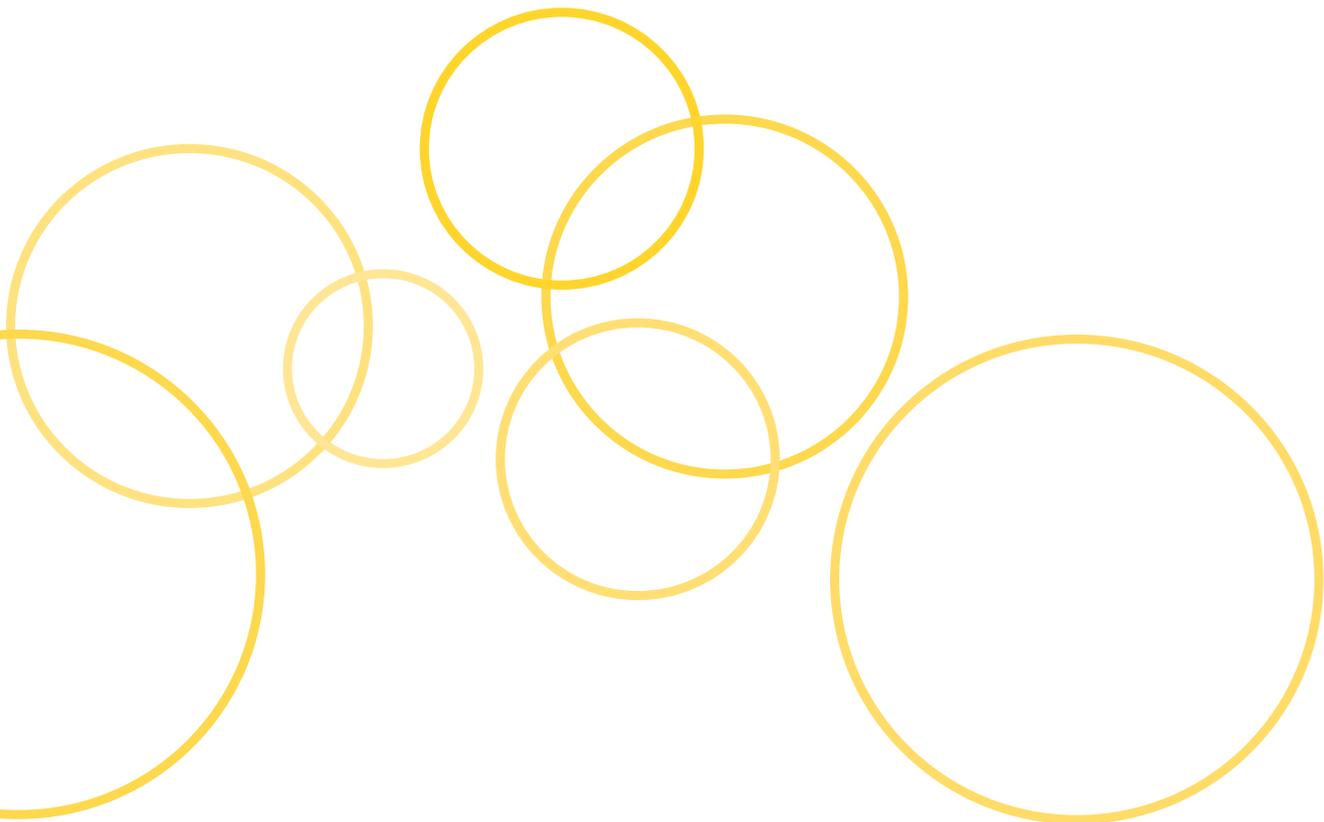


# Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing

A Comparative Study of Video Interpreting (IV)  
Systems in the US, Norway and Sweden



Swedish Institute of  
Assistive Technology



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The Swedish Institute of Assistive Technology (SIAT)

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Oslo, September 24, 2010

Hilde Hualand

## Terminology

**Videophone:** Equipment for live video conversations used to access the video interpreter or for conversations to another videophone.

**Video Interpreting (VI):** or interpreting via videophone: General term for all interpreter services via videophones.

**Video Relay Service (VRS):** Relaying/interpreting telephone calls.

**Video Remote Interpreting (VRI):** Interpreting situations where the Deaf and hearing persons are at the same location and the interpreter is in a different.

**Community Interpreting:** A situation where the sign language interpreter is physically present.

**Video Interpreter:** A sign language interpreter providing services via videophones. (Call Assistant, CA, Operator.)

## Legend – Figures 2, 5, and 9

**Blue:** legislation and regulations

**Purple:** public authorities with legal mandate

**Yellow:** institutions, documents or organisations with consultative status

**Orange:** financial sources

**Green:** VI service providers

**Pink:** videophones/end users

# Introduction

Video interpreting (VI) services are a unique combination of human and technological resources, and have been established in several countries over the last 1-2 decades. Depending on the definition or view of the service, it is a tool to access a telecommunication network in sign language and/or a tool for more effective access to and use of sign language interpreter services or both. The world's first publicly regulated VI service was established in Sweden in 1997, only a few months before a similar service was established in Texas, USA. Today, VI services are provided in several countries, but only the US, Sweden and Norway have services that are partially or fully provided at no charge to end users, and are subject to public regulations. In countries with different political, demographic, legal and economic foundations, the actual use and provision of VI services resemble each other. However, once the questions why, how and who is involved are asked, the differences abound. This report gives an overview of the VI systems in the US, Sweden and Norway, and explains how each system is organised in terms of legislation, regulatory bodies and provision of the VI services and videophones.

Initially, the process of VI is explained, as is the difference between video relay services (VRS) and video remote interpreting (VRI). Here, as in the entire report, the focus is on the regulations, organisation and use of VI services, with few, if any references to technical issues or specifications. A short overview of VI provision in a selection of countries is given, before the VI systems in the US, Sweden and Norway are given full attention, starting with background information on disability politics, the status of Deaf people and sign language, and regulation of interpreter services in these three countries. The VI systems in each country are described in one chapter each. Due to the different ways of organising the services, the organisation of each chapter is not identical. Each chapter starts with a chart giving a quick overview of the systems, actors involved and a short description of the political issues at stake. There are many more actors involved in provision of VI services in the US than in Sweden and Norway, and both the political and financial mechanisms are much more complicated. Therefore, more space is given to the US system than the VI systems in Norway and Sweden. Observed advantages and drawbacks of each country's system are discussed at the end of each chapter. In the final comments, issues of managing sign language interpreter resources versus securing access to telecommunication, and challenges related to technological development are discussed.

# Basic Description of Video Interpreting

Regardless of the diverse regulations and ways of organizing services and provision of equipment in the three countries examined, the process of video interpreting is quite similar with regards to the practical use of human and technological resources.



Figure 1: Video interpreting (Kommunikationsmyndigheten PTS, [www.pts.se](http://www.pts.se)).

The process of VI involves at least three persons: a Deaf (or hearing impaired) person that uses sign language, a hearing person and a sign language interpreter. On the technological side VI involves a videophone, a studio where the interpreter works, which is equipped with a platform for communication with the videophone, a headset with a microphone to communicate with the hearing party and possibly some software to organize eventual queues and other operational necessities.

The VI process usually starts with a Deaf person requesting an interpreter by calling the VI service with his or her videophone. If it is a request for an interpreter for a conversation or event where the Deaf and hearing person are located at the same place, this is called Video Remote Interpreting (VRI).

If it is a request for interpreting of a telephone call, it is called Video Relay Service (VRS). The organizational distinction between VRI and VRS may be very sharp (the US and Germany), or less articulated or emphasised (Sweden and Norway), partially depending on the scope and motivations to provide VI services.

## **Video Remote Interpreting**

During a VRI process, the conversation parties will be at the same location, and only the interpreter will be physically located at another site. The videophone is also equipped with a microphone and a loudspeaker, so the interpreter can also hear from and convey messages to the hearing person. VRI will often be a supplement to or replace a physically present sign language interpreter (so-called community interpreting). VRI may be an efficient way to access the interpreter service, especially in situations when the distance to the interpreter is a barrier, or for spontaneous or acute requests.

## **Video Relay Service**

In a VRS process, the two parties communicating are located in different places. The conversation takes place via the interpreter, who is connected to the Deaf person by way of the videophone, and to the hearing person via a telephone. The interpreter translates to a spoken language what the Deaf person says in sign language, and reversely translates what the hearing person says in a spoken language to sign language. VRS is often defined as a telecommunication service, or an extension of the text relay service that has existed for several decades.

## **Videophones**

There are four groups of videophones.

- 1) Dedicated videophones: equipment that can only be used as a video phone, and has an integrated camera, monitor, possibly a microphone/loudspeaker device and a dial pad.
- 2) TV-mounted sets, including a camera and a modem connected to the television set, which is used as a monitor.
- 3) Software, mainly of two types:
  - a. Software developed explicitly to be used for video interpreting service purposes and/or communication between sign language users. This is most often distributed through quite limited markets or channels. Some examples of this type of software are P3, MMX and Allan eC.

b. Instant messenger software where the video functionality is often supplement or secondary to text and voice functions, and the basic software may often be downloaded as freeware from the Internet (Skype, MSN, oovoo, AIM, Camfrog and many more). These are rarely compatible with VI services but are frequently used for direct conversations between people using sign language.

- 4) Mobile cell phones with integrated cameras, mostly operating on the UMTS-network (also called 3G).

Only recently, and quite exceptionally, some interoperability between the different models has been enabled. There is not yet one standard that functions for all kinds of video telephony. National interoperability between the provided videophones<sup>1</sup> for VI purposes has however been made mandatory by the regulatory bodies in the three countries discussed. In Norway and Sweden, all videophones must use the SIP standard to communicate, while the videophones distributed by VRS providers in the US must be compatible with both the H.263/H.264 and the SIP standards.

## Video Interpreting Worldwide

Various forms of video interpreting services have emerged in several countries the past decade, but only a few are regulated by the government or other public agencies. In some countries, VI is organised as an extension or development of text relay services, while in others it is organised as an interpreter service, partially targeted at limited user groups, often Deaf people in the labour market. VI services have been provided in several countries that have either become permanently established or were trials or short-term projects. The numbers change as new projects emerge and others terminate. It is not always clear whether the trials have a VRI or VRS-centred scope.

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<sup>1</sup> Except 3G mobile videophones, which only operate on the UMTS network.

Table 1: Countries with VI trials (ETSI 2009)

Country	
Australia	trials with VI services by the Disability Service Centre in Victoria
Belgium	local trials
Canada	trials
Czech Republic	limited trials with 10 participants
Denmark	trials by the Work Centre in north Denmark
Finland	nationwide trials run by the Joint Authority for Disability Services in Uusimaa, financed by public funds
France	local, private trials, some government funding is expected in the future
Spain	local trials
The Netherlands	VRI trials

Five countries have established a permanent VI service, but with different emphasizes on VRI and VRS. These are the US, Germany, United Kingdom, Norway and Sweden. In the US and Germany, there is a sharp demarcation between VRS and VRI, while the distinction is not as clear in Sweden and the United Kingdom, and there is an organizational emphasis on VRI in Norway. See the Table in Appendix 1 for a schematic overview of the service in those five countries. The various ways of organizing the VI service reveals that there are different political motivations and scopes behind both the financing and the provision of the service. Of the five countries mentioned above, three countries are compared in this report: the US, Sweden and Norway. In these countries, there is a public regulation of the service, VRS and/or VRI are provided at no cost to end users and VI is accessible to anyone who has a compatible videophone. In the US and Sweden, the service is well established and well known among Deaf people, while the service is still quite new and not so widespread in Norway.

# Background on the US, Sweden and Norway

## **Disability Politics and Employment**

### **Disability-related Legislation and Regulations**

The parliaments in Norway and Sweden have had national disability action plans for decades, which the sector ministries have been expected to implement and enforce. The United States has had an anti-discrimination act for disabled people since 1990 (The Americans with Disabilities Act). Discrimination on the basis of disability is prohibited in all countries, but in practice, Deaf people experience that especially communication and information related activities in society remain inaccessible.

### **Socio-economic Status of Deaf People**

There are few studies that focus on Deaf people and employment. The studies indicate however that the employment rate among Deaf people is higher than the average among people with disabilities (which for all disabilities tips over 50% in all three countries), but lower than the general employment rates. (ECON 2003; U.S. Census Bureau 2005; SCB 2009) As with other groups of disabled people, it is assumed that the average education level is lower among Deaf people, but there are also large groups of Deaf people with secondary education and many with tertiary/higher education in all countries. Deaf people work within a very wide range of positions and occupations, and many are high end, intense and heavy users of information and communication technologies. The status and position of the national sign languages are high (at least compared to the lack of recognition and acceptance of sign language in most countries in the world). The sign language interpreting service is relatively generous, well established and stipulated in public laws and regulations in all countries.

## **Telecommunication Sector and Universal Services**

### **Deregulation of the Telecommunication Sector**

Another similarity between the three countries is the deregulation of the telecommunication market in recent decades. Several of the previous national telecommunication monopolies have changed their status from state-owned

agencies to stock exchange listed telecorporations, but have in many cases retained status as incumbents of the national Universal Service Obligation (USO), obliging them to provide effective and accessible telecommunications with equal conditions, to all citizens. Those obligations often include provision of telecommunication access in rural areas, emergency preparedness and network maintenance, provision of public telephones – and in some countries, also provision of services to disabled people, like free number information and text relay services. All three countries are technologically advanced countries, with a high percentage of the population that has access to and use telephones and have access to the Internet. (Internet Usage World Stats 2010)

### **Universal Service Obligations**

At the time of the deregulations, text telephones<sup>2</sup> were the dominating telecommunication equipment among Deaf people in the US, Sweden and Norway. Text relay services were defined as an obliged, universal telecommunication service. Both Norway and the US explicitly mention that the relay service should not be limited to technologies that existed at the time of the legal resolution in the telecommunication regulations (USO agreements or Telecommunication legislation). Only the US has later included provision of video relay services and other IP-based communication technologies in their Universal Service Obligation definitions, and given them equal status to the text relay services. In Norway, the telecommunication incumbent Telenor, is responsible for providing text relay services, but is not involved in the provision of video interpreting services. The Swedish Post and Telecom Agency is instructed by the parliament to secure universal services that are not sustainable in the market and basic services for people with disabilities are included in this instruction, through procurement. (Förordning med instruktion för Post- och telestyrelsen 2007)

### **Right and Access to Sign Language Interpreters**

In all countries, the right to request a qualified sign language interpreter is stipulated by legislation. Receiving sign language interpreter services is defined as a personal right in Sweden and Norway, while any public institution in the US is legally obliged to provide a sign language interpreter to secure access for Deaf, deaf-blind or hearing impaired clients.

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<sup>2</sup> A text telephone is a keyboard coupled with a telephone, which allows written instead of spoken communication via the telecommunication network. The technology is called "TTY" or "TDD" in the USA, and is incompatible with the text telephones used in Norway and Sweden.

## **USA**

In the US, the obligation to provide sign language interpreters is stipulated in Title II of the Americans with Disabilities Act, which forbids discrimination on the basis of disability by any public entity, and Title III that provides people with disabilities with the rights to equal access to public accommodations. "Public" is not restricted to governmental bodies, but all institutions or businesses whose activity or service is directed towards the public. Sign language interpreter services are not an individual right each Deaf person holds, but an obligation that follows from the ban against discrimination. If a sign language interpreter is the most appropriate solution to secure equal access, the institution or business is obliged to pay for the interpreter. The government does not pay for any kind of interpreter services, except in those cases where the legislation requires that the government, as a public body, provide a sign language interpreter to secure equal access. There are numerous private companies that specialise in providing sign language interpreter services, and most often one of these is appointed when interpreter services are requested. A continuous challenge is that demand may exceed supply for sign language interpreters.

## **Sweden**

The right to request interpreter services, and the obligation to provide such services is included in several regulations. Deaf, deaf-blind and hearing impaired people are entitled to request an interpreter from the regional authorities for "everyday" tasks (private situations that do not involve any public authorities, for example family events or encounters with private businesses), pursuant to the Health and Medical Service Act. However, public entities are obliged to provide interpreters when they encounter Deaf, deaf-blind or hearing impaired clients or customers. However, it is not always clear which authority is responsible to pay for the interpreters, and the government has requested a clarification of the sign language interpreting services.

Each region may organize the service differently. In some regions, there is only one interpreter service agency, while in other regions there may be a competition between numerous providers. As in the US, there is a shortage in the supply of qualified sign language interpreters, and the users frequently experience that there are no sign language interpreters available for situations where they are legally entitled to request one.

## Norway

The Norwegian National Insurance Act regulates the right to sign language interpreters in Norway, and the National Insurance Agency finances most interpreter services. Excepted from this rule are secondary schools, hospitals, churches and courts. These institutions are obliged to provide sign language interpreters if requested, and finance the services from their own budget. Deaf people have the right to request free interpreter services in all aspects of life, and may also bring interpreters abroad for work or educational purposes. There is no need to ask an institution, school or business to provide interpreters, since sign language interpreting is a personal right for people who are Deaf, deaf-blind or hearing impaired. Just like in Sweden and the US, there is a shortage of qualified interpreters, especially after 15.45, when the interpreter service centre closes.

## Similar Service – Different Organizations

Besides being the only three countries with publicly regulated VI services, the principles of inclusion, accessibility and sector responsibility (mainstreaming) have a strong footing in the disability politics of each country. Also, the target populations (sign language using Deaf people) for VI services live under fairly similar conditions. Yet, the VI systems differ greatly both in terms of political scope and motivation, dispersion of videophones, organization of the service(s) and in complexity in terms of actors, regulations and number of both public and private bodies involved. In the description of the VI services that follows, considerably more space will be given to the system in the US than in Sweden and Norway, mainly since the system in the US involves more actors.

# USA

## Main Goals and Issues

There is a sharp distinction between Video Relay Services and Video Remote Interpreting in the United States. Both services are stipulated in the Americans with Disabilities Act, but organised and financed under separate schemes. Compared to the VRI services, the VRS is characterised by strict regulations and involvement of a wide range of public and private bodies.

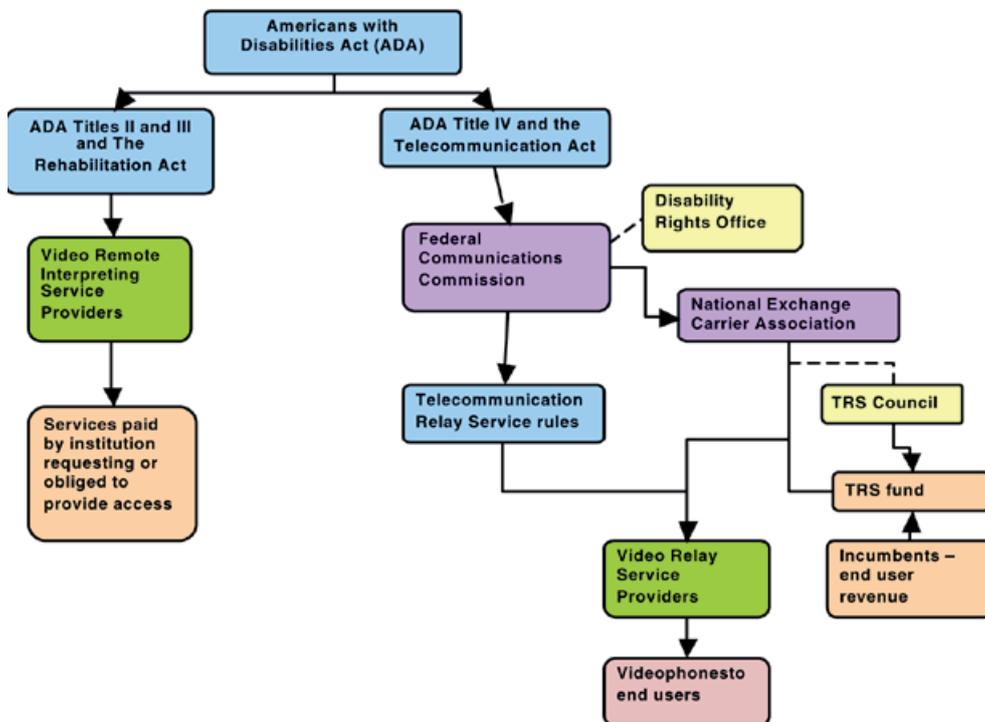


Figure 2: Video Remote Interpreting

### Video Remote Interpreting Services

Video Remote Interpreting (left section of Figure 2) may replace a community interpreter, and responsibility to cover the costs (salary to the interpreter and sometimes the necessary equipment) is regulated by Titles II (Public Services) and III (Public Accommodation) in the Americans with Disabilities Act. VRI has not been subject to public regulation beyond the rules for sign language interpreters in general. A few of the companies providing VRS also provide VRI (for example Purple), but this is the exception. VRS providers that provide VRI have programs that separate between VRS and VRI for billing purposes. VRI is also provided by community or in-person interpreter agencies, and financed or billed like other community interpreter services. Efforts to

expand VRI services are mostly concentrated to hospitals, police stations and other public service points, to which people often do not plan their visits to, or when the need of sign language interpreters is acute.

### **The Video Relay Service**

Access to the telecommunication network is considered a civil right pursuant to ADA Title IV. The videophone distribution and video relay services are dominated by private providers and financing. The video relay service providers are private companies who operate according to the Telecommunication Relay Service (TRS) rules. The rules are written by the Federal Communications Commission (FCC), where the Disability Rights Office (DRO) is the prime administrator of the rules and the regulations. The National Exchange Carrier Association (NECA), is responsible for managing the TRS fund under contract with the FCC. NECA collects money from common carriers and reimburses the expenses of the video relay service providers. The videophones are either loaned or given to clients from the video relay service providers. The clients are encouraged (through the technical settings) to use services and features such as missed calls or automated pre-dialling, to name a few, from the provider from where they borrowed or were given the equipment, but can choose another service provider if they wish by adding their addresses on speed dial.

Video Remote Interpreting is not included in the FCC mandate, and is not reimbursed from the TRS fund because VRI is not considered a telecommunication service. An attempt to use the Video Relay Service to replace Video Remote Interpreting or a physically present community interpreter is regarded as fraud or misuse of the VRS.

### **Early Trials with Video Interpreting – Establishing the Service**

The first trials with VI took place in the state of Texas and some other states in 1995–96. Texas Relay tested provision of video interpreting services with videophones that were placed at four community centres in Texas. Deaf people could travel to these community centres to access remote interpreter services via the videophones that had been placed there. This reduced the need to book or request an interpreter in advance, increased accessibility to interpreter services, and saved both time and travel costs for the service providers at the community centres. Gradually, the trials were expanded to private people's homes, and the participants could use generic computer hardware to call an interpreter. (Strauss 2006)

In 1998, the Federal Communications Commission released a Notice of Proposed Rulemaking where they concluded that the new service could be

considered a service in the meaning of the Telecommunication Act section 255 (on future and improved technologies) FCC evaluated the new service as relevant to the “functionally efficient” measure in the Americans with Disabilities Act. Therefore the costs should be recoverable from the TRS fund that already financed interstate text relay calls.<sup>3</sup> FCC did not require that the VI services should be mandated by the TRS rules at the time, mainly due to technological infancy and uncertainty regarding supply of qualified interpreters. (Notice of Proposed Rulemaking 1998, CC Docket No. 98-67)

The distinction between VRS and VRI was initially not as clear as it is today. VI services were established in several states, but many only at a trial or project basis. The final demarcation between VRS and VRI came in 2000, when FCC underlined that only those services which relayed telephone calls would be reimbursed from the TRS fund. A few months later, FCC declared that “the provision of telephone relay service utilizing sign language interpreters is reimbursable through TRS funds, consistent with the TRS Order, charges associated with (...) sign language services for in-person communications are not recoverable. In order to prevent any further confusion between these two distinct types of services, we hereby change the nomenclature for the service that is reimbursable to ”video relay services” (Order on Reconsideration 2000, II, 10 p 5).

The Disability Rights Office at the Federal Communications Commission handles FCC’s responsibility to implement Title IV of the ADA. They are also responsible to write the rules and regulations for the rights that are found in the legislation (ADA and the Telecommunication Act).

## The Telecommunication Relay Service Rules

In the Americans with Disabilities Act, the Telecommunication Relay Services is defined as:

“... telephone transmission services that provide the ability for an individual who has a hearing or speech disability to engage in communication by wire or radio with a hearing individual in a **manner that is functionally equivalent to the ability of an individual who does not have a hearing or speech disability** to communicate using voice communication services by wire or radio. Such term includes services that enable two-way communication between an individual who uses a text telephone or other nonvoice terminal device and an individual who does not use such a device (Americans with Disabilities Act 1990, Title IV (a)(3)).

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<sup>3</sup> Intrastate text relay was financed by the state telecommunication incumbents.

“Functionally equivalent” is a key concept in this definition and in all discussions on how the telecommunication relay services (including VRS) should be regulated, organised and financed. This concept guides the detailed rules set forth in the mandatory minimum standards paragraph (47 CFR TRS Rules, §64.604), which defines operational, technical and functional standards.

The Telecommunication Relay Service rules originally only regulated the text telephone relay services, but FCC has gradually included new communication technologies. The rules now also, among others, regulate these services:

- speech-to speech (for speech impaired people with difficulties in making themselves understood)
- video relay services/VRS
- IP-relay (text relay via IP based technologies) and
- voice carry over/VCO (Deaf or hard of hearing person using own voice, but response is relayed by text or sign language)
- speed dialling (allows a user to give the operator a short-hand name or number for the user’s most frequently called telephone numbers)
- three-way calling feature (participation in multi-party conference calls)

### **The Operational Standards**

The operational standards define the roles and skills of the Communication Assistants (the operator), confidentiality and types of calls. VRS operators must be qualified, and “... able to interpret effectively, accurately, and impartially, both receptively and expressively, using any necessary specialised vocabulary”. (§64.604 (a)(1)(iv)) The providers must also make best efforts to accommodate to a user’s requested gender when a call is initiated. An operator must stay with the call for at least ten minutes, and cannot be replaced with another operator before then.

The relay services shall be capable of handling any type of call normally provided by telecommunication carriers (§64.604 (a)(3)(ii)), and must have a system for incoming emergency calls, that immediately transfers a call to a public safety answering point.

### **Technical Standards**

The technical standards mainly focus on regulating answering times and how incoming are handled. The main purpose is functional equivalence to the services accessible for those who do not have a hearing or speech disability.

VRS providers must answer 80% of all calls within 120 seconds, measured on a monthly basis, "by any method which results in the caller's call immediately being placed, not put in a queue or on hold" (§64.604 (b)(2)(ii)). The service providers that are mandated by the rules must operate on a 24/7 basis and must have uninterruptible power for emergency use.

Furthermore, it is emphasised that none of the regulations should discourage or hamper development of "improved technology that fosters the availability of telecommunications to persons with disabilities" (§64.604 (b)(5)).

### **Functional Standards**

The functional standards give specifications about the administration and management of the TRS providers, consumer handling and information about their service.

## **Financial Model**

### **The National Exchange Carriers Association (NECA)**

The administration of the TRS services, as well as other funds for Universal Services, are procured in competition. It is currently handled by the National Exchange Carrier Association (NECA), which is a non-profit association of incumbent telephone local exchange carriers.

NECA has administered the interstate Telecommunication Relay Services fund since 1993 after order from FCC.<sup>4</sup> In this sense, the Telecommunication Relay Service (including the VRS) financing is not handled as a welfare or social issue, but as an obliged service for the telecommunication incumbents. A separate fund has been established for the Telecommunication Relay Services – the TRS Fund, which is monitored by the TRS Fund advisory council. The fund consists of the access charges long distance companies pay to use local telephone companies' networks, covering expenses for providing telecommunication access in rural areas and other Universal Service Obligations. Telecommunication Relay Service providers that have been certified by FCC will have expenses for providing the services reimbursed from the TRS fund.

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<sup>4</sup> There are separate funding mechanisms for **interstate** (across the states) and **intrastate** (within each state) TRS. The latter are regulated independently, and large number of states use surcharge as described above, and are handled by each state funding mechanisms. NECA develops annual cost of handling all kinds of **interstate** calls, which include interstate text relay service calls, IP relay calls (which includes VRS since it is difficult to pinpoint the origins of the calls via IP and toll free calls for the same reason). NECA agrees to pay for these calls until the origins of all calls through IP can be located.

### The Telecommunication Relay Services (TRS) Fund

All telecommunication consumers finance the relay services through a small fee that is added to every client's telephone bill. NECA figures the percentage of total TRS costs of the total of all phone carriers' revenues. The reported size and amount of traffic and service in each telecommunication local exchange carrier, and information from the TRS providers constitute the bases for predictions of the size of the Interstate TRS Fund. After obtaining the percentage, NECA collects that percentage (carrier contribution factor) from each carrier's revenues. (This is only for these services approved by the FCC, not the intrastate TRS calls.) In 2009, the annual carrier contribution factor was 0.01137%, which gave a total budget of \$890,992,075 (€650,312,900)<sup>5</sup> for reimbursement to TRS providers (NECA 2009).

The current reimbursement rates for VRS is about three times as high for VRS compared to text relay services,<sup>6</sup> mostly due to much higher specialization in the VRS operators. The text relay services are staffed with relatively low skilled operators, who only have to be fluent in typewriting and are ready to operate only after a short period of training. The VRS must be operated by a sign language interpreter, who is a language specialist, in the sense that he or she must be fluent in at least one signed language and one spoken language. It takes years of practice and training before the required skills are achieved.

For July 2009 – July 2010 the per-minute compensation rates (were \$6.2372 - \$6.705 (4.55-4.89) for Video Relay Services,<sup>7</sup> following a tier system where the compensation rate decreases when the overall minutes exceed 50,000 resp. 500,000 minutes. The compensation for VRS provision has dropped since 2002/03 when the rate was \$17.044 (€12.43) per minute (NECA 2009). It is expected that the rates will go down further from 2011, when a new method for calculating the costs will be implemented.

The relay service reimbursement rates, fund size and contribution factor is revised annually by FCC, mainly based on proposals from NECA. Since 2000, the fund size has grown from \$64,000,000 (€46,712,004) to almost \$891,000,000 (€650,312,900) and a whole system of marketing and advertisements directed towards the Deaf community has emerged.

<sup>5</sup> All conversions to euros (€) are approximate.

<sup>6</sup> More details: [https://www.neca.org/cms400min/NECA\\_Templates/TRSInterior.aspx?id=1264](https://www.neca.org/cms400min/NECA_Templates/TRSInterior.aspx?id=1264)

<sup>7</sup> The compensation rates (measured up to the one-hundredth of a cent) for other services like traditional text relay services, speech-to-speech, IP-relay and captioned telephone are \$1.2801-\$2.9621 (€0.93-2.16). NECA refunds costs for all VRS and other IP-based relay services, and only 20% of the cost for analog text relay services that are placed via traditional TTYs (the rest is covered by state governments or state telecommunication incumbent funds).

### **The TRS Advisory Council**

The advisory council meets at least semi-annually to monitor TRS cost recovery matters, and is a non-paid, voluntary advisory committee of persons from the hearing and speech disability community, TRS users (video, voice and text telephone), interstate service providers and state regulatory representatives.

The TRS advisory council is expected to only discuss cost recovery matters, but the advisory council has had some effect on the policy through their request for information that traditionally had been viewed as proprietary to the TRS providers. The providers have been forced to give information to NECA about the actual TRS costs per minute, separated from expenses related to marketing and technical development.

## **The Market and the Providers**

The provision of video relay services is almost entirely done by private companies, who may provide all or only a selection of the different telecommunication relay services that are defined in FCC's TRS rules. As of August 2010, there were 14 companies certified by FCC for reimbursement from the TRS Fund, according to the NECA website. Not all of these provide VRS services, and several of the companies have joined forces through contracts and shared marketing.

### **Most Common Business Model**

Although video relay service was included in the TRS definition in 2000, there were only a few video relay service providers before 2003. There were no large scale provision for distribution of the required equipment (webcams, computers, videophones), which at that time was quite expensive and few, if any, were designed with Deaf people as a target group. In 2003, Sorenson Communications made a few moves that gave the VRS market in the US the distinct features it still has today. First, they loaned the TV-mounted videophone model VP-100 to the consumers (consumers only had to pay for a broadband connection) and adjusted the VP-100 so the consumers could only use Sorenson VRS for relay calls. By making it complicated or impossible to use the VP-100 for communication with other videophone models and other providers' services, they optimised the payback of the investment in terminals. Until 2006, the VP-100 was not interoperable with other videophones or software for video telephony, like AT&T's software. Within a short time Sorenson VRS had a national market share of about 90%. Other VRS providers at that time required that the users of the service already had a computer, a high-speed Internet access line, a web camera and knowledge of how to download, install and use the software, and thus required considerable more economic resources and know-how from the end users.

## VRS Providers

The American VRS market is still dominated by SorensonVRS, who has a market share of 80–85%, which is a decline from a few years ago when they had about 90% market share, according to employees in the lobby organization Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI, personal communication). Many of the other certified TRS providers have a business model that resembles SorensonVRS. Other large operators include Purple, AT&T, Communication Access Centre for the Deaf and Hard of Hearing (VRS only), CSDVRS, Snap!VRS and Sprint. Some are nationwide, while others only operate in regional or local areas.

## Information and Marketing

Most have websites directed to their consumers, in both American Sign Language and English, and the main purpose is to recruit more clients as well as to inform about and promote their services and technological solutions, including videophones. The VRS providers are also highly visible at the various temporary meeting places in the Deaf community, like expos, conferences and other seminars. Several of the companies are Deaf-led and/or have Deaf people in leading positions, as well as among their other staff.

## Equipment Provision

The VRS providers lend a variety of models and videophone solutions to their clients. The providers compete against each other in both quality of service (their interpreters) and the equipment they lend to their clients. Much emphasis is put on user friendliness, ease of installation and picture quality, often at the expense of text and/or voice transmission. A keyboard can be attached to some models, and transmission of sounds is often excluded.<sup>8</sup>

The largest VRS provider, SorensonVRS, lends a TV mounted set (VP-200, Figure 3), and with their market share of more than 80%, this is also the most widespread videophone for VRS purposes used in the US. Purple, another large VRS provider, has a free software program called P3 (Figure 4), which has been designed specifically for sign language users, and may be downloaded by anyone from their website.

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<sup>8</sup> In Sweden and Norway, all videophones prescribed by public authorities must be able to convey video, sound and text at the same time – and function according to the Total Conversation principle. (See description of Swedish videophones for further details.)



Figure 3: VP-200 from Sorenson VRS ([www.sorensonvrs.com](http://www.sorensonvrs.com))



Figure 4: P3 from Purple ([www.purple.us](http://www.purple.us))

FCC does not give any technical specification for the equipment used for VRS, other than requiring interoperability with videophones from other providers. Videophones must be interoperable, i.e. consumers should be able to call acquaintances with a different videophone brand or model, and to use the services of another VRS provider than the company who lends the videophone terminal (Declaratory Ruling and Further Notice of Proposed Rulemaking 2006, CC Docket 06-57). This means that a person with a VP-200 from Sorenson may call any other person with a videophone, whether it is a software like P3 or a dedicated videophone like the VPAD+, and may call another VRS provider than the company who lends them the videophone.

### Videophone Distribution to Federal Workers

Federal employers are obliged to provide disabled employees with necessary assistive technology (Rehabilitation Act, Section 508; Executive Order 13164), which may include a videophone. But as most VRS providers lend

more than one set of equipment to every customer (for example one at work and one at home, which will increase traffic and hence the amount to be reimbursed from the TRS fund), the federal program for videophone distribution is not used very much.<sup>9</sup>

## Recent and Current Issues in VRS Provision

The financing system encourages the companies to tie as many consumers as possible to their services, in order to increase the relay service minutes the companies could reimburse from NECA. There have been some unforeseen effects of this system, which FCC has corrected, partly due to pressure from lobby and consumer organizations.

### Interoperability

Until 2006, there was limited interoperability between the various models provided by different VRS providers. The clients could not call any other VRS provider or videophone from a provider other than the company who had lent the equipment. Interoperability became a prerequisite for reimbursement from the TRS fund in 2006.

### Misuse of TRS Funds

There are few built-in incentives to reduce the costs related to provision of VRS, since the providers generate more income by increasing the number of costumers. The carrier contribution factor (the share each telecommunication client pays through their bill) is calculated on the basis of previous and predicted TRS traffic. The carrier contribution factor is still a very small fraction of the end consumer's bill, which is unlikely to be a burden to the clients. However, as increased traffic generates more income for the service providers, there have also been examples of misuse. In November 2009, several VRS providers came under FBI investigation for manufacturing fake VRS minutes (by making it appear Deaf persons were engaging in legitimate calls with hearing persons) in order to blow up their reimbursement from the TRS Fund. The first arrests were made in November 2009, when 26 people were charged for engaging in a scheme to steal millions of dollars from the Federal Communications Commission's Video Relay Service program. (FBI 2009) Another company was reprimanded for reimbursing expenses for intra-company meetings. (Federal Communications Commission 2010)

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<sup>9</sup> Personal reports indicate that there is more bureaucracy and paper work involved if/when requesting a videophone from a federal program, compared to requesting a videophone from a major VRS provider.

### **Required Provision of Ten-digit (Regular) Telephone Numbers**

From January 1st, 2009 FCC required VRS and IP text relay providers to provide ordinary ten digit phone numbers to the users. FCC also requires both direct calling between users by using that number, and calling from voice phones via relay services by using the same number. (Report and Order and Further Notice of Proposed Rulemaking 2008, CG Docket No. 03-123) The ten digit numbers are now a prerequisite to be able to use any video relay service, including emergency calls. The ten digit telephone number has two advantages;

#### **Identification**

Deaf people may hand over a regular telephone number to any person they meet. When someone without a videophone calls that number, the call will automatically be connected to a VRS provider, who in turn will call the customer who holds the number.

#### **Emergency calls**

The second advantage is related to quick and secure identification in case of emergency calls. As each ten-digit-number is registered to a physical address, it is (opposed to use of IP-addresses) possible to locate the caller immediately.

### **Concerns Expressed by the National Association of the Deaf (NAD)**

Both the National Association of the Deaf and the TDI (formally known as Telecommunications for the Deaf and Hard of Hearing, Inc.), are consumer associations lobbying for improved VI services. Both have and are involved in continuous lobbying for improved services. Some of the current concerns of NAD are:

- Only Deaf or hard of hearing consumers may receive regular telephone numbers with their videophone, restricting direct calls to and from hearing acquaintances who can sign. In the current situation, all calls between Deaf/hard of hearing consumers and hearing people must be done by way of VRS, regardless of the hearing party's signing ability.
- There is a need for more research and emphasis on development of VRS, as well as to ensure qualified interpreters.
- NAD has developed a guideline for use of VRI in various situations, which also includes suggestions on when it is appropriate to use VRI to replace an in-site interpreter and when it is not.

(Sources: <http://www.nad.org/issues/telephone-and-relay-services/relay-services/video-relay-service-vrs> and <http://www.nad.org/issues/technology/vri>. (National Association of the Deaf 2010))

## Challenges

As a service to secure functionally equivalent telecommunication services, the current VRS system in the US appears as very successful. VRS is not organized as a charity or an optional welfare service, but paid for by all telecommunication clients and only regulated by a public authority to secure equal functionality for the end users and equal conditions for providers of VRS. The service is growing steadily, the fund that finances the services grows as the traffic grows and the costumers may choose more or less freely between a range of service providers. Most important, Deaf people experience that they can access the telecommunication network in a language that is just as natural to them as a spoken language is to a hearing person. Several of the service providers are also Deaf-led, which gives them firsthand knowledge about the needs and demands from the Deaf clients.

While the VRS system as a whole seems to work well to secure functionally equivalent telecommunication services, there are a few issues that may be problematic.

### Managing the Sign Language Interpreter Corpus

Just like in other countries, the demand for sign language interpreter services exceeds the supply in USA. As the VRS industry draws large numbers of qualified sign language interpreters to operate the services, the gap between demand and supply has increased at other arenas, and there are signs that it is becoming more difficult to find available community interpreters when they are requested. The VRS providers rarely provide services, and the VRS operators/interpreters are not immediately available for VRI or community interpreting. Only a few interpreters work both as VRS operators and in community settings. In a survey among VRS interpreters, almost 30% provides community interpreting services less than five times per month, while 9% provide community interpreting services more than ten times per month. (Taylor 2010). The “corpus” of interpreters is much more divided than in Sweden and Norway, where the VI-interpreters continuously switch between community and VI assignments. As such, the overall use and management of the scarce sign language interpreter resources become less flexible in the US, as many are tied up in one kind of service provision.

### **VRS vs. Community Interpreting**

Any public body is obliged to provide sign language interpreters if this is the most appropriate means to secure access for Deaf or hard of hearing people (pursuant to ADA Title II and/or III), but scarce resources and lack of awareness may hamper the actual provision of accommodations. Attempts to use the VRS for situations where a community interpreter or VRI would be more appropriate, is considered illegal. Due to scarce resources, it maybe tempting to suggest a telephone meeting rather than a meeting face-to-face for clients or customers requesting a sign language interpreter. Next, there may be a shortage of available sign language interpreters in the area or at the suggested time for meeting, and the only accessible interpreters will be via VRS. As a consequence, VRS may conceal the actual demand for VRI or community interpreting services, or keep the demand at an artificially low level.

### **Limiting Misuse**

There are few, if any in-built cost reduction mechanisms, as more traffic generates a larger carrier contribution factor to the TRS fund. Future demand is partially calculated based on the predications from the VRS providers themselves, who have an interest in increasing the traffic to generate more income. The providers are very possessive on proprietary rights, as their numbers are being shared only with a few people in NECA and with the TRS Council. To date, the council cannot assess the figures, but only check out the procedures in general. In order to tackle these and other challenges, FCC released a Notice of Inquiry in June 2010, where they ask for comments on the most effective way to make VRS available and for suggestions on the most fair, efficient and transparent cost recovery methodology. (Notice of Inquiry 2010, CC Docket No. 10-51)

# Sweden

## Main Goals and Issues

Different bodies are responsible for distribution of the videophones and for providing the VI services. There is also a heavy presence of engineering companies that specialize in developing videophones (soft and hardware) designed for communication in sign language. There is no formal separation of VRI and VRS services, and the overall goal is to use new telecommunication possibilities to enhance access and inclusion in various arenas of life.

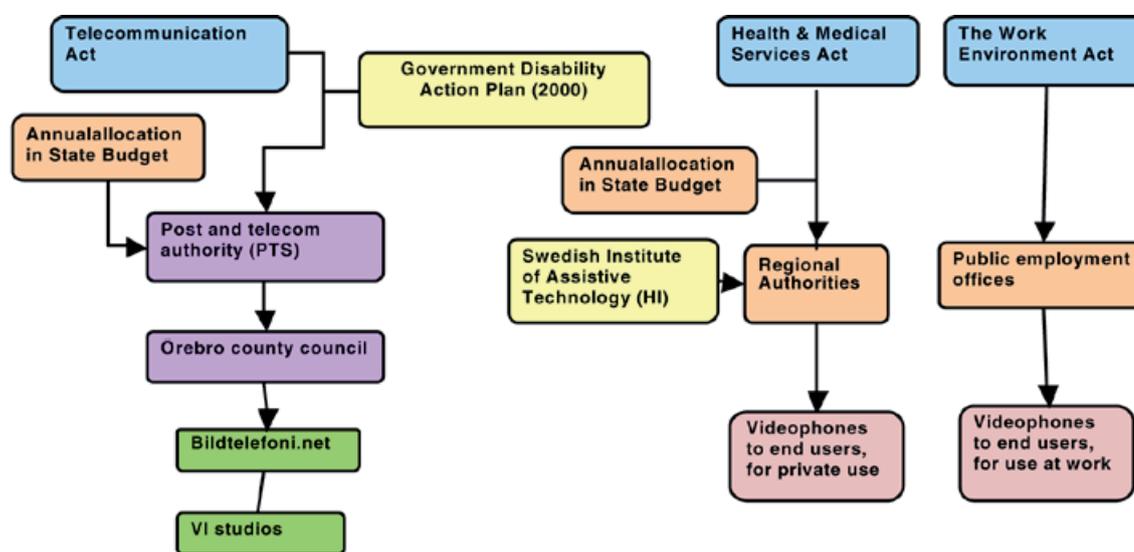


Figure 5: Video interpreting service system in Sweden

The Post and Telecommunication Agency procures the VI service (left side of Figure 5) on behalf of the government, while the videophones are distributed through regional and local public authorities (right side of Figure 5). The videophone is classified as assistive technology under the medical rehabilitation and employment related regulations, while the VI service is provided by a sign language interpreter agency, and viewed as a means to secure access to the telecommunication network and services.

## Brief History

### Videophone Trials

An early trial (1990) was the “Video Communication Project,” where a “network” was established between the Swedish Association of the Deaf’s offices in Leksand and Stockholm (240 km apart). Deaf sign language users, who were in frequent contact with each other, staffed both offices. The network had a capacity of 2Mbit/s, the same speed as the Swedish Telecom’s video conferencing services already established at that time, and could also provide a fairly good picture quality. The main cost was borne by Swedish Telecom (Televerket). While video conferences had to be booked in advance, Swedish Telecom agreed to let the connection between Leksand and Sweden stay open for 24 hours a day (Dopping 1991). Each user had a video terminal consisting of a video recorder (with the recording part disabled), a domestic television receiver and a control unit for dialling, reviewing of own view and with a built-in microphone and a loud speaker. Several user terminals were established at both places and were connected to the long distance connection to Stockholm (Dopping 1991). One video interpreter was also available to the participants, so they could use the video telephone to place calls to people outside the network. The interpreter’s terminal was placed within this network, since establishing a third site (for example at an existing sign language interpreter agency/service central) would make the costs sky-rocket.

### Video Interpreting Service Trials

The first VI trials took place in Örebro, a city with a high frequency of Deaf people. The Swedish state secondary schools for Deaf and hard of hearing youth is located in Örebro, and many of the former students settle in the city after graduation. As a consequence, the demand for sign language interpreter services is high in the area. The regional interpreter centre was and is motivated to find ways to increase access to interpreters. The Interpreter Centre under the Örebro County Council has been involved in video interpreting services trials since 1995, when the centre made the first local trials to see if it was possible to combine video telephony and interpreting services. In 1997, a trial for a nationwide, public video interpreting service was procured in competition by PTS, and the Interpreter Centre in Örebro got the task to run this trial as well. In 2006, PTS procured the first ordinary video interpreting service (Post- och telestyrelsen 2006), after several trials and projects 1998–2006.<sup>10</sup>

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<sup>10</sup> Since the first trials, the technological development within telecommunication has been rapid, and the trials have included tests with IP-telephony/developing an IP-platform and 3G/mobile video telephony.

## Legislation and Regulatory Bodies

### The Government Action Plan

Swedish disability policy involves large sectors of the government. The parliament passed an Action Plan for disability policy in 2000, with the objective: “a social community based on diversity; a society designed to allow people with disabilities full participation in the life of the community” (Swedish National Action Plan for Disability 2000). “Alternative telephony” is an area of commitment in the action plan, partly motivated by the rapid development within communication technology. The Ministry of Social Affairs is ordered to oversee the distribution of end user equipment (text telephones, videophones, etc.), while the Post and Telecom Agency is responsible for monitoring and securing access to the telecommunication network.

### The Post and Telecom Agency

The Swedish National Post and Telecom Agency (PTS) has monitored the electronic communications and postal sectors in Sweden since the deregulation of the telecommunication market in 1992. As a consequence of the Swedish government’s Disability Policy, that emphasizes the principle of sector responsibility, PTS is also responsible for ensuring that the Disability Policy is realised within the communication sector. In the introduction of the PTS strategy report for achieving the Disability Policy objectives within the communication sector they link provision of services to people with disabilities straight to their core vision “that everyone in Sweden should have access to efficient, affordable and secure communication services” (Post- och teles-tyrelsen 2005). Through their program for alternative telephony, PTS’ focus is access to the communication services with whatever telecommunication equipment people have, and to make services of importance for people with disabilities available. PTS procures several different services to secure access to important services within electronic communications and the postal sector for people with disabilities. One of the procured services is the relay service for video telephony. The text relay services are provided by the telecommunication incumbents, and is organised and financed over a different budget.

### The Swedish Institute of Assistive Technology

The Swedish Institute of Assistive Technology (**Hjälpmedelinstitutet**, HI) is run by the Ministry of Health and Social Affairs and the Swedish Association of Local Authorities and Regions. HI carries out several assignments initiated by the government, and has a consultative role towards the local authorities and regions. HI is also responsible for increasing knowledge and awareness about the government program “Alternative telephony” and the possibilities

that exist, among users and local/regional authorities. Where PTS' main focus is access to communication services, HI focus their activities on equipment and assistive technology. HI has been responsible for procurement of videophones on behalf of several regional authorities, but EU directive 2004/18/EC requires the procurement of videophones to be handled directly by local authorities (who are responsible for financing the videophones used by end users) by mid 2010. HI is therefore taking on a more consultative and supportive role towards the regional and local authorities than earlier.

## Video Interpreting Service Provider

The Interpreter Centre in Örebro runs the national VI service under agreement with PTS. Bildtelefoni.net is a subsidiary under the Interpreter Centre, and has six interpreter studios located in Örebro. Bildtelefoni.net also contracts with subvendors (local sign language interpreter provision agencies<sup>11</sup>), which run five studios other places in Sweden. The users need however only call one number to access the video interpreting service, and an internal router will direct the calls to the first available operator. The interpreters shift between working for Bildtelefoni.net and community interpreting assignments.

Lately, a number of regional interpreter agencies have considered establishing own VI studios, mainly to increase the access to interpreter services in cases where VRI may be more efficient than community interpreters. It is not expected that any of these will provide VRS services, which still only is provided by Bildtelefoni.net.

### Marketing and Information

Bildtelefoni.net is currently the only provider of VI services in Sweden. Their marketing and presentation towards the potential users have emphasis on information and advice on best practices to get the most out of their service. The information at [www.bildtelefoni.net](http://www.bildtelefoni.net) is bilingual in Swedish Sign language and written Swedish, and there is also some audio information in Swedish and some written information in English.

## Regulation of Video Interpreter Services

The minimum service requirements are specified in the procurement documents from PTS. The assignment requires that at least 70% of calls be

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<sup>11</sup> There are both private and public sign language interpreter provision and distribution agencies in Sweden. Several of these agencies have agreements or contracts with local and regional authorities (incl. schools, hospitals, etc), who pay for the requested interpreter services.

answered in less than 30 seconds, and that waiting time not exceed 60 seconds for 90% of all calls every month. However, operators are not always available, and the callers are often placed in a queue that can be quite long at peak hours. The service must be able to handle calls to and from video and voice telephones, including regular telephones, videophones, 3G mobile telephones and total conversation units that are prescribed in Sweden.

## Budget and Traffic

PTS allocates a basic contribution of SEK 8,650,200 (€934,566) every year for the first 60,000 relayed calls. If the number of calls exceeds 60,000, a tier system applies, and the Interpreter Centre will receive SEK109.65–129.38 (€11.84–13.97)/assignment for 60,001–100,000 relayed calls, and SEK 97.10 (€10.49)/assignment if more than 100,000 calls are relayed annually (Post- och telestyrelsen 2007).

From September 2010, the operating hours of Bildtelefoni.net is 07.00–22.00 on weekdays, and 09.00–17.00 on weekends and holidays. From 2006 to 2008, the number of unique users has grown from 1,318 to 3,046 in 2008. In the beginning of 2006, Bildtelefoni.net relayed a few hundred calls every month, a number that has grown monthly, and more than 12,000 calls were relayed in may 2010 (Tolkcentralen 2010). The traffic is expected to grow further, especially since only 30–40% of the potential users (sign language users) have a videophone installed at home or at their workplace, and the share is growing steadily.

## Equipment Provision

Depending on place of use (employment/work-related or at home/private), Deaf people direct their application for a videophone to the County Councils' centres for assistive technology or to the local employment office, which will assist and advise the applicant on finding and deciding on the most suitable model or solution. When a videophone has been assigned, users are also entitled to installation and support.

## Total Conversation

All videophones recommended by the Swedish Institute of Assistive Technology follow the Total Conversation standard, which allows use of video, speech and text at the same time. This principle entails that it is the user of the videophone that decides which modality or communication method(s) to use, and should not be dictated by limitations in the videophone.

### Videophones for Private Use

The regional authorities are responsible for the financing and distribution of videophones for use in everyday life/personal use, which is legally stipulated in the law on medical technology products (Lag om medicintekniska produkter 1993:584)<sup>12</sup> and regulations by the National Board of Health and Welfare (Socialstyrelsen 2008)<sup>13</sup>.<sup>14</sup> The definition of video telephony is: “A service or equipment that can be used to communicate via a public communication network, for example PSTN or IP-net, in sign language, sign supported speech, or speech with support from lip reading. Videophones send and receive moving pictures and sounds” (Post- och telestyrelsen 2007).<sup>15</sup>

### Videophones for Work Related Use

The National Insurance Office (**Försäkringskassan**) and the Public Employment Service (**Arbetsförmedlingen**), are responsible for financing assistive technology for use in employment. The Public Employment Service has four teams which act as consultants for local employment offices in providing videophones and other equipment for work related purposes for the Deaf and hard-of-hearing. For people in unemployment or during their first 12 months of employment, the Public Employment Service is responsible for assistive technology in the workplace, whereas **Försäkringskassan** is responsible for people who are in employment for more than 12 months.

### Recommended Videophones

Which telephone the end user borrows depends on personal needs as well as the range of selections provided by the local authorities. The videophones eligible for provision through the public authorities must be compatible with other models, to secure interoperability of the different models and brands that are distributed in Sweden. Few Deaf people are legal owners of the videophone/computer, and only borrow the equipment from the regional authority. Some also receive two videophones, so they can use their equipment to call family that can hearing or close kin who also know sign language directly and not by way of the VI service.

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<sup>12</sup> Medicinal Products Act.

<sup>13</sup> Socialstyrelsens föreskrifter och allmänna råd om användning och egentillverkning av medicintekniska produkter i hälso- och sjukvården

<sup>14</sup> 3G videophones are not covered by any of these public insurance schemes, but are in popular and extensive use among Deaf people in Sweden.

<sup>15</sup> Tjänst eller produkt som kan användas för att kommunicera över ett allmänt kommunikationsnät, t.ex. PSTN- eller IP-nät, med teckenspråk, tal med teckenstöd eller tal med stöd av läppläsning. Bildtelefonen skickar och tar emot rörliga bilder och ljud.

Most of the applicants are granted a locked computer with videophone software (MMX or Allan eC, Figure 6) or dedicated videophones like VT8882 (Figure 7) or TM-9000 (Figure 8) from Visiontech, or the eCPad from Omnitor.

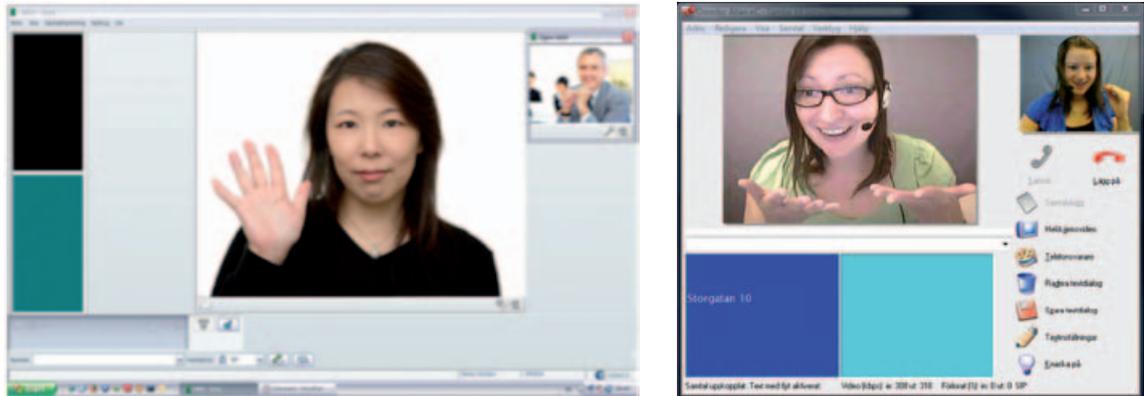


Figure 6: Left MyMMX ([www.nwise.se](http://www.nwise.se)), right Allan eC ([www.omnitor.se](http://www.omnitor.se))

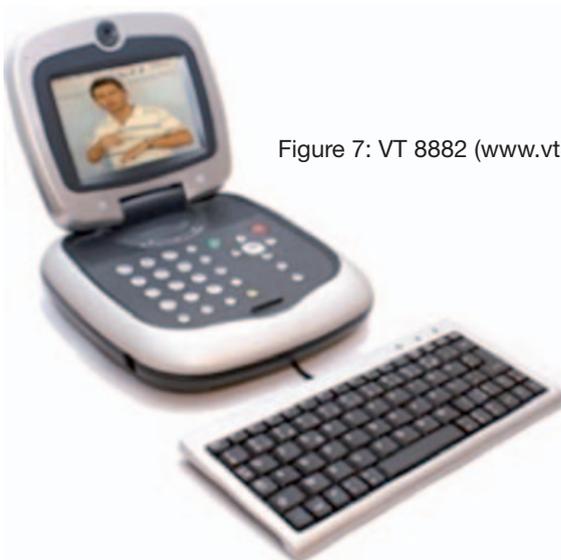


Figure 7: VT 8882 ([www.vt8882.se](http://www.vt8882.se))



Figure 8: TM-9000 ([www.tm9000.se](http://www.tm9000.se))

## Videophone Developers

A distinct feature about the Swedish system is the presence of several milieus of engineers who are involved in developing hard and software for video telephony for people who use sign language to communicate. The engineering companies' presence enhances access to first hand expertise knowledge on video telephony to providers of the video interpreting service, the Swedish Institute of Assistive Technology and the regional authorities. There are several Deaf engineers and technicians, which paves the way for a two-way information flow. Deaf people have access to knowledge about cutting edge videophone technology, and the engineers have first-hand knowledge about desired and needed improvements of the technical equipment.

### NWise

NWise develops and provides a VI service platform (MMX) for service providers that are used in several countries, (including text, video and voice) and videophone software for end users (MyMMX).

### Omnitor AB

Omnitor AB, who develops and distributes the videophone software Allan eC and the videophone Allan eCpad, are also involved in international standardization work through the International Telecommunication Union ITU and the European Technology Standardization Institute ETSI and EU projects).

### Visiontech

Visiontech, markets and sells the dedicated videophones VT-8882 TM-9000, and is mainly focused on developing dedicated videophones.

## Concerns Expressed by the Swedish Association of the Deaf (SDR)

### VI Service Provision

The queue system is currently not satisfying. If the service is busy or has no available operators, the caller is met with a message stating the service is busy, and asked to call later, without any indications of when "later" is. Also, the waiting times are too long during peak hours. It is positive that the operating hours have been extended gradually, but the service should operate on a 24/7 basis.

The quality and competence of the interpreters vary, and SDR sees a need to provide interpreters with courses and further education in interpreting via videophones. There is also a need for more research on various facets of VI, especially in terms of communication and language use.

### **Equipment Provision**

As the equipment is provided by different authorities, depending on arena of use (home or work) and where the users live, the provision may have varying quality to different users. Regional and personal assumptions and decisions may influence which model end users receive. Users may also experience they have been loaned a different model than their primary preference, due to shortage or a limited selection of videophones offered from their regional authority.

### **Organisation**

Although cooperation between the numerous authorities seems to work well, without any overt serious difficulties, SDR has expressed some concern that there are too many authorities involved, and that necessary improvements may be delayed due to complex information and agreement procedures. Also, the fragmentation can be confusing to the end user, since it is not always clear whether a technical problem is related to the videophone, the network or is located to the VI service provider.

## **Discussion – VI in Sweden**

Sign language and sign language interpreters are generally acknowledged and recognized as key to increasing accessibility for Deaf people, a view deliberately pushed forward and encouraged by a conscious and outspoken Deaf movement. Sweden was the first country in the world to provide a video interpreter service regulated and financed by a public authority, and continue to be an inspiration for other countries who consider establishing VI services.

The Swedish VI service is organised to secure “accessible telecommunication services”, and have done so by extending the already well established public interpreter service. By organising the VI service within an established sign language interpreter agency, there are few signs of “splitting” the interpreter resources, as is the case in the US. The interpreters switch between VI and community interpreting, and there is no organisational separation of VRS and VRI services. Providers of sign language interpreter services have larger possibilities to balance the demands for community interpreting and VI, and locate resources where they are needed.

### **Accessibility vs. “Functional Equivalence”**

There are no legal obligations to make the VI service “functionally equivalent,” only a strong commitment to make telecommunication services accessible to disabled people (as expressed in the Telecommunication Act and the government’s disability action plans). On the one hand, it is difficult for the service users to require access to telecommunication services that are functionally equivalent to the access hearing people experience. The queues and limited operation hours become a question of available resources, not a question of violated rights. On the other hand, “accessible telecommunication services,” opens up for broader approaches, and the VI providers do not have to strictly demarcate VRS and VRI. The focus is on how new telecommunication technologies can be used to develop and provide new services to increase access to other services, like for example provision of video interpreters at public counters (post offices, public insurance, tax administration, etc.) and for emergency communication.

### **Fragmented Responsibilities**

The current organisation of videophones and VI services is characterised by a separation of responsibilities. One set of regulations and actors are responsible to develop, market and provide the videophones, while another set of regulations and actors are responsible to provide the VI services. The cooperation between these sections is frequent and close, but there are some unsettled issues, foremost related to distribution of videophones.

Three different authorities are involved in provision of videophones to end users. The regional authorities provide videophones to end users for private purposes. The National Insurance Office (*Försäkringskassan*) and the Public Employment Service (*Arbetsförmedlingen*), are responsible for financing assistive technology for use in employment. Deaf people requesting a videophone both at home and for work must relate to at least two different public bodies. Deaf people with in a position of having an intermediate or less secure employment situation, may experience that it is not always clear whether the National Insurance Office or the Public Employment Service are responsible for installing a videophone at the workplace, since the latter are responsible for temporary employment or employment contracts up to 12 months, while the National Insurance Office is responsible for permanent employment contracts. People in transition between these types of employment have experienced bureaucratic complications when the responsibility is transferred from one public body to another.

When end users experience technical problems, it may not always be possible for them to detect whether it is a local problem with their equipment/videophone, or if it is a network or service provider problem. They may call for assistance from the equipment provider, only to find that the problem may be in the infrastructure (broadband/ISP), or that there is a problem connecting to the VI service.

# Norway

## Main Goals and Issues in Norway

The video interpreting service is defined as a means to improve access to the labour market and enhance inclusion of Deaf people at work, and is organised as a supplement to the regular interpreter service.

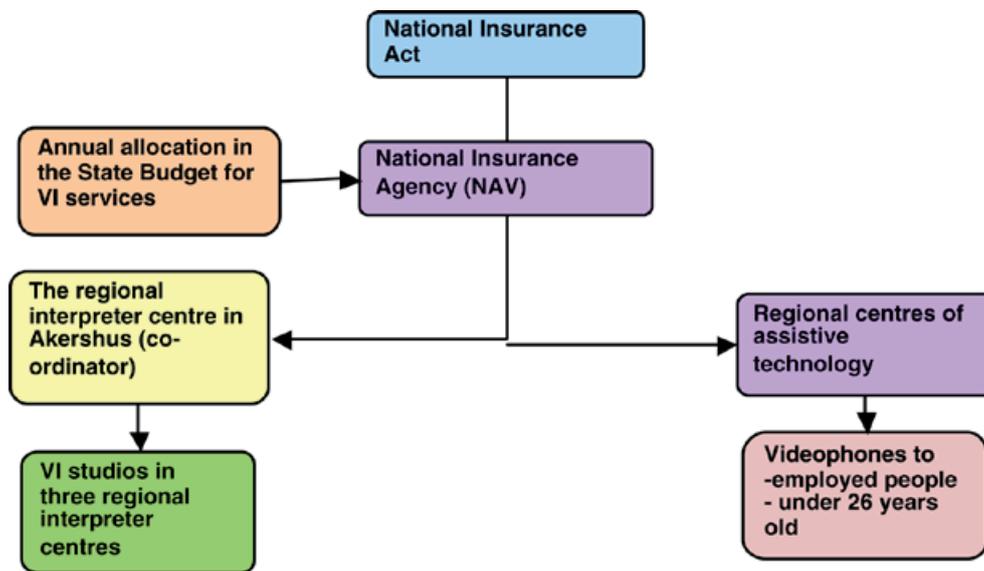


Figure 9: Video interpreter service system in Norway

The National Insurance Agency (NAV) is responsible for regulating, organizing and providing the Video Interpreter service as well as distributing videophones. The videophone is, at least in public discourse, foremost discussed and distributed as a tool to access the video interpreting service. Telecommunication access issues are currently not a salient theme by the service provider.

## Brief History

The first trials (1999–2000) focused on testing the use and benefits of video remote interpreting. They were carried out by the interpreter centre in the county of Møre & Romsdal, where there is a cumbersome transportation and settlement infrastructure that often required interpreters to spend a full working day travelling for only 20 minutes of interpreter service for a

doctor's appointment. The project was inspired by the ongoing projects in Örebro in Sweden, and aimed at gathering experiences under local conditions, focusing on improved interpreter service capacity and saved travel costs. ISDN videophones were used, and one conclusion was that the service worked best for video interpreting assignments. The saved cost (compared to a live on-site interpreter) was NOK720–2,620 (€89–325) for each assignment. (Norges Døveforbund 2001) The next trial project (2001–2003) focused on workplace interpreting services, and reused the ISDN videophones from the previous project, which were installed at 13 different workplaces with Deaf employees all over Norway. The project concluded with a proposal to the National Insurance Agency to establish an interpreter service via videophones for Deaf workers, suggests that the ministry of Transportations and Communication also be involved, and that such a service also become part of the Universal Services, in the same way as text relay services already were. (Norges Døveforbund 2003)

In 2004, the Norwegian parliament granted NOK1,500,000 (€186,284) to the National Insurance Agency, for a project to document the relevance of a video interpreting services for labour market purposes. The report from this project concludes that the previous trials had showed that there was considerable potential for increasing the efficiency of the interpreter services (less travel time and costs), and it would increase accessibility to interpreters for spontaneous situations as well as for planned meetings. Furthermore, the report concluded that videophones and video interpreting services contribute to further the qualifications of hearing impaired people at work,<sup>16</sup> and give more flexibility vis-à-vis colleagues and the management at the workplace. (Rikstrygdeverket 2004) In 2006, the parliament made a decision to establish a permanent video interpreting service for labour market participation for hearing impaired persons in 2006 (St.prp. nr 1 2005–06).

## National Insurance Agency

### Organization of Service

When the VI service had been defined as a supplement to the regular interpreter service, it was natural to involve the interpreter centres at the regional NAV offices for distribution of assistive technology, to establish the service. Interpreter centres in three regions Akershus (south-east), Møre og Romsdal

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<sup>16</sup> \*\*Translate this? The start quote mark is missing.\*\* This is the translation of the meaning in the English text above. "Bildetelefon og bildetolking bidrar til å fremme hørselshemmedes kvalifikasjoner i jobben og gi større fleksibilitet i forhold til kolleger og ledelse på arbeidsplassen."

(west) and Nordland (mid-north) counties were appointed as partners to develop the VI service in Norway, with the interpreter centre in Akershus as national manager. These three centres function as competence and resource centres in their regions (information, technical support, evaluation, keeping statistics) and provide video interpreting services (both telephone calls and remote interpreting).

### **Service Operation**

The service operates from 09.00–15.00 every day,<sup>17</sup> has one common address (SIP), and the users who request VI services are automatically routed to the first available interpreter, regardless of locations (callers as well as interpreters). There are no requirements or specifications for maximum answering time or queue handling, which is quite superfluous given the current limited number of users and low demand. All the studios are staffed by experienced and permanently employed interpreters, who also work as community interpreters. They work according to the national standard for the interpreter service (Rikstrygdeverket 2004), but there are no dedicated specifications or standards for the VI service.

### **Budget and Traffic**

As of 2010, 15 man-labour years are allocated annually for video interpreting, and the service has an annual budget of approximately NOK 6,300,000 (€782,395). The number of monthly assignments has grown from 46 in October 2008, to 102 in January 2009 and to 281 in March 2010 (NAV 2010), and is expected to grow steadily as more workers and employers learn about the service and have videophones installed at the work-place. A rough count by the VI administration indicates that 75% of the requests are for VRS, while around 25% are VRI assignments (NAV 2010).

### **Target Groups and Information**

Even though the service is formally directed at hearing impaired persons at the workplace, there are no limits on the theme or purpose for the requested interpreting service. Users who have not been granted a workplace videophone may use the VI service, providing their (private) equipment meets the technical standards and can communicate with the platform used at the inter-

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<sup>17</sup> Sometimes the service extends their service hours in the afternoon, or close down entirely for a day or two in case of interpreter meetings or events they are required to attend.

preter centre. The information about the service (website and folder) focuses on the advances and utility of the service, and seems to have employers and local NAV officers as their target groups. There is also a video entirely in sign language at the website ([www.nav.no/tolk](http://www.nav.no/tolk)) that presents the service and the process of setting up a video interpreting assignment in sign language

## Equipment Provision

Financial support for videophones is available under the National Insurance Scheme, pursuant to §10-7 f) of the National Insurance Act (Folketrygdloven 1997) which regulates the right to interpreter services for Deaf persons and §10-5 which regulates the right to “conversion of machinery and adaptation of physical surroundings at the workplace when appropriate and necessary for the purpose of enabling the disabled person to obtain or keep suitable work.” Videophones are defined as “video interpreter equipment.”<sup>18</sup> A videophone may be assigned as part of the users’ assigned right to interpreter services at work. The assistive technology centres in each county are responsible to assign videophones to the applicants, whose employers also need to confirm that they will cover network/broadband access costs and provide technical support at the workplace. As of September 2010, ca. 120 videophones had been assigned to users (personal comment by project manager at NAV). Only two models have been accepted for assignment from NAV. These are the MMX softphone (Figure 6) and the dedicated videophone Tandberg 150 (Figure10).



Figure 10: Tandberg 150  
([www.tandberg.com](http://www.tandberg.com))

<sup>18</sup> “Bildetolkutstyr” in Norwegian.

There are also an unknown number of Deaf people who have 3G videophones, and some have purchased a dedicated videophone directly from a manufacturer. NAV does however not guarantee that private videophones will be compatible with the VI service. The VI service administration requires that any model considered for approval as assistive technology must be compatible with the other videophones they provide, and must use the SIP-standard to communicate.

## **Concerns Expressed by the Norwegian Association of the Deaf (NDF)**

The VI service is still quite novel in Norway, compared to Sweden and the US. User experiences are fewer and there are more signs of the service being in a development process. Representatives from the Norwegian Association of the Deaf have identified the following three main challenges related to the current system.

### **Narrow Scope**

The VI service is entirely organised and offered as an interpreter service for Deaf people at work, in part of their work hours. The operating hours are 9-15 on work days, which limits access to the service. Calling a VI often replaces calls that otherwise would have been done with a text telephone. NDF questions why NAV is the sole public agency responsible for a service which also should be a telephone service, extending the current text relay service. By defining the VI as a telephone service, the operating hours need to be 24/7, and calls should be placed immediately.

### **Slow Service and Technical Problems**

It often takes too long time for the interpreter to get “in position” when a Deaf person calls to request their services. Shift of headsets, adjustment of picture (sharpness, distance) and ending other tasks before an assignment can be taken is frustrating. Further, the connection is not always reliable, and conversations are interrupted. Often, one will have to call again, only to meet another interpreter than initially.

## **Equipment Provision**

Only young people under 26 years old and Deaf people who are employed are entitled to receive a videophone from NAV. NAV only prescribes two models, the MMX softphone and Tandberg 150, and these models were selected without consulting the end users. There are other models on the market that NDF has better experience with, but these are not provided by NAV.

## **Discussion – VI in Norway**

### **A New Service**

The VI service is still quite novel in Norway, and must be evaluated in light of the short time it has been operating. Its operating hours are limited, there is still a restricted scope of entitled users, and many users experience both technical problems and delays before a relayed call or assignment actually is provided after they have called the VI service. As it is still in the initial development phase, it is unfair to compare the Norwegian service directly to the VI services in the US and Sweden.

### **Use of Interpreter Resources**

The Norwegian VI service bears similarities to the Swedish VI service, in the sense that it is organised as an extension of the existing public sign language interpreter service, and keeps the sign language interpreter resources within one body. The interpreters who provide VI services also have community interpreting assignments.

### **Too Narrow a Target Group?**

Only those who are already entitled to receive interpreter services at work (pursuant to the National Insurance Act §10–5 and §10–7 (f)), may request a videophone from the National Insurance Agency to access the VI service.<sup>19</sup> Students, pensioners and other unemployed Deaf people may (for the present) not apply for a videophone from NAV. The public motivation behind this priority is to improve access to the labour market and enhance inclusion of Deaf people at work. It could however be asked if limiting

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<sup>19</sup> Videophones are also distributed to young people under age 26 regardless of employment status.

the target group to people who already are employed is the right means to achieve increased access to the labour market. As long as a videophone is only provided **after** a Deaf person has been employed, the videophone cannot be used as a tool to find a job.

However, anyone who has purchased or borrowed a videophone (for example a 3G mobile telephone) that is compatible with NAV's VI-service, and is entitled to receive interpreter services, may use the VI service. Also there are no requirements that the calls must be work related. Deaf employees with a videophone at their workplace may use it for private assignments.

### **System Oriented Limitations**

Since the VI service is defined solely as an interpreter service and has no external financial sources (as for example from a Post and Telecommunication Agency or a telecommunication access budget), the VI service is also restricted by the gap between demand and supply of sign language interpreter services, and the priorities made by NAV to handle this situation. As a consequence, the VI service becomes less accessible and reliable for end users, compared to the situation in the US. The demand for interpreter services does not cease when the regular interpreter service closes at 15.45, and the VI service closes at 15.00. Since the VI service currently only partially meets user demand, the current service appears as more interpreter and system-centred than user-centred.

# Final Comments

## Organising Rights – Balancing the Resources

The process of performing and using a VI service is similar in Norway, Sweden and the US. In all of the countries, at least two videophones, a broadband connection, a Deaf person, a hearing person and sign language interpreter is involved. In all of the countries, the majority of assignments can be classified as video relay services, where the hearing party involved is contacted by way of telephone. Another similarity is that there is an element of disability politics or legalisation involved, and there is a common goal to enhance accessibility and inclusion of the Deaf and hearing impaired.

The VI services are established to secure or support different rights. In the US, the dominating VRS service (compared to the much less widespread VRI services) is organised to secure what is defined as a civil right – namely functionally equivalent access to telecommunication services. The VI services in Sweden and Norway lack a similar strong legal foundation, and are organised as interpreter services, but with different motivations. In Sweden, the legal motivation to provide VI services is to secure accessibility to telecommunication services, while the motivation in Norway is increased access to the interpreter service to enhance labour market participation.

Compared to the US, the sign language interpreter services have a strong public foundation in both Sweden and Norway, and the government already finances a wide range of sign language interpreter services. As a consequence of the Swedish and Norwegian governments' obligation to provide sign language interpreter services, the public bodies providing interpreter services probably also have a higher self-interest in keeping the sign language interpreter services gathered in one corpus. They need to locate and distribute the interpreter resources in ways that give as many users as possible access to an interpreter while simultaneously keeping the costs down. There is also a focus on providing varied and alternating work tasks for the interpreters, so few, if any sign language interpreters only work inside a VI studio.

In the US, there is a focus on providing equal access for all citizens, and VRS have been defined as a service to secure equal access to the telecommunication network for the Deaf and hearing impaired. The sign language interpreters are tools to secure this right, and access to sign language interpreter services is not a right in itself, like it is in Sweden and Norway. Thus, the government does not have the same self-interest in controlling the sign language interpreter resources as Sweden and Norway. The whole emphasis is

on securing functionally equivalent access to the telecommunication network. This entails that the VRS must operate at the closest possible speed as if the telephone call had been placed directly between two regular telephones. All telecommunication providers are obliged to secure that their services are accessible to all customers, including Deaf and disabled people. This and other obligations are shared and partly jointly organised in various ways, and in the case of VRS, the responsibility is shared through a fund administered by the National Exchange Carrier Association.

Of the three systems described in this report, it seems that the VRS system in the US is experienced as the most accessible and customer oriented system by the end users. The financial resources (the TRS fund) grow as the traffic grows, and there is no built-in pressure to limit the usage or demand for VRS services, as is the situation in Sweden and Norway. The success of the VRS services in the US has however probably caused by a split interpreter corpus, and there are signs that the number of available interpreters for community services has decreased.

The Swedish VI system has a “double” focus, where the political motivation is access to telecommunication services, but the service is provided by an established, public sign language interpreter service. It seems that the Swedish system currently best handles the need to balance a coordinated use of the sign language interpreter resources with the need, if not right, the Deaf and hearing impaired have to use telecommunication services, albeit without securing full and equal access to the telecommunication services. The VI service has long queues at peak hours, the demand is already greater than supply, and the traffic is expected to grow as more and more Deaf people get a videophone. Without increased transfers of financial resources it is hard to see how the balance between telecommunication access and interpreter management issues will be maintained.

In both Sweden and Norway, there is a fixed annual budget for VI services, which can only be adjusted or increased through negotiations with the parliament and the annual allocations in the state budgets. The Swedish allocation is administered through the Post and Telecommunication Agency, while it is defined as funds for video interpreting in Norway, with no reference to telecommunication access issues. It would be unjust to judge the relatively novel VI service in Norway in light of the much more developed and experienced services in Sweden and the US. Considering the importance telecommunication issues have for the provision of VI services in the other countries, and the fact that 75% of the assignments are video relayed telephone calls (many of these probably replace calls that earlier would have been done via the text relay service the national telecommunication incumbent Telenor is still responsible for), it appears to only be a question of time before the telecommunication sector becomes involved in one way or another in Norway as well.

## Dedicated or Generic Videophones

Currently, most VI providers only accept calls from dedicated videophones and software that has been distributed by or approved by themselves or a public authority (depending on country in question).<sup>20</sup> VI service providers in the US and Norway distribute the videophones, while several separate public authorities are responsible for equipment provision in Sweden. Many Deaf people use one or more of the free instant messenger software programs with video functions (Skype, MSN, camfrog, oovoo, AIM, iChat and more) to communicate directly with each other. Many prefer these to the dedicated videophones for direct communication, and only turn to their dedicated videophone (if they have one) when they request VI services.

As videophones develops further, and increasingly become more and more compatible between different platforms and standards, it is a question of how long it will be before one can access the VI service with free videophone software. Since there are no built-in mechanisms that expand the budget and available resources when the traffic grows in Sweden and Norway, the growth can cause an increased gap between demand and supply. One consequence may be that strict restrictions for use or other measures to limit access will be implemented if considerably more resources are not spent to expand the VI service. In the US, use of generic videophones to access the VRS service will probably not have the same consequence, as long as the VRS providers can have their expenses reimbursed from a growing TRS fund.

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<sup>20</sup> The VI platform developed by nWise (MMX) has a gateway to accept calls from Skype, but this is only implemented if the VI provider requests this opportunity.

# Regulations, Website Resources and Other References

## USA

### **Federal Communication Commissions**

TRS information page, including laws regulations, history, filings, recent news and updates on TRS and VRS

<http://www.fcc.gov/cgb/dro/trs.html>

The Disability Rights Office at FCC

<http://www.fcc.gov/cgb/dro/>

The Telecommunication Relay Service (TRS) rules (Code of federal regulations (C.F.R.), title 47 Telecommunications § 64.601 – 64.606)

<http://www.fcc.gov/cgb/dro/4regs.html>

### **National Exchange Carriers Association (NECA).**

TRS Resources – various pieces of information on the TRS fund incl. VRS and TRS traffic, fund sizes, VRS providers and more.

[https://www.neca.org/cms400min/NECA\\_Templates/TRS\\_Landing\\_Page.aspx](https://www.neca.org/cms400min/NECA_Templates/TRS_Landing_Page.aspx)

### **Some VRS providers' websites**

Sorenson VRS: [www.sorensonvrs.com](http://www.sorensonvrs.com)

Purple: [www.purple.us](http://www.purple.us)

Snap!VRS: [www.snapvrs.com](http://www.snapvrs.com)

Convo: [www.convorelay.com](http://www.convorelay.com)

Sprint Relay: [www.sprintvrs.com](http://www.sprintvrs.com)

The Z VRS: [www.csdvrs.com](http://www.csdvrs.com)

### **National Association of the Deaf (NAD)**

On Video Relay Services

<http://www.nad.org/issues/telephone-and-relay-services/relay-services/video-relay-service-vrs>

On Video Remote Services <http://www.nad.org/issues/technology/vri>

### **Telecommunications for the Deaf and Hard of Hearing, Inc.**

Consumer and lobbyist association, [www.tdi-online.org](http://www.tdi-online.org)

## Sweden

### **The Swedish Post and Telecom Agency (PTS)**

Information site on Video Interpreting <http://www.pts.se/sv/Funktionshinder/Tjanster/Bildtelefoninet/>

### **The Swedish Institute of Assistive Technology**

Information about the Alternative Telephony programme, including videophones (Swedish only)

<http://www.hi.se/sv-se/Arbetsomraden/Projekt/Alternativ-telefoni/Produkter-och-tjanster/>

### **Video Interpreter Service**

Bildtelefoni.net – information on the VI service in Sweden (Swedish only), [www.bildtelefoni.net](http://www.bildtelefoni.net)

## Norway

### **The National Insurance Agency (NAV)**

Information page on video interpreting and videophones (Norwegian only)

<http://www.nav.no/Helse/Hjelpemidler/Tolketjenesten/Tolketjenesten/183114.cms>

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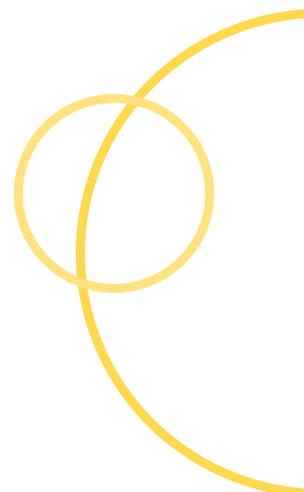
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Appendix 1: Overview of video interpreting services in Germany, USA, UK, Sweden and Norway

	Germany	USA (VRS only)	UK	Sweden	Norway
<b>Legislation</b>	Telecommunication legislation	Americans with Disabilities Act and Telecommunication Act	Disability Discrimination Acts 1995 & 2005; Equality Act 2010	Telecommunication Act, Medical Rehabilitation Act and Work Environment Act	National Insurance Act
<b>Public authority</b>	Federal Network Agency	Federal Communications Commission	no central authority	Post and Telecom Agency	National Insurance Agency
<b>Service providers</b>	Tess GmbH (a business)/German Society for the Hearing-Impaired (an NGO), Telesign (a business)	FCC approved/certified VRS providers (private companies)	Signvideo (social business), Sign Translate and Deaf Connection (charitable)	The Interpreter agency in Örebro county (bildtelefoni.net)	The Interpreter service at the National Insurance Agency
<b>Appointment of service provider</b>	procurement	certification according to the Telecommunication Relay Service rules	procurement/ individual contracts	procurement	
<b>Provision of video-phones</b>	only at work by the Integration department or public employment agency private: no provision	videophones for VRS provided by service provider	financed by department of Work and Pensions through its Access to Work Scheme and by contracts with individual local authorities	regional authorities, national insurance agency or public employment agency	regional centres for assistive technology/ The National Insurance Agency
<b>Universal service</b>	yes (provided there is terminal compatibility), but service is not free	yes	employed people and retired Deaf people (65+) on a subscription basis (not true universal service)	yes	primarily employed people, but service is open to anyone with a compatible videophone
<b>Other</b>	project for 5 years (2004–2009). Procured by the government since 2009.	VRS accepted as Telecommunication Relay service since 2000, financed by a fund/fees from all consumers		trials since mid-1990s, permanent since 2008	periodic trials since 1998, permanent since 2008





The Swedish Institute of Assistive Technology (SIAT) is a national resource centre on assistive technology and accessibility for persons with disabilities. SIAT works for full participation and equality for persons with disabilities by ensuring access to high-quality assistive technology, an effective provision of assistive devices and an accessible environment.

The activities of the Swedish Institute of Assistive Technology cover:

- testing and support to procurement of assistive devices
- research and development
- analyses of needs, knowledge and methodology development
- training and capacity building
- international cooperation
- information and communication

The Swedish Institute of Assistive Technology is run by the Ministry of Health and Social Affairs and the Swedish Association of Local Authorities and Regions (SALAR).



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