APPENDIX A

Appendix A

THE HISTORY OF AMERICAN SIGN LANGUAGE AND THE DEMOGRAPHICS OF THOSE WHO USE IT AS THEIR PRIMARY LANGUAGE

Historically, deaf people have been forced to society's fringes, quite literally excluded from communication with the hearing world. Indeed, because of their limited ability to communicate in spoken language, deaf people were often erroneously considered to be of inferior intelligence and few resources were spent to educate or train them. Consequently, deaf people's inherent difficulties in communicating via the languages of the hearing necessarily hindered their participation in society.

The birth of sign language connected to a particular spoken language (such as French or English) offered a rudimentary opportunity for the hearing majority to communicate with the non-hearing minority. In the mid-18th century, Abbé Charles-Michel de l'Épée developed a means of communication that associated signing already in use by deaf people with various pictures and words that incorporated French grammar.[1] Soon thereafter, society began to realize that deafness was not a sign of intellectual inferiority and schools arose for the sole purpose of educating deaf people.

Approximately 50 years later, in 1817, Laurent Clerc established the American Asylum for the Deaf with Thomas Gallaudet in Hartford, Connecticut. The school brought together formerly isolated deaf individuals into a deaf community that could communicate with one another and, eventually, form their own language and cultural heritage. Over time, the French sign system was "amalgamated with the indigenous sign

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[1] Oliver Sacks, *Seeing Voices* at 15, Vintage Books (1989) ("Sacks").

languages" in the United States "to form a uniquely expressive and powerful hybrid, American Sign Language (ASL)."[2]

It is critical to emphasize that ASL represents a unique language that is distinct from any spoken language. ASL is not English or an imitation of English; rather, it is a language all its own.[3] It maintains its own vocabulary, grammar, syntax, and cultural heritage, and conveys ideas in ways that differ from English.[4] In addition, because sign language is a visual rather than auditory language, body movements and facial expressions are important components of ASL. There is a cinematic quality to ASL which is integral to its effective employment.[5] Consequently, when a deaf person accustomed to communicating in ASL must communicate in English, he or she is

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2 *Id.* at 20.

3 *See Telecommunications Relay Services, the Americans with Disabilities Act of 1990, and the Telecommunications Act of 1996*, Notice of Inquiry, 12 FCC Rcd 1152, ¶ 13 n.35 (1997) ("ASL, generally speaking, is 'linguistically independent of English.'" *quoting* National Center for Law and Deafness, *Legal Rights: The Guide for Deaf and Hard of Hearing People* at 2 (4th ed. 1992)); *see also* Jason Paroline, "American Sign Language is a Foreign Language," at 2, *available at*: <http://www.vengefulstapler.com/serious/aslfl.html> ("The grammatical structure of ASL is different from that of English, and is actually closer to Japanese, although 'ASL is not the derivative of any oral language.'") (citing Susan D. Rutherford, "The Culture of American Deaf People," *Academic Acceptance of American Sign Language* at 21-42, ed. Sherman Wilcox (1992) ("Paroline").

4 Indeed, as of November 2004, over 75% of states recognized ASL as a foreign language and courses in ASL are credited as study in a foreign language. Laurent Clerc National Deaf Education Center, Gallaudet University, "States That Recognize American Sign Language as a Foreign Language," *available at*: <http://clerccenter.gallaudet.edu/InfoToGo/051ASL.html>.

5 Sacks at 96-97.

communicating in a foreign language that lacks some of the basic components for expression found in his or her native language.[6]

ASL is not only a means of communicating ideas, but also a cultural signifier.[7] It has helped unite the historically isolated and fragmented deaf culture.

> Sign for the deaf is a unique adaptation to another sensory mode; but it is also, and equally, an embodiment of their personal and cultural identity. . . . [F]or it is not only biologically but culturally – and unsilenceably – the voice of the deaf.[8]

ASL provides a common language not dependent upon auditory biases. It allows a richer, fuller ability for deaf persons to communicate and to express ideas. The importance of ASL to the deaf community and deaf identity cannot be overstated.

An individual's degree of deafness as well as the age at which deafness began often affects his or her primary language and cultural identity. The National Association

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6 "[I]t is not possible to transliterate a spoken tongue into Sign word by word or phrase by phrase – their structures are essentially different. It is often imagined, vaguely, that sign language *is* English or French. It is nothing of the sort; it is itself, Sign." Sacks at 26; *see also Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Report and Order and Further Notice of Proposed Rulemaking, 15 FCC Rcd 5140, ¶ 45 (2000) ("*Improved TRS R&O*") ("When a message in ASL is converted to typed text, the words are typed in English, but the sentence structure (grammar, syntax, etc.) will be different than if someone fluent in spoken English had typed the same message."); *see* note 11 *infra*.

7 *See* Paroline at 6, *quoting* Susan D. Rutherford, "The Culture of American Deaf People," at 27 ("[T]he core of the American Deaf culture is ASL, and its use is the chief identifying characteristic of membership in the Deaf community."); *see id. quoting* Jan Kanda and Larry Fleischer, "Who is Qualified to Teach American Sign Language?" *Academic Acceptance of American Sign Language* at 86, ed. Sherman Wilcox (1992)("[ASL] is highly prized and increasingly valued by members of the Deaf community, as the language of any community is cherished by its members.").

8 Sacks at 97.

of the Deaf ("NAD"), for example, distinguishes between those who are deaf and people who are hard-of-hearing.[9]

The distinction between being deaf and hard-of-hearing is not merely audiological. It also manifests itself in cultural norms, one of which is language. Persons who are prelingually deaf (that is, having experienced the onset of complete hearing loss before learning to speak) lack experience in speaking English and often lack an audible memory of English.[10] Deaf persons – particularly prelingually deaf persons – are more apt to "think first" in ASL and consider it their primary language. For them, translations to or from a hearing language such as English may sometimes be imperfect and awkward.[11] By contrast, persons who are hard of hearing or whose deafness occurred

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[9] National Association of the Deaf, FAQ, "What Is The Difference Between a Deaf and a Hard of Hearing Person?" *available at*: <http://www.nad.org/site/pp.asp?c=foINKQMBF&b=180410>.

[10] According to the National Center for Health Statistics, approximately 5.4% of the estimated 20 million deaf and hard-of-hearing persons in the United States reported having experienced the onset of hearing loss before 3 years of age. National Center for Health Statistics, Data from the National Health Interview Survey, Series 10, Number 188, Table 13 (1994) *as reported in* J. Holt, S. Hotto and K. Cole, *Demographic Aspects of Hearing Impairment: Questions and Answers*, Center for Assessment and Demographic Studies, Gallaudet University, Third Ed. (1994), *available at*: <http://gri.gallaudet.edu/Demographics/factsheet.html>.

[11] The difficulty of translation becomes more apparent as one further understands some of the many fundamental differences between English and ASL. For example, ASL does not use the linking verb "to be," which is used extensively in English. Moreover, ASL uses Time Sequenced Ordering in which one signs a story in the order in which events occurred. The sentence "I was late to class last night because my boss handed me a huge stack of work after lunch yesterday," would be signed as "YESTERDAY LUNCH FINISH, BOSS GIVE-ME WORK BIG-STACK, NIGHT CLASS LATE-ME." *See* "ASL" on Wikipedia, available online at http://en.wikipedia.org/wiki/American_Sign_Language. In addition, "[f]acial expression is also key in ASL. In signing "ANGRY," a facial expression of anger should be put on. Without expressions like this, the effect would be similar to listening to someone who was speaking in extremely monotone spoken English, or it would be taken as an indication of sarcasm or some other departure from the usual meaning of the sign." *Id.*

later in life either are likely to have had experience speaking English or have an auditory memory of English. Hard-of-hearing individuals may have an easier time of communicating in English and understanding its diction, syntax, grammar, and vocabulary than those who are prelingually deaf. In short, they may be more apt to "think first" in English and seek to translate those thoughts into ASL.

Unfortunately, whether a person is deaf or heard-of-hearing, audism (discrimination against non-hearing individuals) increases the difficulties of that person's day-to-day life. As explained above, before the twentieth century, deaf persons were often considered unintelligent or unable to be educated. They were isolated within hearing communities and found even the most basic levels of communication unavailable to them. Notwithstanding a change in societal views during the twentieth century, many deaf Americans were excluded from the employment opportunities, popular culture and other dominant institutions of hearing society. American society implicitly expected a degree of passivity from deaf people and this view was internalized by many deaf people. As Oliver Sacks describes it:

> [d]eaf depreciation, deaf deference, deaf passivity, and even deaf shame were all too common before the early 1970s; one sees this, very clearly, in the 1970 novel by Joanne Greenberg, *In This Sign* – and it took [William] Stokoe's dictionary, and the legitimation of Sign by linguists, to allow the beginnings of a movement in the opposite direction, a movement toward deaf identity and deaf pride.[12]

It was only with the growing acceptance of ASL and recognition of ASL as a legitimate language that deaf culture and deaf pride began to take hold. In speaking to the

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[12] Sacks at 119.

Association of Late-Deafened Adults, outgoing Gallaudet University President I. King Jordan recalled his own personal experience:

> Attitudes about deafness are really different than they used to be. I went to college in the '60s. In the 1960s, even at Gallaudet, when students left campus, we signed small. If you were standing in line at a movie, and you were signing to someone, you signed small; hoping people would not notice you. If someone looked, you stopped. We tried to hide our deafness. Now you see signing everywhere and people don't hide it anymore.[13]

The separateness and isolation has been acutely present in the context of communications. Until relatively recently "the communication that most of America now takes for granted was completely cut off for millions of deaf and severely hard of hearing individuals. . . . Privacy and dignity were compromised and independence, sacrificed."[14] The Commission itself has explained that "Congress recognized that persons with hearing and speech disabilities have long experienced barriers to their ability to access, utilize, and benefit from telecommunications services."[15]

These barriers translate into grim employment statistics. In 2002, approximately 83.2 percent of the U.S. population was employed, whereas only 68.6 percent of the population of persons with "severe difficulty hearing normal conversation" was

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13 Special Guest Speaker I. King Jordan, *in* L. Piper and D. Watson (eds.), *Selected Proceedings of 2002 Conference of the Association of Late-Deafened Adults*, *available at*: <http://www.alda.org/archive-files/aldacon2002/Proceedings/I%20King%20Jordan%20edited.pdf>.

14 Karen Peltz Strauss, *A New Civil Right: Telecommunications Equality for Deaf and Hard of Hearing Americans* at 2, Gallaudet University Press (2006) ("Strauss").

15 *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Report and Order, Order on Reconsideration, and Further Notice of Proposed Rulemaking, 19 FCC Rcd 12475, ¶ 3 (2004).

employed.[16] Employed deaf Americans earn approximately 25 percent less on average than the American population at large. In 2002, the average employed American earned a mean annual salary of $31,840 whereas an employed person with "severe difficulty hearing normal conversation" earned a mean annual salary of $24,089.[17]

Audism is particularly acute for deaf persons whose primary language is ASL because the importance of facilitating communication in their native language is often ignored or underemphasized. To remedy this problem, Congress added Section 225 of the Communications Act, requiring, *inter alia*, that TRS be made available to all deaf, hard-of-hearing and speech-disabled individuals nationwide.[18] As the FCC has recognized,

> TRS is a critical tool for employment. If people with hearing or speech disabilities cannot communicate by telephone, their ability to compete and succeed in today's job market is threatened. Being able to place a phone call to a prospective employer, to answer an advertisement for a job, to receive training, and to advance one's career through formal and informal networks depends largely on one's ability to communicate with many different individuals and entities.[19]

Indeed, before TRS, deaf persons had "no access to critical and basic telecommunications services that were needed for employment, education, recreational, professional, and social activities."[20] Even today, deaf Americans using ASL remain the most poorly

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16 Erika Steinmetz, *Current Population Reports* in *Americans With Disabilities: 2002, Household Economic Studies*, U.S. Census Bureau, Table 5 (issued May 2006), *available at*: <http://www.census.gov/prod/2006pubs/p70-107.pdf>.

17 *Id.*

18 47 U.S.C. § 225.

19 *Improved TRS R&O* ¶ 7.

20 Strauss at 2.

served community in the United States in terms of access to communications services. Approximately 93 percent of the general population has access to traditional telephone service compared to approximately 10 percent for deaf ASL users.[21] Indeed, the Commission has expressed serious concern about the low overall telephone penetration rate within the Native American population and has launched a series of initiatives to increase subscribership within that population.[22] Yet that penetration rate of approximately 46.6 percent is more than four times greater than the Video Relay Service penetration rate among ASL users. The low telephone penetration rates in the Native American population have been attributed to, *inter alia*, geographic isolation, lack of information, and economic barriers.[23] These same problems also depress VRS penetration among ASL users.

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21 "Universal Service Monitoring Report," CC Dkt. No. 98-202, prepared by the Federal and State Staff for the Federal-State Joint Board on Universal Service in CC Dkt. No. 96-45, at 6-4 and Table 6.1 (2005), *available at*: <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-262986A1.pdf>.

22 *See Federal-State Joint Board on Universal Service: Promoting Deployment and Subscribership in Unserved and Underserved Areas, Including Tribal and Insular Areas*, Further Notice of Proposed Rulemaking, 14 FCC Rcd 21177, ¶¶ 5, 6, and 9 (1999).

23 *Id.* ¶ 6.

ATTACHMENT 1

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Telecommunications Relay Service and	)	CG Docket No. 03-123
Speech-to-Speech Services for	)	
Individuals with Hearing and Speech Disabilities	)	

DECLARATION OF DR. MICHAEL D. PELCOVITS

I. INTRODUCTION AND SUMMARY

1. My name is Michael Pelcovits. I am a principal in the consulting firm MiCRA, Inc. My business address is 1155 Connecticut Avenue, Washington, D.C. 20036.

2. I have been asked by Sorenson Communications to provide an economic analysis of the rate methodologies for VRS and IP Relay service. I will address the economic implications of different rate methodology proposals, including cost-of-service, price caps, and competitive bidding. An important focus of my analysis is to consider the effect of the rate methodology on the incentives of VRS providers to invest in interpreter training. This is an issue of vital importance to the future of VRS. In order to conduct this analysis, I have reviewed decisions and relevant documents in the Docket and had several discussions with

Sorenson's management and with other experts filing declarations on behalf of Sorenson in this case.

3. The main focus of my testimony will be to compare the economic properties of a price cap regime for VRS and IP Relay service to the more traditional cost-of-service scheme now relied upon by the Commission. After discussing the superior properties of a price cap regime, I will explain the necessary components of such a plan, including how to develop a price cap formula and update the formula over time. The Declaration of Cheryl Parrino explains that if the Commission were to retain a cost-of-service approach, significant modifications would be required, including a profit allowance. See Parrino Declaration at ¶¶ 26-31. In this declaration I explain the reason for including a profit margin to account for the risks borne by a firm that is highly labor intensive and does not receive an explicit return on capital sufficient to account for this risk. Finally, I evaluate the competitive bidding option described in the *Further Notice* at ¶ 28.

4. This declaration is organized as follows. In the next section, Section II, I present my background and qualifications. Following this, I will discuss in Section III the goals of a rate setting mechanism and explain why it is critical to create the right incentives for firms relying on a rate setting regime to recover their costs. Following this discussion, in Section IV, I will explain how price cap regimes evolved at the Federal and State level, and how the agencies applied the economic framework, which had been developed in the academic literature. In the next section, Section V, I will explore the conceptual issues that pertain to use of a

price cap-type plan for VRS and IP Relay. In Section VI, I will present the traditional price cap formula and explain how it can be adapted and parameterized for VRS and IP Relay. In Section VII, I will explain the need to include a profit margin for VRS and IP Relay providers, in the event the Commission were to retain a cost-of-service compensation mechanism, rather than adopting a price cap regime. Finally, in Section VIII, I discuss the difficulties associated with using a competitive bidding process to set the VRS rate.

II. BACKGROUND AND QUALIFICATIONS

5. My background and qualifications are summarized in the attached CV. I joined MiCRA in October 2002. Since joining MiCRA, I have filed several declarations before the Federal Communications Commission on a wide range of common carrier, wireless, and international telecommunications policy issues. Prior to my employment at MiCRA, I was Vice President and Chief Economist at WorldCom. In this position, and in a similar position at MCI prior to its merger with WorldCom, I was responsible for directing economic analysis of regulatory and antitrust matters before federal, state, foreign, and international government agencies, legislative bodies, and courts. Prior to my employment at MCI, I was a founding principal of the consulting firm, Cornell, Pelcovits & Brenner. From 1979 to 1981, I was Senior Staff Economist in the Office of Plans and Policy, Federal Communications Commission. I have testified or appeared before the Federal Communications Commission, many state regulatory commissions, the Copyright Royalty Board, the Office of Telecommunications (Oftel) of the UK,

the European Commission, the Ministry of Telecommunications of Japan, and the Civil Aeronautics Board. I have lectured widely at universities and published several articles on telecommunications regulation and international economics. I hold a B.A. from the University of Rochester (*summa cum laude*) and a Ph.D. in Economics from the Massachusetts Institute of Technology, where I was a National Science Foundation fellow.

III. GOALS OF A RATE SETTING MECHANISM

6. Title IV of the Americans for Disabilities Act of 1990 (ADA) requires the Commission to ensure that telecommunications relay services are made available to persons with hearing or speech disabilities to the fullest extent possible and in the most efficient manner. In 2000, the Commission recognized VRS as a form of relay service that was eligible for compensation from the Interstate TRS fund. The statute requires that eligible TRS providers be compensated for their reasonable cost of providing the services authorized under the statute and FCC regulations.

7. These goals for TRS are comparable in several respects to the rate setting objectives of common carrier regulation, which this Commission has implemented and enforced for over seventy years. Under common carrier regulation, carriers must provide service to all requesting customers. In return, the carrier must be given the opportunity to receive just and reasonable compensation for delivery of these services, including a normal level of profits.

To achieve these goals, the Commission has used a variety of rate setting tools, which are analogous to the mechanisms being considered in this rulemaking. Experience has shown that the choice of a rate setting paradigm has a powerful effect on the incentives and performance of the regulated firm.

8. The cost characteristics of traditional telephone services are different from those of VRS and IP Relay service. Traditional telephone services are produced using a highly capital-intensive production process. Moreover, the production function of traditional telephone carriers demonstrates significant economies of scale and scope, which means that average cost declines as total output expands, either in total volume or aggregated across different types of service.

9. These cost characteristics have important implications for the regulatory process. First, the very low marginal cost of a telephone carrier (especially in the short run) means that rates must be set based on accurate projections of output. If output falls short of the projection, the carrier will incur per-unit costs that exceed the rate, and if output exceeds the projection, the carrier will collect revenues in excess of cost. A second implication, which has bedeviled regulatory agencies for decades, is that prices set at long run average cost will exceed long run incremental cost (LRIC). This means that in order to compensate the carrier for all of its costs, rates must be set (at least for some services) above LRIC.

10. By comparison, the task of setting compensatory rates for VRS and IP Relay is quite dependent on the variable cost of labor. Provision of these services requires

very limited capital investments in plant and equipment. VRS and IP Relay providers operate call centers, which require limited equipment and can be housed in leased office space. The telecommunications services used by VRS and IP Relay providers can be obtained from other common carriers on an as-needed basis. The majority of a VRS provider's cost is for ASL interpreters, and for IP Relay providers, for communications assistants (CAs). And the needed quantity of this input (interpreter or CA person-hours) is relatively proportionate to the number of calling minutes handled by the VRS or IP Relay provider. Therefore, it should be possible for the FCC to create a stable and predictable cost recovery mechanism for VRS and IP Relay services.

11. The Commission can accomplish its rate setting goals in this case by targeting rates at the long run average cost of a hypothetical "reasonably efficient" VRS or IP Relay provider. This will provide VRS and IP Relay providers with the incentive to provide service to the deaf community. It is critical that the rates not be set below the long-run cost of a "reasonably efficient" provider, or the providers will lose the incentive to encourage widespread and extensive access to the services for all those who want and need it. Moreover, these incentive effects of too low a rate could not be offset by a mandate that providers serve the public, even at non-compensatory rates, even if that passed Constitutional muster. Even in the short run, firms that act rationally will seek to maximize profits, and it is very difficult and often counterproductive to force firms to act contrary to these incentives.

12. The Commission should be less concerned with projecting total demand for VRS and IP Relay services for the purposes of setting a rate than it would in a traditional "rate case" for a telephone company. Since the vast majority of the providers' costs are variable labor costs, the correct level of compensation on a per-minute basis will be the same regardless of the level of demand (at least within a reasonable range of expectations). Of course, the Commission will need to project the level of demand in order to determine the size of the fund. This projection, however, can be done on an annual basis, separate and apart from the price cap mechanism. In any event, the size of the TRS fund does not affect directly the incentives or behavior of the VRS and IP Relay providers, so long as the per-minute compensation rates are set by a price cap mechanism.

13. Provided that they have a reliable expectation of adequate compensation rates over a long enough period of time, VRS or IP Relay providers can accommodate increases in demand by hiring additional interpreters or CAs. Nevertheless, over the short run, there is a fixed pool of interpreters from which the VRS providers can obtain additional labor input, both in terms of the number of the interpreters and their ability to work at specific call centers. Furthermore, any increase in the supply of interpreters requires a long lead time. As explained in the Declaration of Dr. John Johnson, "most of the major VRS providers require specific educational background, training, or certification from the state in which they reside and/or the Registry of Interpreters for the Deaf (RID) or the National

Association of the Deaf (NAD), and significant interpreting experience."[1] Unless adequate incentives are provided for the training of new interpreters, therefore, the VRS providers may not have sufficient labor resources to handle the demands of the deaf community.

14. In order to meet future demand, VRS providers have been training interpreters and will continue to do so, if given the right incentives. For example, as explained in Dr. Johnson's declaration, Sorenson invests heavily in continuing education for its interpreter pool. Within each region, Sorenson provides workshops that allow interpreters to earn their RID CEUs. On average, Sorenson provides over 100 skill building workshops per quarter across the country.[2] Sorenson also builds centers, bringing the technology to the interpreters, when the interpreters are not willing or able to travel hundreds of miles to the call centers.

15. Because of the potential for a shortage of interpreters, it is vital for all VRS providers to be given increased incentives to continue to invest in interpreter training. Otherwise, interpreter costs are likely to increase on a per-hour basis. This will lead to a higher reimbursement rate for VRS. The challenge facing the Commission is to adopt measures that create incentives for providers to train a larger pool of interpreters. The cost recovery regime chosen by the Commission, therefore, should be evaluated in terms of the incentives it gives providers to engage in extensive training programs.

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[1] Johnson Decl. ¶ 7.
[2] Johnson Decl. ¶ 12.

16. Traditional regulatory practice does not reward investments in "human capital," because the carrier does not earn a return (or profit) on these expenditures. Therefore, the VRS cost recovery mechanism must adopt an appropriate mechanism to include training costs within the definition of allowable costs. More important, the cost recovery regime must provide certainty about future compensation rates to the VRS providers. Otherwise, they will not be able to plan for the future, or undertake investments in human capital that will not provide any short run reward. Generally speaking, additional risk will deter investment or at a minimum raise the threshold return on capital sought by the firm's owners.

17. Although the primary goal of this rulemaking should be to provide carriers with the proper incentives to provide VRS and IP Relay Service to the deaf and hard-of-hearing community and invest in human capital, there are two other key objectives of the regulatory regime. First, the Commission should give service providers the incentive to operate and invest efficiently. Second, the Commission should seek to minimize the administrative costs associated with its rate setting regime, because the administrative costs of both NECA and the providers are included in the TRS fund.

18. VRS and IP Relay providers should be given incentives to operate efficiently. In a typical market setting, where prices are set by the forces of demand and supply, producers will have powerful incentives to operate efficiently. Firms that fail to operate efficiently can be driven from the market by competitors. Also, firms have incentives to lower costs and reduce prices, in order to stimulate market

demand. To the extent that the current system establishes a rate based on the "reasonable" provider, and uses a midpoint approach to do so, it also creates some incentives for providers to be more efficient. The proposed price cap approach described below is superior in providing incentives for access and efficiency. The price cap approach provides for greater predictability and allows providers to make investments in a mix of human and physical resources, such as interpreters and software.

19. By comparison, traditional cost-of-service regulation, particularly regulation that sets provider-specific rates, will not necessarily provide incentives for firms to operate as efficiently as possible. As I will discuss in the next section of the declaration, the cost-of-service mechanism used by this Commission and many other regulatory agencies failed to give regulated firms in other industries, such as wireline local telephone service, an incentive to operate efficiently.

20. Finally, it is important to minimize the administrative costs of any rate setting regime. Administrative costs imposed on service providers will find their way into the rates paid by customers, ratepayers, or taxpayers. Similarly, any costs incurred by the government will be borne either by general taxpayers who fund the agency or by ratepayers that bear the administrative costs of a subsidy mechanism.

IV. PRICE SETTING MECHANISMS

A. Rate-of-return regulation

21. Regulatory agencies have used a variety of ratemaking tools to constrain the pricing of regulated firms. The traditional mechanism used by the FCC, state regulatory commissions, and regulatory authorities in other countries was rate-of-return regulation. Rate-of-return regulation sets the regulated firm's prices so that the firm will achieve a market-based return on investment (*i.e.,* rate base) after covering all of its expenses, including operating costs, taxes, and depreciation. Rate-of-return regulation is sometimes referred to as cost-of-service regulation, because from an economic standpoint the firm's total costs are the sum of its expenses plus a return on capital investment. Return on capital is considered as much a cost of the firm as any of its out-of-pocket expenditures.

22. Rate-of-return regulation was developed early in the history of regulation and applied quite generally to all regulated industries. As explained by a former Chief of the FCC's Common Carrier Bureau: "That basic method was so well accepted by regulators and so frequently affirmed in the courts as consistent with the legal requirements of 'just and reasonable' rates that little consideration was given to major changes in the overall approach to regulation."[3]

[3] Gerald W. Brock, *Telecommunication Policy for the Information Age, From Monopoly to Competition*, Harvard University Press, 1994, at 257.

23. Rate-of-return regulation, however, distorted the regulated firm's incentives and imposed significant administrative costs on the firm and the regulator. These lessons were learned over decades, were analyzed extensively by academics and were applied by the FCC during the Reagan and Bush administrations.

24. The regulated firm's incentives to operate efficiently are distorted by strict cost-of-service regulation.[4] Tying rates to cost "guarantees that the regulated firm breaks even, but the cost-price linkage insures the company against both shortfalls and windfalls and thereby blunts its incentives to pursue cost-saving efficiencies."[5] The failure to achieve available efficiencies is termed X-Inefficiency and has been documented in a large economic literature addressing regulated and unregulated firms with market power.[6]

25. A unique and important distortion created by rate-of-return regulation is the incentive given to regulated firms to choose an inefficient mix of inputs. VRS and IP Relay providers face important decisions relating to investment in human capital and quality of service. Increased spending on interpreter training will increase the long-run supply of interpreters and also improve the quality of the interpreters available to the VRS providers. Cost-of-service regulation may not

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[4] H. Averch and L. Johnson, "Behavior of the firm Under Regulatory Constraint," *American Economic Review* 52, 1962.
[5] John E. Kwoka, Jr., "Implementing Price Caps in Telecommunications," *Journal of Policy Analysis and Management,* Vol. 12, No. 4 (1993) 726-752, at 728.
[6] The seminal article on X-Inefficiency is by Harvey Leibenstein, "Allocation Efficiency vs. 'X-Efficiency," *American Economic Review*, vol. 56 (June 1966) 392-415. For a discussion of the evidence on cost inefficiency, *see* F.M. Scherer and D. Ross, *Industrial Market Structure and Economic Performance,* 3rd edition, Houghton Mifflin, 1990, at 668-672.

allow the VRS providers to recover the cost of these investments, let alone provide a profit margin adequate to compensate for the time between when the investment is made and when the benefit is realized. This would result in VRS providers underinvesting in the short run and allowing their costs to increase in the long run. This would lead to a rate increase as costs increase under a cost-of-service approach.

26. There are steep administrative costs associated with rate-of-return regulation. It became clear to the regulatory agencies in the 1960s that they had to exercise their own judgment about the propriety of different expenditures of the firm. "To do this, first, they had to require the companies to keep uniform systems of account, according to procedures and rules stipulated by the commissions, and subject to their audit."[7] The process of establishing a uniform system of accounts is costly, and even more so is the process of reviewing and passing judgment on the costs incurred by the regulated firm. In practice, regulatory agencies have not been very successful at passing judgment on the reasonableness of the firms' costs, but have instead focused on easy targets, which were less controversial and more visible to the public, such as the allowed rate of return.[8] As a result, the overall effectiveness of cost-of-service regulation has been critically attacked for many years.

[7] Alfred E. Kahn, *The Economics of Regulation*, The MIT Press, 1988, at I-26.
[8] *Id.*, at I-29,30

B. The Incentive Regulation Paradigm - Price Cap Regulation

27. In 1987 and 1990 the FCC adopted price cap regulation, first for AT&T and then for the largest incumbent local exchange carriers (ILECs). This policy change reflected a number of factors, including: (1) an increase in administrative costs stemming from the dynamic nature of technology and the market; (2) the possibility of greater reliance on competition to constrain AT&T and the largest ILECs (to a lesser extent); and (3) the existence of unregulated lines of business of the regulated firms, which made traditional regulation more difficult and "substantially less and less rational."[9] Moreover, the generally favorable experience with price cap regulation in the United Kingdom also encouraged the FCC to adopt it in the United States.

28. Almost all state regulatory commissions adopted price caps or other forms of incentive regulation during the 1990s. Faced with many of the same problems as the FCC, state commissions often froze rates on basic residential local telephone service, and in exchange granted the ILECs significant pricing flexibility for other services. One of the main reasons these plans were adopted was to encourage increased investment by the ILECs in technologically advanced infrastructure.

29. The structure of most price cap plans involved setting a rate and then occasionally reviewing the experience. The states often did not change the rates from one review period to another. The FCC adjusted the productivity factor but did not

[9] Kwoka, at 728.

retarget rates. I am unaware of any circumstance under which a price cap regime was later replaced by a cost-of-service regime, because of the industry's failure to perform adequately under price caps.

V. FOUNDATION OF A PRICE CAP PLAN FOR IP RELAY AND VIDEO RELAY SERVICES

30. Over the past several years, the FCC has set the compensation rate for VRS and IP Relay providers on the basis of the projected costs of the service providers. The compensation rate is reset every year, based on annual filings of the service providers to NECA, which is the TRS Fund Administrator. In many ways this process is similar to the cost-of-service regime that the FCC and other regulatory agencies applied for many years to the regulated telephone companies. And it has many of the same disadvantages of these plans, because it distorts the providers' incentives and encourages inefficient practices.

31. First and foremost, the practice of making annual adjustments to the compensation rate based on annual reporting or projections of costs limits the providers' benefits from cutting costs and becoming more efficient over time. An offsetting and positive factor is that the same cost-recovery compensation rate is set for all providers. This means that a well-performing individual provider will receive some of the benefit of increased efficiency. Nevertheless, a provider's incentive to cut costs will be less than in a more market-based regulatory regime.

32. Second, the cost-of-service regime distorts the VRS providers' incentive to invest in interpreter training, which is so vital to the continued availability of this service. The providers face three problems relating to the cost of interpreter training. First, there is a possibility that not all of the costs of recruiting, training and retaining interpreters will be included among the expenses used to compute the compensation rate. Second, if expenditures on training are not treated as an investment, upon which a profit margin must be earned, the providers will have little incentive to engage in training, even though training will yield benefits in the long run. Rather, they will have an incentive to allow labor costs to rise in the long run, so long as the compensation rate is tied to the increase in costs. The service providers must be allowed to earn a return on their investment in interpreter training to compensate for the gap in time between when the investments are made and when the benefit is received. Third, if the compensation is changed every year, the VRS providers will face significant uncertainty with respect to the payoff from any investment in interpreters, and therefore will underinvest.

33. A price cap regime will alleviate these distortions and encourage interpreter training. When service providers are given the opportunity to reap the full benefits of making investments that will reduce cost or improve service quality over the long run, they will respond to these incentives and by acting in their own interests serve the public interest.

34. In order to reduce the distortion in the providers' incentives created by cost-of-service regulation, it is important for the Commission to establish and commit to a price cap formula for a long enough period of time. Otherwise, the prospect of an early review and a downward adjustment to rates based on the providers' costs would cause the providers to react to price caps as they would to cost-of-service regulation. Ideally, a price cap regime should sever the linkage between costs and rates completely, thereby eliminating the source of the regulatory distortion. A reasonable middle ground, however, would be to limit any review or rate adjustment to no less than three years from the time the plan is first established.

35. I have also been asked to comment on the proposal made in the *Further Notice* to require the providers to "reimburse the Fund for any amount by which their payments exceed reasonable actual costs."[10] In my view, this "true-up" proposal would do enormous damage by removing any incentive for providers to cut costs. This would be the "nightmare scenario" of an absolutist cost-of-service regulation, where providers were not even allowed to retain any cost savings from the year in which they were created. Under such a regime, if a provider had any headroom between actual costs and compensation rates, it would have a powerful incentive to expend money wastefully on anything of any marginal value to the management, rather than turn the money back to the Fund. Moreover, to the extent future rates were set based on past experience, the provider would face a double penalty from reducing costs (as it would have to refund the savings and

[10] *Further Notice* ¶29.

would face lower rates for the subsequent year). As a result, the provider would have an even stronger incentive to engage in wasteful spending under a "true-up" plan.

VI. FORMULA FOR A PRICE CAP PLAN

36. The Commission's price cap systems for ILECs can serve as a foundation for a VRS and IP Relay service. Some modifications will be necessary to accommodate the different cost structure of VRS and IP Relay, but the basic mechanics of a price cap formula can be adapted easily. The key elements of a price cap regime, which I will discuss in detail below, are: (1) the initial rate; (2) annual adjustments to the price cap; and (3) performance review.

37. I believe that a price cap plan should be adopted for VRS and a separate price cap plan for IP Relay. This will give the providers the correct incentives to operate efficiently and facilitate reducing any linkage between an individual firm's costs and present or future rates. Also, the goal of the price cap should be targeted to set rates for what I would term a "reasonably efficient" provider. At this stage in the industry's development, providers will have different cost and operating characteristics, and will have realized different economies or diseconomies of size and scope. It is important to develop a price cap regime that allows many firms to remain in the industry and vie for business, because competition promotes innovation and investment in interpreters. Some firms will need a few years to

achieve greater efficiencies, and may be forced to exit the business if the price cap were based on an actual or hypothetical "most efficient" VRS firm.

A. Initial Rates

38. The logical starting point for the initial price caps would be the current compensation rates for VRS and IP Relay. These rates were recently approved and are based on analyses of the cost information submitted by the providers and then reviewed by NECA. Therefore, they can be presumed reasonable. Further, if as I believe it to be true, the Commission observes that the industry is achieving the goals of the statute and the regulations, it can be confident that the price cap plan will create the right incentives for the providers. First and foremost, the providers will have the incentive to increase capacity to provide a functionally equivalent service to meet the growing demand of the deaf community. Second, the VRS and IP Relay providers will have powerful incentives to control labor costs, invest in interpreter training and operate efficiently.

39. In my opinion, it would be very harmful to set the initial rate too low, for example by reducing the existing rate. This could lead to the early demise of many of the providers that have not yet realized their potential of operating as efficiently as other firms, and would deter new entry. This would be deleterious to the long-run development of competition in these markets. Second, in the short run, if the initial price cap were set too low, the providers would lose the incentive to

increase access to VRS. This would penalize the members of the community who need and want, but do not have, VRS, or who are not aware of the service.

B. Annual adjustments to the price cap

40. Annual adjustments to the price cap should be based on reasonable expectations of the cost trends facing the industry. The established conceptual framework for making adjustment to a price cap is that the change in the regulated price should equal the change in the rate of output price inflation in the economy less an offset "X" to reflect the difference in productivity between the regulated sector and the economy as a whole.[11]

41. In the first few years of the AT&T and ILEC price cap plans, the Commission used GNP-PI, *i.e.,* the Gross National Product Price Index, as the measure of the rate of inflation in the economy as a whole. The Commission selected this measure of producer price change, rather than consumer price changes (e.g. CPI), because the PPI includes a broader collection of goods and services.

42. In 1995, the Commission began using the GDP-PI, the Gross Domestic Product Price Index, which is obtained from the Bureau of Economic Analysis, United States Department of Commerce. GDP-PI is similarly broad-based as GNP-PI and only differs as far as the treatment of production by U.S. firms abroad and foreign firms in the U.S. The ILECs use the 45-day estimate of the GDP-PI in

[11] See, Jeffrey Bernstein and David Sappington, "Setting the X Factor in Price Cap Regulation Plans," NBER Working Paper 6622, June 1998.

their annual access tariff filings and then adjust their access rates when the actual figures become available. Depending on the timing of annual adjustments to a VRS/IP Relay price cap plan, however, it may be possible to use the actual GDP-PI figures rather than the 45-day estimates.

43. The X factor, which has been termed a productivity factor, actually has two components. The first is the difference in the total factor productivity growth rates in the regulated industry and the economy as a whole. The second is the difference in input price growth rates between the regulated sector and the economy as a whole. Therefore, in order to determine the correct X factor for VRS and IP Relay, it is necessary to look at both these components.

44. The VRS and IP Relay businesses are unlikely to experience greater productivity than the economy as a whole. These sectors rely primarily on labor inputs and it is hard to substitute other factors of production for labor, or to use labor much more productively. Every relay call must be interpreted (or in the case of IP Relay, it must be transposed from written to spoken language). Therefore, the traditional mechanisms by which productivity is achieved in the economy (either by input substitution or by adopting new methods for a worker to produce more output in the same amount of time) are not available to this sector of the economy.

45. Input costs, which in this case are predominately labor costs, are more likely to increase at a faster rate than the input costs in the economy as a whole. ASL interpreters are in high demand. Hence input cost changes are not likely to be a

source of productivity improvements in the VRS and IP Relay industries. In fact the opposite is likely to be true. The VRS providers may experience inflation in labor costs that exceed the nationwide average increase in wages and other input costs.

46. Finally, even though the telecommunications expenses of these firms will benefit from the high productivity of this sector, this will not have a material effect on the overall costs and productivity of VRS and IP Relay. At present, telecommunications expenses are a very small portion of the providers' costs. To put these costs in perspective, consider the relationship between the average cost of an interstate toll call, which was six cents a minute in 2004,[12] and the total costs compensated for VRS, which is approximately $6.00. The relationship of telecommunications cost to total VRS costs must be less than the one percent shown in this comparison, because the cost of toll calling has declined the last couple years, and the VRS providers must be paying far less than the average toll rate for the connection to the PSTN. Therefore, any increase in productivity from declines in these costs will have a minuscule effect on the total costs of the VRS providers. For example, ten percent productivity gains in this area would only provide a 0.1% overall gains in productivity to the VRS providers.

47. Therefore, it is reasonable to expect that VRS and IP Relay will not experience the same productivity gains as the economy as a whole.

[12] FCC, Reference Book 2006, Table 1.15

48. The final adjustment used in the traditional price cap formula is for exogenous factors. These are factors, specific to the regulated firm, which are not accounted for by the X factor or other elements of the price cap formula, and which are outside the firm's control.

C. Performance Review

49. At the end of a prescribed period of time, the Commission should review performance of the industry under the price cap regime. The purpose of this review should be to determine whether the policy goals have been realized and whether the compensation rate needs to be adjusted for subsequent price cap periods. As I discussed earlier, the review should occur at least three years after the establishment of the plan. This would reduce the distortion caused by the potential that the providers would not reap the benefits of efficient behavior. Also, this would give the Commission a longer track record to review the industry's performance under the price cap regime.

50. The Commission should review the status of the industry from both a demand and supply side. From the demand side, it should review the use and availability of VRS and IP Relay. The most important factor to consider is whether the needs of the deaf community are being met, and whether any segment of the deaf community is being underserved. From the supply side, the Commission should analyze entry into and exit from the industry in order to determine whether a competitive market has developed or alternatively whether it needs to be

concerned about entry barriers, which limit the intensity of competition in the market.

51. It is entirely reasonable for the Commission to adjust the compensation rate at the end of the initial price cap period. This adjustment should be based on an analysis of industry performance and could constitute a change in the productivity factor or inflation measure used in the price cap formula. However, it is essential that any change in the compensation rate be made on a prospective basis. The Commission should not reach back and "tax" the providers' profits from prior years through any sort of rate adjustment. The prospect of such a "reach back" would reduce dramatically the incentives of the service providers to operate efficiently and improve productivity through investment in training interpreters. In essence, a "reach back" would undo the entire benefit from a price cap regime and convert it back into a cost-of-service regulation.

VII. REQUIRED PROFIT MARGIN UNDER COST-OF-SERVICE REGULATION

52. As explained in the declaration of Cheryl Parrino, a number of modifications to the current cost of service system would be necessary should the Commission not adopt a price cap plan. One of these modifications would be to include a profit margin above the firms' actual expenses. This is necessary because of the difference between the cost structure of the typical VRS and IP Relay provider relative to a traditional telephone company.

53. Traditional telephone services are provided by highly capital-intensive firms. For example, the capital-related costs of a typical local exchange carrier's revenue requirements are in the range of 40%.[13] Return on capital provides income to the equity owners (stockholders) of the regulated firm. The rate of return is targeted to provide an appropriate "risk-adjusted" return to capital owners. Thus, for example, if the long-term cost of capital for a risk-free asset, such as U.S. Treasury securities, is 7%, then the rate of return used in a regulatory proceeding may be in the range of 10% to 15%. This risk adjustment compensates owners for a wide range of risks, including: inability to predict or adjust to changes in demand; and cost increases from any source, such as wage pressure, workforce management problems, rent increases, energy cost increases. Were the regulated firm not to be given the opportunity to set prices that compensated for these risk, it is highly doubtful that it would continue to stay in business, over the longer run.

54. The cost structure of the VRS and IP Relay industries is different from that of the traditional common carrier, or a public utility, such as an electric, water, or gas company. Therefore, the price-setting paradigm must be adjusted to reward a provider's owners for the risks undertaken in this, as in any, business. Even though a VRS or IP Relay provider will invest very little in capital assets, it will invest in many other operational aspects of the firm, such as: software systems, management systems, manager and supervisor training, human resource

[13] Total revenues of the RBOCs in 2004 were $97 billion. Capital-related costs include deprecation of $30 billion and the allowed return of $15 billion on a rate base of $131 billion. Statistics of Communications Common Carriers, 2004/2005 Edition, Table 2.9.

expenditures (including the cost of hiring and training interpreters). Most of these costs are not capitalized on the firm's books, but are nevertheless part of the value of the firm, which is usually termed its "going concern" value. If a firm were acquired or an IPO were initiated, its going concern value would be capitalized in the marketplace.

55. Traditional rate-of-return regulation captures the going concern value of a firm in the return on capital. Rather than trying to disaggregate the different components of risk and reward appropriate for a capital-intensive firm, regulators will look at comparable unregulated firms, or other market data, including risk measures to calibrate the profit margin and total profits that should be included in the firm's regulated rates.[14]

56. I believe it is appropriate to include a profit margin in the cost of a VRS or IP Relay provider, should the Commission continue to use a cost-of-service regulatory approach rather than price caps. This profit margin should be high enough to capture and compensate for the market risks usually borne by firms in comparable industries. The firms I have selected are in different subsets of the Standard Industrial Classification (SIC) Code for "Services," which is Code 8. This includes firms in the health, legal educational and social services.

[14] The two major approaches to estimating cost of capital are the discounted cash flow ("DCF") model and the capital asset pricing model ("CAPM"). The DCF model solves for the rate of return that is consistent with the current stock price of the firm and expected future earnings. CAPM estimates cost of capital by starting with the risk-free rate on Treasury securities, and then it marks up this rate based on the non-diversifiable risk in the stock of the firm.

57. The most reliable and consistent data source on profit margins is Ibbotson Associates, which has provided financial data suitable for cross-firm comparisons for many years. The data I examined is from 2005.[15] Ibbotson selects firms for inclusion in the Yearbook based on a number of factors, including its ability to classify a firm within a well-defined industry category.

58. Ibbotson provides financial data on 156 firms in the SIC Code 8 category. It also subdivides the information based on finer definitions of the firm's activities. I have relied on the data for two service categories: Home Health Care Services, and Residential Care. I chose these categories because they are highly labor-intensive, skilled or semi-skilled, competitive, labor-based industries. The table below provides data on the operating margin of the firms in these categories. I report median figures, which are more meaningful for purposes of establishing a benchmark to VRS and IP Relay. (Mean operating margin would be higher because it skews results towards the best performing firms with very high operating margins.)

SIC CODE	INDUSTRY TITLE	5-YEAR OPERATING MARGIN
8082	Home Health Care Services	9.60%
8361	Residential Care	11.58%

[15] Ibbotson Associates, *Cost of Capital 2005 Yearbook.*

59. Based on these results, I recommend that any cost-of-service approach include at least a ten percent margin above operating costs to compensate for the risk borne by the hypothetical reasonably efficient VRS or IP Relay provider. Therefore, under a cost-of-service mechanism for setting compensation rates, it is necessary to include an explicit profit margin as a component of the costs of the hypothetical reasonably efficient VRS or IP Relay provider. This establishes a correct benchmark for the level of costs for a going concern and more important for the risks of a business downturn or even a business failure.

VIII. PROBLEMS ASSOCIATED WITH COMPETITIVE BIDDING

60. The *Further Notice* seeks comment on using a bidding process to set the VRS rate.[16] No details are provided on how such a process would be implemented, so it is difficult for me to evaluate a bidding mechanism in the abstract. Nevertheless, I would like to point out several difficulties that the Commission would have to resolve, or it would be likely to create more harm than benefit with any bidding process.

61. The first matter to be determined in a bidding mechanism is whether the firms have an incentive to provide good information to the Commission on their costs of doing business. In a typical winner-take-all bidding model, firms have an incentive to bid a lower price in order to win the contract. If the auction is set up

[16] *Further Notice* ¶ 28.

properly, firms will reveal a lot about their costs and the contract will be secured at a price very close to the costs of the most efficient provider.[17]

62. It is my understanding, however, that the Commission would not want to award a VRS contract to only one provider – namely, the provider that wins the bid. Rather, it might want to allow other firms to offer VRS service and be compensated at the price offered by the winning bidder. In that event, the "winner" of the bid (*i.e.,* the provider that offers the lowest price) does not win anything. Instead, each provider will have an incentive to bid well above its reservation price (*i.e.*, its costs) so that it does not force the compensation rate down. The result could be a higher rate than today's compensation rate. Therefore, in order to create any benefit from bidding, the Commission must develop a competitive bidding mechanism that gives the bidders an incentive to win the auction.

63. However, if the Commission were to hold a winner-take-all bid, it would undermine a key policy objective, which is to foster a competitive VRS industry. Most, if not all, of the losing bidders would exit the industry, rather than maintain the infrastructure (*e.g.,* trained interpreters) necessary to provide VRS service in the future. This would lead most likely to a problem with the bidding (and resulting higher rates) in subsequent years, because the firms that exited the

[17] In the commonly used sealed second-price auction, the winning bidder pays based on the second-highest bid, rather than its own bid. This gives the bidders an incentive to reveal their actual reservation price, because the winner will benefit from the difference between its reservation price and the reservation price of its closest competitor.

industry will be unable to bid a low enough rate to discipline the incumbent winner. Any firm entering or reentering the industry would incur higher costs than the incumbent, and in particular the new entrant would have to invest in certain sunk costs, such as the costs of building up and training a workforce. Therefore, after the first year's bidding, the rate could go up, whereas under the price cap formula proposed by Sorenson, it would go down.

IX. CONCLUSION

64. Experience has proven the superiority of a well-designed price cap regime to cost-of-service regulation. By reducing or eliminating the linkage between the rates of the regulated firm and its reported costs, a price cap regime creates incentives for the service providers to operate efficiently and invest in their business.

65. I recommend that the Commission apply a price cap mechanism to the compensation rates for VRS and IP Relay. This will foster efficiency and encourage investment in these industries. Furthermore, it will reduce the regulatory burden placed on the industry and the Commission, which will benefit the public by creating cost savings in government expenditure and in the funding needed for these services.

66. In the event the Commission retains a cost-of-service mechanism to set compensation rates for VRS and IP Relay service, I recommend that a profit margin be added to the expenses incurred by the providers. The reason is that the providers' fixed capital investments are minimal, so the risk-adjusted rate of

return on capital that would ordinarily compensate a regulated firm for the risks undertaken will not be effective. I recommend a profit margin of at least 10 per cent of the costs of the hypothetical reasonably efficient firm, based on the profit margins earned by firms in similar, but unregulated, lines of business.

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CURRICULUM VITÆ

(October 2006)

EDUCATION

Massachusetts Institute of Technology, Ph.D. (Economics), 1976
University of Rochester, B.A. (Economics), *summa cum laude,* 1972

EMPLOYMENT

MiCRA
Principal: October 2002 – Present

MCI Communications (WorldCom, subsequent to its acquisition of MCI)
Vice President and Chief Economist: 1998 - 2002
Executive Director: 1996 – 1998
Director: 1992 – 1996
Senior Policy Adviser: 1988 – 1992

Cornell, Pelcovits & Brenner Economists Inc
Vice President and Treasurer: 1982 – 1988

Owen, Cornell, Greenhalgh & Myslinski Economists Inc.
Senior Economist: 1981 – 1982

Federal Communications Commission, Office of Plans and Policy
Senior Economist: 1979 – 1981

Civil Aeronautics Board, Bureau of International Aviation
Industry Economist: 1978 – 1979

University of Maryland, College Park, Department of Economics
Assistant Professor: 1976 – 1978

ACADEMIC AWARDS

National Science Foundation Graduate Fellowship, 1972 – 1975
Phi Beta Kappa, 1972
Isaac Sherman Graduate Fellowship, 1972 (University of Rochester)
John Dows Mairs Prize in Economics, 1971 (University of Rochester)

PUBLICATIONS

"Long Distance Telecommunications" in Diana L. Moss, editor, Network Access, Regulation and Antitrust, (Routledge), 2005.

"The WorldCom-Sprint Merger" in John Kwoka, Jr. and Lawrence J. White, editors, The Antitrust Revolution, The Role of Economics, 4th Edition (Oxford University Press), 2003.

"Economics of the Internet," (with Vinton Cerf), in Gary Madden and Scott Savage, editors, The International Handbook On Emerging Telecommunications Networks (Edward Elgar), 2003.

"Application of Real Options Theory to TELRIC Models: Real Trouble or Red Herring" in James Alleman and Eli Noam, editors, The New Investment Theory of Real Options and its Implications for Telecommunications Economics, (The Netherlands, Kluwer Academic Publishers, 1999).

"The Promise of Internet Access over Cable TV: Should the government force open access requirements?" (with Richard Whitt), CCH Power and Telecom Law, Vol. 2, No. 7, November/December 1999.

"Toward Competition in Phone Service: A Legacy of Regulatory Failure," (with Nina W. Cornell and Steven R. Brenner), Regulation, July/August 1983.

"Access Charges, Costs, and Subsidies: The Effect of Long Distance Competition on Local Rates," (with Nina W. Cornell), in Eli Noam, editor, Telecommunications Regulation Today and Tomorrow, (New York: Harcourt Brace Jovanovich, 1983).

"The Equivalence of Quotas and Buffer Stocks as Alternative Stabilization Policies," Journal of International Economics, May 1979.

"Revised Estimates U.S. Tax Revenue (with Jagdish Bhagwati), in Bhagwati and Partington editors, Taxing the Brain Drain, (North Holland, 1976).

"Quotas Versus Tariffs," Journal of International Economics, November, 1976.

OTHER PROFESSIONAL ACTIVITIES

Speaker and Panelist (selected examples):

Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, Rutgers Business School, "Open Access Policies, Net Neutrality and Incentives for Innovation in the Telecommunications," June 29, 2006

National Association of State Utility Consumer Advocates, "Telco Structural Separations, Costs & Benefits," June 19, 2001

LeBoeuf, Lamb, Greene & MacRae, "Telecom Restructuring: The Road to Profitability -- Is there a Map?" June 11, 2001

Columbia University, Graduate School of Business, Institute for Tele-Information, "European Lessons in Liberalization: The German Experience in Telecommunications & Internet Applications," February 16, 1999

Massachusetts Institute of Technology, "Economics of the Internet: Lessons from Regulation of Telephony," April 30, 1998

National Association of State Utility Consumer Advocates, "The Telecommunications Act Two Years Later," February 10, 1998

Columbia University, Graduate School of Business, Institute for Tele-Information, "From the Blueprint to Reality: A Look Into the Second Year of the Telecommunications Act of 1996," April 10, 1997

Federal Communications Commission, Federal State Joint Board on Separations, February 26, 1997

Alliance for Public Technology, "Technologies of Freedom: Linking the Home to the Highway," February 21, 1997

Federal Communications Commission, Federal-State Joint Board on Universal Service, June 5, 1996

Columbia University, Graduate School of Business, Institute for Tele-Information, "Telecommunications Act of 1996: The Morning After," February 6, 1996

New York Law School, Communications Media Center, "Universal Service in Context: A Multidisciplinary Perspective," December 6, 1995

Kansas University, "Stakeholders Symposium on Telecommunications," November 2, 1995

Guest lecturer in graduate and undergraduate courses at:

Columbia University, Graduate School of Business
New York University, Stern School of Business
Georgetown University, McDonnough School of Business
George Washington University
Johns Hopkins University
University of Maryland
American University
Northeastern University

RECENT TESTIMONIES (2003 to present)

U.S. DISTRICT COURT

In The United States District Court for The District of Colorado, Civil Action No. 03-F-2084 (CBS), QWEST CORPORATION, Plaintiff, v. AT&T CORP, Defendant. (Deposition taken; case settled)

LONDON COURT OF INTERNATIONAL ARBITRATION

In the Matter of an Arbitration Between: France Mobile Telecom Mobile Satellite SA, Stratos Wireless Inc, Telenor Satellite Services AS Claimants - and – Inmarsat Global Limited Respondents, LCIA Arbitrations No. 6767, 6768, and 6769.

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In the Matter of Digital Performance Right in Sound Recordings and Ephemeral Records, Docket No. 2005-1 CRB DTRA.

STATE UTILITY COMMISSIONS

State of Connecticut, Department of Public Utility Control, DPUC Investigation of Intrastate Access Charges, Docket No. 02-05-17.

State of Connecticut, Department of Public Utility Control, Application of Southern New England Telephone Company for Approval to Reclassify Certain Private Line Services from Noncompetitive to Competitive Category, Docket No. 03-02-17.

Pennsylvania Public Utility Commission, AT&T Communications of Pennsylvania, Inc. v. Verizon North, Inc. Docket Number C-20027195.

Pennsylvania Public Utility Commission, Investigation into the Obligations of Incumbent Local Exchange Carriers to Unbundle Network Elements, Docket No. I-00030099.

Pennsylvania Public Utility Commission, Generic Investigation in re: Impact On Local Carrier Compensation if A Competitive Local Exchange Carrier Defines Local Calling Areas Differently Than the Incumbent Local Exchange Carrier's Local Calling Areas but Consistent With Established Commission Precedent, Docket No. I - 00030096.

Pennsylvania Public Utility Commission v. Verizon Pennsylvania Inc. Tariff No. 216 Revisions Regarding Four Line Carve Out, Docket No. R – 00049524; Pennsylvania Public Utility Commission v. Verizon Pennsylvania Tariff No. 216 Revisions Regarding Switching, Transport and Platform for High Capacity Loop, Docket No. R – 00049525.

RECENT FCC DECLARATIONS

In the Matter of Amendments of Parts 1, 21, 73, and 101 of The Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, WT Docket No. 03-66

In the Matter of Tyco Telecommunications, VSNL Telecommunications, et al, Application for Transfer of Control of Cable Landing Licenses, Petition to Deny of Crest Communications Corporation

In the Matter of Review of the Commission's Rule Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers

In the Matter of AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services

In the Matter of Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers

In the Matter of Appropriate Framework for Broadband Access to the Internet over Wireline Facilities

Center for Communications Management Information, Econobill Corporation, and On Line Marketing, Inc., Complainants, v. AT&T Corporation, Defendant

RECENT CONSULTING ASSIGNMENTS

Telecommunications Industry

Prepared FCC declaration for the Wireless Communications Association International analyzing the impact of limits on spectrum leases in the Educational Broadcasting Service bands on investment in wireless infrastructure

Prepared expert reports for the Infocomm Development Authority of Singapore on access to submarine cable landing stations and regulation of local leased line circuits

Prepared and presented an analysis of the market for termination of calling on mobile phones to Ofcom, the independent regulator and competition authority for the UK communications industries

Hired to provide expert analysis of liability and damage issues in Civil Action No. 5:03-CV-229: *Z-Tel Communications Inc.* v. *SBC Communications Inc. et al;* In the United States District Court for the Eastern District of Texas, Texarkana Division (case settled)

Other Industries

Analyzed the market for Internet music services and recommended a rate for the compulsory license fee for digital audio transmission of sound recordings.

Hired by a rural electric power company to develop a damage model for a case involving the failure of a lessee to properly maintain and utilize a coal-powered electric power plant (case settled)

Analysis of economic benefits and tax revenues from the construction and operations of a hotel and villa complex in the British Virgin Islands

ATTACHMENT 2

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Telecommunications Relay Services and	)	
Speech-to-Speech Services for	)	CG Docket No. 03-123
Individuals with Hearing and Speech	)	
Disabilities	)	

DECLARATION OF

CHERYL L. PARRINO

I, Cheryl L. Parrino, hereby declare the following:

I. Summary

1. My name is Cheryl L. Parrino. I have been asked to comment on three topics relating to the rate methodology for video relay service (VRS) and IP Relay service. First, I will explain why price cap regulation is more appropriate for establishing rates for VRS and IP Relay in comparison to rate-of-return or cost-of-service regulation. Second, I will describe the infirmities of the specific cost-of-service system used for TRS, and explain the minimum changes that would have to be made if the FCC were to continue with the cost-of-service methodology. Finally, I will respond to some of the ideas in the NPRM with respect to changes to the cost-of-service system, and explain why they would exacerbate the problems with the current methodology.

II. Qualifications

2. I am the President of Parrino Strategic Consulting Group (PSCG), a consulting firm specializing in telecommunications and energy issues, mediation and arbitration, compliance policies and procedures, audit planning and review, and board governance issues. I received a Bachelor of Business Administration degree with a major in accounting from the University of Wisconsin. My curriculum vita is attached to this Declaration.

3. Previously, I served as the Chief Executive Officer of the Universal Service Administrative Company (USAC), the corporation charged by the FCC with administering the Federal Universal Service Fund for all four universal service support mechanisms: High Cost, Low Income, Schools and Libraries, and Rural Health Care.

4. Prior to joining USAC I spent almost 22 years at the Public Service Commission of Wisconsin (Wisconsin Commission) and the last 7 years as Chairman. During my tenure as chairman of the Wisconsin Commission, I was elected President of the National Association of Regulatory Utility Commissioners (NARUC) and served as a member of NARUC's Executive Committee and Communications Committee. Prior to becoming a commissioner, I held various other positions in the agency including Executive Assistant to the Chairman (Chief of Staff) and Director of the Bureau of Utility Audits.

III. Preferred Rate Methodology

5. The approach to VRS and IP Relay ratemaking should be designed to advance two overriding public policy objectives: making VRS and IP Relay fully available to the deaf and hard-of-hearing communities as required by the

Communications Act and encouraging VRS and IP Relay providers to offer service as efficiently as possible. Efficiency means that the pricing regime should: 1) create a continuing incentive for VRS and IP Relay providers to invest in ways to lower the cost of service (such as investments that will address the serious impending shortage of qualified VRS interpreters by expanding the pool of available interpreters and thereby keeping costs down); 2) reward more efficient firms (by allowing them to retain the benefits of their efficiency gains); and 3) provide some assurance that rates will remain at reasonable levels for the foreseeable future (and thus will attract efficient entry). A methodology similar to the Price Cap Model used for large telecommunications carriers does a better job of meeting these objectives than the traditional cost-of-service/rate-of-return approach. A price cap methodology provides a stable rate for providers; reduces the administrative burden on the FCC, NECA and the providers; creates incentives for providers to connect additional customers; and creates incentives for providers to invest in interpreters. It is critical that the appropriate incentives are in place to encourage providers to invest in the interpreter pool not only to meet the growing demand for VRS but to also meet the other interpreter needs of the community. The price cap methodology has worked effectively for large telecommunications providers. Based on my experience as a state regulator, I explain below the practical issues associated with rate-of-return systems, which reinforce the conclusion that price caps is better than cost-of-service for TRS.

6. The rate-of-return or cost-of-service methodology provides an incentive for investment in fixed assets and infrastructure and rewards providers by providing a return on that investment. Although this model works when infrastructure investment is

desired and necessary, it does not work when the necessary and desired investments are primarily related to labor resources. In other words, the model will only work for capital-intensive industries and therefore is not suited to the TRS business, which is a labor- not capital-intensive business. The cost-of-service method the FCC currently uses does not provide incentives for investing in interpreters, does not provide incentives for connecting new customers, and does not provide rate stability. In addition the cost-of-service model requires significantly more regulatory resources and imposes higher administrative costs and burdens on the administrator and the providers. In my experience, whether the Commission uses projected costs or historical costs, the regulatory resources necessary to assure that the costs allowed and the rates established are reasonable are very significant. These requirements for significant regulatory intervention also impose costs on the providers.

7. As mentioned above, unlike the Price Cap Model, the inherent incentives of the current method do not match the desired outcomes of reaching all deaf and hard-of-hearing users and of investing in VRS interpreter resources to minimize the overall cost of providing the service. In addition, there are other deficiencies with the current model. For example, the current cost-of-service model closely resembles the cost-of-service method that was used to establish rates for all telecommunications carriers, requiring providers to report cost information on an account-by-account basis. This model was developed in an environment where the business model of one telecommunications carrier was very much like, if not identical to, the business model of another telecommunications carrier. The FCC established a Uniform System of Accounts and required that all providers conform to the accounts and the definition of what should be

included in those accounts. However, VRS and IP Relay providers do not follow the same business model – some are traditional telecommunications carriers, some are only in the business of providing TRS service, and some are Internet-based providers – thereby making it difficult to establish a Uniform System of Accounts. In fact, even the business models for providers of basic telecommunications are diverging, with the provision of telecommunications services now being provided by wireless carriers, cable companies, and IP companies making it more difficult for regulators to compare costs for basic telecommunications service from one provider to another. Given the current environment it is not appropriate for the FCC to establish a Uniform System of Accounts for VRS and IP Relay providers.

8. Another deficiency with the current system is that it does not provide any regulatory certainty. Without regulatory certainty providers are not able to reasonably plan for the delivery of service. The current process establishes a new rate every year, and typically the rate order establishing the rate is issued only days before the new rate is effective. In addition, the rate setting process has changed every year as has the determination of what costs are allowed to be included in the calculation of rates. These process and rule changes, the frequency of the rate changes, and the timing of the rate decision make it difficult if not impossible for providers to effectively plan for the efficient delivery of service. A typical business plans ahead by establishing goals and objectives, preparing a budget, and acquiring the necessary resources to accomplish the objectives. Providers are at great risk for any expenditure or planned expenditure with a process where rates change every year and where the rate is established only days before the rate goes into effect. Regulatory uncertainty limits a provider's willingness to make

short and long term investments and to connect new customers. Therefore, the uncertainty actually produces higher costs. A clear view of the future over a longer period such as three or more years would allow the provider to make longer term investments resulting in lower costs on average per year and over time.

9. The FCC has modified the cost-of-service method used for telecommunications providers in order to take advantage of the competition that exists in the VRS and IP Relay businesses and to recognize that the providers do not all have the same business model. The FCC establishes rates based on the mid-point or average weighted cost of all providers, giving all providers a greater incentive to find efficiencies. This approach uses regulation to set the mandate for efficiency while using the competition that exists to reward efficient firms.

IV. Modifications to the Current Cost-of-Service System are Necessary if the Price Cap Model is Not Accepted

10. If the FCC chooses not to use the Price Cap Model for establishing VRS and IP Relay rates it would be necessary to make modifications to the traditional cost-of-service methodology in order to ensure that VRS and IP Relay are provided in a manner that provides all deaf and hard-of-hearing users with functionally equivalent telecommunications relay services consistent with the statute. While in my view, the cost-of-service approach is far inferior to a price cap methodology for establishing VRS and IP Relay rates, I have been asked to describe the modifications to the current cost-of-service system that are absolutely necessary to meet the statutory mandate and to create additional incentives for efficiency, should the Commission decide to retain a cost-of-

service approach. In this section, I also explain why additional categories of expense should be included in the calculation of the VRS and IP Relay rates.

Align the Categories of Expenses with the VRS and IP Relay Business

11. The FCC and NECA should work with the providers to establish reporting categories that are in line with the VRS and IP Relay businesses, allowing for more consistent reporting, thereby providing the FCC and NECA with better information. In addition, aligning the cost categories would make the reporting process easier for providers and would provide a better audit trail for the auditors. In some instances consolidating categories would be logical while in others separating the costs into separate categories would make sense and would provide better information for NECA and the FCC. For example, the current list includes both "Utilities" and "Telecommunications Expenses" categories. Some providers have reported the cost for telecommunications lines associated with the Relay Centers under the "Utilities" category and other providers have included those costs in the "Telecommunications Expenses" category. Consolidating these two categories into one for Relay Center Utilities would provide for consistent reporting at a level of detail that still allows for analysis. Another example highlights a situation where separating categories might allow for a better analysis by NECA and the FCC. The current list of categories includes one entitled "Subcontractor Expenses" under the category of "other TRS Expenses." Providers report expenses for subcontracted interpreters and communication assistants as well as subcontracts for other services in this account. It may make sense to establish a specific category for subcontracted interpreting and communications assistant services which would allow NECA and the FCC to better analyze the major cost of providing VRS and

IP Relay service. Aligning the reported categories of costs with the VRS and IP Relay business models would provide better and more consistent data for NECA and the FCC, would ease the reporting burden on providers, and would provide a better audit trail for the auditors.

Provide Detailed Direction Regarding What Should be Included in Each Account

12. In addition to revised categories of costs, providers must understand what costs should be included in each category and what costs are allowed in determining the TRS reimbursement rate in order to provide quality data and to make reasonable business decisions. Much more specific guidance is required and the FCC and NECA should work with providers to develop that additional guidance.

13. It is important for the FCC to receive accurate data and these changes will vastly improve upon the information that is received. The new categories, along with the additional guidance, will provide more regulatory certainty for the providers and better information for the FCC and NECA. These changes will provide more consistent reporting while allowing the providers to experiment with different business models, competing to be the most efficient firm. Information will vary from provider to provider because of these differences in business models.

<u>All Reasonable VRS and IP Relay Costs Should be Included in the Rate Methodology</u>

14. The FCC should continue to allow all reasonable advertising, marketing and outreach expenses in the rate calculation for VRS and IP Relay so that all deaf and

hard-of-hearing users are aware of these vital services.[1] In addition, the FCC should allow other costs that encourage providers to reach all deaf and hard-of-hearing users, to invest in the human resources necessary to provide the service, to improve customer service such as the provision of E-911, and to find more efficient ways to deliver the service.

Research and Development

15. Currently research for items not currently mandated by the FCC is not allowed in the calculation of rates.[2] Research is important for identifying service improvements, for meeting new mandates imposed by the Commission, and for identifying efficiencies. Although the benefits of any given research effort are not always certain, it is appropriate for NECA to include research and the associated development costs in developing the rate of a reasonably efficient provider should the FCC determine that the expenditures are in the public interest. The current methodology should be modified and NECA should be allowed to include the amortization of capitalized research and development costs once the FCC has determined that these R&D costs help achieve the goals of reaching all deaf and hard-of-hearing users, providing functionally equivalent telecommunications relay service, and providing critical services to deaf and hard-of-hearing users. For example, the FCC has waived the requirement for VRS and IP Relay providers to provide E-911 service because it is not technologically feasible at this point; however, the FCC is encouraging all providers to solve the technology problems

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1 *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Further Notice of Proposed Rulemaking, 21 FCC Rcd 8379, ¶¶ 33-36 (2006) ("*Further NPRM*").

2 *See id.* ¶ 8.

and to research and develop technological solutions to the provision of this vital public safety service. When E-911 is available, NECA should include a portion of reasonable R&D costs in its calculation of the rate of a reasonably efficient provider. Providers should be given the opportunity to demonstrate that the cost of any given research is outweighed by the benefits provided to users or the FCC and thus those costs should be included in the calculation of the rate for a reasonably efficient firm. This approach would balance the FCC's concern about funding speculative research and research related to services that are not required or mandated by the FCC while providing some incentive for providers to conduct research.

New Customer Installations and Training

16. The current cost-of-service approach does not provide incentives for providers to connect new users. In fact, because the cost of equipment, installations, and training on the use of VRS are not included in the rates that are established, the current methodology penalizes providers for connecting new users.

17. One of the Commission's goals is to bring functionally equivalent communications service to every deaf and hard-of-hearing individual. Chairman Martin emphasized this goal in the statement he released accompanying the FNPRM: "All of these actions have been aimed at fulfilling our statutory goal of ensuring that every person has equal access to this nation's communications services."[3] These thoughts were echoed by other Commissioners in their statements as well. In order to fulfill this goal it is not only important to encourage providers to inform and educate users with regard to

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3 *Further NPRM*, Statement of Chairman Kevin J. Martin, 21 FCC Rcd at 8407.

the availability of the services, as discussed in the outreach section above, but also to encourage providers to connect new users.

18. I recommend that the current methodology be modified to include the costs of connecting new deaf users to VRS in the rate calculation. The installation costs should be capitalized and the depreciation of those costs should be included in the rate calculation. Training deaf users on how to use VRS is an integral part of the service and those costs should be allowed and included in the rate calculation. In order to meet the mandate of reaching all deaf users and providing those users with equivalent telecommunications relay service, it is necessary to train those users on how to appropriately use VRS; therefore, those costs should be included in the rate established for the reasonably efficient provider.

Investment in New Interpreter Resources

19. As discussed in the declaration of Dr. John Johnson[4] and elsewhere,[5] there is a shortage of qualified interpreters. The current method does not provide the same

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[4] Declaration of Dr. John H. Johnson, attached to Comments of Sorenson Communications, Inc., ¶¶ 15, 25.

[5] *See, e.g., Telecommunications Relay Service and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Report and Order, 20 FCC Rcd 13165, ¶¶ 18-19 (2005) (recognizing the concerns of providers and consumers regarding the shortage of interpreters); U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook*, 2006-07 Edition, *available at*: <http://www.bls.gov/oco/ocos175.htm> ("Given the shortage of interpreters and translators meeting the desired skill level of employers, interpreters for the deaf will continue to have favorable employment prospects."); Department of Education, "Training of Interpreters for Individuals Who Are Deaf or Hard of Hearing and Individuals Who Are Deaf-Blind – Priorities and Definitions and Notice of Availability," 70 Fed. Reg. 44,834 (Aug. 3, 2005) ("legal requirements for communication and language access . . . led to an ever-increasing demand for qualified interpreters, outstripped the available pool of qualified interpreters, and created a serious ongoing national shortage.").

incentives as the price cap method for providers to invest in new interpreter resources. The current system should be modified specifically to include recovery of certain costs to encourage investing to expand the pool of available interpreters in order to be able to meet the demand from new users and to keep the cost per minute at a reasonable level.

20. Absent an investment by VRS firms in interpreters to address the impending shortage of interpreters, the cost of VRS will increase with the decrease in the supply of qualified interpreters. This problem is compounded by the need to meet other interpreting needs of the deaf community. The mandate to provide this service to all deaf users, absent investment in interpreters today, will result in providers being required to pay huge salaries to meet the statutory mandate. A reasonably efficient firm would invest in interpreters now in order to ensure the supply of qualified interpreters in order to keep costs down in the long term. A combination of the approaches below should be used to encourage this investment and providers should be required to demonstrate that the expenditures will result in a growth in the number of qualified interpreters.

21. The FCC could allow the inclusion of the costs for an interpreter internship program. A number of industries have used internships quite successfully to encourage students to continue in a certain field, to establish relationships with institutions, and to find skilled labor. Internships provide the institutions with additional tools for recruiting students, the students with valuable learning experiences and wages to support their education, and the company with resources, links to educational institutions and students, and links to a future labor pool.

22. The FCC could also allow the inclusion of a certain number of interpreter scholarships each year. This approach is used in the private sector to encourage

individuals to pursue certain fields of study. Scholarships provide institutions with another tool for recruiting students and by funding some of the costs of the education it would encourage students to enter the field of interpreting.

23. The FCC could also allow the provider to include the basic educational and training costs for a certain number of individuals. The number of individuals funded could be determined as a percent of the current work force or by some other method. The funding could also be determined by allowing the inclusion of only the last couple years of schooling.

24. Another option would be for the FCC to allow direct payments for interpreter education programs. The payments would have to be used to achieve increased numbers of students and graduating interpreters.

25. It makes sense for the FCC to allow providers to select from the options above. Allowing providers to experiment with different options with an evaluation at the end of the three-year rate period to determine the success of those options in growing the number of qualified interpreters would likely produce the best results.

Return or Profit Margin

26. It is reasonable to provide a return to TRS providers in order to encourage firms to enter the market and to stimulate innovation and efficiencies of the other providers. Absent a reasonable profit included in the rate established for a reasonably efficient provider, new providers will not enter the market and current providers will not stay in the market for the long term, leaving deaf and hard-of-hearing users without access to the outside world and without functionally equivalent telecommunications relay services.

27. The current method that establishes the rate for a reasonably efficient provider provides for a profit based on a return on capital investment, similar to the method used for rate-of-return carriers. The 11.25% return applied to VRS and IP Relay net investment is also the current authorized return allowed by the FCC for rate-of-return regulated telecommunications companies. The return allowed is based on a typical utility capital structure which includes both equity and debt and the return provides for a return on investor equity and covers interest expense on the debt. Providing a return on net investment encourages investment in fixed assets and provides a return for that investment.

28. Although this model works where infrastructure investment is desired and necessary and works for capital-intensive industries, it is not a logical method for calculating a reasonable profit for a labor-intensive business. The current method does not provide a reasonable profit and does not take account of the way in which the market values a business that is highly labor intensive. Typically, as discussed below, labor-intensive businesses earn a profit equal to a percentage of the overall costs of running the business.

29. The declaration of Dr. Michael Pelcovits[6] supports the need for businesses to make a reasonable profit in order to compensate for the risks borne by the firm. He also provides an analysis of the profit margins of comparable firms to the VRS providers, and recommends a profit margin of 10% as a level that would be commensurate with the line of business and cost structure of the VRS providers.

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[6] Declaration of Dr. Michael D. Pelcovits, attached to Comments of Sorenson Communications, Inc., ¶¶ 52-59.

30. Dr. Pelcovits' analysis and recommendation is consistent with another area, where the government determines the appropriate level of profits to include in the costs of firms that are paid directly by the government, *i.e.* contracts entered into by federal, state and local governments. The federal government allows contractors to receive a profit over and above allowable costs. In fact, the government recognizes that providing a profit is not only reasonable and necessary but that it also is in the best interest of the government. The Federal Acquisition Regulations, Sections 15.404-4(a)(2) and (3) state in part that:

> (2) It is in the Government's interest to offer contractors opportunities for financial rewards sufficient to stimulate efficient contract performance, attract the best capabilities of qualified large and small business concerns to Government contracts, and maintain a viable industrial base.
>
> (3) Both the Government and contractors should be concerned with profit as a motivator of efficient and effective contract performance.[7]

31. The profit guidelines provided in the Federal Acquisition Regulations support the analysis performed by Dr. Pelcovits: the guidelines allow a profit of 15% of estimated contract costs for experimental, developmental, or research work and allow a profit of 10% of estimated contract costs for all other cost-plus-fixed-fee contracts.[8] Under these contracts, interest is allowed for capital investment involved in the business.

Rate Period

32. The current process[9] does not provide much rate certainty, is administratively burdensome and expensive, and does not provide much incentive to

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7 48 C.F.R. § 15.404-4(a)(2)-(3).

8 *Id.* § 15.404-4(b)(4)(A), (C).

9 *See Further NPRM* ¶¶ 23, 30.

invest in technology or human capital. Establishing rates for at least a three-year period would provide additional rate certainty, would lessen the administrative burden and would provide incentives for providers to find efficiencies during the period.

V. Advertising, Marketing and Outreach Should Continue to be Included in the Established Rates

Advertising and Marketing

33. Some parties commented during the last rate setting process that the FCC should determine that all branded ads should be disallowed.[10] Although on its face it may appear reasonable and easy to implement, this approach is in fact fraught with issues and would create obstacles to accomplishing the FCC's goal of reaching all eligible deaf and hard-of-hearing users and to hiring qualified interpreters and communication assistants. This recommendation would also negatively impact deaf and hard-of-hearing users of VRS and IP Relay. Unless the FCC established an absolute prohibition on the use of a provider name or logo on any website or website notice, sign, document, or other material viewed by the public, implementation and enforcement would be very subjective, time consuming, and complicated. Although the absolute prohibition of the use of a provider name or logo may make it easier to distinguish between what advertising and marketing is allowed, it would hamper the ability of providers to reach deaf and hard-of-hearing users and it would make it more difficult for those users to sign up for VRS and IP Relay services, contrary to the goals of the FCC and ADA. For example, Sorenson's outreach events are specifically designed and planned to reach and target not only new deaf and hard-of-hearing users that are not aware of the TRS options

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10 *See id.* ¶ 36.

available but also qualified interpreters and communications assistants. If Sorenson were not allowed to use its name on printed materials or on the business cards of Sorenson employees, it would make it extremely difficult if not impossible for deaf and hard-of-hearing users and interpreters to reach Sorenson after the event either to sign up for service or to apply for a position. If Sorenson were not allowed to feature links to its website in the materials provided so that users could obtain additional information and sign up for service, it would make it even more difficult than it already is for these users to get service, thereby frustrating the Commission's goal of reaching all eligible deaf and hard-of-hearing users. It is not reasonable to expect that all users can or will sign up for service at the event, so providing detailed contact information is critical for providing customers with the information they need to sign up for the service. The website, events and referrals from those events are key to promoting the service and are required to reach eligible deaf and hard-of-hearing users. As important, TRS users, just like other users, want to know who they are dealing with and they have a right to know who is hosting the event. Deaf and hard-of-hearing users, like other consumers, want to be able to check the reputation of the company and the quality of its product before they sign up for service and if the provider name is not included on any of the materials, users will demand to know. Absent the bright line, the FCC would have to specify each and every document where a provider name and logo was appropriate as well as under what specific conditions the use of those documents were appropriate. Branding should not be a factor in determining whether advertising should be allowed.

34. Some parties also suggested that the FCC should disallow advertising that simply promotes one provider over another. Since the FCC rules require interoperability,

it is reasonable for providers to advertise the availability of their services in order to keep current deaf and hard-of-hearing users and to attract deaf and hard-of-hearing users from other providers.

35. A large portion of Sorenson's advertising and marketing expenditures are for advertising and marketing outreach events specifically targeted at reaching deaf and hard-of-hearing users, interpreters, communications assistants and for providing ASL video messages on the Sorenson VRS, Sorenson IP Relay, and other related Sorenson websites. These dollars are necessary to provide information to deaf and hard-of-hearing users in their own native language and to reach more eligible users.

36. Advertising and marketing expenses are reasonable business expenses and are expenses that are incurred in the normal course of business. Advertising and marketing of outreach events along with the availability of the service are even more important in this business where only a small fraction of eligible users are aware of the service. These expenditures are also needed in the VRS business where there is an impending labor shortage for qualified interpreters. Without advertising and marketing, very few deaf and hard-of-hearing users, interpreters or Communication Assistants would hear about VRS and IP Relay services, frustrating the mandate to provide all deaf and hard-of-hearing users with functionally equivalent telecommunications relay service. It is common business practice for companies to advertise the services they offer and the benefits of using a particular brand over another. In light of the FCC mandate on interoperability and the benefits provided to users all reasonable advertising and marketing should be allowed.

Outreach

37. There is agreement across the industry that outreach should not only be allowed but that it is necessary both for connecting more deaf users to VRS and for educating the hearing community about VRS. The FCC and parties also agree that outreach is necessary for the FCC to reach its goal of providing all deaf users with access to functionally equivalent telecommunications relay services.[11]

38. Sorenson outreach expenditures are for holding events to educate users about VRS and IP Relay, to sign up new Sorenson VRS and IP Relay users, and to recruit interpreters, communications assistants, and rural outreach managers. Many deaf users have not heard about VRS, so basic education about the service, its capabilities and advantages is an important first step and is included in each outreach event. In addition, deaf users are provided with more detailed information about the service, Internet access requirements and the sign up process. In the first two plus years Sorenson outreach managers focused their efforts on and attended events in major cities with large populations of deaf individuals. Sorenson is now also reaching out to rural communities that have access to high-speed Internet (both upload and download speeds). Events are planned in the locations of new VRS interpreting centers to facilitate the recruiting and hiring of interpreters as well as for reaching new customers.

39. Providers should be allowed to include outreach expenditures as long as they can demonstrate that the focus is on reaching new customers and interpreters and on educating the hearing community about the service. This approach would provide flexibility and allow providers to develop and implement their own business plans.

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[11] *See id.* ¶ 34.

VI. Certain Suggestions in the FNPRM Should Not be Adopted Regardless of Methodology Selected

Use Projected Costs Rather than Actual Historical Costs

40. If the FCC does not adopt the recommended Price Cap Model, I recommend that the Commission continue to use forecasted costs rather than historical costs to establish rates for VRS or IP Relay rates.[12] I have consistently supported and advocated the use of projected costs for establishing rates. In fact, the Public Service Commission of Wisconsin has used some form of projected costs consistently since 1958.[13] The use of historical costs in establishing rates does not allow providers the opportunity to recover the reasonable costs of providing VRS and IP Relay services and does not reduce the administrative burden of the rate setting process. In addition, the use of historical costs will not reflect reasonable costs if costs are either increasing or decreasing. If costs are increasing due to inflation or new regulatory requirements, the use of historical costs will underestimate the actual costs of providing VRS during the rate period and deny providers the opportunity to recover legitimate costs and in some instances deny recovery of new costs imposed by regulators. If costs are decreasing due to efficiencies or deflation, the use of historical costs will overestimate the costs of providing service in the rate year and allow recovery for costs that are not incurred.

41. The use of historical costs not only denies the providers an opportunity to recover the actual costs of providing service during the rate year but it does little to decrease the administrative cost for the FCC or the administrator. Although the regulator does not need to evaluate whether the projections are reasonable under this approach, the

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12 *See id.* ¶¶ 22, 29.

13 *See Wisconsin Telephone Co.*, No. 2-U-4904, Order (Wis. PSC Apr. 18, 1958).

underlying need to carefully review and evaluate the reasonableness of costs would continue to exist. Just as with projected costs, the regulator and administrator must scrutinize the information submitted to determine which costs are reasonable, which costs are likely to be ongoing, which costs are unusually high or low, and which costs should be included for establishing rates. The use of historical costs does not diminish the need to carefully scrutinize and review the costs that are submitted by the providers. The use of historical costs only marginally decreases the cost of regulation while denying the provider an opportunity to recover the reasonable costs of providing VRS and IP Relay service.

42. Under a cost-of-service approach, only a projected cost approach provides a reasonable opportunity for a reasonably efficient provider to recover the costs of providing service. Absent this opportunity, providers will be reluctant to provide this service and reluctant to connect new users.

A True-Up Should Not be Adopted

43. I do not support the use of a true-up[14] or interim rates other than in very unusual and unique circumstances. The use of a true-up generally and in this particular case does not advance the goals of the Commission, does not incent providers to be efficient, increases the expected return of investors, and imposes significant administrative burdens on the Commission, the administrator, and the provider. As a regulator, I advocated against using interim rate increases or true-ups except in very unique and extreme conditions. The Wisconsin Commission, as mentioned above, has

14 *See Further NPRM* ¶¶ 22, 29.

traditionally used a fully forecasted test year and has used interim rate increases only in very limited circumstances because of the negative incentives for efficiencies, the increased return required due to increased investor risks, the administrative burdens, and the similarities to retroactive rate making (retroactive ratemaking is not allowed in Wisconsin).

44. A true-up takes away any incentive for providers to be efficient and innovative. With a true-up in place, providers have absolutely no incentive to look for efficiencies because any gains will be taken away at the end of the rate period. If costs were greater than estimated, a true-up would drive up the overall size of the fund providing even less certainty than the Commission has today with regard to the fund size, and the amount that must be collected. For example, with a true-up, providers would be inclined to pay interpreters more or become less efficient to avoid a true-up. In fact, based on my limited experience with true-ups, firms typically spent more, resulting in increased costs in the short and longer-term, thereby avoiding the need for a refund.

45. A true-up process places significant additional burdens on the Commission and the administrator. The Commission and administrator must carefully scrutinize and review the actual costs that are submitted by the providers and compare those to the forecasted costs that were submitted. In addition, the Commission and the administrator must scrutinize the information submitted to determine which costs are reasonable and which costs should be included for establishing rates.

VI. Conclusion

46. A methodology similar to the Price Cap Model used for large telecommunications carriers is better suited to accomplish the FCC objectives for VRS

and IP Relay than the traditional cost-of-service/rate-of-return methodology. If the FCC does not adopt this preferred methodology, changes to the current rate-of-return/cost-of-service methodology are necessary. Use of historical rather than projected costs, or use of a true-up, would only exacerbate the weaknesses of the current cost-of-service system.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge and belief.

Executed on October 27, 2006

Cheryl L. Parrino

Official Biography

Cheryl L. Parrino

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Education

B.B.A. – University of Wisconsin-Madison, 1976. Major: Accounting.

Professional Positions

President, Parrino Strategic Consulting Group, 2/04 – Present

PSCG is a private consulting firm specializing in telecommunications and energy issues, compliance policies and procedures, audit planning and review.

Chief Executive Officer - Universal Service Administrative Company, 6/98 – 1/04

USAC is an independent, non-profit subsidiary created by the Federal Communication Commission in 1997 to administer, temporarily, the universal service support mechanisms for high cost areas and low-income consumers, and the billing, collection, and disbursement functions for the universal service programs for schools, libraries, and rural health care providers.

As CEO, I have responsibility for overall management and financing. As the first CEO of this company, I am responsible for setting up the corporation.

Chairman – Wisconsin Public Service Commission, 1/92 – 5/98

Commissioner – Wisconsin Public Service Commission, 2/91 – 5/98 and 2/89 – 6/89

Appointed Chairman by the Governor and confirmed unanimously in 1989, 1991, and 1997. As a commissioner, I was responsible for ensuring that all citizens of the state were provided with reliable and safe utility service at reasonable rates. As the chairman, I had the responsibility for all administrative matters including personnel and budget.

Executive Assistant to Chairman Charles H. Thompson – Wisconsin Public Service Commission, 5/87 – 2/89 and 7/89 – 2/91

Executive Assistant to Chairperson Mary Lou Munts – Wisconsin Public Service Commission, 5/86 – 5/87

As Executive Assistant, I was responsible for managing the agency on behalf of the Chairman and for providing technical assistance on policy issues. In 1990, I developed a major reorganization plan for the agency and developed a strategic planning process. The reorganization was completed and a strategic plan was developed. Strategic and organizational planning continues to date.

Director – Bureau of Utility Audits – Wisconsin Public Service Commission, 9/82 – 5/86

As Bureau Director, I was responsible for supervising three energy audit teams, a special fuel audit team, and a holding company audit team.

Auditor 5 – Wisconsin Public Service Commission, 6/82 – 9/82

Auditor 4 – Wisconsin Public Service Commission, 11/81 – 6/82

As an Auditor 4 and 5, I was the lead auditor in charge of the audits of all 100 telephone utilities in Wisconsin along with their affiliated interests.

Current Activities

Member of New Mexico State University, Center for Public Utilities, Board of Directors

Member of TEMPO

Member of the University of Wisconsin-Madison, School of Business, Dean's Advisory Board

Member of the Board of Directors of the Wisconsin Public Utility Institute (WPUI)

Director and Officer of Greenbush Heritage Foundation

Past Activities

President of the National Association of Regulatory Utility Commissioners (NARUC)

Member of SAFO, the top management committee of NARUC

Member of NARUC's Executive Committee

Member of NARUC's Committee on Communications

Member of NARUC's Committee on Communications Ad Hoc Legislative Team

President of the Great Lakes Conference of Public Utilities Commissioners

Member of Bellcore Advisory Council

Member of the Federal/State Joint Board on Separations

Chairman of the Board of Directors of the Wisconsin Public Utility Institute (WPUI)

Member of the Ameritech Regional Regulatory Committee (ARRC)

Member of the Governor's Blue Ribbon Panel on Telecommunications Infrastructure

Member of the Governor's Task Force on Clean Air

Member of the Governor's Alternate Fuels Task Force

ATTACHMENT 3

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
	)	
Telecommunications Relay Service and	)	CG Docket No. 03-123
Speech-to-Speech Services for	)	
Individuals with Hearing and Speech Disabilities	)	

DECLARATION OF DR. JOHN H. JOHNSON

I. Introduction

A. Summary

1. My name is John H. Johnson. I am an economist and Vice President of National Economic Research Associates, Inc. (NERA), an international economic consulting firm. NERA was founded in 1961 and provides research and analysis in the field of applied microeconomics, including the economics of competition, labor, regulation, and finance. I have been asked by Sorensen Communications (Sorenson) to provide an overview of the demand and supply conditions in the labor market(s) for Video Relay Service (VRS) interpreters. I have also been asked to identify the best available data on wages for VRS interpreters, and to investigate the trends in VRS interpreter wages relative to those in the labor market as a whole. In preparing this declaration, I, and economists under my direction, have reviewed available data, documents, publicly available government sources, and other available sources, which are cited in Appendix A to this declaration. The conclusions listed below constitute my expert opinion as a labor

economist and are based on my review and analysis of these sources and on conversations I have had with Sorenson personnel.

2. The main focus of my declaration will be to describe the labor market for VRS interpreters. I first explain that the supply of VRS interpreters is constrained by the need for extensive training. I then discuss the growing demand for VRS interpreters, driven by demand for VRS—which has grown, and is projected to continue growing—and by the presence of competing demands for qualified American Sign Language (ASL) interpreters (*e.g.*, the need to meet government mandates and community demands for ASL interpreters in schools, courts and other institutions). If the supply of VRS interpreters is constrained while demand for VRS increases, wages for VRS interpreters can be expected to increase (all else being equal). Pressure to increase interpreter wages could be alleviated by expanding the supply of interpreters, for example, by training existing ASL interpreters so they are qualified to be VRS interpreters and increasing the number of new prospects entering training programs. Because of the extensive training required to become a VRS interpreter, any attempts to ease the expected pressure on interpreter wages will require foresight and planning.

B. Qualifications

3. I received my B.A. in Economics from the University of Rochester and my Ph.D. in Economics from the Massachusetts Institute of Technology (MIT). One of my areas of specialization at MIT was labor economics. Prior to joining NERA, I was an Assistant Professor of Economics and Labor and Industrial Relations at the University of Illinois at Champaign-Urbana. I have published papers on labor economics issues in the *Journal of Labor Economics* and the *Industrial Labor Relations Review*, and wrote my doctoral dissertation on labor economics issues. I also taught three courses on labor economics at the University of

Illinois—Labor Problems, Women in the Labor Market, and Graduate Labor Economics Methods.

4. Since joining NERA, I have worked on a wide range of consulting assignments in a variety of industries. I regularly conduct empirical analyses using large data sets to answer economic questions. I also specialize in econometrics, the use of statistical techniques in data analysis. I have provided written testimony in both the United States and South Korea. My curriculum vitae is attached as Appendix B to this declaration.

5. The opinions and discussions set forth in this declaration are based on my analysis of the matter to date. I reserve the right to revise my opinion and conclusions if additional information is provided to me or if additional research leads me to change my current opinions.

II. Characteristics of the Labor Market for VRS Interpreters

A. Background on VRS

6. VRS is a type of telecommunications relay service (TRS) that allows deaf and hard-of-hearing individuals to place telephone calls.[1] Unlike other types of TRS, VRS utilizes video services, making it possible for deaf individuals to use ASL to communicate with hearing people over the phone. Typically, a deaf user initiates a VRS call by connecting to an IP address that is routed to a VRS provider's call center.[2] At the call center, a VRS interpreter uses a video screen

[1] In 1990, Title IV of the Americans with Disabilities Act (ADA) required the Federal Communications Commission (FCC) to provide "functionally equivalent" relay services, "to the extent possible and in the most efficient manner," to persons with hearing or speech disabilities in the United States. http://www.fcc.gov/cgb/dro/title4.html. The ADA also requires the FCC to encourage the use of improved technology in the provision of TRS.

[2] To use VRS, a deaf caller must have a broadband connection, which is not subsidized by the interstate TRS Fund. Although most VRS calls are initiated by a deaf user, hearing individuals may also use VRS to call deaf ASL users. In that case, the hearing caller uses a regular telephone to dial a toll-free number that is routed to a VRS

to see the deaf caller and read his or her signs. The interpreter then facilitates the conversation between the hearing and deaf parties by interpreting between ASL and spoken English (or Spanish), speaking to the hearing party over the telephone and signing to the deaf party over the video connection.[3]

B. Supply of VRS Interpreters

7. The supply of VRS interpreters is limited and is constrained by the fact that becoming an effective VRS interpreter requires extensive training, even beyond the years of training required to be an ASL interpreter. In order to be an effective VRS interpreter, an individual often must first meet certain minimum educational and certification requirements. The FCC classifies a qualified interpreter as: "an interpreter who is able to interpret effectively, accurately, and impartially, both receptively and expressively, using any necessary specialized vocabulary."[4] As summarized in Table 1, most of the major VRS providers require specific educational background, training, or certification from the state in which they reside and/or the Registry of Interpreters for the Deaf (RID) or the National Association of the Deaf (NAD), and significant interpreting experience.

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provider (*e.g.*, 1-866-FAST-VRS). The caller is then connected to a VRS interpreter who connects the call to the deaf individual being called and begins interpreting between spoken English and ASL.

[3] For a more detailed description of VRS, see for example, http://www.sorenson.com/press/docs/VRS_DATASHEET.pdf.

[4] http://www.fcc.gov/cgb/dro/4regs.html.

Video Relay Service Providers
ASL Interpreters Certification Requirements

VRS Provider (a)	NAD Certification (b)	RID Certification (c)	State Certification (d)	Other (e)
Sorenson	IV, V	CI, CT, CI/CT, CSC	Intermediate or Master Certificate	Professional Interpreter Experience (determined by management)
AT&T	IV, V	CI/CT, CSC	--	--
Communication Access Center	IV, V	RID[1]	State of Michigan QA	--
Hamilton Relay	IV, V	CI, CT, CI/CT, CSC	Equivalent State Certification	--
Hands On VRS	IV, V	CI, CT, CSC, NIC	--	ACCI level IV/V[2]
Verizon (IP-Relay.com)	IV, V	CI/CT, CSC	--	--
Sprint	III, IV, V	CI/CT, CSC	State Certification Where Applicable	--

-- not applicable

[1] Communication Access Center does not provide an RID level of certification required.

[2] The American Consortium of Certified Interpreters (ACCI) also provides certification at level III (generalist), IV (advanced), or V (master).

Source: VRS providers' company websites.

8. The initial pool of VRS interpreters is drawn from several major training programs in the United States. According to the RID, there are currently 158 programs offered at 108 higher education institutions that train interpreters in a variety of programs.[5] Although it is difficult to estimate the number of interpreters in the work force, according to the RID website, there were approximately 6,213 certified interpreters nationwide as of June 2006.[6] Among interpreters in the labor force, work is often sporadic and part time.[7] Many interpreters and translators have a bachelor's degree or at least some college training (associates degree).[8] The educational prerequisites for taking the national interpreter test will become even more stringent in 2008.[9]

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[5] See Appendix C for a listing of the training programs listed on the RID website. As I describe throughout my declaration, interpreters out of training programs are not immediately able to be effective VRS interpreters (¶¶11-12). Similarly, on the demand side, competition for interpreters comes from a wide range of sources. (¶¶16, 17).

[6] http://www.rid.org/faq.html. RID also lists 4,139 "associates" who support RID, but are not nationally certified interpreters.

[7] http://www.bls.gov/oco/ocos175.htm.

[8] http://www.bls.gov/oco/ocos175.htm.

[9] By 2008, anyone wishing to take the NIC Interview and Performance test will need to have an associate's degree, and by 2012, a bachelor's degree will be required. http://www.rid.org/NAD-RIDNICTestsQuestionsandAnswers.pdf.

9. State certification requirements vary by state and are non-transferable.[10] Legal requirements for qualification as an interpreter can also vary by state; for example, Pennsylvania mandates that sign language interpreters working in the state have a national certification, a relatively stringent requirement.[11] The variation in state requirements to be a qualified interpreter places additional constraints on the available supply in certain geographies.

10. The current national certification program, the NIC, consists of a written examination, an interview, and a performance evaluation.[12] As a general guideline, it is expected that 2 years of attending an interpreter-training program are needed to pass the written test.[13] It can take up to five years of professional experience to pass the interview and performance evaluation.[14] In addition to the time and money (including tuition payments) needed to train for the national test and evaluation, candidates must also pay a fee of between $500-$765 to take the NIC test.[15]

11. Even an individual who meets all the educational and certification requirements described above, however, cannot immediately be an effective VRS interpreter. There are a

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[10] http://www.nad.org/site/pp.aspx?c=foINKQMBF&b=180368&printmode=1.

[11] *See* section 5(a) of the Sign Language Interpreters and Transliterators State Registration Act, Act No. 57-2004, 63 Pa. Stat. § 1725.5(a)(1)(iii); Proposed Rulemaking, Department of Labor and Industry, 36 Pa. Bull. 3822, 3823 at §§ 501.1, 501.3 (July 22, 2006); Notice of Comments Issued, Independent Regulatory Review Commission, 36 Pa. Bull. 6064 at §§ 501.1, 501.3 (Sept. 30, 2006); NAD-RID National Interpreter Certification (NIC), http://www.rid.org/nic.html.

[12] http://www.rid.org/nicoutline.pdf.

[13] Questions Asked on 4/29/2006. Received from Sorenson.

[14] Questions Asked on 4/29/2006. Received from Sorenson.

[15] http://www.rid.org/Written_test_app.pdf ; http://www.rid.org/NAD_RIDapp.pdf.

number of other important qualifications and skills that are required to be an effective VRS interpreter. For example, the following is a partial list of skills required:[16]

a. adaptability to different call situations (*e.g.,* calls to doctors' offices, personal calls, conference calls for business),

b. linguistic competence (including increased ASL-to-spoken English interpreting, knowledge of different "dialects," the ability to articulate signs),

c. telephone protocol,

d. voice control,

e. customer service,

f. decision-making,

g. impartiality,

h. technology expertise, including the ability to manipulate video and computer equipment,

i. general world knowledge, and

j. specific knowledge pertaining to the Deaf community.

As a result, even after completing a certification program, it takes several years of hands-on experience (on-the-job-training) for an individual to become an effective VRS interpreter.

12. A VRS interpreter faces a range of unique situations on a daily basis. As a result, achieving an adequate supply of qualified interpreters also requires investments in training. Sorenson, for example, spends approximately $2,500 per new hire to train ASL interpreters to be able to handle the demands of VRS interpreting.[17] As I understand it, new interpreters that need a little extra help to be ready to take VRS calls are those in the pre-certified category. These

[16] Distance Opportunities for Interpreter Training Center, VRS Task Analysis Report. http://www.unco.edu/DOIT/Articles/VRS%20Task%20Force%20Report.pdf.

[17] Based on Sorenson estimates.

individuals are identified through a screening process and undergo a 60 hour intensive mentoring and supervision program at a cost of approximately $3,500 per interpreter. These individuals are those who graduate from interpreter training programs and come into VRS after 2-5 years of working in the community. Further, to remain certified, interpreters must also earn continuing education units (CEU). The professional studies units include cultural and linguistic trends; interpreting theories and skills; and specialized fields, such as law, education, or healthcare.[18] Sorenson invests heavily in providing continuing education opportunities for its interpreters. Sorenson offers CEU workshops to its employees and interpreters in the outside community. Within each region, Sorenson provides workshops that allow its interpreters to advance their initial training and earn RID CEUs. On average, Sorenson provides over 100 skill building workshops per quarter across the country. Sorenson spends at least $500-$1000 per workshop in out of pocket expenses alone.[19]

13. The educational requirements, the certification requirements, the limited number of new interpreters coming out of training programs each year, and the experience required to be an effective interpreter are all factors that place limitations on the available supply of VRS interpreters.

C. Demand for VRS Interpreters

14. VRS interpreters are specialized ASL interpreters. The demand for ASL interpreters is driven by the overall demand for VRS and the need for ASL interpreters in the community. The

[18] Based on interviews with Sorenson personnel.

[19] Based on interviews with Sorenson personnel.

demand for VRS interpreters is in part shaped by the overall demand for VRS. VRS has experienced continued growth since its inception in 2000.[20]

15. In the face of an increase in demand for VRS, all else being equal, the need for qualified VRS interpreters will also increase.[21] As the number of VRS users grows, the demand for interpreters will grow – assuming that the number of minutes per user remains constant. Thus, as the number of VRS users increases, firms will compete more intensely for new interpreters. This is particularly true given that the FCC's speed-of-answer requirements effectively prevent providers from increasing queue times in the face of increased demand.[22] Accordingly, unless and until new sources of VRS interpreting can be found or created, the labor cost per minute of interpreting can be expected to rise in the face of increasing demand. In fact, the BLS reports that the employment for interpreters and translators – a category covering a wide range of interpreting and translating jobs, including VRS interpreters – is projected to increase "faster than average" for all occupations from 2004 – 2014.[23] This eventuality can be mitigated, or even eliminated, however, if VRS providers invest in creating new interpreting capacity to meet the

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[20] See http://www.neca.org/media/090805NASRAPRESENTATION.pdf, at 18. VRS is provided at no per-minute cost to the user. http://www.fcc.gov/cgb/dro/4regs.html. As a result, from the perspective of the user, there is no incremental cost for each minute of use—deaf individuals who want to use the service do not pay for additional minutes of use, and so the number of minutes they use is affected by factors other than price. These factors include personal preferences for using ASL on phone calls, the quality of the service provided, the extent to which deaf individuals substitute other forms of TRS for VRS, the increased availability of broadband access (allowing more individuals the required video access to interpreters), and changes in the price of broadband services. (VRS users must pay for their own broadband connections and these costs are not subsidized by the interstate TRS Fund.)

[21] Of course, demand for VRS is finite and is constrained by a number of factors, including the total number of deaf ASL users and the cost and availability of broadband.

[22] Similarly, there is no viable way to simply increase the number of minutes per hour that interpreters can spend relaying conversations given safety requirements for breaks, logistical time to set up and break down calls, and the long run realization that quality of service and the ability to retain workers for the long haul are adversely affected by increased hours worked.

[23] See http://www.bls.gov/oco/pdf/ocos175.pdf. A rate growing "faster than average" is defined as between 18 – 26%; see BLS Occupational Outlook Handbook: http://www.bls.gov/oco/oco20016.htm.

expected increase in demand for VRS. This can be done in a number of ways. For example, providers could invest in training new interpreters, provide existing ASL interpreters with the additional training necessary to qualify them to provide VRS interpreting, and/or seek additional hours from the existing work force.[24]

16. Individuals qualified to be VRS interpreters are also qualified for many other types of jobs, all of which compete for interpreters' services. Demand for ASL interpreters comes from a variety of sources, including local school systems, hospitals, and local and state governments – all of which are mandated by the ADA or other federal mandates – as well as private industry.[25] Several VRS interpreters acknowledge that they want the "regular personal touch" associated with interpretation work in a community setting.[26] As a result, interpreters who value working in a community setting or with children in an educational setting may choose to forgo VRS interpreting or only want to work part-time at VRS call centers. Attracting qualified, well-trained, and experienced interpreters for VRS requires firms to be flexible by, for example, offering part-time work arrangements.[27]

17. Demand for VRS interpreters is also likely to vary by geography. For example, several VRS providers have call centers within close geographic proximity to major cities. In these

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[24] Another possibility would be for providers to hire interpreters away from other jobs. This alternative is likely to be unappealing to providers, the FCC and the deaf community, however, given that qualified interpreters are needed to meet other government mandates and to provide general interpreting services to the deaf community in schools and other settings. The Rehabilitation Act of 1973, the Individuals with Disabilities Education Act ("IDEA") and the Americans with Disabilities Act all are examples of laws requiring the provisions of interpreters for the deaf. Several court cases also mandate the provision of interpreters.

[25] Elka Jones "Interpeters and Translators" in Occupational Outlook Quarterly, Summer 2002. http://www.bls.gov/opub/ooq/2002/summer/art02.pdf.

[26] Distance Opportunities for Interpreter Training Center, VRS Task Analysis Report, at 23. http://www.unco.edu/DOIT/Articles/VRS%20Task%20Force%20Report.pdf.

[27] Over 85% of Sorenson's interpreters are part-time employees. Similarly, BLS also describes a significant number of part-time workers in the category of interpreters and translators. http://www.bls.gov/oco/pdf/ocos175.pdf.

areas, there will be increased competition for the same pool of potential VRS interpreters. Similarly, the demands of the local deaf community will vary by region; certain cities are likely to have more local programs (*e.g.*, schools) that provide further competition for local interpreting resources. Finally, different locations will be characterized by different general economic conditions; the implication is that the outside opportunities for interpreters vary in terms of both their alternative employment choices and their potential wages.[28]

18. As I understand it, providers must also be sensitive to the need to have ASL interpreters available to serve in the Deaf community and to meet other government mandates, such as the need to provide interpreters in courtrooms, local college classrooms, mental health settings, medical and other public settings.[29] These community-based interpreters must be physically proximate to the institutions they serve (*e.g.*, the local courthouse) and therefore cannot easily provide VRS interpreting at a call center located outside their local area. At the same time, VRS providers cannot place call centers in every community where there are ASL interpreters. Simply put, VRS providers cannot hire all of the qualified interpreters nationwide. Accordingly, VRS providers must begin investing now to increase available interpreting capacity in light of the expected increase in VRS demand. Otherwise, wages can be expected to rise, putting pressure on the per-minute reimbursement rate for VRS.[30]

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[28] It is not surprising that the prevailing wage rates for VRS interpreters vary by geographic region; this is reflected in the BLS wage data for interpreters and translators as well.

[29] Both legal requirements and court cases have mandated the provision of interpreters in these settings.

[30] The pressure on wages might also be mitigated by increases in efficiency, but interpreter efficiency is effectively limited by factors such as regulatory requirements (including speed-of-answer and 24/7 availability), worker safety rules (such as limits on the amount of time interpreters can spend at their terminal) and logistical issues (*e.g.*, the non-reimbursable time needed to set up and "break down" calls).

III. Evidence on Wages of VRS Interpreters

19. Given the increasing demand for qualified interpreters and the limited supply of interpreters, one would predict that, all other things being equal, wages for interpreters would be increasing. This prediction is supported by the publicly available data, which (as explained below) shows that in every year from 2002 to May 2005, the year-to-year growth rate for wages for interpreters and translators has been higher than the growth rate for all occupations. Although information on wages of VRS interpreters is very limited, I have identified a publicly available data source to analyze the trends in wages for VRS interpreters from the Bureau of Labor Statistics (BLS).[31] The BLS is the "principal fact finding agency for the [US] government in the broad field of labor economics and statistics."[32] The BLS collects data on employment and earnings on a wide range of occupations through the Occupational Employment Survey (OES).[33] The survey data is collected from employers in all industry sectors in metropolitan and non-metropolitan areas from 50 states and the District of Columbia.[34] The survey provides an estimate of the mean hourly wages, employment, and earnings for all workers, as well as providing detailed estimates by various occupational groups.[35] The data is reported in six-month

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[31] The RID also reports some ranges for interpreter wages (see http://www.rid.org/faq.html).

[32] http://www.bls.gov/bls/infohome.htm.

[33] *Wages* for the OES survey are straight-time, gross pay, exclusive of premium pay. Base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay including commissions and production bonuses, tips, and on-call pay are included. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, non-production bonuses, employer cost for supplementary benefits, and tuition reimbursements. See http://www.bls.gov/oes/current/oes_tec.htm.

[34] http://www.bls.gov/oes/oes_ques.htm#Ques1.

[35] The OES survey uses the Standard Occupational Classification (SOC) used by the Office of Management and Budget. See http://www.bls.gov/oes/current/oes_tec.htm. *Occupational employment* is the estimate of total wage and salary employment in an occupation across the industries surveyed. The OES survey defines employment as the number of workers who can be classified as full- or part-time employees, including workers on paid vacations or other types of paid leave; workers on unpaid short-term absences; salaried officers, executives, and staff

intervals in May and November of each year from 2003 forward. Prior to 2003, the data is only available annually.

20. To derive estimates of wages that are comparable to the occupational break-down for the economy, I use data from the OES reported for "all occupations."[36] In Table 2, I report the mean wages for all occupations and for interpreters and translators from 2002-2005.[37] To derive an estimate for interpreter wages and employment, I use the occupation category "interpreters and translators." This category is defined as individuals who "translate or interpret written, oral, or sign language text into another language for others."[38]

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members of incorporated firms; employees temporarily assigned to other units; and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. See http://www.bls.gov/oes/current/oes_tec.htm.

[36] This category is classified as SOC code 00-0000.

[37] Starting in 2002, several major changes were made in the survey procedure, including the frequency of the survey and the industry coding system used.

[38] http://www.bls.gov/oes/current/oes273091.htm.

Growth in Mean Hourly Wages for All Occupations and Interpreters and Translators

2002 - May 2005

Date	Mean Hourly Wage Growth: Interpreters and Translators	Mean Hourly Wage Growth: All Occupations
	(Percent)	(Percent)
(a)	(b)	(c)
2002 - May 2003	2.62 %	1.81 %
May 2003 - May 2004	2.26	2.24
May 2004 - May 2005	4.54	2.30
Overall: 2002 - May 2005	**9.71**	**6.49**

Notes: In November 2002, the Occupational Employment Survey changed from an annual survey of 400,000 establishments to a semiannual survey of 200,000 establishments. The OES survey samples and contacts establishments in May and November of each year and, over 3 years, contacts approximately 1.2 million establishments. The full 3-year sample allows the production of estimates at fine levels of geographic, industrial and occupational detail.
Data used in the 2002 survey were combined with annual data from 1999 - 2001.
In 2002, the occupational coding methods used by the BLS changed from the Standard Industrial Classification System (SIC) to the North American Industry Classification System (NAICS).

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment Survey. http://www.bls.gov/oes, accessed August 25, 2006.

21. Table 2 shows point-to-point growth rates in wages for all occupations (column c) and the interpreter and translator occupation classification (column b). I calculate month-to-month growth rates (where possible) to avoid the possibility that seasonal differences in demand contaminate the results.[39] If we simply compare the wage growth between 2002 and May 2005,

[39] After 2002, OES data is provided both in May and November. I have calculated growth rates using May as a base period. Any comparison across different months (i.e. May to November) may be misleading because of the seasonal fluctuations that can occur in the all occupation wage rate category (there does not appear to be a seasonal pattern in the interpreter and translator wage rate measures).

we find that the approximate three-year growth rate in wages for all occupations was 6.49%, compared to 9.71% for interpreters and translators. From 2002-May 2005, the year-to-year growth rate for interpreters and translators has grown faster than that for all occupations in every year.[40] This growth in interpreter and translator wages implies a supply constraint and/or higher demand for workers than in other occupations.

IV. Equilibrium in the Labor Market for VRS Interpreters

22. Given the characteristics of the labor market(s) for VRS interpreters, I now describe the equilibrium in the labor market(s) for VRS interpreters. The demand for VRS, as measured by the number of VRS minutes, has grown steadily over the past few years.[41] As I understand it, the demand for VRS interpreters is expected to continue to increase over the next few years.[42] As I previously stated, since end users of this service do not pay per-minute rates for VRS, price constraints do not limit the demand for minutes of VRS use. Further, the demand for VRS interpreters cannot be separated from the demand for ASL interpreters more generally. According to BLS, the demand for interpreters and translators generally is expected to increase.[43] The overall picture is one of increasing demand over the next few years for VRS interpreters.

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[40] There are limitations to the use of the OES data for time series comparisons, but this is the only available government data providing detailed occupational codes required to identify the interpreter and translator category.

[41] One recent regulatory change that has further increased the demand for VRS interpreters but is not measured by the VRS minutes is the FCC's adoption of speed-of-answer requirements. Sorenson, for example, had to hire more interpreters to handle the same volume of call minutes.

[42] NECA, for example, in a public presentation at the NASRA conference, projected increased growth in the number of VRS minutes would double between 2005 and 2006. http://www.neca.org/media/090805NASRAPRESENTATION.pdf at 19.

[43] For example, the Bureau of Labor Statistics predicts employment growth of about 24 percent for the occupation between 2000 and 2010. See http://www.bls.gov/opub/ooq/2002/summer/art02.pdf at 26.

23. The constraints on the supply side I described above relate to the pool of available and trained interpreters. An important consideration in assessing the equilibrium is the requisite training and lag time required to prepare an individual for VRS interpreting. There are a finite number of individuals coming out of training programs in the United States to meet the increasing demand. These supply factors are important in thinking about the equilibrium in the market(s) for VRS interpreters. The lag time to train new VRS interpreters, the need for flexible work arrangements to attract the pool of trained workers, and the capacity of the existing training programs, are all factors that are likely to create frictions in the labor market that may limit the ability of the supply to keep up with potential growing demand for VRS at current wages.

24. In equilibrium, we expect VRS providers as well as community organizations, educational institutions, and others to compete with each other for the pool of newly available interpreters coming out of educational programs. Available interpreters select jobs based on their own preferences, including the wages offered and other non-pecuniary considerations (such as work conditions, break times, etc.). In recent years, VRS providers have expanded into new geographic locations to find interpreters, incurring increased costs of setting up call centers as well as training costs. This is unlikely to be a viable option for the long run. If demand for VRS interpreters continues to grow while supply remains constant, then for the labor market to equilibrate wages will increase for VRS interpreters and/or firms will be required to invest more heavily in training interpreters.

V. Conclusions

25. Based on my analysis of the matter to date, I have come to the following conclusions:

- The supply of VRS interpreters is limited by the educational requirements, certification requirements, experience, and other skills required to be an effective

interpreter. The long lag time to train new VRS interpreters could create frictions in the labor market that may limit the ability of the supply to keep up with the demand.

- The demand for qualified interpreters is increasing.
    - Demand for VRS is increasing; and
    - Demand for ASL interpreters is not only derived from VRS demand, but also the demand for interpreting services more broadly (which, all else equal, will increase the wages for interpreters).
- Wage growth for interpreters and translators as measured by the BLS has exceeded wage growth for all occupations since 2002. This is consistent with a market in which demand is increasing more rapidly than supply.
- As I understand the likely movements in supply and demand, the long run equilibrium in the labor market(s) for VRS interpreters will likely result in wage increases that will result in increases in the per-minute cost of VRS unless providers take steps to increase the supply of qualified VRS interpreters.

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Appendix B

JOHN H. JOHNSON, IV
VICE PRESIDENT

Dr. Johnson is a Vice President at NERA who specializes in the economics of labor, antitrust, and intellectual property. He also has expertise in damages estimation and the use of econometric methods in commercial litigation. He has extensive experience with Section I Sherman Act matters, including both criminal and civil cartel and price fixing cases.

Dr. Johnson also specializes in the economics of class certification. He has conducted economic research on both common impact and formulaic approaches to damages in both direct and indirect purchaser litigation. He has significant litigation experience in all phases of class action matters.

In addition, Dr. Johnson has a wide range of commercial damages experience. He has conducted economic research with large transaction and demographic data sets, including volume of commerce calculations, pricing analyses, and econometric damages modeling. His experience includes cases involving retroactive ratemaking and Robinson-Patman violations.

In intellectual property, Dr. Johnson has worked on patent damages litigation, including reasonable royalties calculations. He has also written on the use of event studies in intellectual property and on the current state of empirical analysis in intellectual property. Dr. Johnson also teaches CLE courses on the calculation of damages in patent litigation.

In addition to his litigation experience, Dr. Johnson has worked on a variety of merger and competition policy issues. In particular, his work has involved both coordinated and unilateral effects analyses and has focused on specific competitive issues arising in monopsony markets.

Dr. Johnson earned his PhD in economics from the Massachusetts Institute of Technology. He also earned a BA in economics, with highest distinction, from the University of Rochester. Prior to joining NERA, Dr. Johnson was an Assistant Professor of Economics and Labor and Industrial Relations at the University of Illinois at Urbana-Champaign, where he taught courses in labor economics, with a special focus on discrimination and the role of women in the labor market. His recent papers study the impact of long work hours on divorce and the effects of work hour regulation on public sector labor markets.

Education

Massachusetts Institute of Technology
PhD, Economics, 1999

University of Rochester
BA, *magna cum laude* with Highest Distinction in Economics, 1995

Professional Experience

NERA Economic Consulting

2005- Vice President

2003-2005 Senior Consultant

2001-2003 Consultant

University of Illinois at Urbana-Champaign

1999-2001 Assistant Professor of Economics and of Labor & Industrial Relations

Professional Activities

Board of Editors, *Economic Approaches to Intellectual Property Policy, Litigation, and Management Issues*, NERA Economics Consulting

Member, American Economic Association

Member, American Bar Association

Journal Referee, *Quarterly Journal of Economics, Journal of Human Resources, Journal of Business and Economic Statistics, Journal of Public Economics, Quarterly Review of Economics and Finance, Journal of Labor Economics, Scandinavian Journal of Economics, Managerial & Decision Economics, University of Illinois Campus Research Board*

Written Testimony and Expert Reports

Expert Report of Dr. John H. Johnson and Dr. Richard T. Rapp in *In Re Polyester Staple Antitrust Litigation.* Western District Court of North Carolina, Charlotte Division. September 8, 2006.

Expert Report of Dr. John H. Johnson in *The Republic of Korea v. SK Corporation, et al.* Seoul Central District Court, May 2006.

Selected Litigation/Consulting Assignments

For North American Bus Industries, Inc., provide consulting services related to Buy America claims.

For Agrium and Pursell Technologies, assist counsel with analysis of competitive impact of merger.

For Smithfield Foods, assist counsel with analysis of competitive impact of the acquisition of Cook's Hams.

For Hughes Network Systems, provide consulting services on antitrust damages related to Robinson-Patman claims.

For International Paper, provide consulting services on economic issues in several antitrust matters.

For Clearplay, Inc., retained by counsel with Dr. Alan Cox to analyze reasonable royalties in patent infringement case.

For JP Morgan Chase, provide consulting services in antitrust matter with respect to gold industry.

For Quantum Corporation, Fuji Photo Film U.S.A., and Maxell-Hitachi Corporation, support declaration of Dr. Richard Rapp in opposition to class certification in litigation involving intellectual property and vertical relationships in the data storage and recovery industry.

For Novus Corporation, provide economic analysis to joint defense group for mediation hearing in direct purchases suits related to *Re: Methionine Antitrust Litigation.*

For Smithfield Farms, assist counsel with economic arguments supporting successful motion for summary judgment in Packers and Stockyards Act class action complaint about purchasing practices with respect to live hogs.

For Smithfield Farms, assist counsel with analyzing the competitive impact of the acquisition of Farmland Industries hog production and processing assets.

For the National Association of Broadcasters, support expert witness testimony of Dr. Gregory Rosston in the Copyright Arbitration Royalty Panel hearing on allocation of distant signal royalties.

For American President Lines and Sealand, support expert witness testimony of Dr. Andrew Joskow before the Federal Maritime Commission in *Government of Guam vs. Sealand and American President Lines.*

For Sanofi, assist counsel in econometric analysis of market definition issues related to anticoagulants.

For Toyota, assist counsel in econometric analysis of automobile accessory pricing.

For Phillips Petroleum and Conoco Petroleum, assist counsel in analyzing the competitive impact of proposed merger on fractionation services and propane.

For Superior Essex, assist counsel in analyzing the competitive impact of Superior Essex's acquisition of Beleden's OSP copper wire and cable assets.

For Chisso, assist counsel in analyzing antitrust issues related to *Sorbates Antitrust Litigation.*

Publications

"Downstream Discovery in Antitrust Class Actions." (with Laila Haider and Ian Simmons). *The Antitrust Practitioner*. July 2006.

"Is the Tide Turning? Economic Analysis of Class Certification." (with Gregory Leonard). June 2006.

"Economic Evidence in Criminal Cartel Cases," *Antitrust Insights*, January/February 2006.

"The Economics of Patent Policy: A Review of Recent Empirical Studies" in *Economic Approaches to Intellectual Property Policy, Litigation, and Management*, ed. Gregory K. Leonard and Lauren J. Stiroh. (New York: National Economic Research Associates, 2005).

"The Use of Event Studies in Intellectual Property Litigation" (with Vinita Juneja) in *Economic Approaches to Intellectual Property Policy, Litigation, and Management*, ed. Gregory K. Leonard and Lauren J. Stiroh. (New York: National Economic Research Associates, 2005).

"Economic Approaches to Antitrust Damages Estimation," *NERA Economic Consulting Working Paper*, January 2005.

"Do Long Work Hours Contribute to Divorce?" *Topics in Economic Analysis & Policy*: Vol. 4: No. 1, Article 24, October 2004.

"The Impact of Federal Overtime Legislation on Public Sector Labor Markets." *Journal of Labor Economics*, January 2003.

"Death by Lethal Injunction: National Emergency Strikes Under the Taft-Hartley Act." (with Michael LeRoy), *Arizona Law Review*, Spring 2001.

"Effects of Work-Related Absences on Families: Evidence from the Gulf War." (with Joshua Angrist), *Industrial and Labor Relations Review*, October 2000.

Presentations

"Statistical Detection of Cheating: The Chicago Black Sox Scandal of 1919" as panelist on Frameworks for Effectively Presenting and Impeaching Cutting Edge Expert Testimony at the Edward Bennett Williams Inns of the Court, Washington, DC, October 19, 2006.

"Cutting Edge Econometrics in Antitrust Class Certification." NERA Antitrust and Trade Regulation Seminar, Santa Fe, NM, July 2006.

"Patent Trolls and Injunctive Relief." NERA Economic Consulting Intellectual Property Practice Presentation. Villard Mansion, New York City, June 2006.

"The Economics of Antitrust Class Certification. Presentation at Cadwalader, Wickersham & Taft, New York City, December 2005; Hogan & Hartson, Washington, DC, January 2006; O'Melveny & Myers, Washington, DC, February 2006.

"The Economics of Reasonable Royalties." Presentation at Hunton & Williams , Washington, DC, November 2005.

"The Role of Economists in Intellectual Property Litigation." Presentation at Hunton & Williams (with George Korenko), Washington, DC, November 2004.

Panelist, *Special Ethics Concerns in Class Actions*. Federal Trade Commission Conference on Protecting Consumer Interests in Class Actions, Washington, DC, September 2004.

"Class Certification: Theory and Practice." NERA Antitrust and Trade Regulation Seminar, Santa Fe, NM, July 2003.

"The Role of Economists in Litigation." CLE Course at Williams and Connolly (with James Jordan), Washington, DC, May 2003.

"The Economics of Antitrust Damage Estimation." Presentation at Wilmer, Cutler and Pickering, Washington, DC, January 2003.

10/19/06

Appendix C

Registry of Interpreters for the Deaf
Interpreter Training Programs

Type of Program (a)	School (b)	City (c)	State (d)
Certificate	American River College	Sacramento	CA
Certificate	American Sign Language & Interpreting School of Seattle (ASLIS)	Seattle	WA
Certificate	Austin Community College	Austin	TX
Certificate	Burlington County College	Pemberton	NJ
Certificate	CCBC Catonsville	Catonsville	MD
Certificate	Cincinnati State Technical and Community College	Cincinnati	OH
Certificate	Collin County Community College District	Plano	TX
Certificate	Community College of Allegheny County, North Campus	Pittsburgh	PA
Certificate	Cy-Fair College	Cypress	TX
Certificate	Del Mar College - Interpreter for the Deaf Program	Corpus Christi	TX
Certificate	El Paso Community College - Sign Language Interpreter Program	El Paso	TX
Certificate	Georgia Perimeter College	Clarkston	GA
Certificate	Golden West College	Huntington Beach	CA
Certificate	Grant McEwan College - Sign Language Studies Program	Edmonton	Alberta, Canada
Certificate	John A. Logan College	Carterville	IL
Certificate	Kapiolani Community College - ASL Interpreter Education Program	Honolulu	HI
Certificate	LaGuardia Community College via State University of New York	New York City/LIC	NY
Certificate	Lansing Community College	Lansing	MI
Certificate	McLennan Community College	Waco	TX
Certificate	Mount San Antonio College	Walnut	CA
Certificate	New River Community College	Dublin	VA
Certificate	North Harris College	Houston	TX
Certificate	Northcentral Technical College	Wausau	WI
Certificate	Northern Essex Community College	Haverhill	MA
Certificate	Oklahoma State University - OKC	Oklahoma City	OK
Certificate	Oxnard College	Oxnard	CA
Certificate	Palomar Community College	San Marcos	CA
Certificate	Phoenix College	Phoenix	AZ
Certificate	Project TIEM.Online Northeastern University	Boston	MA
Certificate	Riverside Community College	Riverside	CA
Certificate	Saint Paul College - A Community and Technical College	St Paul	MN
Certificate	San Antonio College	San Antonio	TX
Certificate	Seymour Joseph Institute of American Sign Language	Staten Island	NY
Certificate	Sinclair Community College	Dayton	OH
Certificate	St. Clair College (AEIP)	Windsor	ON
Certificate	St. Louis Community College at Florissant Valley	Ferguson	MO
Certificate	Tidewater Community College	Chesapeake	VA
Certificate	Tulsa Community College	Tulsa	OK
Certificate	University of Wisconsin - Milwaukee	Milwaukee	WI
Certificate	Washtenaw Community College	Ann Arbor	MI
Certificate	Waubonsee Community College	Sugar Grove	IL
Certificate	William Rainey Harper College	Palatine	IL
Associate	American River College	Sacramento	CA
Associate	Austin Community College	Austin	TX
Associate	Bethel College - Deaf Studies/Interpreter Training Program	Mishawaka	IN
Associate	Burlington County College	Pemberton	NJ
Associate	CCBC Catonsville	Catonsville	MD
Associate	Central Piedmont Community College	Charlotte	NC
Associate	Chattanooga State Technical Community College	Chattanooga	TN
Associate	Cincinnati State Technical and Community College	Cincinnati	OH
Associate	Collin County Community College District	Plano	TX
Associate	Columbus State Community College	Columbus	OH
Associate	Community College of Allegheny County, North Campus	Pittsburgh	PA
Associate	Community College of Southern Nevada	N Las Vegas	NV
Associate	Corning Community College	Corning	NY
Associate	Cuyahoga Community College, Western Campus	Parma	OH
Associate	Cy-Fair College	Cypress	TX
Associate	Daytona Beach Community College	Daytona Beach	FL
Associate	Del Mar College - Interpreter for the Deaf Program	Corpus Christi	TX

Registry of Interpreters for the Deaf
Interpreter Training Programs

Type of Program (a)	School (b)	City (c)	State (d)
Associate	Douglas College	New Westminister	BC
Associate	El Paso Community College - Sign Language Interpreter Program	El Paso	TX
Associate	Fairmont State Community and Technical College Interpreter Training Program	Fairmont	WV
Associate	Florida Community College at Jacksonville	Jacksonville	FL
Associate	Fox Valley Technical College	Appleton	WI
Associate	Front Range Community College	Westminster	CO
Associate	Georgia Perimeter College	Clarkston	GA
Associate	Golden West College	Huntington Beach	CA
Associate	Hillsborough Community College	Tampa	FL
Associate	Idaho State University	Pocatello	ID
Associate	Iowa Western Community College	Council Bluffs	IA
Associate	John A. Logan College	Carterville	IL
Associate	Johnson County Community College	Overland Park	KS
Associate	Kapiolani Community College - ASL Interpreter Education Program	Honolulu	HI
Associate	Kirkwood Community College	Cedar Rapids	IA
Associate	Lansing Community College	Lansing	MI
Associate	Maple Woods Community College	Kansas City	MO
Associate	McLennan Community College	Waco	TX
Associate	Miami - Dade Community College	Miami	FL
Associate	Milwaukee Area Technical College	Milwaukee	WI
Associate	Mott Community College	Flint	MI
Associate	Mount Aloysius College	Cresson	PA
Associate	Mount San Antonio College	Walnut	CA
Associate	Nashville State Technical Institute	Nashville	TN
Associate	National Technical Institute for the Deaf (NTID)	Rochester	NY
Associate	New River Community College	Dublin	VA
Associate	North Harris College	Houston	TX
Associate	Northcentral Technical College	Wausau	WI
Associate	Northern Essex Community College	Haverhill	MA
Associate	Northern Virginia Community College	Annandale	VA
Associate	Northwestern Connecticut Community College	Winsted	CT
Associate	Nova Scotia Community College	Halifax	NS
Associate	Oklahoma State University - OKC	Oklahoma City	OK
Associate	Oxnard College	Oxnard	CA
Associate	Palomar Community College	San Marcos	CA
Associate	Phoenix College	Phoenix	AZ
Associate	Pikes Peak Community College	Colorado Springs	CO
Associate	Pima Community College	Tucson	AZ
Associate	Riverside Community College	Riverside	CA
Associate	Saint Paul College - A Community and Technical College	St Paul	MN
Associate	Salt Lake Community College - Department of ASL/Interpreting	Salt Lake City	UT
Associate	San Antonio College	San Antonio	TX
Associate	Seattle Central Community College	Seattle	WA
Associate	Sinclair Community College	Dayton	OH
Associate	Southeast Technical Institute	Sioux Falls	SD
Associate	Southwest Collegiate Institute for the Deaf	Big Spring	TX
Associate	Spartanburg Technical College	Spartanburg	SC
Associate	St. Louis Community College at Florissant Valley	Ferguson	MO
Associate	St. Petersburg College	Clearwater	FL
Associate	Suffolk Community College	Selden	NY
Associate	Tennessee Temple University	Chattanooga	TN
Associate	Tidewater Community College	Chesapeake	VA
Associate	Tulsa Community College	Tulsa	OK
Associate	Union County College	Cranford	NJ
Associate	University of Arkansas at Little Rock	Little Rock	AR
Associate	Waubonsee Community College	Sugar Grove	IL
Associate	Wilson Technical Community College Interpreter Education Program	Wilson	NC
Bachelor	Augustana College	Sioux Falls	SD
Bachelor	Bethel College - Deaf Studies/Interpreter Training Program	Mishawaka	IN
Bachelor	Bloomsburg University	Bloomsburg	PA
Bachelor	California State University at Northridge	Northridge	CA
Bachelor	California State University Fresno	Fresno	CA

Registry of Interpreters for the Deaf
Interpreter Training Programs

Type of Program (a)	School (b)	City (c)	State (d)
Bachelor	College of St. Catherine	Minneapolis	MN
Bachelor	Columbia College Chicago	Chicago	IL
Bachelor	Eastern Kentucky University	Richmond	KY
Bachelor	Gardner Webb University	Boiling Springs	NC
Bachelor	Goshen College	Goshen	IN
Bachelor	Idaho State University	Pocatello	ID
Bachelor	Indiana University Purdue University Indianapolis (IUPUI)	Indianapolis	IN
Bachelor	Kent State University	Kent	OH
Bachelor	LaGuardia Community College via State University of New York	New York City/LIC	NY
Bachelor	Maryville College	Maryville	TN
Bachelor	Mount Aloysius College	Cresson	PA
Bachelor	National Technical Institute for the Deaf (NTID)	Rochester	NY
Bachelor	North Central University	Minneapolis	MN
Bachelor	Northeastern University	Boston	MA
Bachelor	Quincy University	Quincy	IL
Bachelor	Seymour Joseph Institute of American Sign Language	Staten Island	NY
Bachelor	Tennessee Temple University	Chattanooga	TN
Bachelor	University of Arizona - Interpreter Training Program	Tucson	AZ
Bachelor	University of Arkansas at Little Rock	Little Rock	AR
Bachelor	University of New Hampshire	Manchester	NH
Bachelor	University of New Mexico	Albuquerque	NM
Bachelor	University of North Carolina - Greensboro - Interpreter Training Program	Greensboro	NC
Bachelor	University of South Florida	Tampa	FL
Bachelor	University of Southern Maine	Portland	ME
Bachelor	University of Tennessee	Knoxville	TN
Bachelor	University of Wisconsin - Milwaukee	Milwaukee	WI
Bachelor	Western Regional Interpreter Education	Monmouth	OR
Bachelor	William Woods University	Fulton	MO
Graduate	Gallaudet University	Washington	DC
Graduate	Indiana University Purdue University Indianapolis (IUPUI)	Indianapolis	IN
Graduate	Kent State University	Kent	OH
Distance	John A. Logan College	Carterville	IL
Distance	Northcentral Technical College	Wausau	WI
Distance	Project TIEM.Online Northeastern University	Boston	MA
Distance	Spartanburg Technical College	Spartanburg	SC
Distance	University of Tennessee	Knoxville	TN
Distance	Waubonsee Community College	Sugar Grove	IL

Source: Registry of Interpreters for the Deaf Interpreter Training Programs Database, *http://filemaker.rid.org/FMPro?-db=Interpreter Training Program_agencies .fp3&-lay=web&-format=Interpreter Training Program_search.htm&-view.*