International Deployments of Video Relay Services

Final Report

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1. EXECUTIVE SUMMARY

Introduction

1.1. Ofcom engaged CSMG to review international deployments of video relay (VR) services. The purpose of the study was to assist Ofcom in understanding how VR services operate in various countries, how adoption has evolved, and how the services are set up with respect to regulation, funding, operations and technology.

1.2. A VR service allows sign language users to make and receive telephone calls with the assistance of a sign language interpreter. A sign language interpreter (also referred to as a VR communications assistant or VR interpreter), joins a call between a VR user and a hearing person, and translates between sign language and speech via a two-way video link with the VR service user.

1.3. Our study follows Ofcom's original consultation into relay services in 2011[1] in which Ofcom sets out a high level assessment of VR and initial views on the costs and benefits of mandating a VR service in the UK.

1.4. There is no standard way to operate VR services, and existing deployments of VR services in different countries show differences across multiple dimensions. Reviews of relay services are currently on-going in multiple countries including Australia, Denmark, France, Norway and the US.

1.5. This report presents key findings from our research and selected case studies of international deployments outside the UK.

Approach

1.6. Our study considered VR services in 8 countries: Australia, Denmark, France, Germany, New Zealand, Norway, Sweden and the United States (US). The study does not cover VR services in the UK. Our selection of countries enabled us to examine a variety of ways in which VR services are operated as well as other differences across multiple dimensions. For example, we covered countries with permanent national VR services such as the US, Norway, Sweden, Germany and New Zealand, but we also covered Australia, Denmark and France which have or are due to run national VR trials. We also believed it would be worthwhile to consider other interesting features exhibited by the selected countries. The US is the only country in the world where VR services are provided 24/7, whereas VR services in all other countries are only available for restricted hours of operation. Germany and Denmark distinguish between business and personal use. Australia and New Zealand use Skype for their VR service, whereas most VR service providers in the other selected countries use dedicated platforms for managing and routing VR calls.

1.7. Between the end of August 2012 and mid-October 2012, CSMG interviewed key organisations and individuals in each selected country, comprising government departments, national regulatory authorities (NRAs), VR service providers and organisations representing those with hearing and/or speech impairments. Interviews were conducted by phone, instant messaging, video conference and VR. Interviewees were given the opportunity to review the country case studies to ensure accuracy.

[1] http://stakeholders.ofcom.org.uk/binaries/consultations/review-relay-services/summary/relay_services.pdf

1.8. CSMG also conducted secondary research, which involved reviewing publicly accessible information and earlier studies comparing international deployments of VR services[2].

Country Overviews

1.9. Examples of VR services can be found around the world. The level of provision and pace of development of VR varies significantly between different countries, so it is important to appreciate the relevant context in each country.

1.10. It is also important to appreciate the relationship between Video Remote Interpreting (VRI) and VR. VRI is the use of a remote sign language interpreter accessed via a video link when all parties in a conversation are based in the same location. In some countries such as the US, Germany and Australia, a strict distinction is made between VRI and VR, whereas in Sweden, Norway and Denmark, no distinction is made between VRI and VR.

1.11. The remainder of this section provides a high level overview of VR in each country. The case studies on the selected countries provide more detail on how VR services operate, how adoption has evolved, and how the services are set up with respect to regulation, funding, operations and technology.

Australia

1.12. The VR service in Australia currently operates as a trial. It is free of charge to users, and can be used for either business or personal use. It is available for 11 hours a day and users do not need to register in order to use the service.

1.13. The VR service is provided voluntarily by Australian Communications Exchange (ACE) which is the current holder of the contract to provide the National Relay Service (NRS). TUSMA (Telecoms Universal Service Management Agency) has responsibility for the NRS contract and does not mandate the service provider to offer a VR service.

1.14. ACE receives funding from TUSMA for providing the NRS contract. At the moment, ACE funds the current VR service through a funding surplus. TUSMA is funded through government funding and a levy on telecoms operators. TUSMA is currently running a tender process to select a NRS supplier post July 2013, but there is no commitment to procure a VR service.

1.15. The VR service uses Skype exclusively.

Denmark

1.16. Denmark does not distinguish between VR and VRI. Denmark features permanent VR/VRI services for business use. The National Interpreters Authority (DNTM), part of the Ministry

[2] Vogler, C. et al. (2011), 'Video Relay Service Practices and Policies Around the World', 2nd International AEGIS Conference, http://www.epr.eu/aegis/wp-content/uploads/2011/12/AEGIS_Conference_proceedings-final.pdf
Haualand, H. (2010), Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing, The Swedish Institute of Assistive Technology (SIAT) (Hjälpmedelsinstitutet, HI) and Fafo Institute for Labour and Social Research, http://hi.se/Global/pdf/2010/103102-pdf-VI-no-usa-swe.pdf
Mission Consulting (2012), 'Canadian Video Relay Service Research and Feasibility Study', Commissioned by Bell Canada in response to a request from the Canadian Radio and Telecommunications Commission (CRTC), http://www.crtc.gc.ca/partvii/eng/2009/8678/c12_200905557.htm

of Social Affairs & Integration, ran a 1-year national trial for personal use, which ended on 30 September 2012. The government has not made a decision yet on whether and how to provide VR/VRI for personal use in the future.

1.17. For permanent VR/VRI services for business use, VR/VRI is free of charge to users. Similarly, the national trial for personal use was also offered free of charge to users. There are 3 providers of VR/VRI in Denmark: TegnKom, 12K and CFD. Business VR/VRI services operated by TegnKom and 12K are available between 0800 and 1600 on weekdays. DNTM's personal VR/VRI trial was also available on weekdays at the same times, except for Tuesday and Thursday on which the service was provided until 2000. Registration is required for business VR/VRI services.

1.18. There is no specific regulation which is directly relevant for VR. However, there is disability regulation which gives hearing impaired people the right to free sign language interpreters in all aspect of life. The DNTM administers community interpreting for personal use.

1.19. Business VR/VRI calls are paid for by local job centres which are financed by local government funding. The DNTM's VR/VRI trial was financed by central government funding.

1.20. Both the DNTM's VR/VRI trial for personal use and business VR/VRI services offered by TegnKom and CFD use a dedicated platform to manage and route VR calls. 12K's VR/VRI service is based on Skype.

France

1.21. VR services in France are currently provided on a commercial basis. There are a number of competing providers, including Websourd, Tadeo and Viable. A publicly funded national trial for a relay service for personal use is expected to start in February 2013, and will run for a year. The trial is for a closed group of 900 users, and will include persons who are deaf and hard of hearing. One of the aims of the trial is to understand how a relay service – public or private – could potentially be funded in the future.

1.22. In France, employers are required to comply with the Law of 11 February 2005, which sets out new rights for disabled people in France and requires employers to make the workplace accessible to disabled employees subject to certain criteria.

1.23. There is no public funding available for private users. Historically there has been funding available for employees to use VR, as part of government accessibility initiatives to promote equivalence in the workplace. Funding for VR services is available for business users from two organisations: AGEFIPH (Association de Gestion du Fonds pour l'Insertion Professionnelle des Personnes Handicapées) and FIPHFP (Fonds pour l'Insertion des Personnes Handicapées dans la Fonction Publique).

1.24. Tadeo provides VR and Text Relay (TR) services, and operates its VR service between 0900 and 1230 and between 1330 and 1730 on weekdays.

1.25. Both Websourd and Tadeo use dedicated platforms to manage and route VR calls.

Germany

1.26. In Germany, personal use and business use of the VR service is provided by the same provider, but are organised separately. Users need to sign a monthly contract and pay subscription and usage charges. For personal use, tariffs are set at an affordable rate. For business use, tariffs are significantly higher (as they must cover the costs of running the service for business use) but the costs are initially paid for by employers and then can be recovered from the Integration Office for their Bundesland (Federal State).

1.27. The service is available for personal calls on all days of the week, between 0800 and 2300 and for business calls on weekdays, between 0800 and 1700. Registration is required for both personal and business use.

1.28. Relay services in Germany are mandated through an amendment of the German Telecommunications Act (TKG). Section 45 of the TKG implements Article 7 of the European Union's Universal Service Directive, but is not placed in Sections 78 to 84 of the TKG, in which the European Union's Universal Service Directive is implemented. It is instead placed with other consumer protection legislation. The amendment stipulates how they will be funded and that they should be available at an affordable cost.

1.29. The telecoms providers are obligated to provide relay services; they can either source their own or use a procurement arrangement run by the Bundesnetzagentur (BNetzA) which is tendered every 2 years. VR and TR are currently provided by Tess.

1.30. The video relay service is available to both personal and business users. Business use is provided at cost and funded by Integration Offices in each Bundesland. For personal usage the majority (95%) of Tess's funding comes from the telecom providers. The other 5% comes from fees charged to the end user. Tess is a non-profit organisation, and if usage is higher than expected, generating incremental income, then the excess is returned to the telecom providers.

1.31. The VR service uses a dedicated platform to manage and route VR calls. The service is available through dedicated video hardware, through softphones on PCs, or via mobile.

New Zealand

1.32. New Zealand has a permanent VR service. The VR service is free of charge to users, and can be used for either business or personal use. It is available between 0900 and 1700 on weekdays and users need to register in order to use the service.

1.33. No legislation is used to mandate VR. The VR service exists in New Zealand, because the NZ Government identified VR as a development priority following a review of the relay service in 2005.

1.34. The New Zealand Government has procured national relay services, which includes VR, from the same single provider, Sprint Relay, since 2004. Sprint Relay receives specific funding for VR from central government via the Ministry of Business, Innovation & Employment.

1.35. Skype is the preferred method to use the VR service and accounts for more than 95% of VR calls. Users can use videophones to make VR calls but this is rare.

Norway

1.36. Norway does not distinguish between VR and VRI. The VR/VRI service is provided on a permanent basis by the State Labour and Welfare Organisation (NAV), a government department. It is free of charge to users, and can be used for either business or personal use. The VR/VRI service is available between 0800 and 1500 on weekdays.

1.37. Users do not need to register in order to use the service, but registration is required for acquiring a videophone or PC client, if conditions are met. The PC client is available free of charge to any deaf user and videophones are available to employees and students. Deaf people under the age of 26 can also apply for videophones for language and communication development.

1.38. VR services are provided as part of a broader right, in the Norwegian National Insurance Act, to interpreting services. The telecoms regulator, NPT (Post- og teletilsynet) is not involved in regulation of VR/VRI services.

1.39. The NAV receives specific funding for VR/VRI from central government.

1.40. The VR/VRI service uses a dedicated platform to manage and route VR calls. The service can be used by anyone with a videophone or PC client.

Sweden

1.41. Sweden does not distinguish between VR and VRI. The VR/VRI service is provided on a permanent basis. It is free of charge to users, and can be used for either business or personal use. The VR/VRI service is available between 0700 and 2200 on weekdays, and between 0900 and 1700 on weekends and holidays. Users do not need to register in order to use the service, but registration is required for acquiring a videophone.

1.42. The Interpreter Centre at Örebro runs the national VR/VRI service, known as "Bildtelefoni.net", on contract from Swedish Post and Telecom Authority (PTS). PTS procures the contract to supply these services on a regular basis (every 4 to 5 years with various options available). The latest procurement of the service has been delayed by legal challenges.

1.43. The VR/VRI service is entirely funded by the government, and can be used for free by both personal and business users. The funding is provided from the central government budget. Provision of the service does not differ for personal and business users, but the funding model for equipment does differ: Personal users borrow equipment from regional authorities, whereas business users can recoup equipment costs from one of two government agencies.

1.44. The VR/VRI service uses a dedicated platform to manage and route VR calls. Users can access the VR/VRI service in a number of different ways. Dedicated videophone hardware or software is common, as is use of a web client through PCs.

United States

1.45. VR services in the US are available for free and unrestricted 24/7 for all users, and for any purpose. Users must register in order to use the VR service. VR equipment is also distributed by some VR providers for free.

1.46. The US had many VR providers, but the number has fallen due to the introduction of a stricter certification process and requirements designed to reduce misuse and fraud. VR is undergoing major changes in the US. The Federal Communications Commission (FCC) is discussing proposed reforms with stakeholders, and expects these reforms to start in 2013 and take two years to implement.

1.47. In the US, relay services including VR are mandated under Title IV of the Americans with Disabilities Act of 1990 (ADA). This requires communication providers to offer access to the telephone system that is functionally equivalent to voice telephone services.

1.48. Approved VR service providers are compensated on a per-minute basis, tiered according to call usage volumes, from a government-mandated fund which is funded by telecom providers.

1.49. Due to scale of the VR market in the US, all VR service providers use dedicated platforms to manage and route VR calls. Most users use dedicated videophones which are distributed for free by VR providers.

2. SIMILARITIES AND DIFFERENCES

Introduction

2.1. This section presents key insights from our study, identifying similarities and differences between countries.

2.2. Germany, New Zealand, Norway, Sweden and the US offer permanent national VR services for both personal and business use. Denmark features permanent VR services for business use, and ran a 1-year national VR/VRI trial for personal use, which ended on 30 September 2012. In Australia, the current relay provider is running a VR trial, although it is unclear how this will evolve, once the new contract for the national relay service is awarded. France features several commercial providers, and is scheduled to launch a government-run national trial in 2013.

2.3. The following table provides a high-level comparison of VR services in each country.

Figure 1: High Level Country Comparison of Video Relay (VR) Services

Country	VR Status	VR Funding Source	Cost to User	Number of VR Providers
Australia	Voluntary trial run by current relay provider	Mixed funding from telecom providers and government	×	Single
Denmark	Permanent for business use; National trial for personal use ended in Sep 2012	Government	×	Multiple
France	Commercial services; National trial expected in 2013	Employers fund services run by relay providers Government in upcoming trial	×	Multiple
Germany	Permanent	Mixed funding from telecoms providers, government and users	✓	Single
New Zealand	Permanent	Government	×	Single
Norway	Permanent	Government	×	Single
Sweden	Permanent	Government	×	Single
United States	Permanent	Telecoms providers which apply a levy on all customers	×	Multiple

Mandate for Video Relay

2.4. In most countries, VR is mandated using disability related legislation.

2.5. In the US, relay services including VR are mandated under Article IV of the ADA. This requires communications providers to offer access to the telephone system that is functionally equivalent to voice telephone services. In Sweden, Norway and Denmark, disability regulation gives hearing impaired people the right to free sign language interpreters in all aspects of life. Sweden also separately has a law on electronic communication which governs the VR/VRI service[3]. In Germany, relay services are covered in an amendment in 2007 of the German Telecommunications Act (Section 45 TKG), which sets out how relay services should be funded and states that relay services should be available at an affordable cost to users. In France, employers are required to comply with the Law of 11 February 2005, which sets out new rights for disabled people in France and requires employers to make relay services available to disabled employees; Decree No. 2009-546 (2009) also mandates access by hearing impaired people by telephone to the public sector.

2.6. In New Zealand and Australia, VR is not mandated. The VR service exists in New Zealand because the Government identified VR as a development priority. In Australia, TUSMA, which is currently procuring for a new national relay service provider, has not decided whether to procure VR as part of the national relay services contract.

2.7. In some countries, no distinction is made between VRI and VR services, and as a result, interpreters do not treat VRI calls differently from VR calls. Examples of such countries include Sweden, Norway and Denmark. At the other end of the spectrum are the US, Germany and Australia, which do not allow VR sign language interpreters to take VRI calls; VRI calls in these countries are available at a cost to the user. New Zealand also distinguishes between VR and VRI, but is likely to provide VRI for free in addition to VR from 2013 using government funding; the distinction between VR and VRI may also be removed, as both services would be government funded and likely to be provided by the same provider.

VR Service Providers

2.8. One notable difference between countries is whether VR services are provided by a single provider or multiple providers. A single provider may be more suitable, if the operational scale is likely to be limited by the number of VR consumers. A single provider may also be preferred in order to simplify planning and delivery of VR. Examples of countries with single VR service providers include Germany, Sweden, Norway, New Zealand and Australia.

2.9. Some countries opt for multiple providers in order to promote competition, which can potentially reduce the cost of the service to those funding it and offer more choice and innovation to consumers.

2.10. The market for VR services in the US features multiple providers, which need to be certified by the FCC in order to operate. Users can choose any provider and, in fact, can use multiple providers at the same time. The US previously had over 50 VR service providers, but as of March 2012, this had reduced to 8 providers. The number of providers

[3] http://www.notisum.se/rnp/sls/lag/20030389.HTM

has fallen due to the introduction of a stricter certification process and requirements designed to reduce misuse and fraud. Furthermore, although the market features multiple providers, the market is dominated by a single provider with approximately 80% market share, and the FCC has commented that the current industry structure could potentially be more efficient if it shifted from having multiple sub-scale providers and a single at-scale provider to having several at-scale providers[4].

2.11. Denmark and France also feature multiple VR service providers. In France, VR services are provided by multiple commercial providers, in the absence of a nationally mandated service. France is expected to run a trial for a publicly funded service in 2013.

2.12. In Denmark, hearing impaired people in employment can choose their preferred VR/VRI provider for business use. In the 1-year VR/VRI trial for personal use which ended on 30 September 2012, the DNTM invited different interpreter providers to compete over time slots and chose the cheapest provider for each time slot.

2.13. As observed in Denmark, competition can be achieved by a formal tendering process, which can be used to select one or more providers. In Germany, Sweden, New Zealand and Australia, single VR service providers are tendered for by the relevant government department or NRA. The advantage of a formal tendering process is that it offers the option of introducing price competition between potential providers. Relay providers in New Zealand and Australia, however, bid for contracts with fixed prices set in advance, so competition during tendering is not based on absolute price, but what can be delivered within the tender value.

2.14. A formal tendering process is currently used by the US Federal Government to select a single VR service provider to handle calls to and from federal government agencies. These calls are outside the scope of VR services mandated by the FCC.

2.15. Most VR services are not limited to non-profit organisations. VR service providers can be provided by profit making organisations in the US, Sweden, Denmark, New Zealand, Australia and France. However, VR contracts in some of these countries are currently held by non-profit organisations. For example, the current provider in Sweden is Örebro County Council, which is not allowed to make a profit from VR due to laws on regional authorities. In Australia, the current provider, ACE, which is voluntarily offering VR on a trial basis funded by the surplus on TR provision, is also a non-profit organisation.

2.16. In Norway, the VR/VRI service is both regulated and provided by the NAV, a government agency. In Germany, if the VR service generates higher usage than expected and consequently generates incremental income, then the excess is returned to the telecom providers, which fund personal VR calls.

[4] The FCC comments on this in FCC 11-184 (Structure and Practices of the Video Relay Service Program, Further Notice of Proposed Rulemaking, 15/12/2011). 'Sub-scale' and 'at-scale' are economic terms which refer to the level of production in relation to the 'minimum efficient scale' (MES) of production. MES is defined as the minimum level of output required to minimise long run average costs. In the context of VR, an 'at-scale' VR service provider generates a volume of minutes large enough to minimise long run average costs. 'Sub-scale' VR service providers operate below the MES volume of minutes, and thus, do not generate sufficient VR minutes to benefit from economies of scale.

2.17. Some providers offer products and services beyond VR. In Sweden, Norway and Denmark, there is no distinction between VR and VRI, and most of the providers also offer community interpreting services. In countries which make a sharp distinction between VR and VRI, VRI is usually a chargeable service. VR providers in the US, Australia and Germany also offer VRI as separate commercial services.

Source of Funding

2.18. In most countries reviewed, VR services are partly or wholly government funded. Sweden, Norway and New Zealand have permanent services which are wholly funded by government. Trials run by the government such as those seen in Denmark and France are also funded by the government, but it is unclear how VR services would be funded if they became permanent. If VR is made permanent in Australia, it would be funded by TUSMA, whose budget is financed by a government subsidy and a levy on telecoms providers' revenues.

2.19. Germany also features a mixed funding model, but in addition to being financed by telecoms providers and government funding, it is also financed by user fees. User fees for the personal VR service account for less than 5% of the total costs.

2.20. In the US, VR service providers are funded by telecom providers, which contribute a percentage of their interstate telecom revenue to cover the calculated costs of the service; telecom providers raise these funds by applying a small surcharge on the phone bill of all telecom consumers.

Funding Structure

2.21. The countries reviewed show a mix of capped and uncapped budgets for VR. New Zealand, Australia and Norway are examples of countries which set a fixed budget each year. For example, in New Zealand, the VR service provider receives less than NZD 1 million of government funding each year, regardless of the number of minutes handled. Norway's VR service receives a fixed budget of NOK 6,300,000 but can be allocated more money if demand exceeds projections.

2.22. Some countries impose caps on funding indirectly. For example, as part of procurement, Germany specifies the number of sign language interpreters required. As sign language interpreters represent the largest proportion of total costs, restricting the number of interpreters is a method to cap funding.

2.23. In all countries, except for the US, VR services are only available for certain hours and days per week. Restricting the operational hours of a VR service means that sign language interpreters are required for less time, and therefore provides another method to cap funding. The US is the only country in the world to offer a VR service which is available 24/7. For other countries, the hours of operation for VR services vary. Some countries such as Australia, Denmark, New Zealand and Norway only offer VR services on weekdays. In Sweden, the VR/VRI service is available on weekends too, albeit for shorter hours. In Germany, the VR service for business use is available for certain hours on weekdays, but the VR service for personal use is available for longer hours and on all days of the week.

2.24. In Sweden and the US, VR service providers are reimbursed using fixed rates per minute or call, but also need to meet service level requirements such as answering a certain percentage of calls within a specified time limit (i.e. 'speed of answer'). The level of VR

funding in these countries is therefore mainly driven by the level of VR adoption, and is theoretically uncapped.

2.25. Reaching funding caps was not a major concern in most cases as the majority of the costs are fixed (the cost of the interpreters) and so the budget can be adhered to through limiting the number of interpreting hours. Interviewees were not concerned about expenditure exceeding the funding cap as the budgeted capacity was sufficient. If demand increases beyond expectations, the interpreter utilisation and also the time users may spend in a queue increases rather than the budget being exceeded, within any limits set by service level requirements.

Demand and Adoption

2.26. Adoption of VR services does not follow the same take-up profile across different countries. In Norway, the number of VR calls has increased rapidly year on year. In contrast, the level of adoption in Germany has been flat throughout 2011. In the US, usage increased rapidly in the first 10 years, but in recent years has levelled off.

2.27. Take-up profiles are different across countries, because VR services are implemented and marketed differently. Even though there are common drivers and barriers, their relative significance is usually unique to each country.

2.28. Many potential VR users have grown up without VR and need to be educated on the benefits of VR such as being able to communicate easily with anyone they wish and being better equipped in the workplace. Marketing and outreach activities therefore can have a major positive impact on VR adoption by improving awareness in the hearing impaired community.

2.29. The lack of availability of high-speed broadband can also be a barrier to the adoption of VR. VR providers typically recommend minimum upstream and downstream broadband speeds, so that the video quality is sufficiently high for interpreters and VR users to sign visibly. In New Zealand, the cost of broadband (and also of the PCs used to access the service) was mentioned as the main barrier to the adoption of VR. However, interviewees from most of the countries tended to see the lack of awareness of the VR service as being the main adoption barrier. In Australia, the cost and availability of broadband is not expected to be a future adoption barrier to VR, as a result of the National Broadband Network (NBN) roll-out. In the US, there is limited high speed broadband availability in rural areas and reluctance by some users to install broadband regardless of availability and cost. The FCC is therefore looking at ways to attract new users which have not used VR before, for example by providing a broadband subsidy.

2.30. It may also be possible for some countries to experience slower adoption at the launch of the service. As an example, initial adoption in Norway was hampered, as the NAV, the VR service provider, dealt with technical difficulties and improved user experience.

2.31. In some countries, potential VR users also encounter problems when attempting to gain approval for VR accounts or funding. In Denmark, 12K, a VR service provider, cites inconsistency across local governments in funding VR for business use as being an adoption barrier. In Germany, local Integration Offices are sometimes reluctant to approve requests from potential business VR users, and require convincing that VR is really needed in each case.

2.32. Statistics on usage in isolation should be treated with caution as apparent trends may be caused by external events. For example, the apparent decline in calls in Germany at the start of 2011 was due to a change in pricing for business users and stricter enforcement between business and personal calls. This led to a reduction in personal calls as people had previously been using personal accounts for business calls. The increase in call length observed in the statistics for the VR service in Sweden in 2006 was due to a change in the method of call length measurement.

2.33. The need for user registration in order to use a VR service differs between countries. Registration is necessary in the US, Germany, Denmark (for business VR/VRI services), France and New Zealand, whereas registration is not required in Australia, Norway and Sweden. In Norway and Sweden, however, users need to register when applying for videophones.

Technical Approaches

2.34. Many VR service providers use dedicated platforms to manage and route VR calls. For example, the MMX platform offered by nWise is used by various VR service providers in Germany, Sweden, Norway, Denmark and the US. Dedicated platforms can offer various benefits such as adherence to industry standards (e.g. 'Total Conversation (TC)'[5]), automatic creation of call detail records (CDRs), forwarding of calls to other sign language interpreters, call queue management and generation of statistics. The MMX platform can also be configured to inform customers of their position in their queue, and meet different regulatory requirements (e.g. supporting adherence to 'speed of answer' requirements and removing the ability to make P2P (point-to-point) calls[6]).

2.35. The MMX platform is not directly compatible with Skype, but uses a Skype-SIP gateway which translates between Skype and SIP signals. Development of the Skype-SIP gateway is still under way, so functionality is currently limited. As of September 2012, the Skype-SIP gateway had only been used to augment the MMX platform in the DNTM's VR/VRI trial in Denmark. In this trial, it could handle a maximum of one call at a time and was limited to calls from Skype clients installed on PCs, not mobile devices. Some users experienced a significant degradation in video quality when using the VR service via Skype.

2.36. VR providers in New Zealand and Australia have opted for Skype to run their VR services, instead of using a dedicated platform such as MMX. Generic mass market products such as Skype and ooVoo typically do not offer as many features as dedicated platforms and are not specifically designed for VR. For example, Skype does not offer call queue management and VR users must use Skype to check if interpreters are available, and only

[5] The International telecommunication Union (ITU) developed the 'Total Conversation (TC)' standard, which is defined as an "audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more locations". The benefits of TC extend to the whole of society and are not limited to people with hearing and/or speech difficulties.
http://www.itu.int/en/ITU-T/studygroups/com16/accessibility/Pages/conversation.aspx

[6] In Germany, the MMX platform is configured by nWise to not support P2P calls between two deaf users. The contract under which the VR service is procured is to enable deaf and hearing impaired users to hold telephone conversations with hearing people. A telecommunications platform for communication between two deaf persons is outside the scope of the contract.

contact them, if their Skype presence shows them as available. Skype may also be less suitable for deaf-blind users.

2.37. Existing generic mass market products such as Skype and ooVoo can potentially be faster and cheaper to set up for the VR provider. New Zealand uses Skype for VR because it is popular with hearing impaired users for P2P calls, free to download for users and delivers comparable video quality to videophones. 12K, which provides business VR/VRI calls in Denmark via Skype, is in the process of designing a customised system to integrate with Skype to manage call queues.

2.38. The majority of VR users in Sweden and the US access the VR service via dedicated videophones, as the providers in these two countries have established programmes/practices for distributing videophones free of charge to VR users. Videophones officially distributed in Sweden and Norway must also adhere to the TC standard.

2.39. Most providers expect a shift from the use of videophones to soft clients, which can be used on PCs and mobile devices. There may still be a need for dedicated videophones though as they may be more suitable for deaf-blind and elderly users. Soft clients also sometimes have issues with firewalls, especially if they have been installed on PCs which host incompatible software.

2.40. VR service providers and NRAs are also increasingly enabling improved support for generic mass market products such as Skype and ooVoo. As mentioned, Skype is popular with hearing impaired users for P2P calls. In the upcoming new contract for the VR service in Sweden, the provider will need to provide support for Skype. The FCC is also considering promoting generic mass market technologies, as they could be less expensive and evolve faster than customised videophones offered by VR providers. Moreover, this could potentially alleviate the problem of limited interoperability between equipment between VR providers. Although interoperability is currently required, the FCC has had to waive rules on interoperability on multiple occasions.

2.41. Mobile devices such as smartphones and tablets with front facing cameras are increasingly being used to access VR services. Various countries are also considering developing or recommending specific apps for accessing VR services. Hearing impaired people, especially those in employment, find it convenient to be able to access VR services on the move. Video quality on mobile devices is however dependent on a user's mobile signal strength, which can become particularly weak inside buildings. The speed of adoption via mobile devices is therefore likely to depend on video quality.

Potential Issues with the Service

2.42. In Germany and Denmark, business and personal calls via VR are organised differently. In Denmark, during the DNTM's VR/VRI trial for personal use, personal calls should have been directed to the DNTM's service, but this was not strictly enforced. Business VR providers in Denmark are usually comfortable with accepting occasional, short personal calls. In Germany, however, the distinction between business and personal calls is sharp, due to the difference in funding arrangements. Employees using VR for business must access the business service, and Tess now asks each user at the start of each call for their contract number to indicate their account type. This can be awkward if a business VR user needs to make a short one-off personal call, sometimes in urgency.

2.43. Some technical issues such as interoperability between videophones, firewall issues with soft clients and compatibility with Skype have already been mentioned. Interoperability can also be hindered if a significant number of VR users are using legacy videophones. For example, in Sweden, some legacy videophones do not support the TC standard, although all new videophones officially distributed now adhere to the standard. In Sweden, there are also reported issues of videophones using SIP headers which are incompatible with internet service providers (ISPs), and some firewalls are not configured to be SIP compliant.

2.44. In most countries, a lack of sign language interpreters is cited as a major barrier to launching or expanding a VR service. Although in some countries, the number of interpreters required to be on duty at one time may be low, providers need to draw resources from a larger pool of interpreters. Regular breaks are typically required for sign language interpreters to ensure they are not overused. For example, Tess staffs its personal service with 3 interpreters and its business service with 4 interpreters during peak times, but relies on a pool of 46 interpreters.

2.45. Moreover, demand for VR sign language interpreters can potentially reduce the supply of interpreters available for community interpreting. In New Zealand, prior to the launch of the VR service, the relevant Ministry recognised there was a shortage of sign language interpreters and therefore funded diploma scholarships for interpreters to ensure existing resources were not taken away from community interpreting.

2.46. Most government departments and NRAs did not cite any examples of misuse or fraud. The US was the exception, and the FCC acknowledges that this has been a longstanding challenge facing the VR services in the US. From interviews, there appears to be a general consensus that high reimbursement rates incentivised VR providers to generate illegitimate minutes and overstate costs, and that fraud is unlikely to be completely eliminated if providers do not compete on price. The FCC's increase in oversight and introduction of stricter rules has led to a reduction of misuse and fraud, and implementation of additional reforms is likely to further improve the situation.

Country Case Studies

3. AUSTRALIA

Summary

3.1. The VR service in Australia currently operates as a trial. It is free of charge to users, and can be used for either business or personal use. It is available for 11 hours a day and users do not need to register in order to use the service.

3.2. The VR service is provided voluntarily by Australian Communications Exchange (ACE) which is the current holder of the contract to provide the National Relay Service (NRS). TUSMA (Telecoms Universal Service Management Agency) has responsibility for the NRS contract and does not mandate the service provider to offer a VR service.

3.3. ACE receives funding from TUSMA for providing the NRS contract. At the moment, ACE funds the current VR service through a funding surplus. TUSMA is funded through government funding and a levy on telecoms operators. TUSMA is currently running a tender process to select a NRS supplier post July 2013, but there is no commitment to procure a VR service.

3.4. The VR service uses Skype exclusively.

Overview of the Service

3.5. Within Australia there are approximately 20,000 registered deaf sign language users[7] and 321 registered members of the Australian Sign Language Interpreters Association (ASLIA).[8]

3.6. The VR service in Australia currently operates as a trial. TR services are implemented as part of the Universal Service Obligation under the "National Relay Service" brand, and the TR provider operates VR alongside as a trial.

3.7. The VR service is available for 11 hours a day and can be used for either business or personal use. There is no charge for using the service.

3.8. In July 2012 the "Telecoms Universal Service Management Act" came into force and created TUSMA (Telecoms Universal Service Management Agency) which now has responsibility for the NRS contracts.

3.9. The current NRS provider is ACE which is a non-profit organisation. ACE was formed in 1995 from the merger of two deaf-focused organisations. It began providing a VR service in 2008.

3.10. The current contract runs until July 2013 and TUSMA is currently running a tender process to select a NRS supplier post July 2013. TUSMA has developed the tender based on a review of access to telecommunications by people with disabilities. The tender is broken into 2 components: a relay service and an outreach service. The outreach service will need to promote community awareness and acceptance of the NRS, and deliver training and operate a helpdesk. Organisations can tender for one or both aspects of the service.

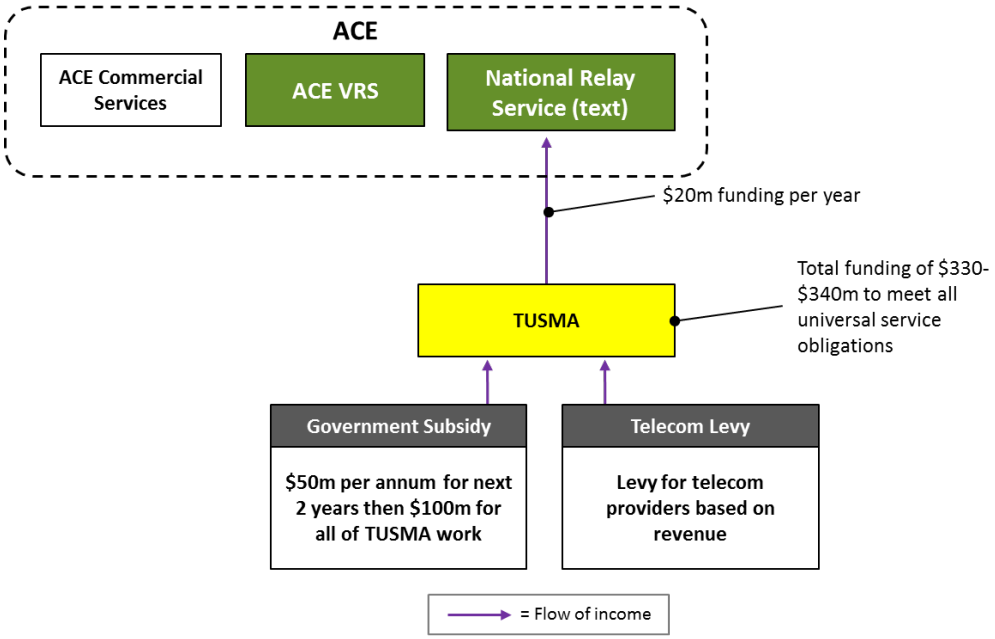
[7] http://www.deafsocietynsw.org.au/courses/pdfs/auslan_statistics.pdf
[8] http://aslia.com.au/

3.11. The relay services component is further broken into 3 parts: (i) core relay services (TTY (special textphone), internet relay, Speak & Listen) including the introduction of a two-way internet relay service, (ii) captioned telephony (alternative service delivery for speak and read) and (iii) solution for AUSLAN (Australian Sign Language) – organisations are asked to include their proposals for AUSLAN users and TUSMA may decide to include this in the procurement. Core relay service and captioned telephony, if procured, would start from 1 July 2013 and VR, if procured, from January 2014.

Funding

3.12. TUSMA is funded through government funding and a levy on telecoms operators. They have an estimated budget of AUD $330-340 million per year to meet all universal service obligations. In the tender there is a cap of AUD $20 million of funding available for relay services. At the moment only TR is funded directly through TUSMA and ACE fund the current VR service through a funding surplus, as they are a non-profit organisation. Going forwards VR could become part of the overall relay service funding if TUSMA decides to include VR in its procurement.

Figure 2: Overview of Funding in Australia



Demand and Usage

3.13. There are approximately 500 registered users of the VR service. During 2011 the call volume was over 3,000 calls. The calls are predominantly for personal use, however the service is also popular with small businesses run by deaf people.

3.14. The service has received positive user feedback with users saying it has made a big difference to their lives and appreciating that is faster than TR. The scale of the service means it is not always possible to make calls at the desired time and the users' internet connection speed sometimes impacts service quality. With the rollout of the National Broadband Network (NBN), which will offer high connection speeds, broadband availability is unlikely to be a future adoption barrier.

Operational Details

3.15. The service is available at the following times in the different States and Territories[9].

Figure 3: Hours of Operation for the VR Service in Australia

State or Territory	Hours of Operation (Weekdays)
Western Australia	0500-1600
Northern Territory and South Australia	0630-1730
Queensland and New South Wales	0700-1800
Australian Capital Territory, Victoria and Tasmania	0700-1800

3.16. To start using the VR service, users only need to add the Skype account used by the service. Users do not need to register in order to use the service.

Technical Details

3.17. The service uses Skype and the user needs to have a PC, webcam and high speed broadband. Speeds of 512 Kbps upstream and downstream is recommended. Skype version 3.8 or higher is advised. Calls from the interpreter to the call recipient can be made using a fixed or mobile voice call.

3.18. Incoming calls can also be made to VR users. There is a single phone number which people can call to reach the interpreter who then connects the call to the user via Skype.

[9] http://www.aceinfo.net.au/index.php?option=com_content&view=article&id=5&Itemid=16

4. DENMARK

Summary

4.1. Denmark does not distinguish between VR and VRI. Denmark features permanent VR/VRI services for business use. The National Interpreters Authority (DNTM), part of the Ministry of Social Affairs & Integration, ran a 1-year national trial for personal use, which ended on 30 September 2012. The government has not made a decision yet on whether and how to provide VR/VRI for personal use in the future.

4.2. For permanent VR/VRI services for business use, VR/VRI is free of charge to users. Similarly, the national trial for personal use was also offered free of charge to users. There are 3 providers of VR/VRI in Denmark: TegnKom, 12K and CFD. Business VR/VRI services operated by TegnKom and 12K are available between 0800 and 1600 on weekdays. DNTM's personal VR/VRI trial was also available on weekdays at the same times, except for Tuesday and Thursday on which the service was provided until 2000. Registration is required for business VR/VRI services.

4.3. There is no specific regulation which is directly relevant for VR. However, there is disability regulation which gives hearing impaired people the right to free sign language interpreters in all aspect of life. The DNTM administers community interpreting for personal use.

4.4. Business VR/VRI calls are paid for by local job centres which are financed by local government funding. The DNTM's personal VR/VRI trial was financed by central government funding.

4.5. Both the DNTM's VR/VRI trial for personal use and business VR/VRI services offered by TegnKom and CFD use a dedicated platform to manage and route VR calls. 12K's VR/VRI service is based on Skype.

Overview of the Service

4.6. Within Denmark, there are approximately 4,000-5,000 registered deaf sign language users and 210 qualified Registered Sign Language interpreters[10].

4.7. There is no specific regulation which is directly relevant for VR. However, there is disability regulation which gives hearing impaired people the right to free sign language interpreters in all aspects of life. The DNTM administers community interpreting for personal use. This involves allocating sign language interpreters to requests and determining which government department should pay. Annual funding is fixed for different types of community interpreting (e.g. DKK 3 million for large private parties and DKK 0.5 million for antenatal). There are 3 VR/VRI providers which are present in Denmark: TegnKom, 12K and CFD.

4.8. Denmark features permanent VR/VRI services for business use. The DNTM), part of the Ministry of Social Affairs & Integration, ran a 1-year national trial for personal use, which ended on 30 September 2012. The government has not made a decision yet on whether and how to provide VR/VRI for personal use in the future. DNTM's trial was run by different providers. At the start of the trial, TegnKom was the sole provider. With the

[10] http://www.eud.eu/Denmark-i-180.html

extension of the operating hours, DNTM invited additional providers to compete on price over different time slots, and began to use 12K and CFD in addition to TegnKom.

4.9. 12K also offered an independent free VR/VRI trial for personal use via Skype for 49 weeks between April 2011 and April 2012, independent of DNTM's VR trial. 12K eventually closed its own VR/VRI service in June 2012, and became one of the providers of DNTM's VR/VRI trial. 12K's independent trial was a self-funded service, financed using revenue from community interpreting contracts with government agencies.

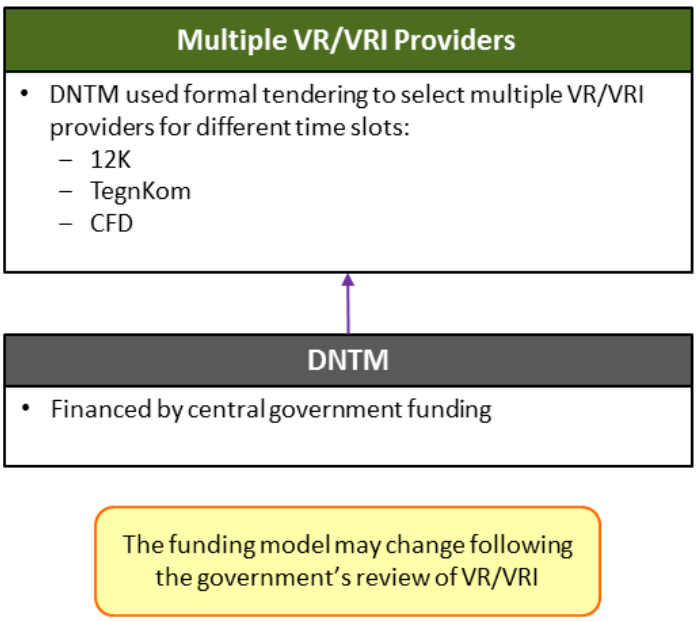
4.10. Denmark features permanent VR/VRI services for business use. These are provided commercially, but are reimbursed by local job centres. Business users of VR need approval from their local job centre, which determines the number of interpreting hours that each user is entitled to, based on their need. Local job centres may or may not specify a particular form of interpreting (i.e. community interpreting or VR/VRI).

4.11. Business VR/VRI users at TegnKom usually have approval for 1 hour of VR/VRI per week; a small proportion of users are entitled to more hours. 12K offers 3 subscription packages for business VR/VRI calls: Silver, Gold and Platinum. Users obtain approval from their local job centre for the type of subscription package they require based on their needs. The Silver package only supports outgoing calls, whereas the other packages support both incoming and outgoing calls.

Funding

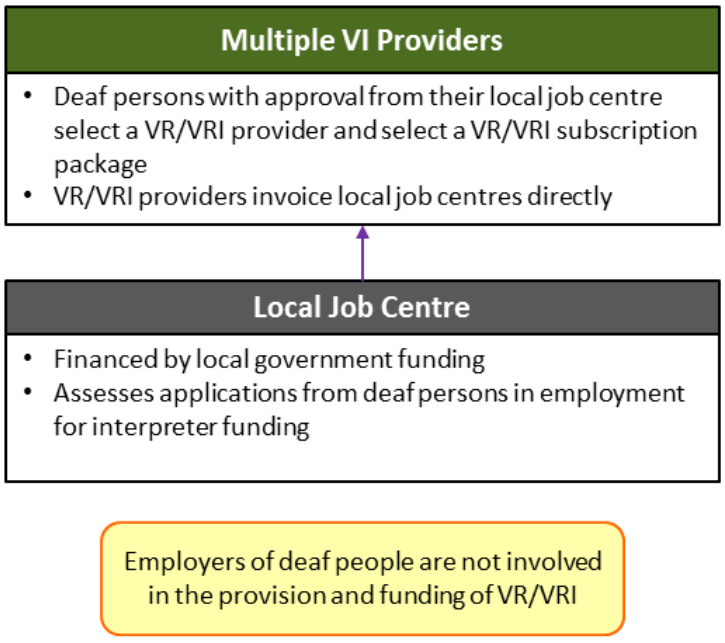
4.12. As part of the DNTM's VR/VRI trial, personal VR/VRI calls were paid by the DNTM, financed by central government funding. As described, the DNTM used formal tendering to select providers for different time slots. The DNTM paid the providers for the hours of operation, regardless of the actual time spent on VR/VRI calls. It is unclear if a national VR/VRI service will be provided in the future, how funding for personal calls will be organised and how VR/VRI providers will be selected.

Figure 4: Funding Model for DNTM's Personal VR/VRI Trial



4.13. Business VR/VRI calls are paid by local job centres financed by local government funding. Deaf persons in employment can request funding for sign language interpreters from their local job centres. Each applicant is assessed individually by his/her local centre, and is allocated a maximum number of interpreting hours per week. Local job centres may or may not specify a particular form of interpreting (e.g. community interpreting or VR). Approved applicants can then subscribe to a VR service with a provider, which would in turn invoice local job centres.

Figure 5: Funding Model for Business VR/VRI



4.14. Local job centres also sometimes provide funding for laptops to business VR/VRI users.

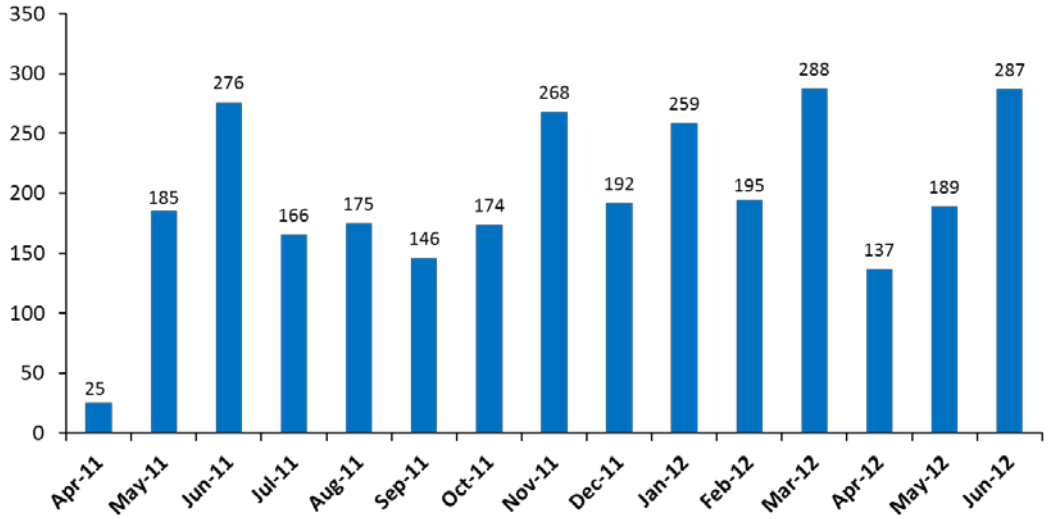
4.15. The ease of obtaining approval and willingness to fund interpreters for deaf persons varies significantly between local governments. This is a barrier to VR/VRI adoption by potential business users.

4.16. TegnKom's VR/VRI service for business use is part of Aarhus County Council and has been funded by different organisations over time. Between 2006 and 2008, TegnKom was financed using funding from the European Commission. Between 2008 and 2010, TegnKom was financed using disability-related funding from central government. Since 2010, TegnKom has been financed mostly by invoicing local job centres.

Demand and Usage

4.17. In the DNTM's VR/VRI trial, monthly VR/VRI usage (in terms of number of VR/VRI calls) in June 2012 compared to June 2011 was 4.0% higher; in absolute terms, there were 11 additional calls. From the data, it appears usage was low after the first month of launch, but this increased rapidly by 740% in the following month. Call usage rose modestly and was driven mostly by seasonal fluctuations. We do not have additional data for July 2012 onwards.

Figure 6: DNTM Personal VR/VRI Trial: Total Number of VR/VRI Calls



4.18. Between April 2011 and June 2012, the number of calls made by the top 20 users contributed to 63% of all calls made. If we exclude data for April 2011, the first month of the service, average call duration between May 2011 and June 2012 is 6.2 minutes.

4.19. 12K's independent VR/VRI trial for personal use had approximately 230 registered VR/VRI users towards the end of the trial. During the trial (between April 2011 and April 2012), average call duration was 8.1 minutes and the average number of calls per user was 3.0 calls.

4.20. Hearing impaired people from younger generations tend to be familiar with the high pace of technological development and therefore are able to fully recognise the benefits of VR/VRI. In contrast, hearing impaired people from older generations have tended to show a smaller need for sign language interpreters.

4.21. For marketing and outreach, VR/VRI providers reach out directly to hearing impaired people, local governments, job centres and personal contacts, and advertises on websites, magazines and social media such as Facebook.

4.22. For the DNTM's VR/VRI trial service, user feedback suggested the image size on the web-based client was too small, and that VR/VRI sessions sometimes suffered from interruptions. TegnKom also commented video and sound quality can sometimes be disrupted, if the VR/VRI user is in a busy or noisy environment.

Operational Details

4.23. DNTM's VR trial had the following operating hours:

- Monday, Wednesday and Friday: Between 0800 and 1600
- Tuesday and Thursday: Between 0800 and 2000

4.24. As described, TegnKom was originally the sole provider of DNTM's VR/VRI trial, but 12K and TegnKom won contracts for specific time slots. 12K was the provider between 0800 and 1600, except for 1400-1600 on Friday, which was provided by TegnKom. CFD was the provider between 1600 and 2000 on Tuesday and Thursday.

4.25. The DNTM's VR/VRI trial was staffed by 1 sign language interpreter at any time. Each interpreter was required to take a break every 30 minutes; calls were automatically switched to another interpreter using the MMX platform. Each provider used their own studios to provide the service during their allocated time slots.

4.26. TegnKom's VR/VRI service for business use operates between 0800 and 1600 on weekdays. TegnKom employs 1 employee to provide technical support. This involves on-site visits to new VR users, training them on how to use the service, and customising PCs if necessary.

4.27. 12K's VR/VRI service for business use operates between 0800 and 1600 on weekdays, and is usually manned by 1 sign language interpreter at any one time; on rare occasions, this is increased to 2 interpreters to meet demand. 12K draws on a pool of 15-20 interpreters.

4.28. As 12K's VR/VRI service is Skype-based, there is no formal call queue management system. VR users use Skype to check if interpreters are available, and only contact them, if their Skype presence shows them as available. Users rarely book calls in advance. During 12K's independent VR/VRI trial for personal use, users sometimes experienced long waiting times.

Technical Details

4.29. For the DNTM's trial for personal use, VR/VRI calls could either be made using a web-based client or Skype. The DNTM recommended 1MB upstream and downstream bandwidth.

4.30. The DNTM's VR/VRI trial for personal use used the MMX platform to manage and route VR calls; business VR/VRI services offered by TegnKom and CFD also use the MMX platform. The MMX platform provides call detail records (CDRs), forwarding of calls to other sign language interpreters, call queue management and generation of statistics. The MMX platform used by TegnKom is configured to inform customers of their position in their queue.

4.31. Skype is a popular in the hearing impaired community for P2P calls. For the DNTM trial, a Skype-SIP gateway was used to augment the MMX platform, in order to allow VR calls to be made via Skype. However, some users experienced a significant degradation in video quality when using the VR/VRI service via Skype, compared to Skype to Skype calls between the caller and an interpreter, for example, using 12K's service.

4.32. Mobile devices are an increasingly popular access technology method. The service can be accessed from some mobile devices using a MMX mobile client or Skype. Users need to pay for the MMX mobile client themselves.

4.33. With 12K's VR/VRI service, a typical user uses Skype via PC, tablet or smartphone to connect to a sign language interpreter on duty. Skype is popular with the hearing impaired community, so users usually do not require any help with installation and support.

4.34. 12K rarely rejects VR/VRI calls from users calling from smartphones, as they usually deliver sufficient video quality via 3G and WIFI. VR users with a smartphone can also set their device to automatically conference in incoming calls to 12K; the deaf user only needs to set up a Skype session with the interpreter to start the call.

5. FRANCE

Summary

5.1. VR services in France are currently provided on a commercial basis. There are a number of competing providers, including Websourd, Tadeo and Viable. A publicly funded national trial for a relay service for personal use is expected to start in February 2013, and will run for a year. The trial is for a closed group of 900 users, and will include persons who are deaf and hard of hearing. One of the aims of the trial is to understand how a relay service – public or private – could potentially be funded in the future.

5.2. In France, employers are required to comply with the Law of 11 February 2005, which sets out new rights for disabled people in France and requires employers to make the workplace accessible to disabled employees subject to certain criteria.

5.3. There is no public funding available for private users. Historically there has been funding available for employees to use VR, as part of government accessibility initiatives to promote equivalence in the workplace. Funding for VR services is available for business users from two organisations: AGEFIPH (Association de Gestion du Fonds pour l'Insertion Professionnelle des Personnes Handicapées) and FIPHFP (Fonds pour l'Insertion des Personnes Handicapées dans la Fonction Publique).

5.4. Tadeo provides VR and TR services, and operates its VR service between 0900 and 1230 and between 1330 and 1730 on weekdays.

5.5. Both Websourd and Tadeo use dedicated platforms to manage and route VR calls.

Overview of the Service

5.6. Within France there are 5 million people with some degree of hearing impairment, of which there are an estimated 500,000 who are unable to use a regular telephone. The number of potential users of relay services has been estimated at 417,000. There are currently 500 registered sign language interpreters.[11]

5.7. In France, employers are required to comply with the Law of 11 February 2005, which sets out new rights for disabled people in France and requires employers to make the workplace accessible to disabled employees subject to certain criteria. The Law of 11 February 2005 requires any business with more than 20 employees to have at least 6% of its total workforce to be disabled employees.

5.8. VR services in France are currently provided on a commercial basis. There are a number of competing providers including Websourd, Tadeo and Viable. For the purpose of understanding the context of VR services in France, this case study focuses on Websourd and Tadeo.

5.9. Websourd was established in 2002 by the National Federation of the Deaf of France (Fédération Nationale des Sourds de France) and the Regional Union of Cooperatives in Midi-Pyrenees (Union Régionale des SCOP en Région Midi-Pyrénées). It partners with IVèS,

[11] http://www.arcep.fr/uploads/tx_gspublication/etude-access-handicap-serv-tel-janv2011.pdf

which provides the technology platform, and also Orange (France), which has been involved in research and development initiatives.

5.10. Tadeo has provided both TR and VR for business use since late 2007. It is a profit making organisation which was founded by a consortium of 14 large French businesses. Delta Process is the technical platform provider. Tadeo's services are only available to employers, and sign language interpreters are trained to relay conversations on business topics and also commercially sensitive areas.

5.11. A publicly funded trial for a relay service for personal use is expected to start in February 2013. The trial is being led by the Directorate-General of Social Cohesion (Direction Générale de la Cohésion Sociale) of the Ministry of Social Affairs and Health (Ministère des Affaires Sociales et de la Santé), and will run for one year. As part of the planning for the trial, the Ministry has coordinated discussions between the French mobile operators, service and technology providers, deaf and hard of hearing associations, and the Ministry itself. The trial will be for a closed group of 900 users, and include persons who are deaf and hard of hearing. Users will not be able to use the relay service for business use, but will be able to use it to search for employment.

5.12. In October 2012, the Ministry of Social Affairs and Health issued a request for tender to select a VR service provider[12]. The selected service provider must offer the service which will be operational between 0830 and 1900 on weekdays, and offer multiple communication options including French Sign language (LSF, Langue des Signes Française/VR), cued speech (LPC), real-time text transcription, and spoken French language. Each recruited user will be allocated one hour of free interpretation per month.

5.13. The relay service provider in the trial must also collect comprehensive statistics on calls. For example, the provider must record the call type (e.g. LSF, LPC, etc.), call duration, dropped calls, waiting time, and call content (e.g. health/work/family).

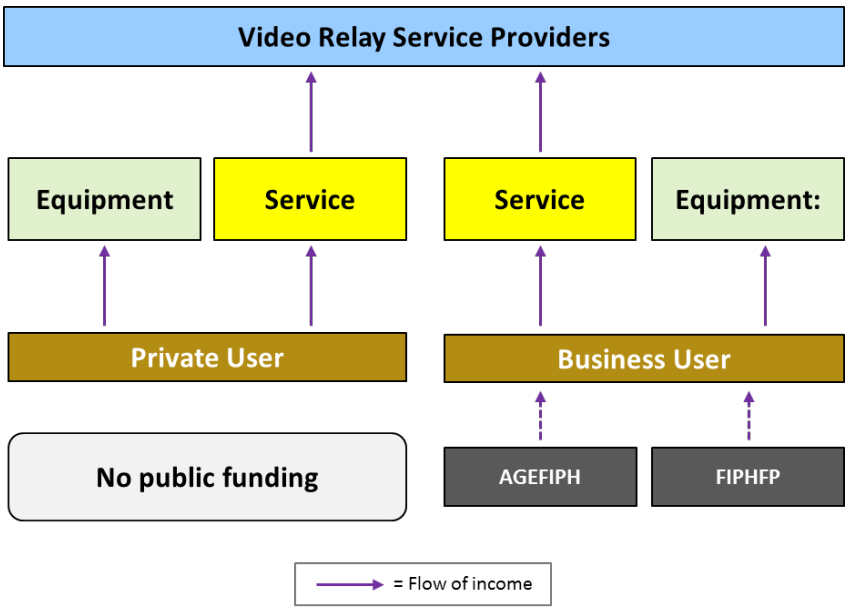
Funding

5.14. Currently there is no funding available for private users. Funding for VR services are available for business users from two organisations: AGEFIPH and FIPHFP.

5.15. Businesses which do not comply with the Law of 11 February 2005 are required to pay a contribution to FIPHFP or AGEFIPH. Large businesses which employ disabled employees can apply for funding from FIPHFP to pay for services offered by VR service providers such as Tadeo and Websourd. Business users can also apply for funding from AGEFIPH to finance a portion of equipment and service costs if they wish to sign up to a VR service.

[12] http://ted.europa.eu/udl?uri=TED:NOTICE:319422-2012:TEXT:EN:HTML&tabId=0

Figure 7: Overview of Funding in France



5.16. Tadeo's VR service is paid by the employer and therefore is free for hearing impaired employees. In the past, Tadeo has received EU grants and loans from the government to finance development its service. Usage fees paid by customers and contributions from consortium members fund service operations.

5.17. Tadeo does not use standard pricing with its customers and agrees commercial terms with potential customers on a case-by-case basis, dependent on the potential customer's needs (e.g. expected call usage patterns, conversation type, call duration and conference calls).

5.18. The expected 2013 relay service trial led by the Directorate-General of Social Cohesion will be funded by the government. One of the aims of the trial is to understand how a VR service, public or private, could potentially be funded in the future.

Demand and Usage

5.19. The number of potential users of relay services was estimated at 417,000, of which 75,000 are sign language users, 10,000 are cued speech users, and 332,000 users prefer to use text. The number of users accessing relay services is expected to reach 91,000 in ten years, which comprises: 54,000 for TR, 34,000 for French sign language VR, and 3,000 for cued speed relay. Take-up will reach its peak in 12 years for VR (with strong adoption in the first year), 14 years for TR and 16 years for cued speech relay. The 10-year volume of call minutes is expected to be around 43 million: 37 million minutes for personal calls (87%), 6 million minutes for business calls (13%). In the first year, 4,000 users would consume approximately 1.5 million call minutes[13].

5.20. As services are currently provided on a commercial basis in France by separate providers, there is no publicly sourced actual data on usage, either for a single provider, or in aggregate. It is thus difficult to validate these figures. Anecdotal reports indicate that

[13] http://www.arcep.fr/uploads/tx_gspublication/etude-access-handicap-serv-tel-janv2011.pdf

usage has been rising steadily, and that users would be likely to increase adoption and usage if public funding was more readily available.

5.21. Tadeo currently has 200 organisations as its customers, which includes both public and private entities. From this customer base, a total of 400 users use the service. Many organisations have only one hearing impaired employee using the service.

Operational Details

5.22. Websourd is a cooperative organisation, which invests any profits from the provision of VR back into the service, for example into research and development.

5.23. Websourd has four distinct types of offering: The first is making information available to deaf users in written and sign-language French. Such information would include news, job opportunities, etc. The second is the provision of VR and TR services. The third is a service which converts speech or written text into signing via an automated avatar.[14] Finally the fourth is a research centre for the development of all of the above assistive technologies.

5.24. Websourd draws on a national pool of approximately 100 interpreters across 18 commercial interpreter services. The services and interpreters are widely distributed across France. Interpreters connect to Websourd's platform via a computer and attached camera.

5.25. Websourd manages the inbound VR calls and distributes traffic to available interpreters. In order to ensure there is sufficient interpreter resource, Websourd enters into agreements with interpreters such that the interpreters will make themselves available upon Websourd's request, given certain conditions.

5.26. Tadeo provides VR and TR services, and operates its VR service between 0900 and 1230 and between 1330 and 1730 on weekdays. It currently operates 2 studios in Paris and Lyon and expects to add a new studio soon. Tadeo works with 7 partnering interpreter providers to draw on a pool of 50-100 interpreters, in addition to the 20 sign language interpreters which they directly employ. Tadeo provides on-site training and support to all of its customers.

5.27. Both Websourd and Tadeo require bookings for calls longer than 30 minutes.

5.28. A major challenge facing VR providers is the lack of sign language interpreters available in France. Some VR providers are therefore working with the government on initiatives to train sign language interpreters.

[14] An "avatar" is a graphical representation of a user. In this case, the avatar is a computer-generated image of a person which uses sign language.

Technical Details

5.29. Websourd's technology platform is provided by IVèS. Interpreters connect to the Websourd platform from various locations using software. The call centre is thus virtual and "in the cloud". A schematic overview of IVèS' platform is given below.

Figure 8: Overview of the IVèS Technology Platform (Source: IVèS)

5.30. Tadeo's technology platform is provided by Delta Process. Users of Tadeo's VR service must use a laptop supplied by Tadeo, which comes with a webcam, 3G data card and a soft client for VR and TR.

5.31. Interoperability between different VR providers is technically possible, since all are using compatible technology. However, there are strategic challenges to interoperability. Different providers have different commercial structures, and diverging long-term goals. There are also issues on the ownership of the customer, how call revenue is transferred and allocated, etc.

6. GERMANY

Summary

6.1. In Germany, personal use and business use of the VR service is provided by the same provider, but are organised separately. Users need to sign a monthly contract and pay subscription and usage charges. For personal use, tariffs are set at an affordable rate. For business use, tariffs are significantly higher (as they must cover the costs of running the service for business use) but the costs are initially paid for by employers and then can be recovered from the Integration Office for their Bundesland (Federal State).

6.2. The service is available for personal calls on Monday-Sunday, between 0800 and 2300 and for business calls on Monday-Friday, between 0800 and 1700. Registration is required for both personal and business use.

6.3. Relay services in Germany are mandated through an amendment of the German Telecommunications Act (TKG). Section 45 of the TKG implements Article 7 of the European Union's Universal Service Directive, but is not placed in Sections 78 to 84 of the TKG, in which the European Union's Universal Service Directive is implemented. It is instead placed with other consumer protection legislation. The amendment stipulates how they will be funded and that they should be available at an affordable cost.

6.4. The telecoms providers are obligated to provide relay services; they can either source their own or use a procurement arrangement run by the Bundesnetzagentur (BNetzA) which is tendered every 2 years. VR and TR are currently provided by Tess.

6.5. The video relay service is available to both personal and business users. Business use is provided at cost and funded by Integration Offices in each Bundesland. For personal usage the majority (95%) of Tess's funding comes from the telecom providers. The other 5% comes from fees charged to the end user. Tess is a non-profit organisation, and if usage is higher than expected, generating incremental income, then the excess is returned to the telecom providers.

6.6. The VR service uses a dedicated platform to manage and route VR calls. The service is available through dedicated video hardware, through softphones on PCs, or via mobile.

Overview of the Service

6.7. Within Germany there are approximately 100,000 sign language users and 360 registered sign language interpreters[15].

6.8. Overall disability funding is managed through individual Integration Offices in each Bundesland. Relay services in Germany are mandated through an amendment of the German TKG. Section 45 of the TKG implements Article 7 of the European Union's USD, but is not placed in Sections 78 to 84 of the TKG in which universal service is regulated. The amendment covers how they will be funded and that they should be available at an affordable cost.

[15] http://www.eud.eu/Germany-i-184.html

6.9. There is one national provider that is selected through a procurement process run by the BNetzA. The current provider TR and VR providers is Tess GmbH. Tess GmbH employs 46 interpreters from Telesign for its VR service and employs 9 interpreters from Neue Dienste Vogelsberg for its TR service.

6.10. Personal and business use are organised separately. Users need to sign a monthly subscription contract. Users must provide a contract number on each call, to indicate whether their account is personal or business. Deaf users can request VR from employers, but employers are not obliged to provide such services; a user applying for a VR business account must be supported by his/her employer.

6.11. Tess GmbH recently won the tender by the BNetzA for a new relay service provider for 2013 and 2014.

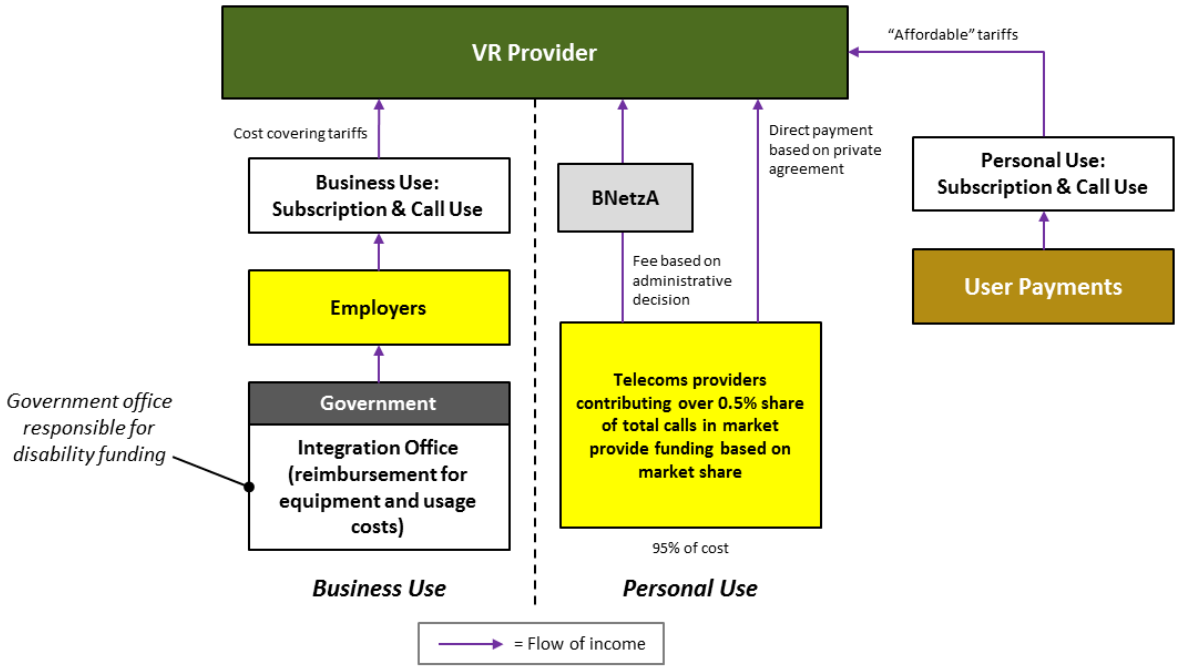
Funding

6.12. The VR service provider estimates fixed costs for the next 2 years, and submits these at the time of tender. For the current contract, the cost of providing the VR service for personal use is around €1.75M per year. The whole service is structured around cost recovery both from the Integration Fund (for business calls), and telecoms providers and end users (for personal calls).

6.13. Rates for personal usage are not cost covering, accounting for about 5% of the cost. The telecoms providers fund the other 95% of the cost of the personal VR service. If personal usage is so high that the service makes a profit, the incremental revenue is given back to the telecoms providers. The top 100 telecoms providers by size/volume are measured and providers which contribute more than 0.5% of total calls are required to fund a share of the VR service. The share of the cost is proportional to share of total volume of outgoing minutes (consumer and business, fixed, mobile, and international).

6.14. For business use, there is a compensation fund managed by the Integration Office (payment income is derived from fines on companies, proportional to the percentage below the target quantity of disabled employees they must employ). An employee using VR for business must access the business service. The connection charges are much higher than for private use and businesses must initially pay for equipment and usage. All of businesses costs (equipment and usage) can be recovered by businesses from the Integration Office for their Bundesland. Subscription and usage rates set for business use need to be set such that they cover the cost of interpreters for business use.

Figure 9: Overview of Funding Model in Germany

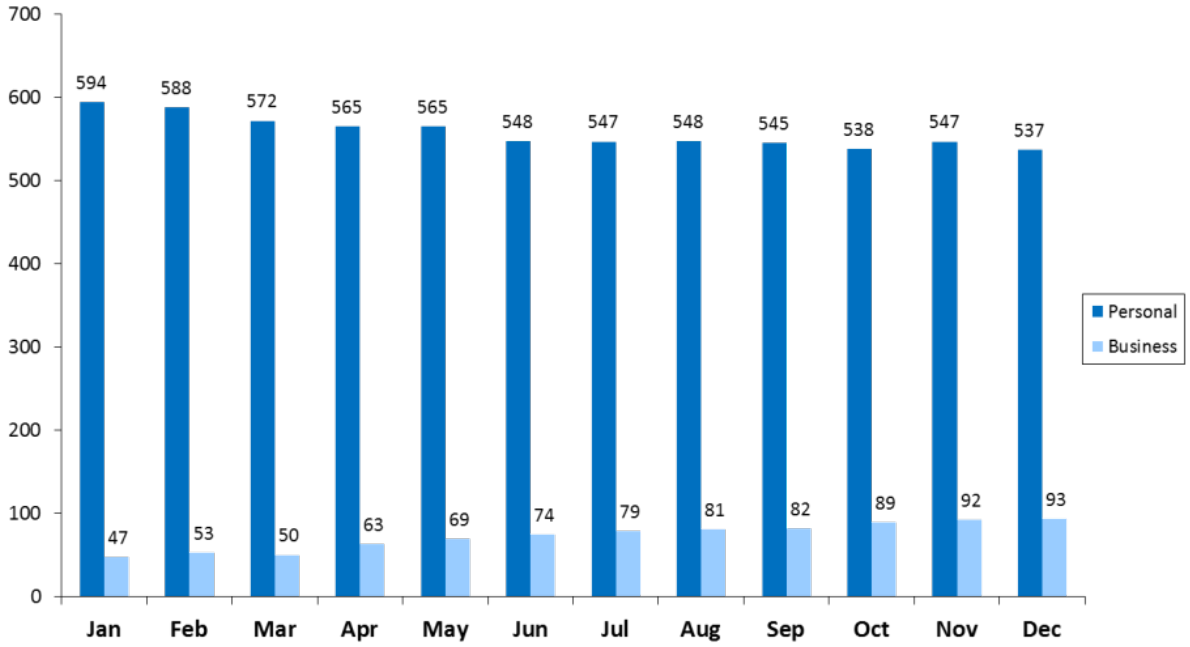


Demand & Usage

6.15. Germany currently has a low user base of 800 users (for both VR and TR) and only moderate growth is expected. Projections for demand increases to date have not been met. In 2010, Tess forecasted 810 subscribers in September 2012.

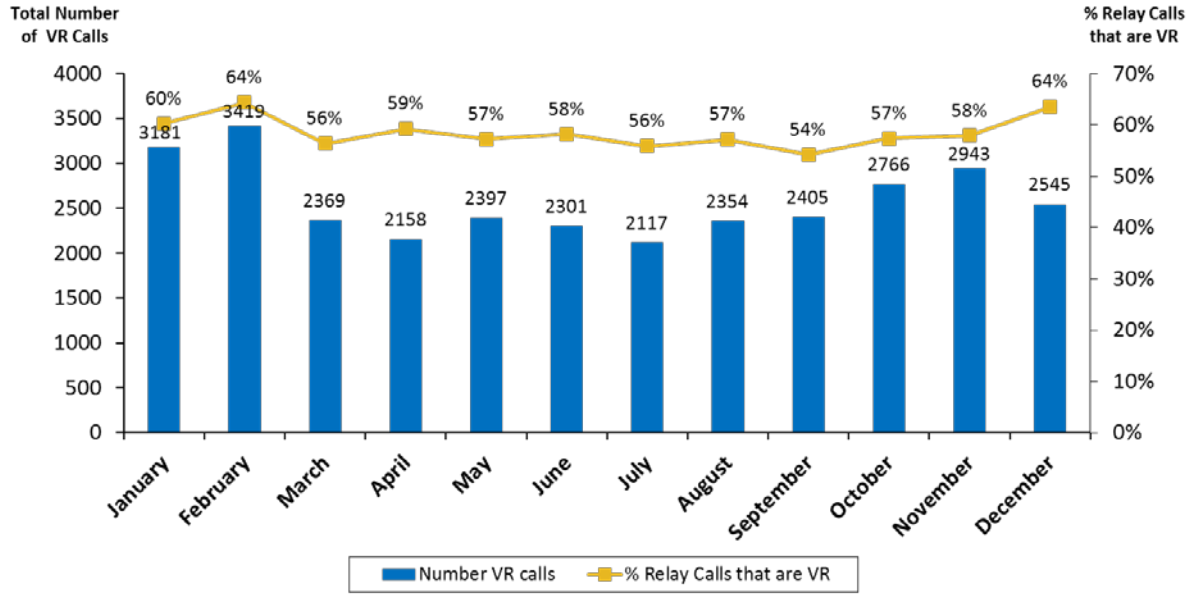
6.16. Less than 20% of accounts are business subscriptions. During 2011 the number of personal users fell from 594 in January to 537 in December, whilst the number of business users increased from 47 in January to 93 in December. This change in subscriber type is at least partly due to a change in the charging structure. Prior to 28 February 2011 the business and personal users were charged the same amount. From 1 March 2011, onwards, significantly higher charges were brought in for business users and so there was stricter enforcement of usage between personal and business accounts.

Figure 10: Total Number of Customers: Customer Breakdown VR and TR (2011)[16]



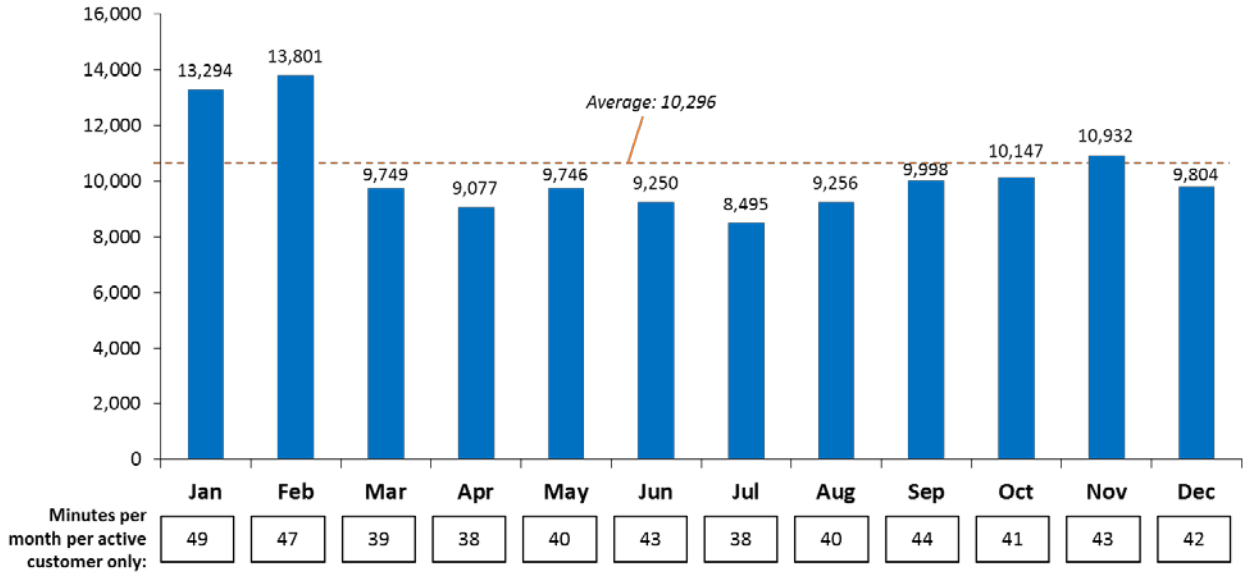
6.17. On average there are 2,500 personal VR calls made per month accounting for 60% of total relay calls. Usage, both in terms of number of calls and number of minutes, fell after February due to the charging change and enforcement between business and personal mentioned earlier.

Figure 11: VR Calls By Month – Personal Only (2011)[17]



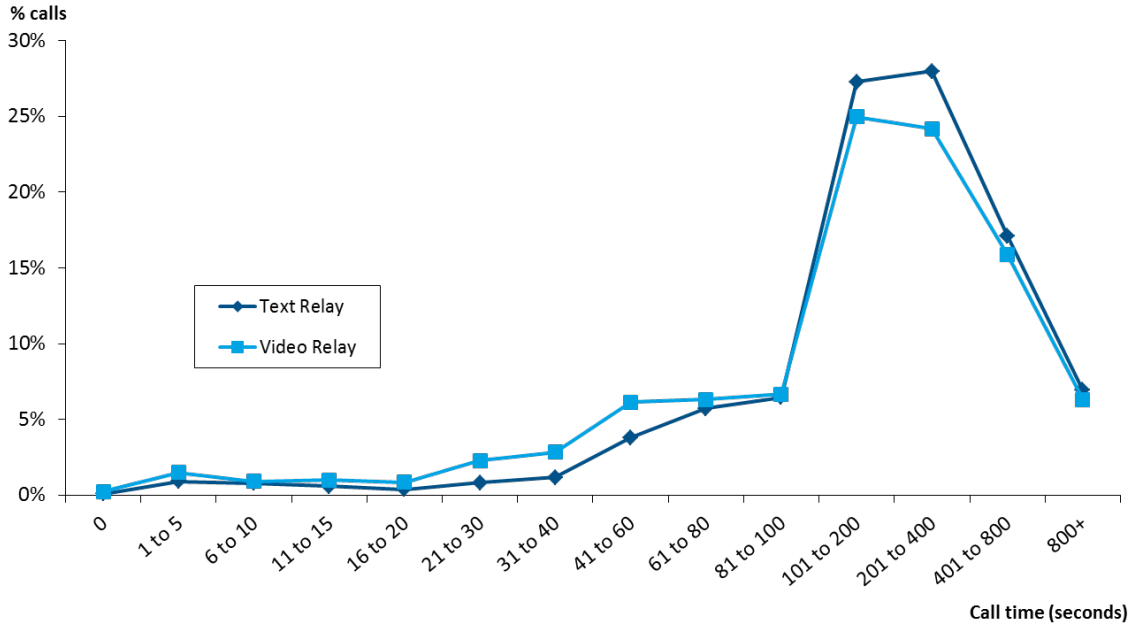
[16] Bundesnetzagentur Tender Anlage 2
[17] Bundesnetzagentur Tender Anlage 2

Figure 12: Total Minutes By Month – Personal Only (2011)[18]



6.18. The average call length for a VR call is approximately 5 minutes[19]. This excludes any time the caller may spend in the queue. The average call length profile for TR and VR calls are very similar, as show in the figure below.

Figure 13: Average Length of Personal VR and TR Calls[20]



[18] Bundesnetzagentur Tender Anlage 2
[19] Tess, October 2012
[20] Bundesnetzagentur Tender Anlage 2

6.19. Tess also generates statistics on the type of technology used for incoming calls to VR users and outgoing calls from the VR users (e.g. SIP, ISDN, MMX, PSTN and 3G). It is not possible to distinguish between incoming and outgoing MMX calls, but it can be deduced that the volume of outgoing PSTN calls from the VR service provider to call recipients exceeds the volume of incoming calls from VR users to the VR service provider. This is explained by instances when a sign language interpreter is unable to reach the intended call recipient, and the VR user offers alternative telephone numbers to make contact.

6.20. Tess believes that as there has historically been little use of telecoms in the deaf and hard of hearing community it is difficult to get people to change how they do things. They are not used to making telephone calls by themselves and often ask friends or members of the family to call a hearing person to arrange things for them. Telesign also believe awareness is a major barrier to usage and state they often see a spike in usage after conventions where the service has been demonstrated.

6.21. Some users are dissatisfied that they need to pay extra for calls, compared to non-deaf users. They are accepting of paying the same rate but are not satisfied with the incremental charges as they feel this is not equal treatment.

Operational Details

6.22. Tess' personal call charges are set by BNetzA. Personal use is charged at €5/month plus €0.28/min for VR and €0.14/min for TR (all including VAT). Users pay up front for the equipment and for the subscription and per minute charge and receive no reimbursement. There is no restriction on call length.

6.23. The rationale for the value of the charge to the user is based on the number of calls made and the standard call rate. There are 2 calls made (1 to the interpreter and 1 from the interpreter to the destination). The call is classified as a "service number" and the rate set by Deutsche Telekom for service numbers is 14c/min. As there are 2 calls, the rate is 28c/min.

6.24. Business use is charged at a rate to cover costs and is currently €220/month plus €1.00/min for VR and €0.50/min for TR (all excluding VAT. Similar to personal usage, there is no restriction on call length. Employers pay for employees' use of VR and apply to recoup costs from the Integration Office. Billing happens in a variety of ways depending upon the individual Bundesland Integration Office. Some Integration Offices are billed direct and in others the businesses are billed and they claim back from the Integration Office.

6.25. The service is available for personal calls on Monday-Sunday, between 0800 and 2300, and for business calls on Monday-Friday, between 0800 and 1700. Peak operational capacity is between 0900 and 1100 for both personal and business calls. Personal Interpreters are accessible for total of 204 hours/week; a maximum of 3 interpreters are available at any one time. Business Interpreters are accessible for total of 100 hours/week; maximum of 3 interpreters at available at any one time. Where additional interpreters are supplied above those specified in the contract with BNetzA, these are voluntary and can also be used by the VRI service that Tess provides on a commercial basis.

6.26. If an interpreter is not available the call is placed in a queue. During 2011 over 90% of personal calls were answered within 30 seconds. During March to December 2011, on average, 155 personal calls per month were terminated whilst in the queue.[21]

6.27. Interpreters are entitled to a 15 minute break every 30 minutes, but these aren't always taken so presence is actually 80%. In Tess and BNetzA calculations the service is assumed to be utilized at 70% (for the 80% presence) giving an overall utilization rate of 56%. However, as would be expected, utilization varies heavily by time of day and day of the week.

6.28. All interpreters in Germany are generally bound to "rules of (their) profession". One of these rules is to protect the user's privacy under all circumstances (in the same manner as a priest or physician). Additionally all interpreters dialling with Tess have to sign a discreetness obligation. The users of the service are able to send their banks or doctors a signed authorization that Tess - Relay-Services is allowed to call them and to exchange private information during a relay call. An application form is available on the website. The recipients are not obliged to accept the authorization and in some cases they don't accept it.

Technical Details

6.29. Germany uses the MMX platform. There are multiple ways of connecting to the service. The recommended way (and the way the majority of the calls happen) is using a PC with MMX software. Other potential ways include a SIP videophone, an ISDN phone (not recommended due to low image quality) or a mobile phone (long calls are discouraged due to low bandwidth and the small image). The minimum upload speed recommended is 256 Kbps.

6.30. A VR user needs to call the VR service first; once connected to an interpreter, the interpreter will call the requested calling party via a phone connection. If all lines are busy, additional calls are placed on hold at no cost to the caller. The same process needs to be followed for emergency calls.

6.31. The service also supports calls from hearing users to VR users, however incoming calls to the web client are not supported. Incoming TR calls to the web client are supported.

[21] Bundesnetzagentur Tender Anlage 2

7. NEW ZEALAND

Summary

7.1. New Zealand has a permanent VR service. The VR service is free of charge to users, and can be used for either business or personal use. It is available between 0900 and 1700 on weekdays and users need to register in order to use the service.

7.2. No legislation is used to mandate VR. The VR service exists in New Zealand, because the NZ Government identified VR as a development priority following a review of the relay service in 2005.

7.3. The New Zealand Government has procured national relay services, which includes VR, from the same single provider, Sprint Relay, since 2004. Sprint Relay receives specific funding for VR from central government via the Ministry of Business, Innovation & Employment.

7.4. Skype is the preferred method to use the VR service and accounts for more than 95% of VR calls. Users can use videophones to make VR calls but this is rare.

Overview of the Service

7.5. Within New Zealand, there are approximately 4,000 culturally deaf people[22], 24,000 registered deaf sign language users[23] and 112 qualified New Zealand Sign Language interpreters[24].

7.6. Users of government services are entitled to access to sign language interpreters, but ease of access to community interpreting depends on location. Access to sign language interpreter resources is most convenient in the Greater Auckland region, as it is inhabited by half of the deaf population in New Zealand and the NZSL (New Zealand Sign Language) Diploma and BA courses are only available at the Auckland University of Technology (AUT). In contrast, in some locations such as the West Coast of the South Island, there are no resident interpreters, so government agencies tend to wait until there are multiple interpreting requests before arranging for an interpreter to visit the location.

7.7. TR is mandated using USO legislation, but no legislation is used to mandate VR. The VR service exists in New Zealand, because the Government identified VR as a development priority following a review of the relay service in 2005. The Ministry of Business, Innovation & Employment (formerly the Ministry of Economic Development) also had unspent funding allocated to the provision of textphones (which was not required at all as New Zealand had introduced internet based relay); this unspent funding was thus used to fund a NZSL scholarship programme at the AUT to develop an interpreter workforce in preparation for VR.

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[22] The 2006 New Zealand Census recorded 24,000 New Zealand Sign Language Users, but the Ministry of Business, Innovation & Employment and Deaf Aotearoa (a non-profit organisation promoting New Zealand Sign Language and the rights of deaf people) understands there to be approximately 4,000 culturally deaf people in New Zealand, which use New Zealand Sign Language as their first language.

[23] http://www.deaf.co.nz/nz-sign-language/about-sign-language/interesting-facts

[24] Ministry of Business, Innovation & Employment, New Zealand

7.8. Since September 2011, New Zealand has provided a permanent VR service which is free for all users. New Zealand had previously been trialling the VR service from June 2009. The New Zealand Government has procured national relay services from the same single provider, Sprint Relay, since 2004.

7.9. The current 5-year contract for relay services, including VR and with an option for VRI, started in September 2011 and will end in 2016; the Ministry has the option to extend the contract to 2019. VR does not have strict service level requirements, due to the small scale of the current VR operation. In contrast, 85% of TR calls must be answered within 15 seconds.

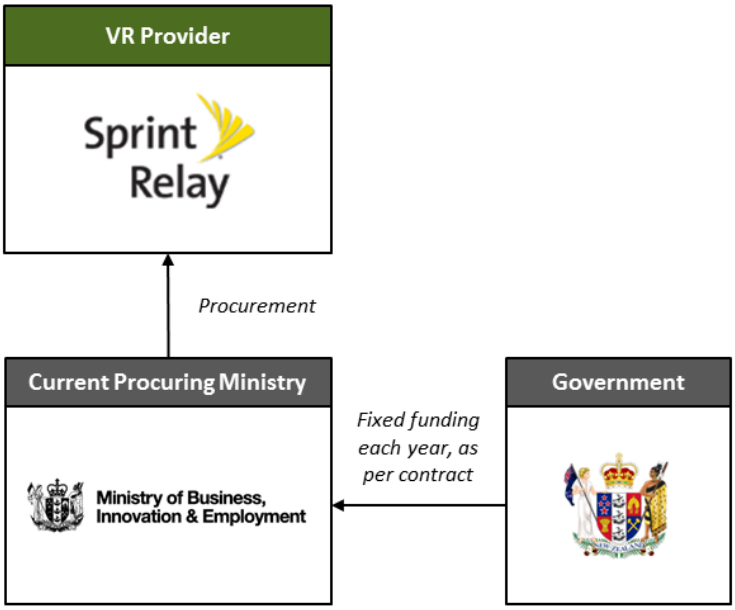
7.10. Captioned telephony service accessible by hybrid telephone and via the web will be introduced on 1 March 2013. Wireless captioned telephony will be introduced in late 2013 or early 2014.

7.11. An instant messaging application will be launched for smart phones in 2013 to allow real-time TR service to and from mobile devices. This may also be the basis for a real-time alternative to the SMS TXT111 service currently used by deaf as one method of accessing emergency services, the other two methods being the TR service and fax

Funding

7.12. As part of the current contract for national relay services, the Ministry of Business, Innovation & Employment on behalf of the New Zealand Government provides less than NZD 1 million of funding each year to Sprint Relay to offer VR. The level of funding is not dependent on the number of minutes handled, but the effective price per minute is comparable to the US FCC Tier 1 reimbursement rate.

Figure 14: Funding Model for VR in New Zealand



7.13. VR users need to purchase their own PC and broadband connection, and receive no financial support for this.

7.14. VR was previously financed by unspent funding allocated in the previous contract for the provision of textphones.

7.15. TR and speech-to-speech services are funded by the telecommunications industry via a USO levy.

Demand and Usage

7.16. For the month of August 2012, the VR service in New Zealand had 443 registered VR users. On average, each user made approximately 2 calls per month and the average call duration was between 10 and 11 minutes. However, it should be noted that the number of VR users understates reality, as some hearing impaired households have multiple VR users and some organisations such as Deaf Aotearoa offer drop-in centres which provide communal access to the VR service.

7.17. The VR service in New Zealand was first trialled in June 2009. Adoption of the trial service was initially high for the first 6 months, but this was due to outreach events. Subsequently, the number of VR users was relatively flat for the rest of the trial, as many potential VR users were only willing to commit to investing in a new PC or broadband subscription, if the service became permanent.

7.18. In September 2011, the hours of operation were extended and access via Skype was enabled. Prior to September 2011, VR access was delivered via SIP and H.263/4 videophones and free downloadable clients other than Skype. The impact of these changes was a rapid increase in the number of VR users, which in turn increased the total volume of call minutes and encouraged a large proportion of deaf TR users to use VR instead.

***Figure 15:*Figure 1: *Number* of VR Users (since Service Launch)**

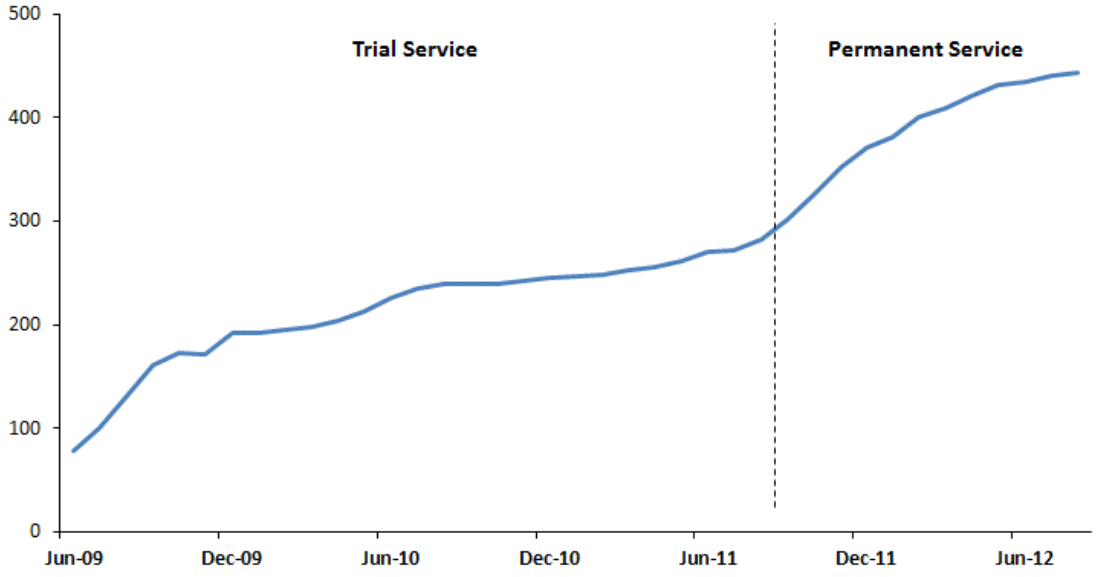
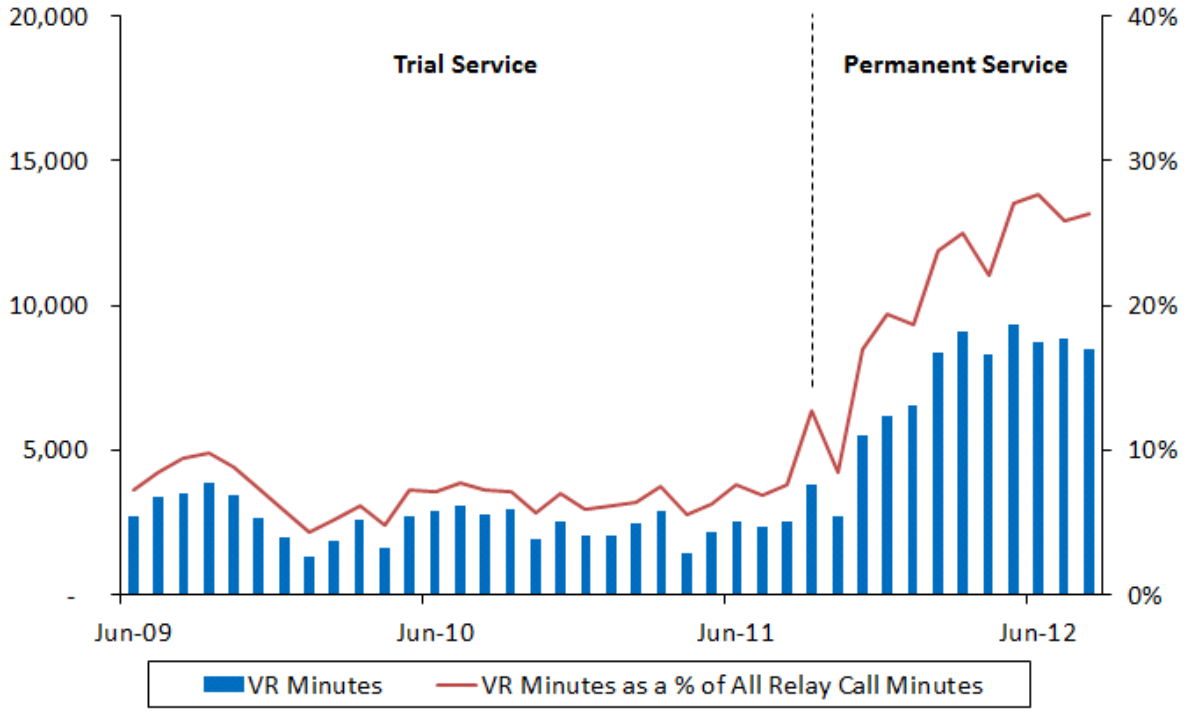


Figure 16: Monthly Volume of VR Minutes and VR Minutes as a % of All Relay Call Minutes[25]

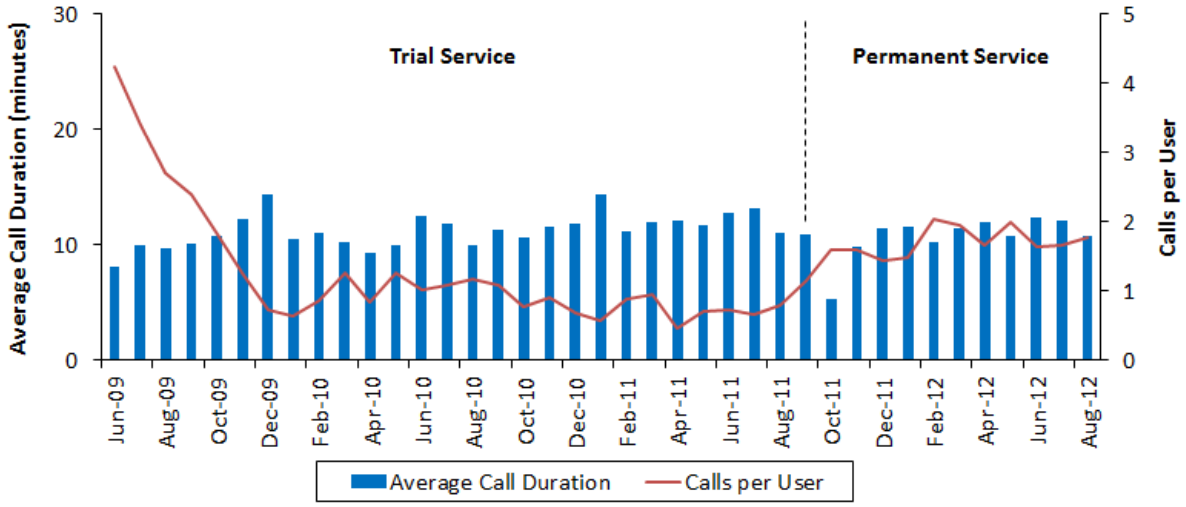


7.19. The extension of hours to between 0900 and 1700 per weekday was designed to cater for deaf users in employment or those seeking employment. Before the extension, the service was available for 4 hours per weekday between 0900 and 1300 on Monday, Wednesday and Friday; between 1500 and 1900 on Tuesday and Thursday to facilitate social calls. Operating hours on Tuesday and Thursday were originally set to between 1600 and 2000 during the trial, but a lack of calls during the primetime TV slot for VR users encouraged the change from 1 May 2010 to between 1500 and 1900 for those two days. The service was also closed during the Christmas and New Year holidays for cost reasons.

7.20. Average call duration was more than 50% lower in October 2011, compared to September 2011 (when the VR service was made permanent), but more or less recovered in the following month. This can be explained by the time taken for users to change their method of accessing the VR services from the previous downloadable client to Skype, and to upgrade their Skype software to version 5.5, which was necessary in order for VR users to have a satisfactory experience. The server that supports the earlier free downloadable clients has now been removed.

[25] The national relay services provider in New Zealand currently offers 5 types of services: text-voice conversion including IP relay calls; voice-text conversion; voice and hearing carryover; speech-to-speech; and VR.

Figure 17: VR Service: Average Call Duration and Calls per User



7.21. In recent months, growth in the usage of the VR service has slowed down. In the first few months of making the VR service permanent, for example, between September 2011 and December 2011, total VR minutes increased by an average compound monthly growth rate of 17%. In comparison, between December 2011 and August 2012, total VR minutes increased by an average compound monthly growth rate of 4%, driven mostly by an increase in the number of calls per user and a higher number of users. Average call duration, in fact, has shown a slight average monthly decline of 0.8% in this period.

7.22. Users are generally very positive about the VR service. VR offers more natural and faster conversations compared with TR. It has also been particularly popular with VR users who have low literacy rates and therefore could not use TR well. The Ministry of Business, Innovation & Employment stated that only a small number of complaints were related to waiting times. The main barrier to deaf people adopting VR is the cost of broadband and PCs used to access the service. There is also scope to increase awareness of the benefits of the service in the deaf community.

Operational Details

7.23. In the provision of VR, Sprint Relay must meet the following contractual requirements:

- Service must be available between 0900 and 1700 on weekdays
- 2 sign language interpreters and 1 supervisor to be employed at any one time
- All interpreters must be qualified with a Diploma in Sign Language Interpreting (DipSLI)
- Each sign language interpreter must have at least 2 years' community interpreting experience; the supervisor must have at least 4 years' community interpreting experience
- Interpreters must take a break once every 20 minutes

7.24. VR calls do not need to meet other mandatory service level requirements due to the small scale of the current VR operation.

7.25. In practice, Sprint Relay uses 3 interpreters at most at any one time, and relies on a pool of 9 interpreters for VR. Interpreters for VR have a 50% utilisation rate, compared to 20% for TR. The Ministry of Business, Innovation & Employment explained that the low utilisation rate is not surprising due to the small scale of the TR and VR operations, and it is also predicted by standard Erlang formulae[26]. The low utilisation rate is also currently a driver for VR and VRI services to be co-located, so that interpreter resources can be used more efficiently.

7.26. New Zealand has paid specific attention to how sign language interpreters are managed and trained. In addition to adhering to the contractual requirements of allowing interpreters to take a break once every 20 minutes, Sprint Relay does not allow interpreters to work more than 20 hours each week to mitigate the risk of "occupational overuse syndrome" and to encourage interpreters to take on a mix of community interpreting and VR interpreting.

7.27. Prior to the launch of the VR service, the Ministry recognised there was a shortage of sign language interpreters. From 2008, the Ministry has funded sign language interpreter diploma scholarships to ensure that existing resources were not taken away from community interpreting. Qualified interpreters in New Zealand rose from 91 in 2008 to 112 in 2012. Funding for scholarships will end in 2012, so that it can be used to fund the depreciation of CapTel® phones.

7.28. Sprint Relay does not set a time limit on calls, but users are encouraged to limit calls to 20 minutes to reduce waiting time for other users. Users which make calls to organisations that use IVR often experience long wait times whilst on the call. Call queues are not used, as VR users use Skype to check if one of the three interpreters is available, and will only contact them via Skype if their Skype presence shows them as available. If all interpreters are busy, a user will simply wait and try again later.

7.29. On confidential calls to some organisations such as banks and the Inland Revenue Department, voluntary arrangements have been made with the relay service that satisfy security requirements. There is no legislation mandating acceptance of relay calls by any call recipient.

Technical Details

7.30. Skype is the preferred method of most users to use the VR service. A typical user uses Skype to connect to one of 3 Skype accounts used by the sign language interpreters on duty.

7.31. Before the launch of the VR service, the relevant Ministry considered the use of videophones for VR, but was deterred by cost, and found no significant difference in video quality compared to Skype. Skype is free to download for users, and is popular with hearing impaired people for P2P calls. In a recent survey by the Ministry in 2012; 76% of hearing impaired respondents selected Skype as their preferred TR instant messaging solution for mobile devices.

[26] Erlang formulae are typically used to forecast call centre capacity requirements. For example, they can be used to calculate utilisation ratios and take into account the average time taken to answer each call.

7.32. More than 95% of VR users use the service via Skype. Version 5.5 or higher of Skype is recommended for VR users, in order to ensure satisfactory video quality. The VR service is accessible via 3 Skype accounts used by the sign language interpreters.

7.33. Users can use videophones to make VR calls but this is rare. Videophones use SIP and H.263/4 to connect to the VR service.

7.34. VR calls to landline numbers are free, but if the VR user wishes to contact a mobile, international or premium rate number, the VR user can purchase a pre-paid calling card and inform the interpreter of the dialling method. Alternatively, VR users can make use of 'Sign Carry Over (SCO)' whereby the sign language interpreter calls the VR user, and the VR user then conferences in the intended called party typically using his/her telecom provider's 3-way conference service. SCO thus allows VR calls to non-landline numbers to be charged via the VR user's phone bill.

7.35. The VR service in New Zealand supports incoming calls. Hearing callers can call VR users, by calling New Zealand Relay via a normal phone number and specifying the Skype username of the VR user they wish to call.

7.36. The VR service also supports Voice Carry Over (VCO) which allows a VR user to speak directly to the called party. VCO is ideal for sign language users who prefer to use their own voice.

7.37. The VR provider uses a customised system integrated with Skype to generate CDRs, in order to produce statistics and monitor usage.

8. NORWAY

Summary

8.1. Norway does not distinguish between VR and VRI. The VR/VRI service is provided on a permanent basis by the State Labour and Welfare Organisation (NAV), a government department. It is free of charge to users, and can be used for either business or personal use. The VR/VRI service is available between 0800 and 1500 on weekdays.

8.2. Users do not need to register in order to use the service, but registration is required for acquiring a videophone or PC client, if conditions are met. The PC client is available free of charge to any deaf user and videophones are available to employees and students. Deaf people under the age of 26 can also apply for videophones for language and communication development.

8.3. VR services are provided as part of a broader right, in the Norwegian National Insurance Act, to interpreting services. The telecoms regulator, NPT (Post- og teletilsynet) is not involved in regulation of VR/VRI services.

8.4. The NAV receives specific funding for VR/VRI from central government.

8.5. The VR/VRI service uses a dedicated platform to manage and route VR calls. The service can be used by anyone with a videophone or PC client.

Overview of the Service

8.6. There are 5,000 sign language users in Norway and 175 registered sign language interpreters.[27]

8.7. The Norwegian National Insurance Act regulates the right to sign language interpreters in Norway, and the NAV finances most interpreter services. 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. Approximately 90% of requests for booking a sign language interpreter for community interpreting can be fulfilled; the remainder of requests are usually not fulfilled because of resource constraints or they are made out of hours. Requests related to education and health take priority, but there are also regional differences in how community interpreting requests are responded to.

8.8. A TR service is provided under USO; however VR services are considered part of the interpreting service right. NPT is not involved in regulation of VR/VRI services

8.9. The VR/VRI service is organised and funded by the NAV. There have been periodic trials since 1998 and the service has been permanent since 2008.

8.10. The VR/VRI service is available between 0800 and 1500 every weekday. Users of the service do not need to register in advance, and can access the service using a SIP videophone or PC client. The service is free of charge for all users and there are no restrictions on the usage volume per user and the type of call (e.g. business or personal).

[27] http://www.eud.eu/Norway-i-194.html

8.11. The service can be used by anyone with a videophone or PC client. The PC client is available free of charge to any deaf user and videophones are available to employees and students (regardless of their age). If a deaf person requires a free videophone or PC client, he/she must register. For those, which are using sign language interpretation for the first time, they must need approval from a doctor. Deaf people under the age of 26 can also apply for videophones, if they are officially certified to receive assistance for language and communication development and can demonstrate that their kin have videophones.

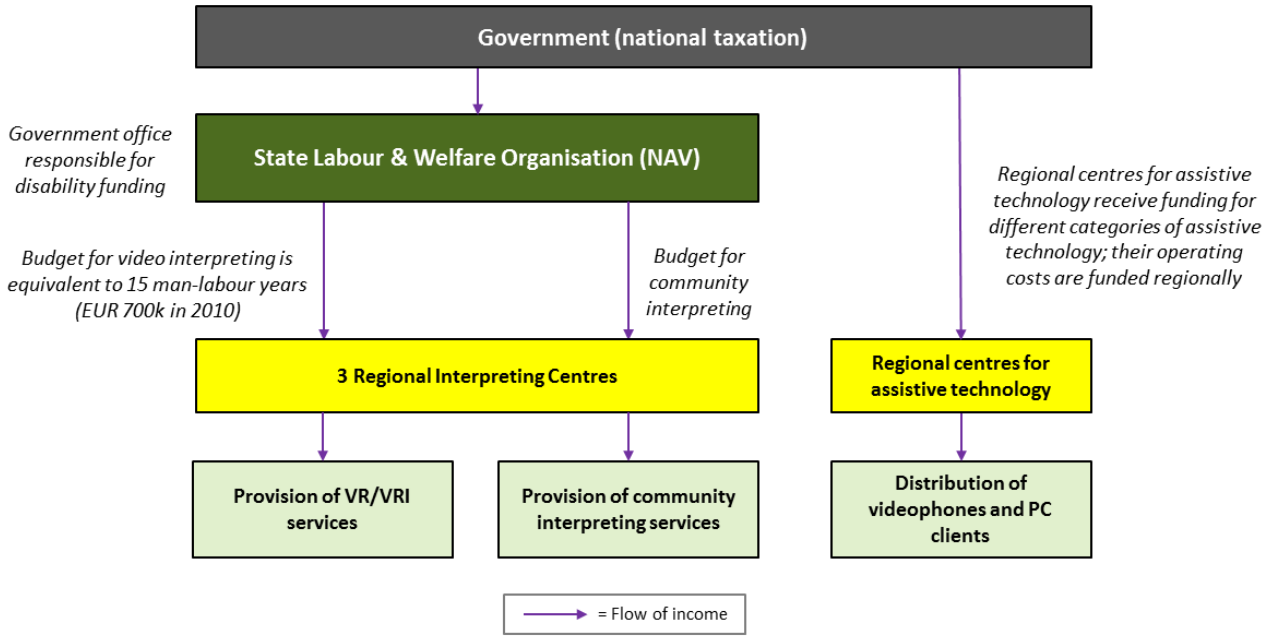
Funding

8.12. The NAV is funded by the Government for different kinds of disability related services. Specifically, for VR/VRI services, the NAV receives funding equivalent to 15 man-labour years. This funding is then distributed across 3 regional interpreter centres to cover personnel costs associated with video interpreting (i.e. sign language interpreters, technicians, management, support). Sign language interpreters employed by the regional interpreter centres typically do a mix of VR/VRI and community interpreting. There is no cap as such, because if more interpreters are needed they are added and funding is increased. If they did reach the point, where a cap was needed, this would be a political decision. The regional interpreter centres receive separate funding from the NAV to finance community interpreting assignments.

8.13. The PC client is provided free of charge to all users. Dedicated videophones are distributed free of charge to employees and students. Users aged over 26, who wish to use the VR/VRI service and are not in employment or education, can either use the free PC client or fund their own videophone.

8.14. The cost of videophones and PC client licences is financed by national funding received by regional centres of assistive technology; the NAV is not responsible for this cost. The running costs of the regional centres of assistive technology are funded regionally.

Figure 18: Funding Model in Norway



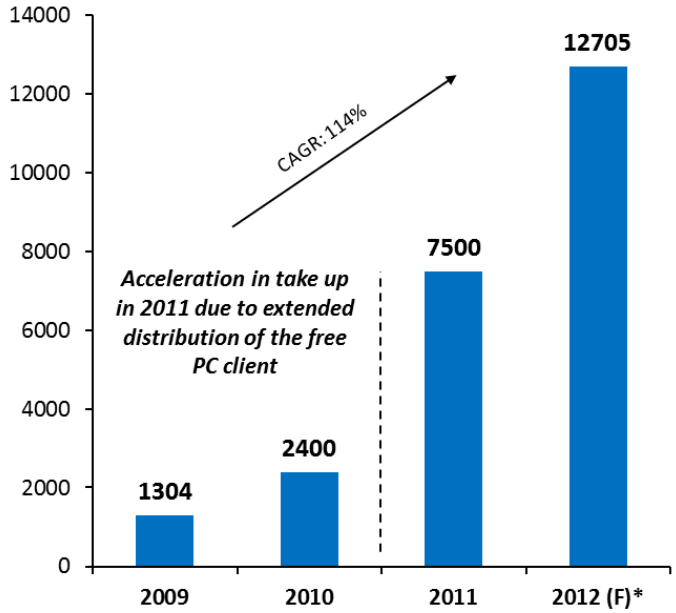
Demand & Usage

8.15. There is unlimited free usage to both personal and business callers. Users are able to call internationally free of charge. The only restriction is that premium rate numbers are not available. Approximately 25% of calls are video interpreting calls in 2010[28]. On average calls are approximately 6-7 minutes long.

8.16. Business users wishing to use the service need to apply for a videophone to the regional assistive technology agency in the county in which they live in. The employer must also agree, as they are responsible for providing the connectivity. Where an employee is on a fixed contract, the videophone is only provided for the duration of that contract.

8.17. The initial take up was hampered by poor user experience while technical difficulties were overcome. Since 2011, take up has increased rapidly as a result of several changes. Distribution of the free PC client was previously restricted to approved requests from deaf persons in employment or under the age of 26. In March 2006, distribution was extended to approved requests from all deaf persons. In addition, the service has been heavily marketed and NAV believes that word of mouth has played a critical part in driving take up. In mid-2012, distribution of videophones was extended to approved requests from students.

Figure 19: Number of VR/VRI Calls[29]



Operational Details

8.18. There are 25-30 interpreters across the 3 regional centres and 4 are on duty at any time. The service is available between 0800 and 1500 every weekday. From 1st October 2012 to

[28] Haualand, H. (2010), 'Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing, A Comparative Study of Video Interpreting Systems in the US, Norway and Sweden', The Swedish Institute of Assistive Technology (SIAT) (Hjälpmedelsinstitutet, HI) and Fafo Institute for Labour and Social Research

[29] NAV – 2012 forecast based on pro-rated number on actuals up to end of August 2012

21st December 2012, there is a trial extension to 1700. There is a desire amongst users for a weekend service but there are currently no fixed plans for this.

8.19. If all lines are busy, calls are placed on hold at no cost to the caller. A single queue is used, and waiting callers are informed of their position in their queue. NAV monitor demand and queuing and add more interpreters as necessary. It is currently only using interpreting studios in 3 of the 17 regional interpreting centres and could expand to studios in additional interpreting centres if needed.

8.20. There is variation in how regional interpreter centres coordinate sign language interpreter resources between VR, VRI and community interpreting. For example, some sign language interpreters at some centres use half a day per week for community interpreting assignments, and some alternate on a weekly basis between VR/VRI and community interpreting.

Technical Details

8.21. The VR service in Norway is based on the MMX platform. Any SIP-based videophone or soft client can be used to access the VR service; web clients are currently not supported in Norway. A VR user needs to call the VR service first (using a videophone or PC client); once connected to an interpreter, the interpreter will call the requested calling party via a phone connection.

8.22. The service had technical issues to begin with. For example, soft clients sometimes have issues with firewalls but videophones can be used to overcome this.

8.23. The service also supports calls from hearing users to VR users. The caller needs to call the interpreting service and give the SIP address they wish to reach.

8.24. VR in Norway does not currently support Skype access. However in the future they would like to support integration with third party applications. To date whilst the applications may theoretically be compatible with NAV's platform, in reality the user experience is too poor quality for this to be rolled out.

9. SWEDEN

Summary

9.1. Sweden does not distinguish between VR and VRI. The VR/VRI service is provided on a permanent basis. It is free of charge to users, and can be used for either business or personal use. The VR/VRI service is available between 0700 and 2200 on weekdays, and between 0900 and 1700 on weekends and holidays. Users do not need to register in order to use the service, but registration is required for acquiring a videophone.

9.2. The Interpreter Centre at Örebro runs the national VR/VRI service, known as "Bildtelefoni.net", on contract from Swedish Post and Telecom Authority (PTS). PTS procures the contract to supply these services on a regular basis (every 4 to 5 years with various options available). The latest procurement of the service has been delayed by legal challenges.

9.3. The VR/VRI service is entirely funded by the government, and can be used for free by both personal and business users. The funding is provided from the central government budget. Provision of the service does not differ for personal and business users, but the funding model for equipment does differ: Personal users borrow equipment from regional authorities, whereas business users can recoup equipment costs from one of two government agencies.

9.4. The VR/VRI service uses a dedicated platform to manage and route VR calls. Users can access the VR/VRI service in a number of different ways. Dedicated videophone hardware or software is common, as is use of a web client through PCs.

Overview of the Service

9.5. There are an estimated 10,000 sign language users in Sweden, and 600-650 active sign language interpreters[30].

9.6. The Health and Medical Service Act in Sweden states that county councils have a legal obligation to provide interpreter services to citizens who are hard-of-hearing, deaf or deaf-blind. The legislation does not state individual rights, but community obligations.

9.7. Community interpreting services are freely available to users. Provision to "Priority 1" cases is available on an unlimited basis, and provision to "Priority 2" and "Priority 3" cases is constrained based on resources.

9.8. The VR/VRI service in Sweden is governed by the law on electronic communication[31]. The law requires the government to ensure that hearing impaired people can access voice telephony services either by using a USO provider or to procure a VR/VRI service directly. The Government in Sweden uses the second option and appoints PTS to procure the service.

[30] PTS, October 2012
[31] http://www.notisum.se/rnp/sls/lag/20030389.HTM

9.9. Örebro County has a large proportion of deaf users (almost as many in number as Stockholm). Örebro County Council thus has an Interpreter Centre which has provided sign language services for many years.

9.10. The Interpreter Centre of Örebro County Council originally just provided community interpreting services. High demand for sign language interpreting and limited resources motivated the Interpreter Centre to offer VR/VRI services nationally from 1997, which helped to reduce overall cost. No distinction is made between VR and VRI; both are provided to users free of charge.

9.11. The Interpreter Centre at Örebro now runs the national VR/VRI service, known as "Bildtelefoni.net", on contract from PTS. PTS procures the contract to supply these services on a regular basis (every 4 to 5 years with various options available).

9.12. The service is available through dedicated video hardware or software, web clients, UMTS mobile phones with video capabilities (H.324 M) and smartphones/tablets with supported applications. Users first call the VR/VRI service directly and then provide details to the interpreter of the number they would like to call.

Funding

9.13. The VR/VRI service is entirely funded by the government, and can be used for free by both personal and business users. The funding is provided from the central government budget.

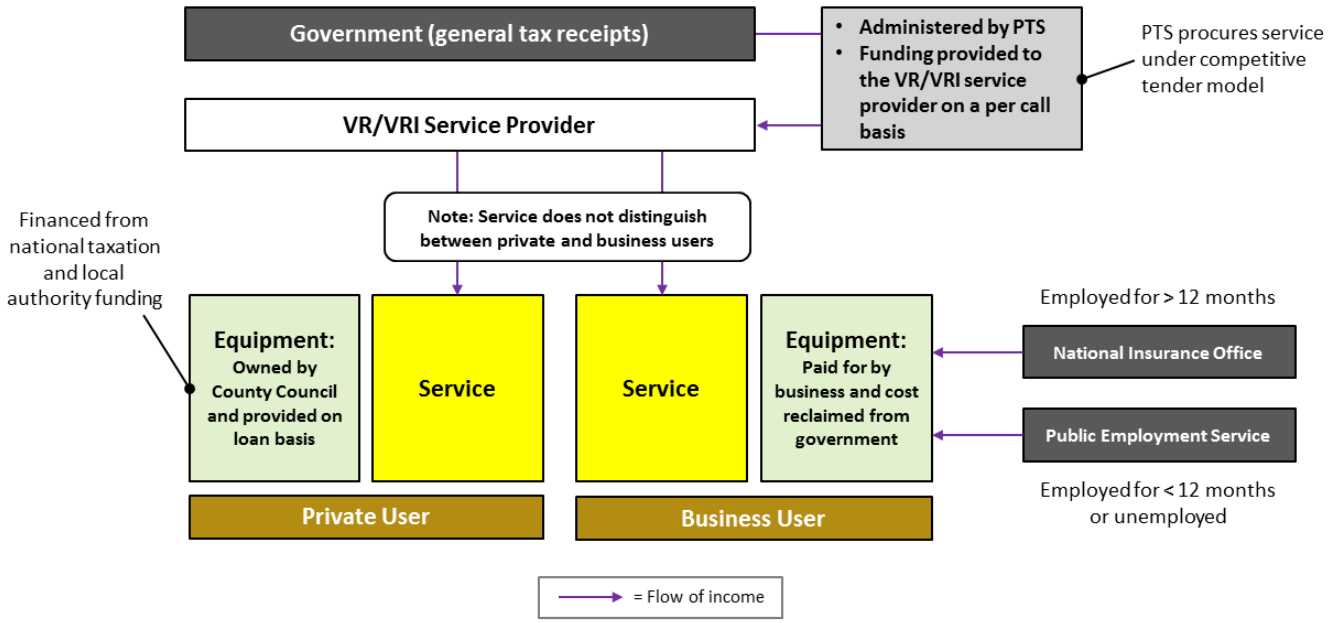
9.14. The funding is administered by the PTS. Funding to the vendor is currently provided on a per call basis. During 2011, the total cost of the VR/VRI service to the PTS was SEK 26.3 million, compared to 17.2 million in 2010.

9.15. Personal users can borrow VR equipment from their local county council. A mix of state government (approximately SEK 20 million) and regional authority government (approximately SEK 10 million) funding is used to procure and maintain the equipment.

9.16. Funding for VR equipment is provided to business users by two governmental bodies: (i) the National Insurance Office and (ii) the Public Employment Service. The first provides funding when users have been employed for more than 12 months, and the second when users have been employed for less than 12 months.

9.17. The following schematic explains how the VR/VRI service and equipment are provided to personal and business users in Sweden.

Figure 20: Overview of Funding in Sweden



9.18. Funding for calls is based on the number of calls. During the procurement, providers submit proposals to run the service which include the reimbursement rate per call which they would like to receive. Upon award of the contract, PTS reimburses the selected vendor using the proposed per call reimbursement rate. Providers are allowed to make a profit. However, because of laws on regional authorities, Örebro County Council is not allowed to make a profit from VR/VRI – any excess cash must go back into the VR/VRI service.

9.19. 80-85% of costs are for personnel (i.e. sign language interpreters and support staff). 15-20% of costs are for technology (i.e. bandwidth, booking system, security).

9.20. Funding was historically based on tiered reimbursement for calls on a yearly basis, with the cost of a call starting at SEK 144, and falling to SEK 97 with increasing volume.

9.21. Reimbursement for costs incurred in providing the VR/VRI service is now provided on a flat rate model, at SEK 150.21 per call. This is a "temporary" arrangement until the procurement is finalised following the resolution of legal challenges. Under the new contract, the reimbursement rate per minute (measured in seconds) will be SEK 29.87.

9.22. As per the requirements of the delayed procurement, PTS plans to move from a per-call to per-minute (measured in seconds) reimbursement model, and to change call length measurement from when a call is connected between all three parties (i.e. caller, interpreter, and call recipient) to when the interpreter answers and ends the call from the caller, thus representing actual costs more effectively.

9.23. PTS expects the cost per call to fall as a result of the increased competition between providers in the recent procurement process. The service will be improved in a number of other dimensions: (i) an extension of opening hours is planned to 0600 to 0000 on all days, including holidays; (ii) applications for iPhone, iPad, and Android smartphones and tablets will be part of the service; (iii) support for Skype will be included; and (iv) 112 calls will be prioritised.

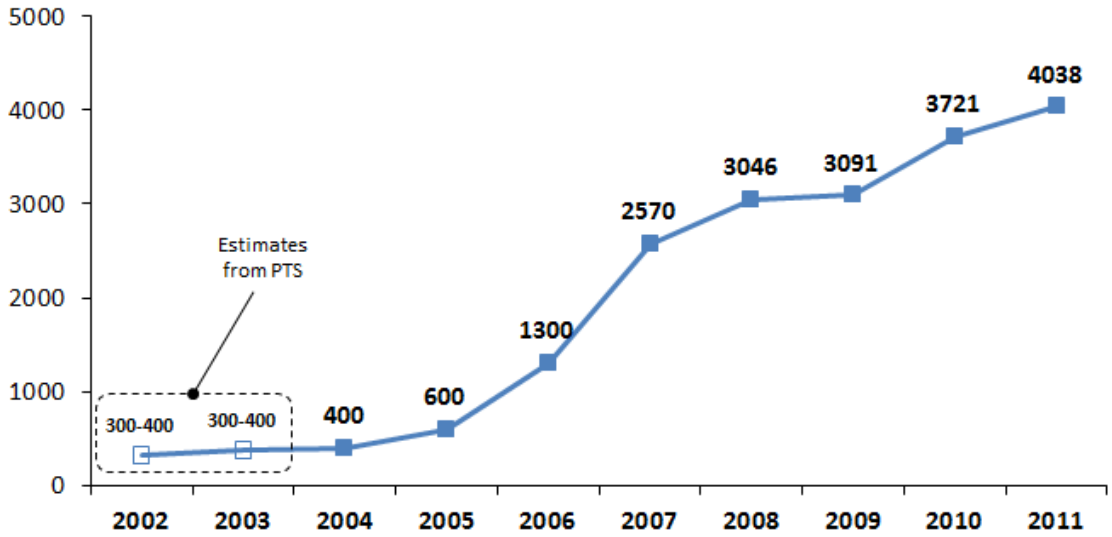
Demand and Usage

9.24. As a public service, data is available on usage from the VR/VRI provider.

9.25. Annual usage of the VR/VRI service rose from 169,000 minutes in 2006 to 590,000 minutes in 2011 at an average compound annual growth rate (CAGR) of 28%. Total number of calls rose from 45,000 in 2006 to 205,000 in 2011 at an average CAGR of 36%. The number of unique users rose from 1,300 in 2006 to 4,000 in 2011 at an average CAGR of 25%. The increase in overall usage has slowed in recent years; for example, in 2007, usage by calls and minutes doubled as a result of the number of users doubling.

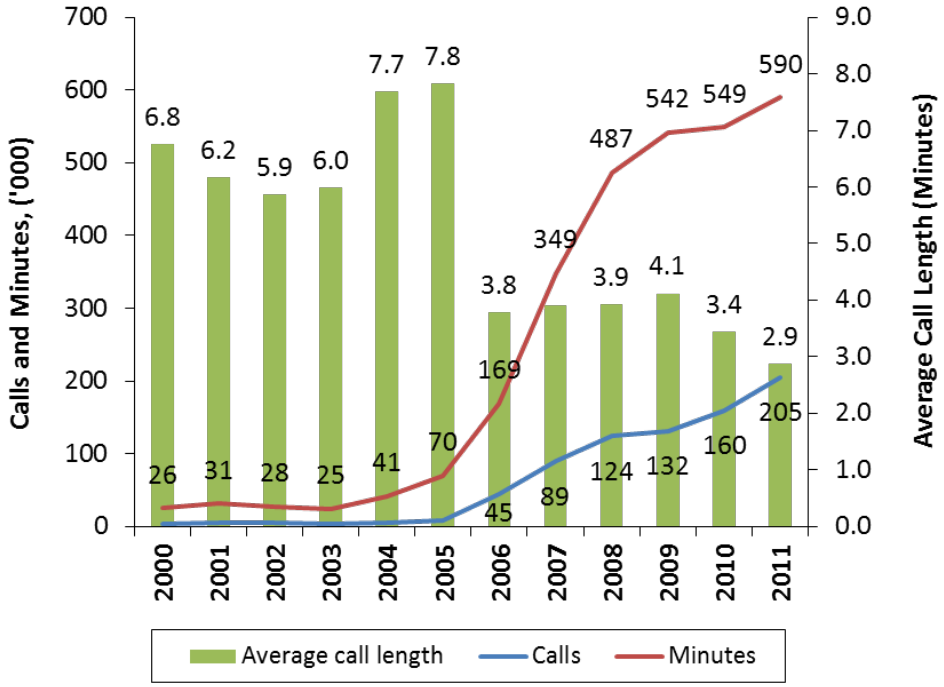
9.26. The following chart shows the rise in the number of VR/VRI users. Exact values were not provided for 2002 and 2003.

Figure 21: **Total Number of VR/VRI Users, 2002-2011**



9.27. The following chart shows the rise in the number of calls and minutes for the VR/VRI service.

Figure 22: Usage of the VR/VRI service in Sweden



9.28. It is important to note that statistics for the 2000-2005 cannot be compared with 2006-2011, due to changes in data collection methodology. During 2000-2005, call durations were measured from when the interpreter received a call to when the interpreter completed the call with the VR/VRI user; call durations therefore included time taken for VR/VRI user to brief the interpreter in advance of the call, and to thank the interpreter for their assistance. Since 2006, call duration has been measured from when the interpreter calls the intended called party; this therefore caused measured "average call duration" to fall sharply in 2006.

9.29. Between 2006 and 2011, average call length fell from approximately 3.8 minutes to 2.9 minutes per call. In comparison, for the same period, calls per user per month rose from 2.9 to 4.2. This suggests the average VR/VRI user is making more calls of a shorter duration. The majority of VR/VRI calls indeed do not last for long durations. For example, in 2011, 54% of VR/VRI calls were completed in less than 1 minute; an additional 28% of calls lasted between 1 and 5 minutes, and a further additional 11% of calls lasted between 5 and 10 minutes.

9.30. As mentioned, there were 4,000 unique users over 2011. There were only 1,200 unique users per month though, which suggests some users do not use the service on a monthly basis. In 2011, the VR/VRI service experienced highest usage in March and lowest usage in July in terms of number of calls.

9.31. Average waiting time for a VR/VRI call is 20-30 seconds, although this occasionally can rise to several minutes.

Operational

9.32. The Interpreter Centre in Örebro employs 100 sign language interpreters and subcontracts out to other interpreter studios in other parts of Sweden. There are 12 interpreter studios

located in Örebro, with 7 additional studios in Sweden. Not all studios run simultaneously, and some act as backup. Calls longer than 30 minutes are staffed by 2 interpreters. Örebro County Council can use interpreter resources for tasks in addition to video interpreting, but must ensure that minimum service level requirements are achieved. Peak utilisation is approximately 32 interpreters.

9.33. Demand is forecasted based on user needs and demand for VR/VRI from historical traffic data.

9.34. Service levels are set by PTS as requirements in the tender process. The VR/VRI service provider must answer at least 90% of calls within 90 seconds and at least 70% of calls within 40 seconds. If service level requirements are not reached, for example in terms of how long a user must wait to access an interpreter, the VR/VRI service provider must pay a fine. This fine must be deducted from the monthly invoice which the VR/VRI service provider issues to PTS. As part of the requirements, the VR/VRI service provider is also responsible for marketing and outreach.

Technical

9.35. Users can access the VR/VRI service in a number of different ways. Dedicated videophone hardware or software is common, as is use of a web client through PCs. The service is also compatible with legacy ISDN video, and circuit switched video through UMTS mobile handsets (H.324 M). It is currently not compatible with Skype.

9.36. Thus most calls are SIP-based. In terms of bandwidth, a minimum of 386 Kbps downstream and upstream is recommended as guaranteed bandwidth. If bandwidth is not guaranteed, a minimum of 512 Kbps downstream and upstream is recommended.

9.37. The service has a unique SIP address. To make a call, a VR/VRI user places a video call to that SIP address. Once connected to an interpreter, the user either signs or types the number to be called. The interpreter then places a voice call to this number.

9.38. The same process needs to be followed for emergency calls.

9.39. The service supports calls from hearing users to VR/VRI users. Hearing users dial the service number and then read out the SIP address or videophone address to the interpreter, who then places the video call.

9.40. The VR/VRI service currently uses a centralised MMX platform to manage and route VR calls. The MMX platform provides call detail records (CDRs), forwarding of calls to other sign language interpreters, call queue management and generation of statistics. It is configured to inform customers of their position in their queue at regular intervals.

9.41. Some technical issues exist:

- Some videophones are sometimes incompatible with ISPs, as the SIP headers used by videophones tend to be large and not handled consistently by ISPs. SIP headers can thus become truncated. Only videophone vendors can change SIP headers: the service provider cannot modify these

- SIP uses a dynamic port range. Some videophones are currently not compatible with some 'triple play subscriptions'[32]
- SIP calls are also sometimes not possible with some videophones, if firewalls are not SIP-compliant

[32] In telecommunications, triple play subscriptions refer to bundled provision of three bandwidth services, typically a phone service, internet access and TV service.

10. UNITED STATES

Summary

10.1. VR services in the US are available for free and unrestricted 24/7 for all users, and for any purpose. Users must register in order to use the VR service. VR equipment is also distributed by some VR providers for free.

10.2. The US had many VR providers, but the number has fallen due to the introduction of a stricter certification process and requirements designed to reduce misuse and fraud. VR is undergoing major changes in the US. The Federal Communications Commission (FCC) is discussing proposed reforms with stakeholders, and expects these reforms to start in 2013 and take two years to implement.

10.3. In the US, relay services including VR are mandated under Title IV of the Americans with Disabilities Act of 1990 (ADA). This requires communication providers to offer access to the telephone system that is functionally equivalent to voice telephone services.

10.4. Approved VR service providers are compensated on a per-minute basis, tiered according to call usage volumes, from a government-mandated fund which is funded by telecom providers.

10.5. Due to scale of the VR market in the US, all VR service providers use dedicated platforms to manage and route VR calls. Most users use dedicated videophones which are distributed for free by VR providers.

Overview of the Service

10.6. The FCC noted a very wide range of estimates for the number of deaf sign language users, and referenced a range of 100,000 to 15,000,000[33].

10.7. In the US, relay services including VR are mandated under Title IV of the Americans with Disabilities Act of 1990 (ADA). This requires communication providers to offer access to the telephone system that is functionally equivalent to voice telephone services.

10.8. Titles II and III of the ADA require public entities and places of public accommodation to provide interpreting services to deaf people unless there is an undue burden. Community interpreting is therefore provided by some public entities, but is not readily available due to due to cost burdens and a lack of sign language interpreters which do not already work for a VR service provider

10.9. VR in the US is available for free and unrestricted 24/7 for all users. VR equipment is distributed by some VR providers for free. The US distinguishes between VR and VRI, and only provides funding for the former.

10.10. VR is undergoing major changes in the US. The FCC is discussing proposed reforms with stakeholders, and expects these reforms to start in 2013 and take two years to implement.

[33] FCC 11-184 (Structure and Practices of the Video Relay Service Program, Further Notice of Proposed Rulemaking, 15/12/2011) references: Ross E. Mitchell, "Can You Tell Me How Many Deaf People There Are In The US?", http://research.gallaudet.edu/Demographics/deaf-US.php

10.11. Multiple providers are currently certified by the FCC to provide VR; in fact, users can switch VR providers easily on a per call basis. The market is dominated by Sorenson with approximately 80% market share and 2 medium sized providers. Some VR providers have attracted users by offering free items in addition to free videophones such as iPads, TVs and PCs; this has encouraged some users to use multiple VR providers.

10.12. The number of providers has fallen due to the introduction of a stricter certification process and requirements designed to reduce misuse and fraud; many providers are currently 'conditionally certified' and are being audited to ensure they are compliant with regulations.

10.13. The FCC believes the current industry structure would be more efficient if there were fewer players. The FCC would like to shift from having multiple sub-scale providers and a single at-scale provider to having several at-scale providers[34].

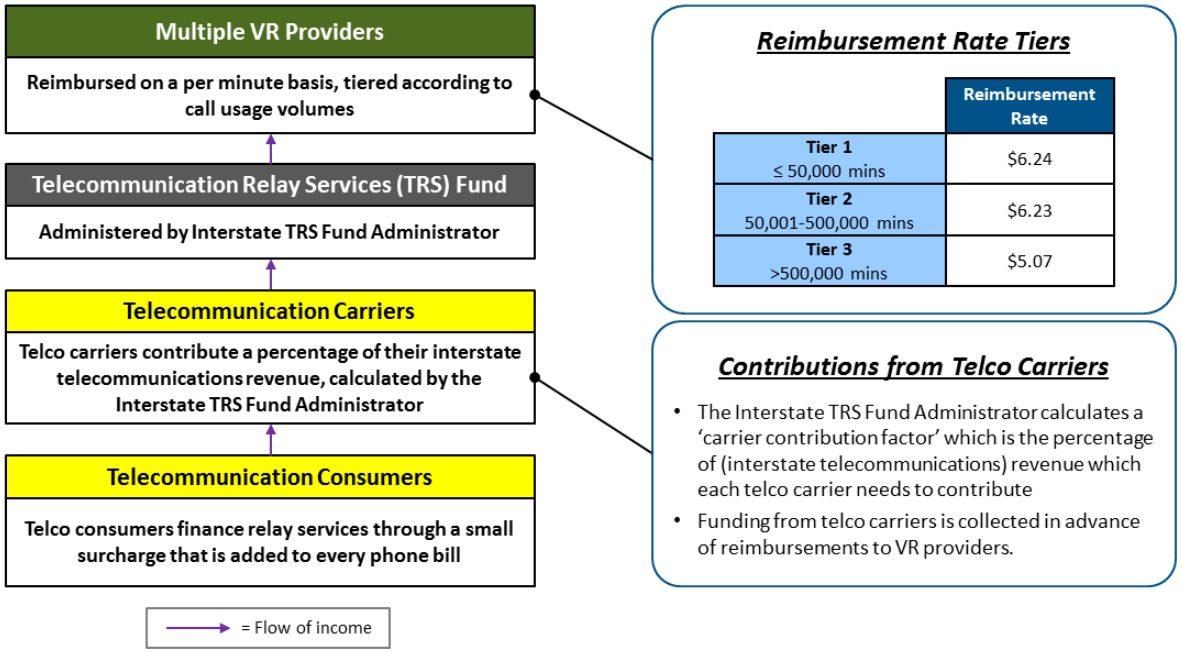
10.14. In addition to the VR services regulated by the FCC, a separate VR service for US Federal Government also exists. The US Federal Government uses a formal tendering process (via the General Services Administration, a Federal Government procurement department) to select a single VR service provider to handle calls to and from federal government agencies. Federal agencies are billed on a per minute basis The Federal VR service is not regulated by the FCC. It is currently provided by Sprint Relay. It is available between 0700 and 2200 (US Eastern Time) on weekdays, excluding public holidays, and sign language interpreters are available in English and Spanish.

Funding

10.15. VR is funded entirely using the Interstate TRS Fund. Although some VR calls occur between users within the same state, all VR calls are treated as interstate calls. Telecommunication consumers finance relay services through a small surcharge that is added to every phone bill; this contribution is collected from telecommunication carriers by the Interstate TRS Fund Administrator, appointed by the FCC. Approved VR service providers are then compensated using the Interstate TRS Fund on a per minute basis, tiered according to call usage volumes.

[34] The FCC comments on this in FCC 11-184 (Structure and Practices of the Video Relay Service Program, Further Notice of Proposed Rulemaking, 15/12/2011)

Figure 23: VR Funding Model in the US



10.16. The Interstate TRS Fund is administered by Rolka Loube Saltzer Associates (RLSA), which calculates how much to reimburse VR providers on a monthly basis. RLSA analyses demand (historical and projected) and VR providers' reimbursable costs. Providers are compensated for reasonable costs of providing the service. RLSA applies an 11.25% mark-up on the weighted average of costs, not dependent on the capital structure, in order to calculate the size of the Interstate TRS Fund and recommend reimbursement rates to the FCC for the coming year. RLSA invoices telecom providers for their contributions to the Interstate TRS Fund in advance of reimbursements to VR providers.

10.17. All VR providers must submit detailed reports including a CDR (Call Detail Record) for each 'reimbursable' call to RLSA on a monthly basis. Providers must remove CDRs for calls ineligible for reimbursement, and RLSA analyses submitted CDRs for calls which are non-eligible, fraudulent, or fail to meet mandatory operational requirements. RLSA can withhold reimbursement payments in part or in full if it discovers anomalies.

10.18. Although some VR providers offer additional premium products and services such as VRI, most providers' primary source of income is the Interstate TRS Fund. As described by the FCC in FCC 11-184[35], the Interstate TRS Fund has therefore been used implicitly/indirectly to fund non-applicable expenditure items such as free videophones and customer acquisition costs.

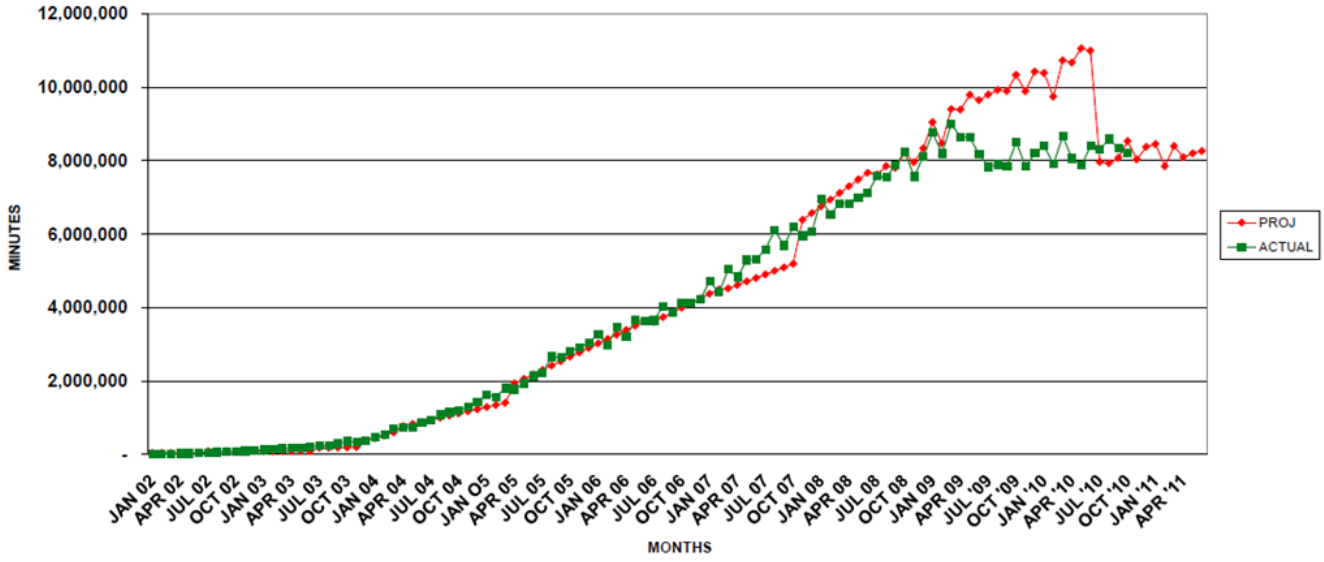
10.19. The FCC also established the National Deaf Blind Equipment Distribution Program (NDBEDP) to provide funding to FCC-certified entities for the distribution of specialised customer premises equipment to low income individuals who are deaf blind.

[35] FCC 11-184 (Structure and Practices of the Video Relay Service Program, Further Notice of Proposed Rulemaking, 15/12/2011) http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-184A1.pdf

Demand and Usage

10.20. Usage in terms of minutes increased rapidly in the first 10 years, but in recent years has levelled off. It difficult to calculate the number of unique users, as many users tend to use multiple providers. The following chart from NECA, the previous Interstate TRS Fund Administrator, illustrates this.

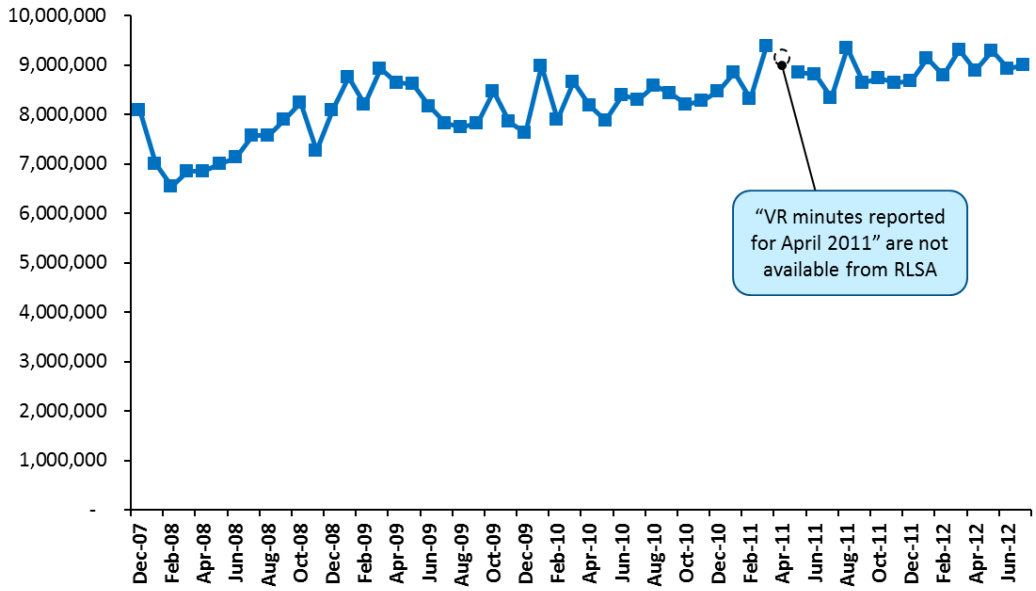
Figure 24: Reported VR Minutes per Month (Source: NECA)



10.21. The new Interstate TRS Fund Administrator, RLSA, generates monthly Interstate TRS Fund Reports[36], offering more recent statistics on the volume of VR minutes. However, care should be taken when reading this statistics, as some months contain out of period adjustments.

[36] http://www.r-l-s-a.com/TRS/Reports.htm

Figure 25: Total Actual VR Minutes Reported by VR Providers (Source: RLSA)



10.22. Most calls using VR equipment are for P2P calls.

10.23. VR users are generally positive about the services available. Some users would like the option to pick interpreters based on their skills and areas of knowledge.

10.24. Although VR users generally do not experience long waiting times, the quality of sign language interpreters can be variable across different providers.

10.25. A large number of deaf/hard of hearing people do not have VR due to lack of broadband access. High speed broadband is also not available in some rural areas. The FCC is proposing to create a TRS Broadband Pilot Program which would use the TRS Fund to subsidise broadband internet access for low income VR users. The FCC is proposing to provide incentives to VR providers to add new users, which have not used VR before.

Operational Details

10.26. According to the FCC, average usage per month per user is approximately 70 minutes.

10.27. VR providers need to adhere to standards and rules designed to maintain quality of service and mitigate misuse/fraud. The FCC requires 80% of all calls must be answered within 120 seconds and that VR services must be offered 24 hours a day on all days of the year.

10.28. The growth of VR in the US has attracted the majority of available sign language interpreters, but as a result, has led to fewer interpreters being available for community interpreting. Some providers also employ interpreters outside the US, and have therefore affected the availability of interpreters in other countries.

10.29. The FCC acknowledges that this has been a longstanding challenge facing VR services in the US. From interviews, there appears to be a general consensus that high reimbursement rates incentivised VR providers to generate illegitimate minutes and overstate costs, and that fraud is unlikely to be completely eliminated if providers do not compete on price. The FCC's increase in oversight and introduction of stricter rules has led to a reduction of misuse and fraud, and implementation of additional reforms is likely to

further improve the situation. For example, “white label” VR providers which completely outsource operations are no longer allowed. VR providers are audited to ensure they employ their own interpreters, own/lease facilities with redundancy, and locate an ACD (automatic call distribution) platform on their own premises. VR providers are also audited on financing and are not allowed to link interpreters’ salaries and financing of ACD platforms to VR minutes provided.

Technical Details

10.30. The technical capabilities of VR in the US are driven by need to achieve functional equivalence to voice telephony services. For outgoing and incoming calls, callers can contact an intended party directly; any calls involving a VR user will automatically be routed to an interpreter of the selected VR provider. VR providers must provide users with a standard 10-digit number, allowing users to receive incoming calls and benefit from location identification on 911 calls. A standard 10-digit number also enables reduces the likelihood of a call being rejected, as VR calls previously appeared to come from a VR service provider or toll-free number, and therefore were often mistaken for being a non-local or telemarketing call

10.31. Most users use dedicated videophones which are distributed for free by VR providers. VR equipment distributed by VR providers must be interoperable with equipment from other VR providers, but FCC has waived rules on interoperability several times. Enhanced feature sets such as address books and speed dial lists cannot be ported between videophones or providers. Soft clients are increasingly being used.

10.32. The FCC is keen to promote mass market access technology such as Skype, which could potentially be less expensive and evolve faster than customised equipment offered by VR providers.

Annex

11. GLOSSARY

ACD	Automatic Call Distribution Platform
ACE	Australian Communications Exchange (Australia)
ADA	Americans with Disabilities Act of 1990
AGEFIPH	Association de Gestion du Fonds pour l'Insertion Professionnelle des Personnes Handicapées
ASLIA	Australian Sign Language Interpreters Association
AUSLAN	Australian Sign Language
AUT	Auckland University of Technology
BNetzA	Bundesnetzagentur (German Regulator)
Bundesland	Federal State (Germany)
CA	Communications Assistant / VR Sign Language Interpreter (US)
CDR	Call Detail Record
DipSLI	Diploma in Sign Language Interpreting
DNTM	National Interpreters Authority (Denmark)
FCC	Federal Communications Commission (US Regulator)
FIPHFP	Fonds pour l'Insertion des Personnes Handicapées dans la Fonction Publique
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ITU	International Telecommunication Union
LPC	Cued speech (France)
LSF	French Sign Language
MES	Minimum Efficient Scale
MMX	Platform from nWise to deliver video relay services
NAV	State Labour and Welfare Organisation (Norway)
NBN	National Broadband Network (Australia)
NDBEDP	National Deaf Blind Equipment Distribution Program (US)
NECA	National Exchange Carrier Association (Former Interstate TRS Fund Administrator)

NPT	Post- og Teletilsynet (Norwegian Regulator)
NRA	National Regulatory Authority
NRS	National Relay Service (Australia)
NZSL	New Zealand Sign Language
P2P	Point-to-Point
PSTN	Public Switched Telephone Network
PTS	Swedish Post and Telecom Authority (Swedish Regulator)
RLSA	Rolka Loube Saltzer Associates (Interstate TRS Fund Administrator, US)
SCO	Sign Carry Over
SIP	Session Initiation Protocol
TC	Total Conversation – standard for videophones
TKG	National Telecommunications Act (Germany)
TR	Text Relay
TRS	Telecommunications Relay Services (US)
TTY	Special textphone
TUSMA	Telecoms Universal Service Management Agency (Australia)
USD	Universal Service Directive
USO	Universal Service Obligation
VCO	Voice Carry Over
VR	Video Relay
VRI	Video Remote Interpreting
VRS	Video Relay Service

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Please note that the list above does not include all organisations which were interviewed. Some organisations did not confirm whether they would like to be acknowledged as contributors.

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