. Palau National Communications Corporations, Civil Action No. 835-88	Lost Profit Damages
U.S. District Court for the District of Columbia	A&S Council Oil Company, Inc. et al. v. Patricia Saiki, et al. Civil, Action No. 87-1969-OG	Damages

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
U.S. District Court for Eastern District of Texas	R & D Business Systems, et al. v. Xerox Corp. Civil Action No. 2: 92-CV-042	Valuation of Non-Monetary Provisions of Stipulation of Settlement
U.S. District Court Eastern District of Michigan, Southern Division	Little Caesar Enterprises, Inc. v. Gary G. Smith, et al. Civil No. 93-CV-73354-DT	Class Certification (Joint Declaration with Philip Nelson)
FCC	Various	Cellular Radio Pricing: Critique of Competing Applications for Cellular in Seattle, Miami, Denver and Detroit
FCC Pricing	83-1145	Directory Data Base and Access

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
U.S. District Court for the District of Columbia	American Association of Cruise Passengers v. Host Marriott Corp. et al.	Damages
U.S. District Court for Eastern District of Texas	Jason R. Searcy et al. v. Philips Electronics North America Corp. et al. Consolidated Civil Action No. 1:95-CV 363, 364	Damages
U.S. District Court for Eastern District of Texas Beaumont Division	USA ex. rel. Lloyd Bortner v. Phillips Electronics	Penalties under False Claims Act
FCC	In Re: Applications of Motorola, Inc.; Motorola SMR, Inc.; and Motorola Communications and Electronics, Inc. and FCI 900, Inc. For Consent to Assignment of 900 MHz Specialized Mobile Radio Licenses DA 00-2352	Wireless Dispatch Services (with Michael Baumann)
FCC (Market Disputes Resolution)	McLeodUSA Publishing Company v. Wood County Telephone Company, Inc.	Subscriber Listing Information
FCC (Market Disputes Resolution)	Yellow Book USA, Inc. v. Broadwing Inc. and Cincinnati Bell Telephone Company	Subscriber Listing Information (Written Report and Deposition Testimony)

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
United States of America v. United Kingdom of Great Britain and Northern Ireland	U.S. – U.K. Arbitration Concerning Heathrow Airport User Changes	Participating in Negotiations Leading to Settlement of Arbitration and Related Litigation
FCC	In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Exchange Carriers CC Docket No 01-338	Broadband Telecommunications Services
FCC	Core Communications, Inc. v. Verizon Maryland Inc. File No. EB-01-MD-007. Report.	Damages