TELECOMMUNICATIONS RELAY SERVICE: AN INDUSTRY OVERVIEW INCLUDING IMPACTS AND IMPLICATIONS OF RECENT RULEMAKINGS FOR CONSUMERS, MANAGERS, AND POLICY MAKERS

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PROJECT

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TELECOMMUNICATIONS RELAY SERVICE: AN INDUSTRY OVERVIEW INCLUDING IMPACTS AND IMPLICATIONS OF RECENT RULEMAKINGS FOR CONSUMERS, MANAGERS, AND POLICY MAKERS

A Project

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Monica Lam, Ph.D.  
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The Telecommunications Relay Service (TRS) industry is a unique niche industry that facilitates telephone calls for primarily for deaf and hard of hearing individuals. Regulation plays a key role in this industry, and as such traditional market dynamics do not always apply. Governmental rulemakings have significant impacts on the way TRS companies create and execute strategy. This paper examines this unique industry, paying particular attention to the impacts of recent Federal Communications Commission (FCC) rulemakings. There are two specific questions addressed in this paper. First, how has the FCC’s 2006 ruling on the interoperability of TRS equipment impacted the industry? Second, what are the potential implications of the FCC’s 2008 TRS ten-digit numbering order? Overall this paper seeks to understand how these industry shocks impact consumers, regulators, and TRS providers.

Data for this paper comes from publicly available materials, including FCC filings, consumer advisories, and fact sheets. Significant data was also obtained from the National Exchange Carrier Association (NECA).

In conclusion this paper finds the need for additional education of TRS consumers, and calls on consumer groups and FCC regulators to help ensure that TRS consumers understand their rights and responsibilities. Furthermore, this paper suggests strategies for TRS companies to
peruse in response to the FCC’s recent TRS rulemakings. These strategies vary based on each company’s relative market share as well as the degree to which they specialize in providing TRS. Additional implications for regulators are also discussed.

______________________
Jai Joon Lee, Ph.D.

______________________
Date
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>vii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>viii</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2. TRS INDUSTRY OVERVIEW</td>
<td>4</td>
</tr>
<tr>
<td>TRS Industry Competition</td>
<td>13</td>
</tr>
<tr>
<td>TRS Suppliers</td>
<td>21</td>
</tr>
<tr>
<td>TRS Consumers</td>
<td>22</td>
</tr>
<tr>
<td>3. INTEROPERABILITY RULING</td>
<td>24</td>
</tr>
<tr>
<td>Background and Rationale</td>
<td>24</td>
</tr>
<tr>
<td>Process and Details</td>
<td>25</td>
</tr>
<tr>
<td>Results and Implementation</td>
<td>27</td>
</tr>
<tr>
<td>4. NUMBERING ORDER</td>
<td>30</td>
</tr>
<tr>
<td>Background and Rationale</td>
<td>30</td>
</tr>
<tr>
<td>Process and Details</td>
<td>31</td>
</tr>
<tr>
<td>Results and Implementation</td>
<td>32</td>
</tr>
<tr>
<td>5. IMPLICATIONS AND CONCLUSION</td>
<td>35</td>
</tr>
<tr>
<td>Consumer Implications</td>
<td>35</td>
</tr>
<tr>
<td>Managerial Implications</td>
<td>36</td>
</tr>
<tr>
<td>Regulatory Implications</td>
<td>39</td>
</tr>
<tr>
<td>Concluding Remarks</td>
<td>40</td>
</tr>
<tr>
<td>References</td>
<td>41</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Table 1 TRS Fund Performance, 2002 – 2008</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Table 2 Monthly TRS Minutes by Type</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>Table 3 Text Relay and STS Per-Minute Rates Paid to Providers</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>Table 4 Tiered VRS Per-Minute Rates Paid to Providers</td>
<td>11</td>
</tr>
<tr>
<td>5.</td>
<td>Table 5 Which TRS Companies Provide IP Relay and VRS</td>
<td>14</td>
</tr>
<tr>
<td>6.</td>
<td>Table 6 TRS Company Strategic Groups</td>
<td>17</td>
</tr>
<tr>
<td>7.</td>
<td>Table 7 TRS Company Paths to Market Leadership</td>
<td>20</td>
</tr>
<tr>
<td>8.</td>
<td>Table 8 Recommended Strategies by TRS Company Quadrant</td>
<td>38</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Page

1. Figure 1 Facilitation of a Text Relay Call................................................................. 8
2. Figure 2 Facilitation of a VRS Call........................................................................ 9
Chapter 1
INTRODUCTION

Telephone use has become nearly ubiquitous in the United States, with over 97% of households having a telephone in the year 2000 (Federal Communications Commission, 2008). Even in areas where telecommunications service is available, one group of Americans has historically been unable to take advantage of this widely available mode of communication. This group includes the deaf and hard of hearing as well as those with speech disabilities. Recent estimates indicate that in the United States there are close to one million functionally deaf individuals, and nearly ten million individuals who are hard of hearing (Mitchell, 2006). For much of the twentieth century deaf and hard of hearing individuals were unable to directly access the nation’s telecommunications network (Bahr, 1992). Instead, they had to rely on hearing friends or family members to make or receive calls on their behalf. This has impacted both deaf and hard of hearing Americans, as well as millions of their friends, family members, colleagues, and associates. In recent decades, advances in technology and governmental regulation have begun to drastically improve communication for Americans with hearing and speech disabilities. The companies which provide telecommunications access for the individuals are known as Telecommunications Relay Service (TRS) providers. These TRS providers play a critical role in equalizing communication for deaf and hard of hearing individuals, by enabling them to make and receive calls using the nation’s telecommunications network.

Companies operating in the TRS industry face a number of challenges, some of which are unique and some of which parallel those found in other areas of telecommunications and technology. Like other telecommunications companies, TRS providers operate within an evolving framework of complex regulations. For example, the FCC’s regulations for the provision of TRS include differing speed of answer requirements for the various forms of TRS.
Providers are required to answer 85% of traditional TRS calls within 10 seconds, and 80% of Video Relay Service (VRS) calls within 120 seconds (FCC, 2008). The next chapter of this paper gives further details on each of the six forms of TRS currently available. In addition to working within regulatory guidelines, TRS companies must also anticipate and drive technological advances to help deliver products and services which users value. One example of TRS innovation is the video-based messaging systems that providers have developed for VRS users. Another example is new TRS applications that run on popular hardware products such as Apple’s iPhone.

Unlike traditional telecommunications companies, TRS providers do not charge users for the service that they provide, but rather rely on funding administered by the National Exchange Carrier Association (NECA), under the jurisdiction of the Federal Communications Commission (FCC). Although TRS users can select one company as their “default provider”, the FCC mandates that users must be able to easily “dial around” to other providers any time they choose (FCC, 2006). The result is an industry that in many ways is similar to the Internet search engine industry, in which consumers can easily change providers, and companies offer a service at no charge. Search engine companies offer their services to the public at no cost, because when they attract a large volume of users they are able to obtain more revenue from advertisers. Similarly, TRS providers offer their services at no cost to the users and rely on NECA to provide revenue. In both cases firms are relying on a third party to provide revenue, advertisers in the case of the search engine industry, and NECA in the case of TRS. The mechanics of funding TRS providers is discussed in more detail in the next chapter.

TRS is a niche telecommunications industry, within which traditional market dynamics do not always apply. In the TRS industry government regulation is a powerful force, and FCC rulemakings have significant impacts on the way TRS companies create and execute strategies.
This paper examines this unique industry, paying particular attention to the impacts of recent FCC rulemakings. There are two specific questions addressed in this paper. First, how has the FCC’s 2006 ruling on the interoperability of TRS equipment impacted the industry? Second, what are the potential implications of the FCC’s 2008 TRS ten-digit numbering order? Overall this paper seeks an understanding of how these industry shocks impact the TRS industry in the US.

This paper begins with an overview of the TRS industry including a brief history and a look at competitive differentiation of TRS providers. Next, the paper provides a detailed look at the two key rulemakings mentioned above, including implications for the industry as a whole as well as specific recommendations for TRS consumers, companies, and regulators.
Chapter 2

TRS INDUSTRY OVERVIEW

The TRS industry gives deaf and hard of hearing individuals access to the nation’s telecommunications network through the use of individuals known as communications assistants (CAs). These CAs are a special kind of operator, trained to serve as an intermediary between TRS users and other individuals.

TRS began in the late 1960s with text-based relay calls typically being facilitated by volunteer CAs (Bahr, 1992). By the 1980s many states began providing more formalized intrastate text relay TRS, and in 1988 the FCC began seeking proposals for interstate text relay TRS systems (Bahr, 1992). While the FCC was developing regulations for interstate text relay TRS, the Congress passed the Americans with Disabilities Act of 1990 (ADA). Title IV of the ADA gave the FCC jurisdiction over all forms of intrastate and interstate TRS, and it required telecommunications companies to provide relay services to deaf and hard of hearing customers (Jaeger, 2006). The ADA added section 225 to the Communications Act of 1934, and mandated that relay users have a telecommunications experience that is “functionally equivalent” with that of voice users (FCC, 2006). In addition, the ADA stated that TRS users would not be required to pay for TRS (FCC, 2006).

The FCC’s jurisdiction over TRS includes intrastate, interstate, as well as some international calls. Specifically:

- Intrastate TRS – Calls which originate and terminate within a single state. These are traditional text-based relay calls made using special text telephone known as a TTY.
- Interstate TRS – Calls which cross state lines, including newer forms of TRS that are facilitated through the Internet.
- International TRS – International calling is permitted for VRS calls, so long as the TRS user is located in the United States.

As a result of the ADA, the TRS industry is funded by mandatory contributions from all companies that provide interstate telecommunications services, including wireline and wireless carriers. The amount of each company’s contribution is based on the amount of end-user revenue that it generates. For the 2009-2010 fund year the FCC approved a contribution factor of 0.01137, in order to satisfy NECA’s funding requirement of $891.2 million (FCC, 2009). As a result, interstate telecommunications providers were required to pay $0.01137 into the TRS Fund for each dollar of their end-user revenues generated. Table 1 shows the size of TRS Fund disbursements from for calendar years 2002 through 2008.

Table 1

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>TRS Fund Disbursements</th>
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<tbody>
<tr>
<td>2002</td>
<td>$61,007,585</td>
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<tr>
<td>2003</td>
<td>$116,620,837</td>
</tr>
<tr>
<td>2004</td>
<td>$211,001,162</td>
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<tr>
<td>2005</td>
<td>$328,667,536</td>
</tr>
<tr>
<td>2006</td>
<td>$418,957,624</td>
</tr>
<tr>
<td>2007</td>
<td>$547,939,901</td>
</tr>
<tr>
<td>2008</td>
<td>$667,074,727</td>
</tr>
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</table>


When the ADA was passed in 1990 the majority of TRS calls were text-based relay calls in which the TRS user relied on a TTY connected to the Public Switched Telephone Network (PSTN) (FCC, 2006). In 2002 TRS expanded to the Internet, with a new form of text relay calls known as Internet Protocol (IP) Relay. IP Relay calls function much like traditional TTY-based calls, however they utilize the Internet instead of the PSTN to connect TRS users with CAs.
Rather than using a TTY, today most text relay calls are IP Relay calls routed through the Internet by a user with a personal computer or wireless phone device (FCC, 2008). Table 2 shows the number of TRS minutes for which NECA paid providers each month from January 2008 through August 2009. The minutes are broken down into six types of relay: Interstate TRS, Interstate CTS VCO, IP Relay, Interstate STS, IP CTS, and VRS. Note that as of August 2009 IP Relay accounts for over eight times as many minutes as traditional Interstate TRS.

Table 2

<table>
<thead>
<tr>
<th>Month</th>
<th>Interstate TRS</th>
<th>Interstate CTS VCO</th>
<th>IP Relay</th>
<th>Interstate STS</th>
<th>IP CTS</th>
<th>VRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-08</td>
<td>1,009,681</td>
<td>547,603</td>
<td>6,704,482</td>
<td>14,705</td>
<td>0</td>
<td>7,005,984</td>
</tr>
<tr>
<td>Feb-08</td>
<td>883,164</td>
<td>524,775</td>
<td>5,859,948</td>
<td>13,393</td>
<td>0</td>
<td>6,548,706</td>
</tr>
<tr>
<td>Mar-08</td>
<td>868,482</td>
<td>561,405</td>
<td>5,390,302</td>
<td>13,649</td>
<td>31,307</td>
<td>6,853,465</td>
</tr>
<tr>
<td>Apr-08</td>
<td>824,272</td>
<td>529,098</td>
<td>5,333,213</td>
<td>14,921</td>
<td>41,482</td>
<td>6,853,948</td>
</tr>
<tr>
<td>May-08</td>
<td>819,868</td>
<td>558,112</td>
<td>5,579,159</td>
<td>15,045</td>
<td>53,191</td>
<td>7,010,569</td>
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<tr>
<td>Jun-08</td>
<td>803,689</td>
<td>535,268</td>
<td>5,547,088</td>
<td>12,212</td>
<td>57,810</td>
<td>7,129,678</td>
</tr>
<tr>
<td>Jul-08</td>
<td>830,230</td>
<td>547,475</td>
<td>5,932,638</td>
<td>13,059</td>
<td>67,474</td>
<td>7,580,792</td>
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<tr>
<td>Aug-08</td>
<td>787,511</td>
<td>551,769</td>
<td>5,703,307</td>
<td>13,118</td>
<td>70,553</td>
<td>7,577,678</td>
</tr>
<tr>
<td>Sep-08</td>
<td>777,909</td>
<td>549,394</td>
<td>5,475,810</td>
<td>10,987</td>
<td>80,969</td>
<td>7,903,179</td>
</tr>
<tr>
<td>Oct-08</td>
<td>776,303</td>
<td>572,114</td>
<td>5,631,953</td>
<td>10,805</td>
<td>87,677</td>
<td>8,242,652</td>
</tr>
<tr>
<td>Nov-08</td>
<td>718,452</td>
<td>599,079</td>
<td>5,000,077</td>
<td>9,246</td>
<td>89,784</td>
<td>7,270,422</td>
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<tr>
<td>Dec-08</td>
<td>784,479</td>
<td>656,293</td>
<td>5,400,543</td>
<td>11,210</td>
<td>97,411</td>
<td>8,087,897</td>
</tr>
<tr>
<td>Jan-09</td>
<td>767,454</td>
<td>646,352</td>
<td>5,573,797</td>
<td>11,953</td>
<td>99,005</td>
<td>8,766,660</td>
</tr>
<tr>
<td>Feb-09</td>
<td>656,434</td>
<td>587,427</td>
<td>5,303,967</td>
<td>9,777</td>
<td>98,035</td>
<td>8,204,242</td>
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<tr>
<td>Mar-09</td>
<td>679,407</td>
<td>675,579</td>
<td>5,701,554</td>
<td>11,039</td>
<td>153,566</td>
<td>8,930,681</td>
</tr>
<tr>
<td>Apr-09</td>
<td>651,965</td>
<td>649,444</td>
<td>5,440,542</td>
<td>8,021</td>
<td>141,049</td>
<td>8,647,791</td>
</tr>
<tr>
<td>May-09</td>
<td>648,360</td>
<td>687,882</td>
<td>4,914,734</td>
<td>14,086</td>
<td>147,394</td>
<td>8,625,203</td>
</tr>
<tr>
<td>Jun-09</td>
<td>657,521</td>
<td>690,894</td>
<td>5,267,472</td>
<td>11,486</td>
<td>165,363</td>
<td>8,174,094</td>
</tr>
<tr>
<td>Jul-09</td>
<td>673,587</td>
<td>697,612</td>
<td>5,989,368</td>
<td>12,900</td>
<td>174,788</td>
<td>7,831,512</td>
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<tr>
<td>Aug-09</td>
<td>664,477</td>
<td>726,824</td>
<td>5,589,176</td>
<td>10,589</td>
<td>187,839</td>
<td>7,744,160</td>
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</table>

*Note.* Shows monthly TRS minutes for which providers were reimbursed. From data in “TRS Fund Performance Status Reports”. National Exchange Carrier Association, 2009.
As shown in Table 2, there are several forms of TRS available today. Most TRS calls fall into one of two categories:

- **Text relay** – Calls in which the TRS user communicates with the CA using typewritten text. This includes Interstate TRS, Interstate CTS VCO, IP Relay, and IP CTS.
- **Video relay** – Calls in which the TRS user uses a video connection and American Sign Language (ASL) to communicate with the CA. These are VRS calls.

Text relay calls can be initiated by a deaf or hard of hearing individual or by a hearing person. When a TRS user wishes to make a text relay call they first connect to a CA, as shown on the left side of Figure 1. The TRS user provides the CA with the phone number of the hearing person they wish to call. Next, as shown in the middle of Figure 1, the CA places a voice call to the hearing person, as depicted on the right side of Figure 1. From that point on the CA facilitates the call by voicing whatever the deaf or hard of hearing person types and by typing whatever the hearing person says. Similarly, when a hearing individual wishes to call a TRS user through text relay, the hearing person will make a voice call to a CA, and the CA will then establish a text relay connection with the TRS user. Note that Figure 1 shows an internet connection being used as the link between the TRS user and the CA. A traditional TTY-based text relay call functions in the same way, however the connection between the TRS user and the CA is established over the PSTN. Traditionally text relay using the PSTN is available in the US by dialing 711, however internet-based forms of TRS are accessed via applications on personal computers or wireless devices (FCC, 2008).
Figure 1. Facilitation of a Text Relay Call. This figure illustrates how a text relay call is facilitated through IP Relay.


As high speed internet access began to proliferate in the late 1990s and early 2000s, some TRS users started to call for video based TRS which would enable users to communicate with a CA using ASL instead of typewritten text. This led to the establishment of video relay calling. VRS was first recognized by the FCC as a form of TRS in 2002 (FCC, 2006). In a VRS call the deaf or hard of hearing user establishes a video connection with the CA, and communicates using ASL. The connection between a VRS user and CA is shown on the left side of Figure 2. Similar to a text relay call the CA will voice whatever the deaf or hard of hearing individual signs in ASL, and the CA will sign whatever the hearing individual says. Note that the hearing user as shown on the right side of Figure 2 does not need any special equipment to participate in a VRS call. For VRS users and CAs however, VRS requires more sophisticated equipment, and also greater bandwidth than text relay calling. For ASL users and hearing individuals a VRS call is generally a more fluid conversation, and the use of VRS has grown rapidly since its inception. In January 2002 providers received payment for approximately 7,200 VRS minutes, and just two
years later in January 2004 the providers received payment for nearly 500,000 VRS minutes (FCC, 2006).

Figure 2. Facilitation of a VRS Call. This figure illustrates how a VRS call is handled.


In addition to TTY-based text relay, IP Relay, and VRS, there are three other forms of TRS which NECA recognizes and funds:

- Captioned Telephone Service Voice Carry Over (CTS VCO)
- IP Captioned Telephone Service (IP CTS)
- Speech-to-Speech (STS)

In a Captioned Telephone Service (CTS) call the TRS user will read typed communication from the CA, but will use their own voice instead of typing. This form of relay is particularly useful for senior citizens or others with some residual hearing because they can use their own voice to speak directly with a hearing individual, while benefiting from the CA typing or “captioning” whatever the hearing individual is saying (FCC, 2008). IP CTS is the newest form of TRS as it utilizes the internet instead of the PSTN to link TRS users with CAs. Although
there is a large potential market for CTS, these forms of TRS currently represent less than 3% of monthly TRS fund payments (National Exchange Carrier Association, 2009).

Speech-to-Speech (STS) calling is intended for individuals with speech disabilities, and no special equipment is required. In an STS call the TRS user will make a voice connection with a CA who is trained in understanding speech from individuals with speech disorders. The CA will then repeat whatever the TRS user says so that the other party can understand what has been said (FCC, 2008). Although STS has been available since 2001 it accounts for less than 1% of monthly TRS fund payments (NECA, 2009).

Companies that perform any type of TRS are required to provide NECA with call detail records each month showing the number of Relay minutes they have provided (FCC, 2006). NECA then pays providers out of the TRS Fund for each minute of service using a rate structure approved by the FCC. Table 3 shows the current per-minute payment rates for the various forms of text relay and STS.

Table 3

<table>
<thead>
<tr>
<th>Text Relay and STS Per-Minute Rates Paid to Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate TRS</td>
</tr>
<tr>
<td>$ 1.5938</td>
</tr>
</tbody>
</table>

*Note.* Shows the rates at which providers are compensated for providing various forms of TRS. From data in “TRS Fund Performance Status Reports”. National Exchange Carrier Association, 2009.

Payments for VRS minutes are calculated on a tiered basis, as shown in Table 4. The first 50,000 VRS minutes that a provider handles each month are funded at a rate of $6.70 per minute. When providers handle additional minutes the funding rate goes down to account for economies of scale. Providers are paid $6.44 for each VRS minute handled between 50,001 and
500,000, and providers are paid $6.24 for each VRS minute handled in excess of 500,000 minutes in any one month. Note that even at the lowest reimbursement level providers receive nearly $375 per hour of VRS performed.

Table 4

<table>
<thead>
<tr>
<th>Tiered VRS Per-Minute Rates Paid to Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of VRS Minutes Handled by Provider in a Single Month</td>
</tr>
<tr>
<td>Up to 50,000 minutes</td>
</tr>
<tr>
<td>Minutes between 50,001 and 500,000</td>
</tr>
<tr>
<td>Minutes above 500,000</td>
</tr>
</tbody>
</table>

Note. Shows the rates at which providers are compensated for providing VRS. From data in “TRS Fund Performance Status Reports”. National Exchange Carrier Association, 2009.

For both text-based relay calls and VRS calls, the primary purpose of TRS equipment is for facilitating relay calls. However, it should be noted that in many cases TRS equipment can also be used for communication between two TRS users. This could be a text-to-text call similar to instant messaging, or a point-to-point video call using VRS equipment. Calls from one TRS user to another do not require the use of a CA, and therefore providers do not receive any payment from the TRS fund when users make these types of calls. Although providers do not receive revenue for calls between TRS users, many providers have developed functionality to easily facilitate these calls as TRS users appreciate being able to make calls to one another. Providers are willing to incur some costs by facilitating calls between TRS users, because doing so provides consumers with a service they value and promotes user loyalty.

In order to provide TRS services and receive payments from the TRS fund, companies must undergo a certification process administered by the FCC. New entrants in the TRS industry must either complete this certification process, or act as a contractor for an existing certified provider who will then submit funding requests to NECA. In order to become certified, the
FCC’s TRS rules require that any provider wishing to engage in TRS must provide the FCC with the following documentation:

- A description of the forms of TRS to be provided (i.e., VRS and/or IP Relay);
- A description of how the provider will meet all non-waived mandatory minimum standards applicable to each form of TRS offered;
- A description of the provider's procedures for ensuring compliance with all applicable TRS rules;
- A description of the provider's complaint procedures;
- A narrative describing any areas in which the provider's service will differ from the applicable mandatory minimum standards;
- A narrative establishing that services that differ from the mandatory minimum standards do not violate applicable mandatory minimum standards;
- Demonstration of status as a common carrier; and
- A statement that the provider will file annual compliance reports demonstrating continued compliance with these rules.

Entering the TRS industry requires capital investment. TRS providers must set up complex systems and networks in order to handle relay calls – in many cases this requires the development of proprietary technology. Providers are also faced with competition for qualified CAs, particularly for VRS which requires highly skilled sign language interpreters. The demand for VRS outweighs number of skilled interpreters available, and many companies pay interpreters as much as $56 per hour (Barundia, 2005).

As of November 2009 NECA’s website lists 14 companies certified to receive payments from the TRS fund. The following is a list of the 14 TRS companies along with a brief description of which types of TRS they provide.
- American Network, Inc. – Provides IP CTS only.
- Ameritech – Listed on the NECA website as a certified provider, but not included on any 2009 NECA Fund Status Performance Reports as receiving reimbursement for providing TRS.
- AT&T – Provides Interstate TRS, IP Relay, and VRS.
- Communication Access Center for the Deaf and Hard of Hearing – Provides VRS only.
- CSDVRS – Provides VRS only.
- Purple Communications (formerly GoAmerica Inc.) – Provides Interstate TRS, IP Relay, Interstate STS, and VRS.
- Hamilton Telecommunications – Provides all types of TRS except VRS.
- Hands On VRS Service (Subsidiary of Purple Communications) – Provides VRS only.
- Healinc Telecom LLC – Provides VRS only.
- Kansas Relay Service, Inc. – Provides Interstate TRS, Interstate CTS VCO, and Interstate STS.
- Nordia – Provides Interstate TRS and Interstate STS.
- Sorenson Communications – Provides IP Relay and VRS.
- Snap!VRS – Provides VRS.
- Sprint – Provides all forms of TRS.

Note that this list includes a variety of companies, ranging from large multi-national telecommunications companies AT&T and Sprint, to smaller niche providers such as Purple Communications and CSDVRS. The next section of this paper provides more details on each provider and examines competition amongst them.

TRS Industry Competition
The two sectors of the TRS industry which consistently account for over 90 percent of TRS fund payments are IP Relay and VRS, and as such competition is most pronounced in these areas. The competitive landscape of the IP Relay sector differs from the VRS sector as not all companies provide both services. Table 5 shows which firms currently receive compensation for providing IP Relay and VRS. Data for table 5 is based on NECA’s 2009 TRS Fund Performance Status reports.

Table 5

<table>
<thead>
<tr>
<th>TRS Company</th>
<th>IP Relay</th>
<th>VRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Network, Inc.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Ameritech</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Communication Access Center</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>for the Deaf and Hard of Hearing (CAC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSDVRS</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Hamilton Telecommunications</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hands On VRS Service (Purple</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Communications)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healinc Telecom LLC</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Kansas Relay Service, Inc.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Nordia</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Purple Communications</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SNAP!VRS</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sorenson Communications</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Sprint</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>


As shown in Table 5, four firms do not compete in the IP Relay and VRS sectors:

American Network Inc., Ameritech, Kansas Relay Service, Inc., and Nordia. American Network provides IP CTS only. They are a new entrant in the TRS market having been granted permission
to provide CTS in January 2009. Ameritech is listed on the NECA website as a certified provider, but not included on any 2009 NECA Fund Status Performance Reports as receiving payments for providing TRS. Ameritech was one of the seven Regional Bell Operating Companies, and is now a subsidiary of AT&T. Kansas Relay Service is a not-for profit corporation that provides Interstate TRS, Interstate CTS VCO, and Interstate STS. Nordia is based in Quebec Canada and operates numerous call centers internationally, providing Interstate TRS and Interstate STS as well as other types of call center outsourcing services. These four companies are limited to smaller sectors of the TRS market, and do not play a significant role in competition within the industry.

Nine firms offer either IP Relay, VRS, or both. Of these, two are smaller firms that have very little presence in the TRS industry. These firms, Communication Access Center for the Deaf and Hard of Hearing (CAC) and Healinc Telecom LLC, are service providers only and they do not distribute equipment for TRS use. CAC provides VRS only and is based in Flint, Michigan. Healinc is based in New York City and is a subsidiary of Language Access Network, a company that specializes in Video Remote Interpretation (VRI).

This leaves seven firms that have a more noteworthy presence in either the IP Relay sector, VRS sector, or both. As mentioned earlier, two of these are large multi-national telecommunications companies, AT&T and Sprint. AT&T was one of the first firms to offer TRS and now provides Interstate TRS, IP Relay, and VRS. Despite being an early provider of TRS, AT&T has dramatically reduced its efforts to market TRS. Sprint provides all forms of TRS, and actively promotes text-based forms of TRS that can operate on wireless phones using Sprint’s wireless service to access the company’s TRS.

Unlike AT&T and Sprint, the other firms offering IP Relay or VRS are specifically focused on the TRS market. CSDVRS, Snap!VRS, and Purple’s Hands On brand each
concentrate on providing VRS only. CSD began as a not-for-profit interpreting agency in the
1970’s. The company spun off a separate for-profit entity in 2006 to focus on VRS, and has
brought a series of new videophone products to market within the past two years. Snap!VRS
markets a the “Ojo” videophone manufactured by Motorola for use with the company’s VRS.
Hands On VRS has also marketed a unique videophone known as the MVP. According to the
Purple Communications website, the Hands On VRS brand is the nation’s second largest VRS

In addition to providing VRS through the Hands On brand, Purple Communications is the
largest IP Relay provider, handling more IP Relay minutes than any other provider. Purple does
business in the text relay sector under two brand names, “i711” and “IP-Relay”. The i711 brand
was created by Purple, whereas the IP-Relay brand was created by MCI/Verizon, and was sold to
Purple in early 2008. The IP-Relay brand is unique in that it shares its name with that of the
entire sector, and term IP Relay can therefore refer to the brand or the sector. This is somewhat
similar to the way that the brand Kleenex is often used interchangeably for any brand of facial
tissue.

Hamilton Telecommunications is the only company providing IP Relay that does not also
provide VRS. In late 2008 Hamilton chose to exit the VRS market when it ended its contract
with Birnbaum Interpreting Service (BIS). BIS is a third party contractor that had been providing
CAs for Hamilton’s VRS business, and that now provides CAs for CSDVRS (Bosson, 2008).

Sorenson Communications provides both IP Relay and VRS. In the VRS sector,
Sorenson Communications “is the dominant provider as both a videophone manufacturer and a
provider of sign interpreters at video-relay call centers” (Fernandez, 2009). Sorenson handles
more VRS minutes than any other provider, and states that it is the largest VRS provider in the
country on its corporate website. Of the approximately 150 VRS call centers in the US, 90 are
operated by Sorenson (Fernandez, 2009). There is no public reporting of precisely how many VRS minutes Sorenson or any other provider handles each month, but in Purple’s most recent 10-K filing with the Securities and Exchange Commission, Purple estimated that Sorenson has a 75% share of the VRS market.

To better understand the current positioning of TRS companies there are many dimensions which can be considered. These factors include: how long the company has been in business, how long the company has provided TRS, the types of TRS provided by the company, the degree to which the company provides services besides TRS, and the company’s relative market share in the TRS industry. Two of the most salient factors in the TRS industry are each company’s estimated market share and the degree to which they specialize in TRS. Table 6 plots the top IP Relay and VRS providers on a grid based on these two factors. Though neither the FCC or NECA publish how many TRS minutes specific providers are compensated for each month, Table 6 shows estimated market share based on claims made by providers in their marketing materials as well as data from Fernandez (2009). In looking at the impacts of recent FCC rulemakings this paper will specifically consider implications for providers based on their current operating quadrant as shown in Table 6.

Table 6

<table>
<thead>
<tr>
<th>Scope of Services</th>
<th>Small</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primarily TRS</td>
<td>Quadrant 1: CSDVRS, Hamilton, Hands On VRS (Purple), Snap!VRS</td>
<td>Quadrant 2: i711 &amp; IP-Relay (Purple), Sorenson</td>
</tr>
<tr>
<td>Primarily Other</td>
<td>Quadrant 3: AT&amp;T, Sprint</td>
<td>Quadrant 4:</td>
</tr>
</tbody>
</table>

*Note.* Groups TRS providers based on estimated market share and overall scope of services offered by the company.
Companies in Quadrant 1 have a smaller market share in the TRS industry, however they are focused on TRS. These companies do not rely on income from other types of operations as do AT&T and Sprint. Instead, these companies are relying on their intimate knowledge of the TRS market to help them deliver a quality service through attractive equipment, and all four Quadrant 1 companies have made efforts to move into Quadrant 2. CSDVRS, Hands On VRS from Purple, and Snap!VRS have introduced unique videophone models in an effort to grow their market share. Hamilton has exited the VRS sector and retrenched its efforts to develop TRS service that is accessible through applications such as AOL Instant Messenger and Google Talk.

In Quadrant 2 the companies with a larger TRS market share work to maintain their place in the industry. Sorenson and Purple continue to advertise and promote their services through targeted media outlets and events. Both firms also have the resources and interest necessary to maintain relationships with organizations that influence the TRS community, such as Gallaudet University and the National Association of the Deaf (NAD).

As mentioned earlier, AT&T and Sprint are well known companies in voice telecommunications, however neither is a market leader in TRS. As such, both of these firms are in Quadrant 3. While Sprint promotes its TRS offerings through many of the same targeted media outlets and events as Quadrant 2 companies, AT&T has spent less energy in growing its business in the TRS industry. Despite Sprint’s efforts to market TRS, the specialized companies in Quadrants 1 and 2 continue have as much or more name recognition among TRS users.

At this time none of the firms competing in the TRS industry qualify to be in Quadrant 4. As large telecommunications providers AT&T and Sprint could move into Quadrant 4 by expanding their reach in the TRS industry. The other firms in the TRS industry which are focused on TRS could potentially move into Quadrant 4 if they were to significantly expand their scope of services.
Unlike other industries, price is not a key factor in TRS competition. FCC rules stipulate that TRS users may not be charged rates higher than what is paid for functionally equivalent voice communication services. However, today all TRS providers offer their services at no charge to end users. Since all TRS providers offer service at no cost there are no price differences between providers, and therefore no monetary costs to users that wish to change providers. Porter (1998), suggests that there are two basic types of strategies that firms can choose from: being a differentiated value provider or a cost leader. In effect, all TRS providers compete on the basis of differentiated value as a result of FCC rules.

Instead of using Porter’s two basic strategy choices to classify firms, this paper evaluates TRS providers using a framework of three paths to market leadership proposed by Treacy and Wiersema (1993): operational excellence, customer intimacy, and product leadership. Operational excellence is an orientation in which a firm differentiates itself based primarily on having efficient operations which translate into lower prices or greater convenience for customers. Firms that focus on customer intimacy go out of their way to learn about their customers, and to ensure that they provide each customer with a positive experience. Product leadership is a strategy that firms can pursue by regularly introducing products that are on the leading edge of technological advancements. Based on each company’s product offerings and marketing messages, Table 7 evaluates the top TRS providers based on the emphasis which they appear to place on these three attributes. Note that Purple is listed twice because they provide text relay and VRS under separate brand names, whereas other providers use a consistent brand name for all of their TRS services.
Table 7

**TRS Company Paths to Market Leadership**

<table>
<thead>
<tr>
<th>TRS Company</th>
<th>Emphasis on Operational Excellence</th>
<th>Emphasis on Customer Intimacy</th>
<th>Emphasis on Product Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT&amp;T</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>CSDVRS</td>
<td>Med</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Hamilton Telecommunications</td>
<td>Med</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Hands On VRS (Purple Communications)</td>
<td>Med</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>i711 &amp; IP-Relay (Purple Communications)</td>
<td>High</td>
<td>Med</td>
<td>High</td>
</tr>
<tr>
<td>Snap!VRS</td>
<td>Med</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Sorenson Communications</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Sprint</td>
<td>Med</td>
<td>Med</td>
<td>Low</td>
</tr>
</tbody>
</table>

*Note.* Shows which areas firm appear to emphasize in their overall strategy.

In the TRS industry, operational excellence is not about offering lower prices, but rather is an orientation toward customer convenience. This results from a combination of network reliability and an adequate supply of CAs to facilitate calls. Because there is a lack of highly skilled CAs—particularly for VRS—companies in this industry often face a trade-off in excelling at operational excellence or delivering a quality experience and customer intimacy. Companies that hire only the best CAs risk having longer wait-times as people queue for the higher quality service, whereas companies willing to hire less qualified CAs can typically offer faster call response times. The market leader in VRS is Sorenson Communications, and the company appears to place its emphasis on both operational excellence and product leadership. Similarly, the market leader in text relay is Purple Communications and its i711 and IP-Relay brands, which also appear to focus on operational excellence and product leadership. Note that in Table 6 both of these firms are grouped in Quadrant 2.

Firms focusing on customer intimacy are those with a combination of smaller market share and a specific focus on TRS. In Table 6 these firms are shown in Quadrant 1. In addition
to technological advances discussed earlier, CSTVRS, Snap!VRS, and Purple’s Hands On VRS brand all appear to place an emphasis on customer intimacy. This is manifested in each firm’s web presence. On their websites and in social media these firms appear to be keenly interested in both providing information as well as establishing a dialogue with users.

Product leadership has been an important way for TRS companies to differentiate themselves since accessing TRS requires that users have special equipment, such as a TTY, videophone, or IP Relay software program. Prior to 2006 some TRS providers distributed equipment that blocked users from using other providers. A 2006 rulemaking ended this practice, and mandated that all equipment provided for TRS use be able to access any certified provider, making it easy for users to change providers (FCC, 2006). This rulemaking is discussed in detail in chapter 3 of this paper. Sorenson Communications became the VRS market leader through widespread distribution of the VP-100 and VP-200 videophones which it developed. Although other firms have begun to introduce competing videophones, Sorenson’s products continue to dominate the market. Sorenson has made a significant investment in the development of these videophones, and has distributed nearly 100,000 at no charge to TRS consumers (Fernandez, 2009).

TRS Suppliers

As stated earlier, TRS companies rely on highly skilled sign language interpreters for VRS. IP Relay and other forms of text relay require less skilled CAs. Sign language interpreters tend to have a great deal of bargaining power given that they possess a sought-after skill which takes years to master. Many sign language interpreters train for over eight years before being qualified to work for in VRS. The extensive training needed to become an interpreter results in high salaries paid by TRS companies.
Another key factor in looking at interpreters as suppliers in the TRS industry is that they are spread out throughout the US. This means that TRS companies must set up multiple call centers throughout the country in order to be located in the places where there is a supply of interpreters. In some cases these new call centers have frustrated the deaf and hard of hearing community because they result in fewer interpreters being available for live community interpreting jobs, as well as increased fees for interpreting services (Barundia, 2005).

Some TRS companies contract with other firms to provide sign language interpreters for VRS and CAs for IP Relay. A notable example of this is Purple Communications’ contract with Nordia, which is regularly mentioned in Purple’s SEC filings. Another example is BIS, the firm which provided VRS CAs for Hamilton VRS prior to December 2008, and which now provides VRS CAs for CSDVRS.

In addition to CAs, TRS companies must also rely on technology suppliers. TRS companies need to have technological networks for routing calls, as well as equipment for CAs to use in handling calls. In addition, TRS companies that choose to provide equipment such as videophones to consumers must find suppliers for those products. Sorenson has partnered with D-Link, a company that specializes in networking and communications services to produce videophones such as the D-Link i2eye, as well as Sorenson’s own VP-100 and VP-200 models. As mentioned earlier, Snap!VRS markets the “Ojo” videophone which is manufactured by Motorola.

TRS Consumers

There are virtually no switching costs for consumers in the TRS industry. This makes it very easy for customers to change their TRS provider. A TRS user can attempt a call with one provider, and if after a few seconds the provider does not initiate a call the user can try placing
their call with a competing provider. This gives TRS consumers a good deal of power in the industry.

TRS consumers also have power in that they are protected by the FCC. FCC rules require that all TRS providers must maintain a log of all consumer complaints against them. Providers are required to record when each complaint was filed, as well as details of the complaint and how the issue was resolved. On a yearly basis providers must submit their complaint logs to the FCC. Consumers can also file complaints directly with the FCC. Details of all complaints are posted online, and the FCC can remove a company’s TRS certification if the company consistently violates rules or upsets customers.

Most TRS consumers are individuals, so there is minimal concentration of power. An exception to this is schools and universities focused on serving the deaf. These institutions, such as Gallaudet University which enrolls nearly 2,000 deaf and hard of hearing students, have some ability to influence larger blocks of TRS users. Sorenson Communications has entered into a partnership agreement with Gallaudet University, and provides VRS on the campus at videophone booths (Salmon, 2004).
Chapter 3

INTEROPERABILITY RULING

The FCC was granted jurisdiction over TRS in 1990, and since that time the FCC has released numerous orders and notices which have shaped TRS rules in the US. These rules govern how TRS is to be provided, minimum standards of operation, and emergency call handling requirements. The FCC’s rules for TRS are intended to further the ADA mandate that relay users have a telecommunications experience that is functionally equivalent with that of voice users (FCC, 2006). In recent years two rulemakings in particular have had major impacts on the TRS industry. This chapter discusses one of these significant rulings, the 2006 ruling on the interoperability of VRS equipment.

On May 9, 2006 the FCC released a *Declaratory Ruling and Further Notice of Proposed Rulemaking* that directly addressed the issue of VRS equipment interoperability. In this ruling the FCC mandated that when providers distribute equipment to consumers they must not block customers from using that equipment to make calls to other providers (FCC, 2006). Although not all TRS providers offer VRS, the VRS sector has seen tremendous growth in recent years as noted earlier. In addition, the higher costs of providing VRS result in this sector receiving over eighty percent of TRS fund payments (NECA, 2009). This key rulemaking changed the strategic landscape for TRS companies, and it has also had notable effects on TRS consumer behavior. Furthermore, this rulemaking laid the groundwork for the FCC’s 2008 VRS and text-based TRS ten-digit numbering order which is discussed in Chapter 4.

Background and Rationale

The most common type of equipment used by VRS consumers to place or receive calls is a videophone attached to a television. In 2006 the majority of VRS consumers used one of two videophone models, the D-link i2eye videophone or the VP-100 (FCC, 2006). Both of these
models were developed by Sorenson, however the VP-100 had additional features not included with the D-link i2eye. To expand its market share in the rapidly growing VRS industry, Sorenson alone distributed the VP-100, and it did so at no charge to TRS consumers. In exchange for the installation of a free VP-100, Sorenson restricted its consumers from using the device to make an outgoing VRS call through any competing provider’s service. Hands On VRS acted in a similar manner by distributing D-link i2eye videophones with pre-configured routers which also prevented users from making calls through any competitor’s service. By 2005 these practices began to attract the attention of TRS consumer groups. In particular, the California Coalition of Agencies Service the Deaf and Hard of Hearing (CCASDHH) expressed concern that VRS call blocking was negatively impacting the functional equivalency of consumers and potentially causing unnecessary delays in the event of emergency call handling.

Process and Details

In 2005 the practice of call blocking and restricting equipment to a single provider was challenged in a petition filed with the FCC by the CCASDHH. Within the petition there were several arguments in favor of a ruling which would stop providers from distributing equipment that was restricted to use with only one provider’s services. First, the group asserted that the practice of a provider restricting the use of equipment went against Section 225’s functional equivalency mandate, because consumers wishing to access multiple providers would need to have multiple sets of equipment – a considerable burden for consumers. Second, the group argued that blocking access to other VRS providers creates a dangerous situation when the TRS user needs to make an emergency (911) call if a that individual is limited to just one provider as that provider could potentially have a large queue of calls and therefore a long wait time for consumers. Finally, the group claimed that call blocking was at odds with the FCC’s emphasis on open and integrated telecommunications networks.
Six TRS providers filed comments with the FCC when the CCASDHH petition was placed on Public Notice. Of the six providers to comment, Sorenson was the only provider to oppose the petition. Sorenson characterized its VRS service as a “total service platform”, and likened it to the bundled service packages offered by wireless providers to voice telecommunications users (FCC, 2006). In its comments, Sorenson stated that the result of an interoperability ruling would be that “much of the incentive to develop innovations will disappear because any new technology will be shared with all other VRS providers, thus precluding the inventor from recovering or profiting on any investment made” (FCC, 2006). Furthermore, in response to safety concerns Sorenson explained that it planed to update its call routing systems to move emergency callers to the front of the queue to ensure that emergency calls would be answered by the next available CA (FCC, 2006).

Despite Sorenson’s objections, the FCC essentially accepted all of the arguments of the petitioning group, and thereby mandated interoperability in the VRS sector. As was argued by the CCASDHH, the FCC stated that restricting access to competing VRS providers was inconsistent with its mandate to provide functionally equivalent services (FCC, 2006). The FCC noted that voice users almost always receive a dial tone when they pick up a phone, and that for TRS users the equivalent of a dial tone is an available CA. When a TRS user is limited to only one provider there could be periods of time in which they wait an excessive period of time for an available CA, and as such the FCC was compelled to order that providers no longer restrict users ability to reach any provider (FCC,2006). Additionally, in this rulemaking the FCC included a Further Notice of Proposed Rulemaking section, in which they started a discussion on the feasibility of establishing a common database of phone numbers for VRS users which would be shared by all providers. In many ways this ruling was a precursor to FCC’s 2008 Ten Digit Numbering order which would impact VRS as well as text-based forms of TRS.
Results and Implementation

The interoperability ruling was quickly praised by TRS providers with limited market share, such as those shown in Quadrants 1 and 3 in Table 6. A day after the ruling was made Hands On VRS issued a statement commending the FCC and vowing that the company would “immediately cease blocking with respect to all new customers, and will remove all previously blocked devices previously installed” (HOVRS today, 2006). For companies in Quadrants 1 and 3 the interoperability ruling would make it possible for tens of thousands of individuals with Sorenson VP-100 videophones to place calls using any service provider. As Sorenson began removing blocking in the videophones that it distributed, TRS providers with smaller market share began mobilizing their employees to show customers how to “dial around” to other providers on a Sorenson videophone. In most cases customers would be instructed to add the smaller provider’s domain name to their Sorenson VP-100 contact list. The contact list had originally been intended as a speed dial function that would allow customers to store frequently used phone numbers, but now it was being used to store the contact information of competing providers.

Contrary to Sorenson’s predictions of stifled innovation, a number of new TRS videophone devices were launched within three years of the interoperability ruling, including the Mobile Video Phone (MVP) from Hands On VRS, as well as the Z-150 and Z-340 from CSDVRS. Sorenson had predicted that TRS companies would cease investing in new technology, but new videophones continued to come on the market, and Sorenson itself introduced a new model known as the VP-200. Although consumers with a VP-100 or the new VP-200 could choose to dial-around to any provider, the process of dialing-around was generally more cumbersome than simply using Sorenson’s service. When dialing-around users would need to use sign language to communicate what phone number they wished to call, whereas when
using the Sorenson service on a VP-100 or VP-200 the user could enter the phone number through a keypad and could store phone numbers in a contact list for easy speed dialing. Many customers tried dialing-around, but ultimately found it easiest to use the provider which gave them their equipment.

In petitioning the FCC to encourage interoperability, CCASDHH argued that users would be safer, because they would have the ability to dial-around to multiple providers in the event of an emergency. Although the ruling did open up the ability for users to dial-around in the case of an emergency, most consumers recognized that their videophones were internet-based, and in the case of 911 calls no location information would be automatically passed to emergency service providers. Additionally, although users could dial-around to multiple providers, consumers had no way of knowing what the wait time would be like with any one provider when initiating calls. Overall, safety concerns persisted after this ruling (FCC, 2008).

Another claim made by the CCASDHH, and supported by the FCC in this ruling, was that interoperability would make it easier for hearing callers to reach TRS users. Prior to the ruling, when TRS consumers were locked into using only one provider, a hearing caller would have to know which company to call in order to be connected to the TRS user. Once the hearing caller reached the correct company they could then be connected to the TRS user, provided that either the provider or the hearing caller had a current IP address for the TRS user. Although the interoperability ruling helped make it somewhat easier for hearing users to reach TRS users, the dynamic nature of most user IP addresses continued to make it difficult for hearing users to successfully initiate calls with TRS users (FCC, 2008).

Another outcome for TRS providers is that after this ruling it became more difficult to forecast demand. Because there was no switching costs for users, it was easy for them to try any service. This made it harder for providers to predict how many calls they would get in a given
day, and therefore made it more difficult to predict how many CAs should be staffed. Due to the relatively high salary requirements for video interpreter CAs some companies chose to cease providing VRS, notably Hamilton Telecommunications in late 2008.

The next chapter of this paper examines the more recent 2008 FCC order pertaining to ten-digit numbering for all TRS users. The nature of the order and the initial impacts are considered. Then, in Chapter 5 this paper discusses broader implications and conclusions for the TRS industry as a whole.
Chapter 4

NUMBERING ORDER

In June of 2008, just over two years after mandating interoperability in the TRS industry, the FCC released a Report and Order and Further Notice of Proposed Rulemaking in which it adopted a system for giving IP Relay and VRS consumers ten-digit telephone numbers linked to the North American Numbering Plan (NANP). In this important rulemaking the FCC mandated that NANP telephone numbers be provided to TRS users so that those individuals can be easily reached by both voice users and other TRS users. Although it is too soon to determine the full impact of this order this paper discusses the initial impacts as they are important in understanding the industry moving forward.

Background and Rationale

The FCC sited two primary reasons for this rulemaking. Similar to the justification provided for the 2006 interoperability ruling, the FCC first stated that this ruling is intended to make the telecommunications experience for the deaf and hard of hearing more like that of the experience for hearing people. In doing this the FCC believes that it is furthering its functional equivalency mandate. Second, the FCC stated that this rulemaking will help ensure that emergency calls placed by all TRS users are routed directly and automatically to the proper 911 authorities (FCC, 2008). This also builds upon the 2006 interoperability ruling which was intended to improve emergency call handling for VRS users. Whereas the 2006 ruling enabled consumers to use any VRS provider for emergency calls, the 2008 ruling enhances emergency calls by improving how they are handled and how a caller’s location is routed to authorities in the event of an emergency.

As part of its justification for this rulemaking the FCC provides some background on TRS call routing. The FCC points out that IP Relay and VRS users typically have dynamic IP
addresses. These dynamic IP addresses can change frequently, which makes it difficult for voice users to reach TRS users. In many cases a voice user must first obtain the TRS user’s current IP address through an email, text message, or other form of communication so that the voice user can provide the IP address to the CA for proper call routing. The FCC notes that some TRS providers have created their own databases of “proxy” or “alias” numbers to track the dynamic IP addresses of their customers and facilitate some call routing. These databases are generally not shared, and despite interoperability resulting from the FCC’s 2006 ruling, hearing users must know which provider to call in order to reach a given TRS user based on a proxy number. The FCC also points out that IP Relay users are often difficult to reach because their unique identifier is typically a username or screen name which can not by dialed on a traditional phone.

Process and Details

Much of this rulemaking focuses on two major items: (1) the means for NANP number assignment to TRS users, and (2) the creation of a central numbering directory mechanism.

In this rulemaking the FCC mandated that TRS users obtain NANP telephone numbers from providers. Although some providers had advocated for a third part number administrator, the FCC believed that having users obtain numbers from providers is more functionally equivalent, and in many ways analogous to number assignment by VoIP providers of voice telecommunications. The FCC pointed out that most TRS consumers view their provider as being their phone company. Furthermore, the FCC stated that the costs associated with the assigning of NANP telephone numbers to TRS users are to be borne by all telecommunications carriers, and that TRS providers need not directly contribute to the costs of number assignment. Also, the FCC decided that when a user obtains an NANP telephone number from a provider it is thereby deeming that provider to be his or her “default provider”. As such, default providers are
given additional responsibilities for the collection and maintenance of certain user information as will be addressed in our discussion of the central numbering directory for TRS.

This rulemaking mandated the creation of a centralized numbering directory mechanism administered by a neutral third party. The purpose of this directory is to map each TRS user’s NANP telephone number to the user’s device. The centralized numbering directory database must include Uniform Resource Identifiers (URIs) that include IP addresses for VRS users and domain names and usernames for IP Text relay users. The FCC stated that the directory must be provisioned by TRS providers and that only TRS providers will have access to the directory. The directory is not intended to be used for storing the registered location information of users, but rather the directory must store routing information from users, and providers will maintain customer location information for emergency call handling.

Also of note in this rulemaking is that the FCC mandated a December 31, 2008 deadline for implementation. This gave a period of approximately six months for providers to cease giving out “alias” or “proxy numbers, and to instead begin giving out NANP telephone numbers. Additionally, within this six month period the FCC committed to the creation of a centralized directory for TRS. In its efforts to be expedient the FCC did not refer this issue to the NANC as has been done for past numbering contracts, but instead it delegated authority to the Office of the Managing Director and urged them to begin the contracting process “as soon as possible” (FCC, 2008).

Results and Implementation

When initially released the numbering order created a fair amount of confusion amongst TRS users. First, after providers rushed to set up mechanisms for distributing ten digit numbers they quickly went to work encouraging people to sign up for them. As a result, individuals were often bombarded with offers to sign up for a ten digit number. Many providers branded the ten
digit numbers that they gave out, such as the “Home Town Number” from Hamilton, and the “Purple Local Number” from Hands On VRS and Purple Communications. Ultimately many TRS consumers became confused, not knowing if they could or should sign up for multiple ten digit numbers. In April 2009 the FCC released a series of videos featuring sign language to help address confusion around numbering (FCC, 2009).

The confusion of obtaining multiple ten digit numbers was intermixed with consumer uncertainty regarding the concept of “default providers.” Within a few months of the numbering order, questions began to surface regarding whether or not a user’s videophone would loose certain features such as speed dial or missed call lists if the user selected a new default provider. By September of 2008 some smaller providers petitioned the FCC to allow users to keep all videophone features when selecting a new default provider. Because Sorenson had the largest base of existing videophone installations, it argued that if users could select a new default provider and keep all videophone features the result would be decreased innovation in the TRS industry. Ultimately the FCC sided with Sorenson, and now stipulates that enhanced videophone features may not be available after switching default providers. Despite this, users are still able to dial-around to other service providers, regardless of whom they select as their default provider.

In the FCC’s quest to provide functional equivalence to TRS users, one potentially unintended consequence has been opening up TRS users to telemarketing. Prior to ten-digit numbering TRS users were isolated from most telemarketing, however with their numbers now linked to the NANP many TRS users are finding that they are receiving a substantial number of telemarketing calls. In some cases this has proven to be particularly disruptive as telemarketers often use automated dialing systems, some of which will hang up upon connecting to a relay service because the relay service may start with a recorded message from the TRS company. To
counter this some TRS providers have taken steps to educate consumers regarding the national Do Not Call Registry.

Another issue for TRS users has been the continued use of proxy numbers by some providers. Notably Sorenson petitioned the FCC to allow it to continue issuing and using proxy numbers throughout 2009 (FCC, 2008). The FCC responded in December 2008 with a second report and order in which it established a three month registration period, January-March 2009, and a three month permissive dialing period, April – June 2009. This essentially allowed the use of proxy numbers to continue through June of 2009. The FCC later extended the permissive dialing period through November 12, 2009. During and after the permissive dialing period it has been difficult for some TRS users to make point-to-point video calls to users that have chosen a different default provider. This is due to the fact that proxy numbers are not in the central TRS database, and therefore, when a user dials a proxy number the TRS provider’s system will not find it in the database and will connect the user with a CA as if making a relay call.
Chapter 5

IMPLICATIONS AND CONCLUSION

In looking at the outcomes of the FCC’s 2006 ruling on the interoperability of TRS equipment and the potential effects of the FCC’s 2008 TRS ten-digit numbering order, this paper outlines implications and opportunities for each of the major players in the industry: consumers, providers, and regulators. All three of these are experiencing notable changes as a result of these rulings.

Consumer Implications

For TRS consumers the 2006 interoperability ruling was intended to provide three benefits. First, as a result of the ruling consumers would not need to have multiple pieces of equipment to access providers. This was particularly impactful for users of the two largest providers of VRS equipment as those providers had previously engaged in call blocking which forced users to access only one provider with their equipment. Second, the ruling was intended to allow users to dial-around to other providers in the event that one provider was providing inferior service – such as long wait times or substandard CAs. Third, the intent of the interoperability ruling was to improve safety for TRS users by enabling them to dial-around to an alternate provider in the event that the user experienced long wait times when making an emergency call.

In many ways the interoperability ruling fulfilled its intended results for TRS consumers. As a result of the ruling TRS users were able to access any provider from their existing equipment. TRS consumers gained power as a result of this ruling because it allowed them to easily switch providers at no cost. Although liberating in many was this ruling had the essentially unintended effect of incentivizing TRS providers to more aggressively market their services to any user with TRS equipment. Ultimately most TRS users continued to use the service of whichever provider gave them equipment as that was the most convenient way to use their
device. In addition, though the ruling did give TRS consumers the ability to dial-around in the event of an emergency, the FCC continued to recommend that consumers instead use a TTY connected to a PSTN for emergency calls. It does not appear that the interoperability ruling had a significant impact on the safety of TRS users.

The 2008 numbering order was intended to provide TRS consumers with a better call experience, more like that of voice telecommunications users. The order was designed to improve the handling of emergency calls for TRS users, and to also make it easier for voice users to reach TRS users. In addition, many TRS users expected that the creation of a nationwide TRS user database would help facilitate better communication between TRS users, regardless of which provider they typically used. Not all of these benefits have yet come to fruition for TRS users. Most notably there has been confusion amongst TRS users regarding how to obtain and use a local phone number for TRS. In order to benefit from this ruling users must better educate themselves. Consumer groups such as the NAD are particularly critical at this time, and should help educate TRS users and thereby ensure that the 2008 order has a positive impact on the experience and safety of TRS users.

Managerial Implications

For TRS providers operating in the VRS sector, the 2006 interoperability ruling provided a notable shock to the way they had been conducting business. The equipment previously provided to consumers no longer offered the kind of guaranteed revenue stream that providers had been able to rely on. A new era of service competition began.

Recall that Table 6 grouped companies operating in the TRS industry based on their market share and overall scope of services. Quadrant 1 included companies with smaller market share operating primarily in TRS, whereas Quadrant 2 consisted of companies with a larger TRS market share, also operating primarily in TRS. Quadrant 3 was made up of companies with
smaller TRS market share operating primarily in other areas of the larger telecommunications industry. There are no companies in quadrant 4 as the companies that are primarily engaged in other areas of telecommunications are not market leaders in TRS.

For companies in quadrants 1 and 3 the interoperability ruling presented an opportunity to rapidly expand by taking advantage of existing consumer equipment now available for use with any provider. Quadrant 1 and 3 companies may have expanded some of their TRS market share as a result of the interoperability ruling, but the incumbents in quadrant 2 have been able to hold on to large portions of the market as these companies have existing relationships with the majority of TRS users, and because users have found it easiest to keep using their equipment to reach the provider for which it was originally intended. In order for companies in quadrants 1 and 3 to grow their market share they will need to continue to develop and distribute their own equipment. For companies in quadrant 1 that specialize in TRS there is a strong motivation to develop and distribute equipment, as evidenced by recent product introductions from CSDVRS and others. However, for a quadrant 1 company to successfully bring to market a new piece of TRS equipment a significant investment is necessary. As such, two specific recommendations can be made for quadrant 1 companies. First, Quadrant 1 companies should look to partner with quadrant 3 firms that likely have more cash available as a result of their activities in other areas of the telecommunications industry. In addition, quadrant 3 firms likely have some of the technical resources necessary to develop new TRS equipment. For quadrant 3 firms this is likely to be an advantageous partnership because their diversification has historically resulted in a lack of intimacy with the TRS market. As such, companies in quadrant 1 have a better understanding of the kind of products desired by the TRS market, and are better positioned to bring those products to consumers. Another option for companies in quadrant 1 is to develop software applications that can function on existing hardware such as computers equipped with webcams. In this option
there is still a fair amount of development expense, however the cost of distribution is greatly
reduced as quadrant 1 companies providing software would not necessarily incur the
manufacturing and distribution costs associated with a hardware product.

Incumbents in quadrant 2 can maintain their large market share by consistently delivering
reliable TRS service, and by continuing to develop and provide equipment for their customers
with features that those customers value. Table 7 helped illustrate the degree to which each TRS
company focuses on three paths to market leadership: operational excellence, customer intimacy,
and product leadership. Both of the companies in quadrant 2 have historically focused on
operational excellence and product leadership. Although it is important for these companies to at
least meet the minimum industry standards in customer intimacy, the best way for these
companies to maintain or even grow their positions will be to continue focusing on the areas in
which they excel. Table 8 summarizes strategic recommendations for TRS companies by
quadrant.

Table 8

<table>
<thead>
<tr>
<th>Recommended Strategies by TRS Company Quadrant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Share</td>
</tr>
<tr>
<td>Small</td>
</tr>
<tr>
<td>Primarily TRS</td>
</tr>
<tr>
<td>Primarily Other</td>
</tr>
<tr>
<td>Quadrant 1:</td>
</tr>
<tr>
<td>Partner with quadrant 3 companies; develop software products</td>
</tr>
<tr>
<td>Quadrant 3:</td>
</tr>
<tr>
<td>Partner with quadrant 1 companies</td>
</tr>
<tr>
<td>Quadrant 2:</td>
</tr>
<tr>
<td>Continue leveraging core competencies</td>
</tr>
<tr>
<td>Quadrant 4:</td>
</tr>
<tr>
<td>n/a</td>
</tr>
</tbody>
</table>

*Note.* Shows recommended strategies for TRS firms based on their market share and overall
scope of services provided.

The FCC’s 2008 numbering order reinforces the strategic paths that this paper has
outlined for companies in all quadrants. Although users can now dial-around to reach any
provider, the establishment of local ten-digit numbers for TRS users and the resulting default provider relationship makes it increasingly important and lucrative for providers to give consumers equipment which they will value and use regularly with the provider that distributed it. This is particularly true given that the FCC has maintained that if a user chooses to select a default provider that is not the same as the provider that supplied their equipment, the equipment supplier can disable enhanced features such as missed call lists and speed dial functionality (FCC, 2009). In order to thrive in the TRS industry as it is currently regulated, providers must develop and distribute unique endpoint devices with enhanced features. This is particularly important in the VRS sector. Despite the ability for users to dial-around to any service provider, most TRS users find it easiest to continue to use the provider which provided them with their equipment. With the addition of additional features, users become increasingly tied to the provider that gave them equipment.

Regulatory Implications

For the FCC, the 2006 interoperability rulemaking was a significant step in increasing competition in the TRS industry. This helped the FCC advance its mission to give TRS users functional equivalency in accessing the US telecommunications infrastructure. To further incite healthy competition in the TRS industry the FCC could order TRS providers that distribute equipment to publish software code which would enable any provider the ability to program any videophone in such a way as to give it enhance features. This could result in a market not unlike the wireless phone industry, in which users can in some cases keep their existing phone when changing to a new carrier.

Implementing the 2006 interoperability rulemaking proved to be easier than implementing the 2008 numbering order. This is largely due to the fact that the 2006 order did not require consumers to take any action, whereas with the 2008 order consumers have had to
register with a provider in order to continue using TRS. A key learning here is for the FCC to take a more active role in consumer education when releasing a ruling which requires consumers to take an action such as registering with a provider. Furthermore, the FCC should partner with TRS consumer groups to help ensure an adequate level of TRS user education.

Concluding Remarks

The TRS industry’s unique market dynamics provide for interesting analysis, and present challenges and opportunities for consumers, providers, and regulators. Recent FCC rulemakings have had major impacts on the market, and it will be beneficial to further evaluate these impacts as additional time elapses. Ongoing analysis in this area can examine the continuing impacts of the 2006 interoperability ruling and the 2008 numbering order, as well as future rulemakings. International TRS can also be explored further. As the baby boomer generation ages and the population of deaf and hard of hearing individuals continues to grow, the TRS industry continues to provide an important communications lifeline for a significant number of Americans.
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Sorenson Communications Urges VRS Users to Choose Default Provider by FCC Deadline.


