

VRS Feasibility Study Final Report

Mission Consulting

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A Collaborative Endeavour

This Feasibility Study for potential Canadian Video Relay Services was accomplished with the assistance of many consumer representatives in Canada and other countries, as well as assistance from the Canadian interpreting community. It has been a privilege to work with these individuals and to learn from their expertise. We extend our thanks to everyone who contributed. In particular we would like to thank those individuals who participated on the Canadian VRS Feasibility Study Advisory Committee:

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Appendices under separate cover:

- Phase 1 Project Confirmation
- Phase 2 Legal Background for Canadian VRS
- Phase 3 Consumer Interests and Perspectives
- Phase 4 VRS Models in Other Countries
- Phase 5 Technologies and their Forecasts
- Phase 6 Interpreter Considerations
- Phase 7 Quality of Service
- Phase 8 Potential Related Services
- Phase 9 Forecasts of VRS User Demand
- Phase 10 VRS Cost Variables and Forecasts
- Phase 11 Potential Canadian VRS Models

VRS FEASIBILITY STUDY

EXECUTIVE SUMMARY

1. VRS Feasibility Study Background

This VRS feasibility study final report represents the findings of the eleven phases of a study commissioned by Bell Canada (Bell) as part of a deferral account proposal. The objective of the feasibility study is to provide information to facilitate informed decisions regarding potential regulations and implementation of Canadian video relay service (VRS). Bell engaged Mission Consulting to conduct an independent and comprehensive study of the feasibility of VRS for Canada. This final feasibility report will draw, in part, on information contained in the research summaries of each of the eleven earlier phases.¹

The earlier eleven research phases of the study were as follows, each resulting in an extensive written analysis:

- Phase 1 Project Confirmation
- Phase 2 Legal Background for Canadian VRS
- Phase 3 Consumer Interests and Perspectives
- Phase 4 VRS Models in Other Countries
- Phase 5 Technologies and their Forecasts
- Phase 6 Interpreter Considerations
- Phase 7 Quality of Service
- Phase 8 Potential Related Services
- Phase 9 Forecasts of VRS User Demand
- Phase 10 VRS Cost Variables and Forecasts
- Phase 11 Potential Canadian VRS Models

This Phase 12, *VRS Feasibility Study Final Report*, provides an analysis of the foremost potential considerations for providing VRS in Canada, including but not limited to:

- Background and methodology of the VRS feasibility study report
- Description of Video Relay Services
- Legal jurisdiction for CRTC to implement VRS in Canada

¹ Each research phase is attached as an appendix to this phase 12, *VRS Feasibility Study Report* to provide detailed information for each of the issues summarized in this report.

- ☑ International landscape of how VRS is provided in other countries
- ☑ Consumer perspectives on proposed services
- ☑ Goals and challenges of providing VRS in Canada
- ☑ Recommendations for a VRS solution in Canada

2. Summary Findings

The primary findings of this study include the following. Additional findings and detail are available in each phase report.

Project Confirmation

- ☐ The VRS feasibility study was comprehensive in scope and included significant consumer input.
- ☐ Future development of VRS should involve Deaf leadership.

Legal Background for Canadian VRS

- ☐ Canadian laws and regulations have established a legal framework for the operation of Message Relay Services by telecommunications service providers, which will also support VRS.
- ☐ The legal framework will support a variety of VRS deployment and funding models, including an approach similar to that used for the Canadian LNP Consortium, the Central Fund Administration Consortium, and the Commissioner for Complaints for Telecommunications Services (CCTS).

Consumer Interests and Perspectives

- ☐ The provision of a relay service that utilizes the natural language of the Deaf community reduces the impact of communications and cultural barriers between the Deaf and hearing populations.
- ☐ Video communication represents a vast improvement over text-based communication for people who use signed languages, allowing them to converse naturally, convey emotional context, and share non-verbal cues and information that typically does not occur with text based communication.
- ☐ Removing the obstructions to equal access to information and people allows visual communicators the ability to participate more fully in society, and as such society benefits from that participation.
- ☐ No accurate estimates of the Canadian Deaf and hard of hearing communities exist.
- ☐ Consumers desire a VRS that balances VRS access with the availability of community interpreting.²

² The term “community interpreting” is used herein for all in-person interpreting assignments, including personal, social, legal, medical, religious, educational, workplace, and all others.

VRS Models in Other Countries

- All countries with VRS began with a trial prior to permanent service.
- Only the United States offers consumers unlimited VRS 24 hours a day, 365 days a year. All other countries limit hours or usage.
- Summary statistics are not necessarily comparable between countries (see section 3).³ Some countries limit access per user, by type of call (e.g., business or government calls only), or by other means. Most countries are in a limited funding mode. Nevertheless the following table offers some contrasts:

Table 1: Summary comparison of countries

Country	Total population (millions)	Availability AM - PM	Hours per week	Primary funding sources	Est. annual program costs (CAD)	Annual VRS minutes	Primary users
Australia	22.3	7 to 7 weekdays	60	TSPs	\$1.1 M	30,000	Public
New Zealand	4.4	9 to 5 weekdays	40	TSPs and Government	\$4.0 M	42,000	Public
France	65.0	8:30 to 7 weekdays	52.5	Business	n/a	n/a private	Business
Finland	5.4	8 to 4 M,T,Th,F 8 to 6 W	42	Government	\$1.8 M	n/a trial	Public
Sweden	9.4	7 to 10 M-F 9 to 5 S-S	91	Government	\$2.0 M	100,000	Public
Germany	82.1	8 to 11 7 days a week	105	Business, TSPs & Govt	n/a	n/a	Public
Switzerland	7.8	9 to 12 M-F +4PM to 9 T,Th	21	Government & Donors	n/a	n/a trial	Public
United Kingdom	62.2	8 to 6 weekdays	50	TSPs	n/a	90,000	Business & Gov't
United States	310.9	24 hours/day 7 days a week	168	TSPs	\$568.8 M	98.8 million	Public

- The VRS models of Sweden, Finland, France, Switzerland and Germany offer examples of VRS provided by interpreter organizations.
- The U.S. model of unlimited VRS reimbursement, with per minute rates based on vendor self-reported costs, has resulted in very high program costs, as well as fraud and abuse not reported by any other country.

³ For example, Australia and New Zealand each only fund two interpreter positions, thereby restricting access by creating a VRS busy or wait condition when more than two people wish to use the service at the same time. See section 3 for a summary of some conditions. See phase 4, *VRS Models in Other Countries*, for more information.

Technologies and their Forecasts

- Recent developments in highly capable technical products such as computers, mobile devices and videophones offer consumers unprecedented communication capabilities.
- Wired and wireless broadband services are presently available to almost all Canadians.
- Independent VRS platforms are available to ensure transparency, flexibility, scalability and ubiquity as well as compatibility between equipment and VRS providers.
- Highly capable consumer products, together with the very high availability of broadband, plus the availability of independent VRS platforms, indicate that there are no technical barriers to implementing VRS in Canada.

Interpreter Considerations

- Significant differences including preparation, skills, and consumer expectations exist between VRS and community interpreting.
- Critical shortages of sign language interpreters are widely reported, particularly in rural areas.
- VRS must address how to effectively create strategies to increase the interpreter labour pool, balance community needs, and avoid aggravating interpreter shortages.
- Potential VRS providers for Canada should be cognizant of the community's concerns and work closely with these organizations to implement a VRS that effectively utilizes the resources available.

Quality of Service

- There are a wide range of quality of service factors to consider in provisioning VRS. These include issues related to the provider's network, staff, and operations; consumer issues; as well as community education, outreach and feedback.
- Quality of service factors for VRS will need to be specified in a procurement document in advance of provider selection or system procurement and implementation.
- All stakeholders (including representatives of the Deaf user community) should be included in the planning and definition of quality of service standards.

Potential Related Services

- Potential related services or features that should be incorporated within VRS as basic services include:
 - Video mail
 - Voice carry over (VCO) and Hearing carry over (HCO)
 - Non-ASL and non-LSQ forms of visual communication, e.g., speech reading
 - Availability of interpreters with specialized skills or vocabulary
 - Video relay of emergency calls to 9-1-1 call centers (PSAPs)

- Potential related services that should not be incorporated within VRS include:
 - Video remote interpreting (VRI)
 - Translation between ASL and French; translation between LSQ and English; or translation between ASL and LSQ

Forecasts of VRS User Demand

- Significant challenges make forecasting the potential usage of VRS problematic, including lack of verified statistics on the size of the Canadian signing population.
- About 45% of the estimated 34,000 Canadian sign language users (15,345) are forecast to become consumers of VRS. VRS users are forecast to use approximately 6,820,853 annual minutes of VRS, at about 70 percent of the U.S. average per person.
- The 70% usage rate compared to the U.S. is due to a combination of factors, including the timing of VRS relative to the adoption of alternative forms of communication, the amount of fraudulent calls in the U.S., and the past marketing pressure in the U.S. on consumers to make VRS calls.
- Approximately 77% of the VRS traffic will be for ASL/English relay, and 23% will be for LSQ/French relay.
- The largest challenge to reaching the forecasted maximum minutes of use is the lack of ASL and LSQ interpreters. The forecasted numbers of part time interpreters (working 15 hours per week in VRS) needed for a fully deployed and subscribed VRS are 453 ASL and 135 LSQ, representing about 75% more than the estimated number of existing ASL and LSQ interpreters.
- The ASL and LSQ Deaf communities report that there are presently not enough interpreters to serve the needs of the communities.
- An estimated one-third of the current ASL interpreters are working for a VRS company providing service to U.S. consumers.
- Current LSQ interpreters have no uniform standards of proficiency that can be used for qualification to work for VRS.
- Because most of the Canadian colleges and universities are at present unable to increase the size of their interpreter training programs, and since it typically takes at least five years to develop a qualified ASL or LSQ interpreter, the fulfillment of consumer demand for VRS will likely be constrained over a period of time as qualified interpreters are developed.

VRS Cost Variables and Forecasts

- A fully deployed VRS operating 24/7, subscribed by all forecast users, and provided by multiple vendors will cost approximately \$32 million annually, including administrative costs.
- If funding, interpreters or other resources are limited, program costs can be constrained by various means including limiting the hours of VRS availability to 8 AM to 8 PM weekdays as

shown below in Table 2.⁴ All reductions in overall costs are dependent upon providing fewer annual minutes of VRS than are the forecasted total demand by consumers.

Table 2: Annual VRS provider and administrative forecast costs alternatives

Total VRS annual funding:	\$32 Million (24x7 unrestricted)	\$27 Million (8 to 8 M-F)	\$20 Million (restricted)	\$10 Million (restricted)
VRS operational costs:	\$29,329,666	\$24,343,624	\$17,490,000	\$7,490,000
VRS admin costs (includes platform management):	\$2,510,000	\$2,510,000	\$2,510,000	\$2,510,000
VRS total costs:	\$31,839,666	\$26,853,624	\$20,000,000	\$10,000,000
Minutes at \$4.30 each:	6,820,853	5,661,308	4,067,442	1,741,860
Minutes per user per year:	444.5	368.9	265.1	113.5
Minutes per user per month:	37.0	30.7	22.1	9.5

- Potential methods of reducing costs include:
 - Limiting availability by restricting operational hours
 - Limiting the minutes of use for each VRS user
 - Limiting the number of individuals allowed to use VRS
 - Limiting the number of funded VRS interpreters
 - Charging consumers to use VRS

- Although all of the above constraints are possible, they each include significant operational, management, and political challenges. (If the only limitation is a modest restriction of the hours of operation relative to the demand for service, e.g., 8 AM to 8 PM M-F, these challenges may be largely mitigated.) For these reasons (discussed in report section 7.3.6) the recommended long-term service level is unrestricted availability 24x7.

- While U.S. VRS data can be an informative tool or aid for forecasting Canadian VRS usage and costs, there are significant discrepancies within the U.S. data that make its application to Canada problematic.

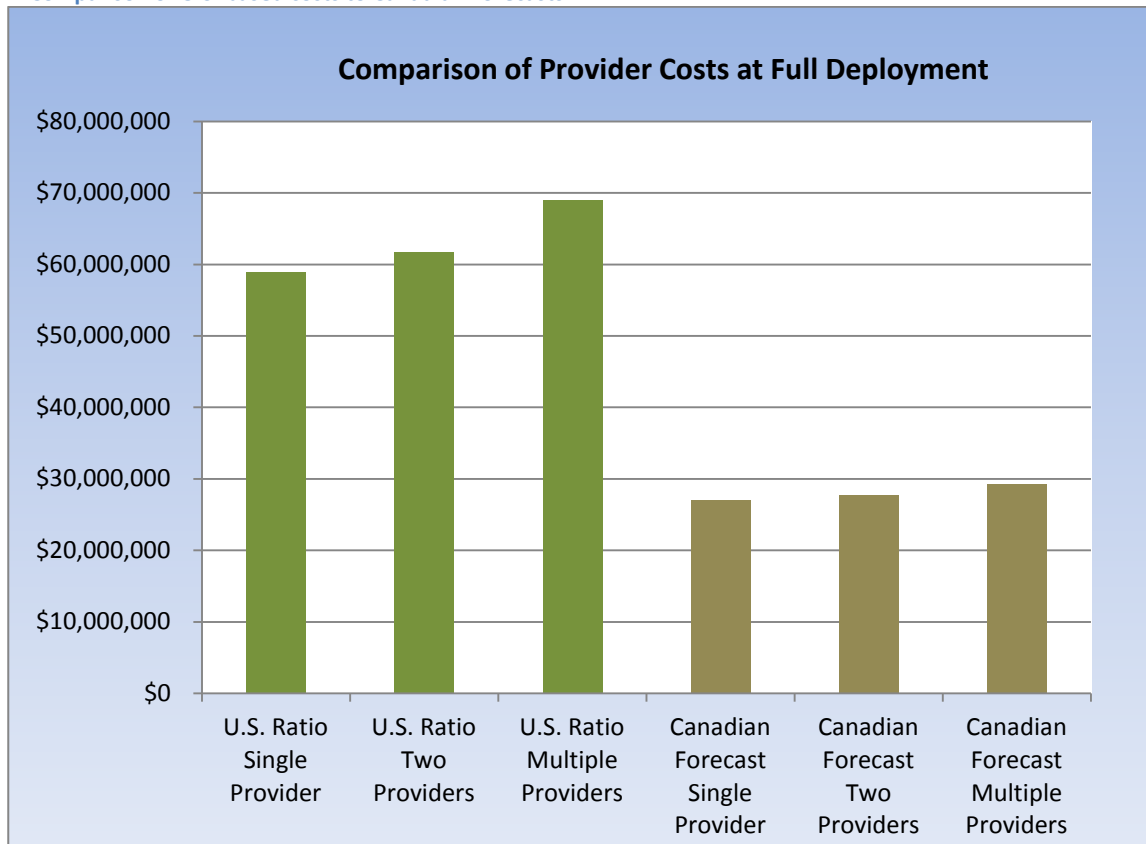
- The costs forecast for Canada are based on modified U.S. usage rates (lower minutes of VRS per person), and independently derived estimated Canadian VRS provider cost reimbursement rates.

- For comparative purposes only, the forecast of Canadian VRS provider costs at full deployment with Canadian usage and rate assumptions are about 45% of U.S. VRS provider costs with U.S.

⁴ Potential cost limitations are presented in section 7.3.6.

usage rates applied to Canada. See Figure 1, below (which does not include program administrative costs).

Figure 1: Comparison of U.S. based costs to Canadian Forecasts



- The actual VRS provider reimbursement rates for a fully deployed VRS may be based on market conditions (e.g., competitively bid services) and may be higher or lower than the forecasted rates and costs.

Potential Canadian VRS Models

- There are a number of model elements that can be selected. The most significant recommendations are provided below. Complete recommendations are addressed in phase 11, *Potential Canadian VRS Models*, and are summarized in sections 7 and 9 of this *Final Report*.
- Multiple providers offering VRS in either LSQ and/or ASL should be encouraged. VRS providers should be organizations that have relationships with local interpreters and Deaf organizations.
- ASL should only be offered in coordination with an LSQ offering.
- Providers that offer LSQ should have a Québec presence.
- For the long term benefit of consumers who will rely upon both community interpreting and VRS, to achieve lowest program costs, and to facilitate administration of the program, select a model that emphasizes VRS provided from locations within Canada.

- Require all VRS providers to use the same interoperable VRS call center platform and consumer registration database, provided and operated by a third party VRS program administrator to encourage competition by avoiding artificial barriers to entry and portability between VRS providers, and to provide uniform reporting.
- Consumers should be responsible to obtain their own VRS equipment or software, and to obtain and pay for their broadband access to VRS. There is no additional cost to consumers to use VRS, i.e., all VRS calls are free, as are non-relayed point-to-point calls.
- The VRS program should be managed by an independent third party administrator corporation with a balanced board comprised of representatives of consumer organizations, telecommunications services providers funding VRS and independent directors.
- The VRS program should be funded by all telecommunications service providers, wireless service providers, and Internet service providers (collectively referred to herein as “TSPs”) as a percent of their telecommunications operations revenues, as mandated by the CRTC.
- Canadian VRS should be deployed in two phases: 1) an initial research phase, and 2) a full deployment phase.
 - The first phase should initiate the third party administrator who will provide grants to Canadian college and university interpreter training programs to provide an initially restricted service while gathering further data on usage and costs. The grants can be expanded to include interpreter referral agencies. This phase will also ensure both languages can be accommodated.
 - The second phase should be competitively awarded VRS to multiple organizations that have focused experience with interpreters: interpreter training programs, interpreter agencies, and experienced VRS companies.
- The first phase of deployment should result in the following accomplishments:

Table 3: First deployment phase numbers by year

At the end of each year:	Yr 1	Yr 2	Yr 3	Yr 4	Referenced in report
# of service providers:	6	6	11	16	Section 7.3.3, page 59
# of VRS interpreters:	48	72	112	152	Section 7.2, Figure 11, pg 54
Minutes of VRS use:	631,411	947,117	1,473,293	1,999,469	Section 7.3.3, Table 12, pg 59
Cost per minute:⁵	\$4.30	\$4.30	\$4.30	\$4.30	Section 7.3.3, Table 10, pg 57
# of users:	1,420	2,131	3,314	4,498	Section 7.2, Figure 10, pg 53

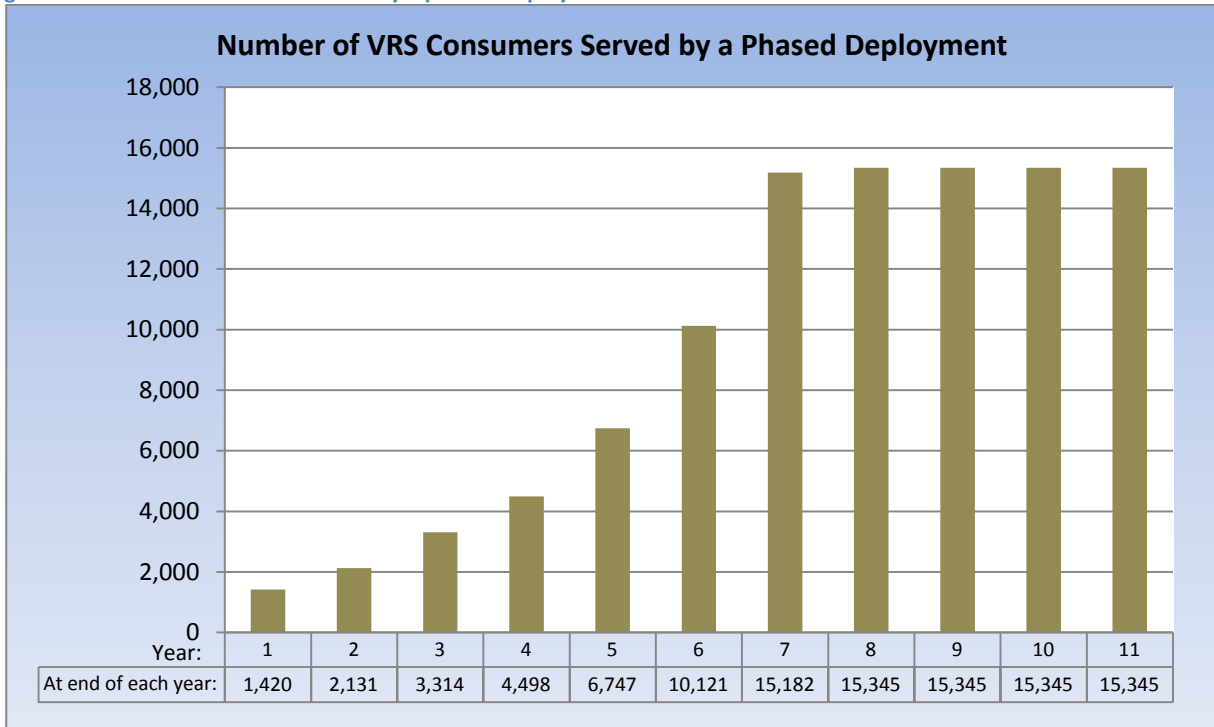
Final Report Considerations

- Research conducted during the first implementation phase will help craft the most economical and beneficial VRS for full competitive deployment.

⁵ Reimbursement for the first phase is not recommended to be on a cost-per-minute basis. Table 10 breaks down the grant costs by category for each year, with cost of VRS operations and support equivalent to \$4.30 per minute.

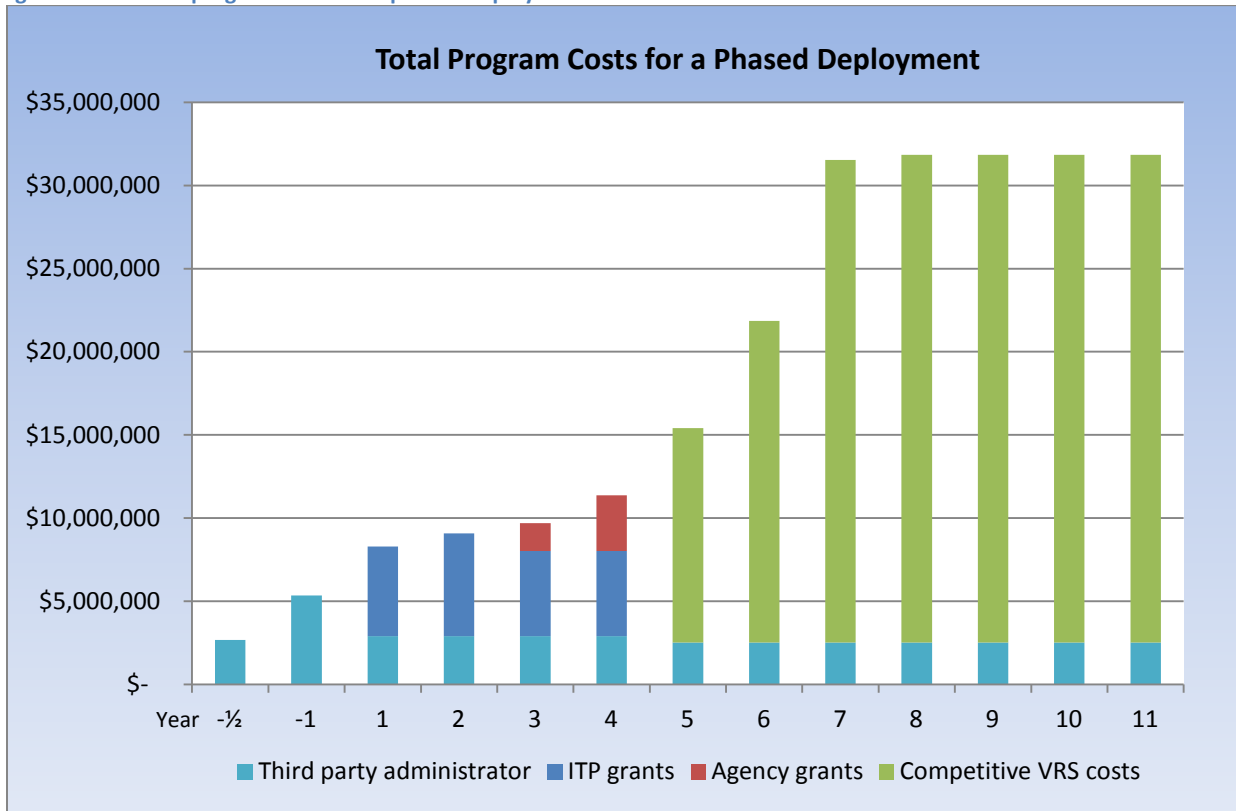
- The recommended two-phased approach is anticipated to facilitate an increase in the capacity of the interpreter training programs, and benefit from existing relationships with professional interpreters, thereby improving the availability of interpreters for VRS and allowing VRS to meet consumer demand earlier, as depicted below in Figure 2.

Figure 2: Number of consumers served by a phased deployment



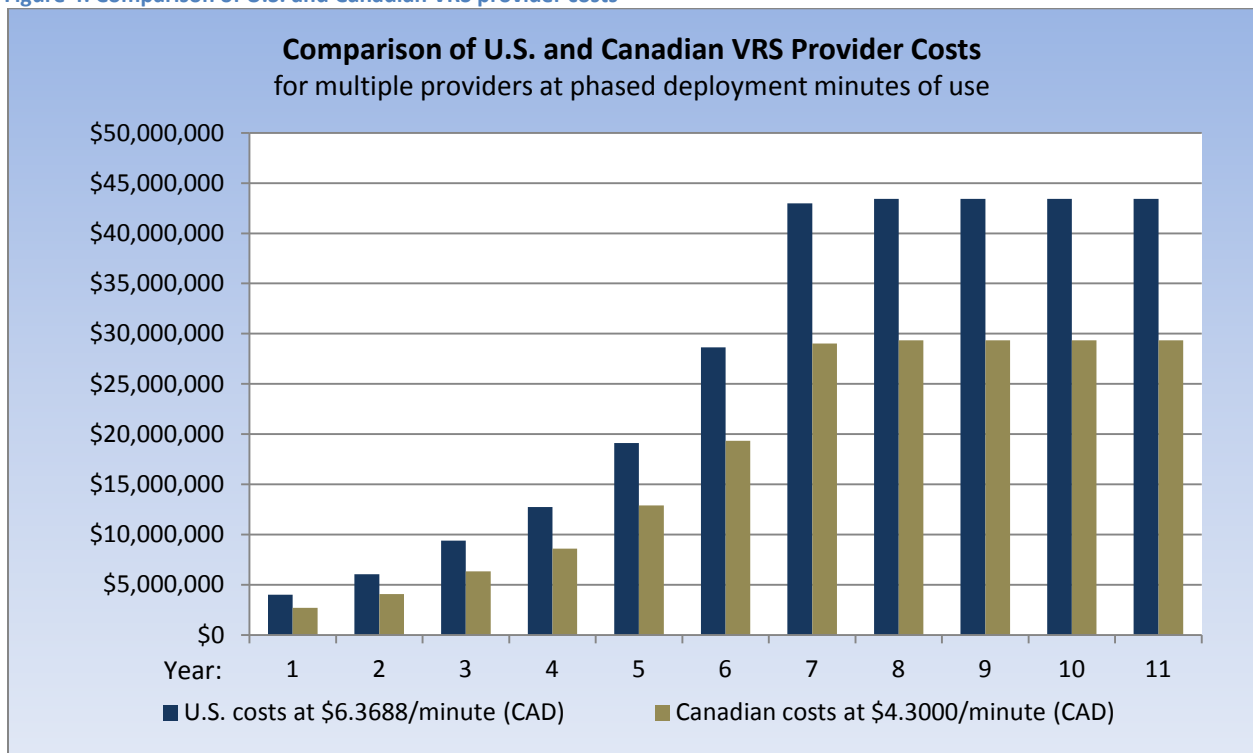
- Because more consumers are being served, the costs for the phased deployment are expected to be initially higher than for a non-phased approach, as shown below in Figure 3.

Figure 3: Total VRS program costs for a phased deployment



- Outsourcing of VRS to U.S. firms is not recommended for a variety of reasons including much higher costs, significant potential for fraud and abuse, LSQ inequity, and long term dependency on U.S. market providers. The U.S. model creates a strong incentive for VRS service providers to artificially inflate usage to increase reimbursement. The U.S. reliance on VRS service providers' self-reporting costs lacks transparency and appears to have resulted in higher reimbursement costs. The FCC has found it impossible to successfully audit most U.S. VRS providers, including those that provide over 90% of the U.S. VRS traffic.
- Comparison of the feasibility analysis of the recommended solution to the same number of minutes of use paid for at the current U.S. rates for multiple providers are shown below in Figure 4 (does not include additional necessary administrative or research costs).

Figure 4: Comparison of U.S. and Canadian VRS provider costs



3. Conclusion

The objective of this study is to gather objective data on the feasibility of various options for VRS in Canada. While the recommended solution is for a fully deployed VRS, the same phased approach may be used to deliver VRS on restricted budget and availability. Key elements of any VRS option must be to encourage growth in the supply of Canadian interpreters and balancing user demand both for VRS and other obligations to sign language users, such as community interpreting.

The recommended solution for Canadian VRS is to allow interpreter referral agencies, interpreter training programs, and VRS companies the ability to compete to offer VRS. Awarded provider organizations should be required to use a single VRS technical call center platform and consumer

registration system (software and hardware) licensed to the VRS providers, thereby assuring transparency, accountability, scalability, and interoperability. VRS should be national in scope; that is, not regional or by operating company; and it must equally service LSQ and ASL consumers.

Because there is a lack of qualified ASL and LSQ interpreters necessary for VRS, and because appropriate standards for interpreter qualifications do not exist for either ASL or LSQ VRS interpreting, it will be necessary to increase the number of qualified interpreters in Canada. The most practical way to do so is to include the Canadian college and university interpreter training programs in an initial research phase of VRS deployment, prior to full deployment. This initial research phase will provide grants to the universities to not only provide limited VRS, but to also increase their capability for graduating more interpreters, and to also conduct necessary research on VRS that will ensure that the program is defined for the long-term in a manner that will result in the lowest program costs for the necessary level of quality of service.

Canadian provider reimbursement costs and VRS usage rates are forecast to be less than half of what they would be if the model and usage patterns of the United States were adopted. The Canadian VRS program should be funded by telecommunications service providers, wireless service providers, Internet service providers (i.e., TSPs) as a percent of their telecommunications operations revenues.

The VRS program should be managed by an independent third party administrator corporation with a balanced board comprised of representatives of consumer organizations, telecommunications services providers funding VRS, and independent directors. This corporation should be supported by a staff and a consumer advisory committee. The corporation should develop the program budget, report to the CRTC, establish VRS requirements, and award grants and contracts for services. It should also acquire and license the VRS platform for use by the awarded VRS providers.

The approach outlined above is suitable for either an unrestricted, fully deployed service if funding permits, or for a service with restricted service to accommodate lower levels of annual VRS funding. While unrestricted, fully deployed VRS would best address the needs of sign language users, service at lower annual funding levels are feasible (with challenges), as demonstrated by the many countries where VRS is provided on a restricted basis.

VRS is a complex service with many initial challenges. It is very feasible, but it must be designed and implemented with careful planning in order to maximize benefit and minimize cost and potential waste, and to minimize potential harm to current levels of community interpreting. Planning and oversight should involve consumer representatives, as well as TSP representatives. The recommended two-phased approach, together with the ongoing management support of an independent third party administrator, should provide the basis for a very successful VRS, eventually serving all Canadians who will benefit from the service.

VRS Feasibility Study

FINAL REPORT

1. Purpose and Methodology

1.1. Purpose

This feasibility study was undertaken in order to provide an independent analysis of the factors that determine the feasibility of Video Relay Service (VRS) for Canada. Its purpose is to permit the CRTC to make informed decisions about the potential for VRS in a Canadian context based on the best information available, considering a wide scope of complex and interrelated issues.

This Final Report recaps key points documented in this study's Research Summaries of the prior phases 1 through 11. Additionally as a result of the recommendations of phase 11, this report also provides revised cost forecasts not contained in earlier phases. For significant additional detail, see the phase 1 through 11 documents provided as appendices to this report.

1.2. Methodology

Extensive research was conducted for each of the eleven prior study phases, and the documentation for each phase was continually updated as new developments and information became available. Mission Consulting and Bell Canada recognize that consumer input is crucial to ensuring that this study considers the diverse needs of people with communication disabilities who may utilize future Canadian VRS. Various Canadian advocacy groups have worked diligently over a long period of time to consider and support the need for VRS in Canada. Therefore, in addition to a thorough study phase focused on consumer interests and perspectives, the study methodology also draws on contributions of leaders and subject matter experts from a variety of Canadian consumer organizations, professional interpreter organizations, as well as experts involved in the provision or regulation of VRS in other countries.

Bell Canada worked with the leadership of specific organizations that provide support services to, and advocate on behalf of, people with hearing disabilities in the crafting of its Request for Proposal (RFP) for the *VRS Feasibility Study Report*, and in evaluating responses and selecting the contractor, Mission Consulting, LLC to conduct the study. These same leaders were convened throughout the study to attend seven Advisory Committee meetings to discuss findings and to review the interim study deliverables resulting from phases 1 through 11 and this phase 12 final report. Advisory Committee members also reviewed the study's progress, provided oversight, suggested direction and considerations, and offered continuous feedback throughout the project via an online project collaboration tool provided by Mission Consulting. The organizations and individuals that participated in the VRS Feasibility Study Advisory Committee are listed following the report's title page.

The advisory committee also provided additional names and contact information for a variety of Canadian consumer, interpreter, and other subject matter experts to be available to contact for advice as needed throughout the research process. In person interviews were conducted across Canada with various individuals and groups. Meetings were held with individuals and with groups. Communication also occurred through video calls, emails and by phone. In depth questionnaires were also distributed to Canadian Deaf and hard of hearing organizations, professional interpreter organizations, interpreter training programs, and commercial interpreter referral agencies. An online consumer survey in English and French was also provided resulting in almost 1,300 responses. Overall, consumers and advocates were consulted over a nine month period, in addition to the consumer advisory committee participation throughout the project, to ensure an appropriate level of consultation took place.

Research was not limited to consumer input. Other research papers and pertinent documents were also solicited and reviewed. Analysis of regulatory proceedings and law contributed to the characterization of the legal framework that VRS must operate within. Research on the availability of the broadband networks and equipment necessary for VRS was undertaken and documented.

The status and capacity of interpreter training in Canada was researched, including extensive document review, interviews at the Canadian college and university interpreter training programs (ITPs), specialized extensive questionnaires, in-person interpreter training program and interpreter agency/professional focus groups, and significant personal communication. Interpreter referral agencies (interpreter agencies) – organizations that provide community interpreting – were also consulted in a similar manner: questionnaires, interviews, focus groups, individual communication, and research documents.

Canada represents a broad spectrum of potential VRS users. Of this spectrum, two groups stand out as the dominant potential users: people who use American Sign Language (ASL) as their preferred language, and people who use Langue des Signes Québécoise (LSQ) as their preferred language. Many ASL users also read and write English, and many LSQ users read and write French. Primary research was conducted by Mission Consulting in English and ASL, and in French and LSQ through translation and interpretation services. For example questionnaires and surveys were conducted and responded to in both English and French; interviews and meetings were conducted by Mission Consulting staff in ASL and English; and in LSQ and French through interpreters. The study methodology was careful to ensure that all language groups were equally represented.

Research on VRS in other countries included extensive document and online research, as well as interviews. In depth questionnaires were provided to other countries' VRS regulatory agencies, VRS providers, and consumer organizations. Research on VRS in the U.S. was supplemented by extensive regulatory documentation, including FCC, vendor, consumer and administrator filings.

1.3. Overview of Video Relay Services

For individuals with hearing or speech disabilities, Message Relay Services (MRS) facilitate improved access to telecommunication services, allowing them to place and receive telephone calls to individuals without such disabilities. The service utilizes an operator often referred to as a communication assistant

(CA) to facilitate calls between people with hearing or speech disabilities and those without such a disability. Traditionally MRS has made use of text-based input devices⁶, where a person using such a device places a call to the MRS call center and is connected to another text-based device operated by the CA. The caller types the phone number of the person they wish to call and the CA makes a voice call to that person. The CA then facilitates the call by relaying what is typed into spoken language and vice versa. Several forms of MRS are available internationally, including TTY based relay, Internet Protocol (IP) relay, Captioned Telephone Service,⁷ and Video Relay Service (VRS).

VRS is significantly different from traditional text-based relay service in that the consumer communicates using visual language⁸ to the video relay operator, often referred to as a video interpreter (VI). It also differs in that the video relay operator is a highly skilled professional trained in sign language and the procedures of sign language interpreting.⁹

Utilizing the natural language of Deaf and hard of hearing individuals in relay services has resulted in tremendous appreciation for the service. VRS offers significant benefits over traditional text based relay for visual language users, particularly those who are not comfortable communicating in written English or French.¹⁰ Some of these benefits are summarized below:¹¹

- VRS allows those persons whose primary language is sign language to communicate in sign language, instead of having to rely on typing what they want to say.
- Because consumers using VRS communicate in sign language, they are able to more fully express themselves through facial expressions and body language, which cannot be expressed in text.
- VRS sessions flow back and forth similar to a telephone conversation between two hearing persons. The ability to interrupt each other in real time is included, which is not available via a traditional text based MRS, where the parties must take turns communicating with the relay operator. For many deaf and hard of hearing individuals, VRS provides access to telephone services better than any other form of relay service.

⁶ Examples include traditional TTYs and Internet capable devices.

⁷ Available over traditional telephone lines, and Internet technologies.

⁸ Typically VRS consumers use signed languages such as American Sign Language (ASL) or Langue des Signes Québécoise (LSQ). However as indicated in this study's phase 3, *Consumer Interests and Perspectives*, other forms of visual communication may be preferred by some people.

⁹ See this study's phase 6, *Interpreter Considerations*, for a description of the complexities related to sign language interpreting and minimum standards for qualification particularly as they apply to Canada.

¹⁰ Sign languages do not have an equivalent written form. See this study's phase 3, *Consumer Interests and Perspectives*, for an analysis of sign language and how it differs grammatically and syntactically from spoken language.

¹¹ See FCC *Consumer Facts* at: <http://www.fcc.gov/guides/video-relay-services>

- Because the conversation flows more naturally back and forth between the parties, the conversation can take place much more quickly than with text-based MRS. As a result the same conversation is much shorter through VRS than it would be through forms of text-based MRS.¹²

Video relay works by connecting a consumer to the video relay center operator in a two-way visual method to enable the use of sign language.¹³ The sign language user operates any device capable of both high-speed Internet access and video communication to capture their image so it can be seen by the video interpreter (VI).¹⁴ In turn, the VI has a similarly capable device to enable real-time signed communications back to the user. To generate a call to the third party, the VI uses the equivalent of a standard telephone line to communicate via speech to a hearing telephone user.

¹² While the same conversation may be shorter, the average VRS call may not result in less conversation time. With VRS people are able to converse using a more natural and fluid language, which can result in more communication content and duration than might be comfortably sustained by text communication.

¹³ This is different from point-to-point video calls that are made between two users who use sign language to communicate with each other via a video link and do not need the assistance of a video relay operator. Video remote interpreting (VRI) is also different in that the Deaf user is in the same room as the hearing person and the interpreter facilitates communication between the two parties from a remote location via a video connection. Traditionally interpreting between parties in the same location is accomplished through an on-site interpreter (also referred to as “community interpreting”). VRI is not usually considered a Message Relay Service (see this study’s phase 8, *Other Related Services*.)

¹⁴ VRS requires sufficiently fast network connections to successfully transmit the full motion real-time video images between the user and the video interpreter.

Figure 5: Illustration of a VRS call



Certain features are frequently offered to augment VRS, including but not limited to:

- Video mail messaging option, where the user may retrieve signed video messages if they miss a call, similar to voice mail services.
- Ability to select specialized interpreters (e.g., interpreters with special vocabulary, experience, or regional/cultural knowledge, or of a particular gender).
- Consumer technical support provided in sign language.
- Simultaneous text for speed in relaying names, numbers and addresses.

VRS also always includes:¹⁵

- Voice Carry Over (VCO), for consumers who sign and speak for themselves, but cannot hear. With VCO sign language only occurs one-way, from the VI to the user.
- Hearing Carry Over (HCO), for consumers who sign and have some hearing, but cannot speak. With HCO, sign language only occurs one-way, from the user to the VI.

¹⁵ HCO and VCO are widely regarded as basic and integral requirements of relay, and should not be considered as optional.

The provision of VRS occurs through a mixture of components including call center activities, technologies (network, hardware and software), and interpreting. One of the most significant components for providing VRS, other than skilled interpreters, is the specialized VRS automatic video call distribution platform used. Historically most initial VRS providers used proprietary platforms to support their VRS services. Each of these platforms had different connectivity requirements, and often would not support interoperability between end-users' different hardware/software or between different VRS providers.¹⁶ However with the increase of Internet VoIP and video services, as well as the advances in wireless cellular communication through 3G and 4G technologies, came a natural progression toward a more open, cross-compatible approach to VRS. VRS services are now widely available via traditional videophone hardware, computer videophone software applications, web browser-based clients, and 3G/4G and Wi-Fi connected mobile devices such as cellular phones and tablet computers.

Although many VRS providers still use proprietary internal system platforms, most providers are moving toward an environment where users can connect to VRS from almost any broadband or 3G/4G connected device. Many countries have adopted the International Telecommunications Union Standardization Sector (ITU-T) "Total Conversation" recommended standard,¹⁷ in which users can choose to use video, speech, and/or text simultaneously via commercially available call center platforms that support connectivity to and from users via a variety of gateway protocols.¹⁸ Therefore while many private VRS providers have developed or re-engineered their own proprietary call center platforms, commercial VRS platform solutions that are available independently of any VRS provider have been successfully deployed in multiple countries.

Specific requirements placed on VRS providers to attain minimum services and standards are often determined by each country's regulatory body as it defines requirements in formal requests for proposals and in the vendor selection process or in regulations that may affect the provision of relay services.

¹⁶ In the U.S. the lack of device interoperability by the dominant VRS provider (Sorenson) was ostensibly resolved by an FCC order in response to consumer complaints and advocacy group pressure. FCC regulations now require that VRS hardware distributed by a certified VRS provider must be interoperable, that is, compatible with VRS services and equipment available from other certified VRS providers, however as noted in FCC-11-184A1- *Further Notice of Proposed Rulemaking*, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 10-51, released December 15 2011, section III at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1215/FCC-11-184A1.pdf, interoperability problems continue in the U.S. due to the prevalence of older proprietary end-user devices that were installed without ITU-T equivalent standards in place.

¹⁷ Total Conversation is "An audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more location." ITU F.703 Recommendation at <http://www.itu.int/rec/T-REC-F.703-200011-I/en>.

¹⁸ Including: textphones (Baudot, V.21, EDT, the ITU standard of V.18), Skype video and voice, H.323, H.264 M (3G video), standard API for SIP-enabled equipment such as media gateways, as well as the PSTN, see this study's phase 5, *Technologies and their Forecasts*, and phase 4, *VRS in Other Countries*, for more information.

2. Legal Jurisdiction for VRS in Canada

The following is a brief overview of the legal and regulatory framework found in the phase 2 research related to the provision of MRS in Canada particularly as may apply to potential Canadian VRS.¹⁹

2.1. General Regulatory Context in Canada

The *Telecommunications Act*²⁰ is the principal federal statute governing the regulation of telecommunications services in Canada. Under the provisions of the *Telecommunications Act* (hereinafter the “Act”), the Canadian Radio-television and Telecommunications Commission (the “CRTC” or the “Commission”) regulates the offering of telecommunications services in Canada.

Under the *Act*, the offering and provision of any telecommunications service by a Canadian carrier are subject to any conditions imposed by the CRTC. Canadian carriers are prohibited from offering a telecommunications service except in accordance with a tariff filed with and approved by the CRTC unless the Commission has forborne from requiring a carrier to file tariffs for a service. The rates charged by a Canadian carrier for a telecommunications service must be “just and reasonable”. A Canadian carrier is also prohibited from “unjustly discriminat[ing] or giv[ing] an undue or unreasonable preference toward any person, including itself, or subject[ing] any person to an undue or unreasonable disadvantage” in providing, or charging a rate for, a telecommunications service.²¹ The CRTC determines what is a just and reasonable rate, as well as whether unjust discrimination, an undue or unreasonable preference or an undue or unreasonable disadvantage have occurred, as matters of fact. The Commission’s policies regarding service providers’ obligations in relation to the supply of services to persons with disabilities rely substantially upon the previously mentioned provision prohibiting unjust discrimination or preferences and upon a balancing of the objectives of Canada’s telecommunications policy.²²

The Commission addresses the potential problems associated with balancing policy objectives with access to services by customers with disabilities as follows:

The Commission notes that, over the years, it has been required to make determinations mandating that the ILECs and competitors accommodate the needs of persons with disabilities or vulnerable consumers. The Commission further notes that in Decision 97-8 [in which it allowed local exchange competition and forbore from regulating most

¹⁹ See this study’s phase 2, *Legal Background for Canadian VRS*, for further details.

²⁰ S.C. 1993, c.38 as amended (the Act can be found at <http://laws.justice.gc.ca/en/T-3.4/>).

²¹ Unless the Commission, through a forbearance order, has exempted a carrier from complying with this requirement.

²² In most instances in which it has forborne, the Commission has retained its powers to impose conditions upon the offering of a telecommunications service (section 24 of the *Act*). In many instances it has also retained its authority to prohibit unjust discrimination or preferences (under section 27(2) of the *Act*).

services offered by new entrants], *the Commission retained its powers under subsection 27(2) of the Act in relation to CLEC retail local exchange services.*

*The Commission is not convinced that the operation of market forces will serve to discipline the behaviour of ILECs with respect to vulnerable customers such as customers with disabilities. The Commission notes that it has had, in the past, to address problems involving vulnerable customers served by competitors that already operate in a largely unregulated environment...*²³

The Commission also balances its policy objectives with the protections for individuals with disabilities set out by the Constitution Act's *Charter of Rights and Freedoms*, the *Canadian Human Rights Act (CHRA)*, and the *U.N. Convention on Rights of Persons with Disabilities*²⁴.

In Broadcasting and Telecom Regulatory Policy 2009-430 *Accessibility of telecommunications and broadcasting services* ("TRP 2009-430")²⁵ the Commission determined that its findings set out in that Regulatory Policy were consistent with the provisions of the Charter of Rights and Freedoms:

As a regulatory tribunal, the Commission must exercise its powers to implement the policy objectives set out in the Broadcasting Act and the Telecommunications Act. The Commission must also act in a manner that is consistent with the Canadian Charter of Rights and Freedoms.

The Commission's rationale underlying its decision to require the provision of MRS was reiterated in Telecom Regulatory Policy 2009-430:

In previous decisions, the Commission has established a policy framework that recognizes the telecommunications needs of persons with hearing and speech disabilities. The Commission determined that Canadians with hearing and speech disabilities should have the same ability as other users of telephone services to communicate using such services. It also noted that relay services provide persons with hearing or speech disabilities with the technical means to communicate via a telephone call with other subscribers.

TTY Relay is also part of what the CRTC has referred to as the "basic service objective" ("BSO").²⁶ The BSO sets a basic level of telephone service that the CRTC requires the ILECs to meet. CLECs who want to

²³ Telecom Decision CRTC 2006-15 *Forbearance from regulation of retail local exchange services*, at <http://www.crtc.gc.ca/eng/archive/2006/dt2006-15c.htm>, paragraphs 458-460. "CLEC" refers to a Competitive Local Exchange Carrier. "ILEC" refers to Incumbent Local Exchange Carrier.

²⁴ Canada is a signatory to and has ratified the United Nations' *Convention on the Rights of Persons with Disabilities*. See: <http://www.un.org/disabilities/countries.asp?id=166>

²⁵ <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>.

have access to the CRTC's local service subsidy regime²⁷ (which provides a subsidy for retail rates in higher cost locations) must also meet the BSO.

MRS (i.e., TTY and IP Relay) is provided at no charge to users of the service, however the equipment and connection method²⁸ are not part of the offering.²⁹ To date, the costs associated with TTY Relay and now IP Relay have been recovered through a tariff rate collected from service providers' general body of local access subscribers. Costs incurred to provide access to TTY Relay are bundled in the retail rates for local telephony services. The rate approved by the CRTC is applied on the basis of switched network access lines provided to all residence and business customers, and has also been extended to lines provided by independent telephone companies and wireless competitive local exchange carriers³⁰ which interconnect to the ILECs' networks. The Commission has set what might be termed as a "deemed" or proxy rate which has been frozen for some time. For service providers whose retail local telephony rates are subject to regulation, the rate has been set by the Commission and is incorporated in such service providers' basic local telephone service rate.

The ILECs were directed in TRP 2009-430 to file tariffs for IP Relay for Commission approval. Evidence submitted to the Commission in the proceeding initiated by Telecom Public Notice 2008-8 *Unresolved issues related to the accessibility of telecommunications and broadcasting services to persons with disabilities* indicated that the current rates recovered for TTY Relay exceeded (in the period 2004-2008) the costs incurred by the ILECs to provide TTY Relay.³¹ On the basis of its finding that "the amount

²⁶ Telecom Decision CRTC 99-16 *Telephone service to high cost serving areas* at <http://www.crtc.gc.ca/eng/archive/1999/DT99-16.HTM>.

²⁷ Established in Decision CRTC 2000-745 *Changes to the contribution regime* at <http://www.crtc.gc.ca/eng/archive/2000/DT2000-745.htm>. More recently summarized and consolidated in Telecom Circular CRTC 2007-15 *The Canadian revenue-based contribution regime* at <http://www.crtc.gc.ca/eng/archive/2007/ct2007-15.htm>.

²⁸ The consumer is responsible for the cost of the TTY terminal, Internet capable device, phone line, and/or Internet connection required to access MRS. Some of these devices may be subsidized through Provincial programs.

²⁹ There is no charge for use of TTY Relay for local calls. For long distance calls there is also no charge for use of the relay operator service. However, toll charges apply to long distance calls but such toll charges are subject to discounts: see, for example Telecom Decision CRTC 87-4 *British Columbia Telephone Company – 50% Discount for intra company message toll service rates for hearing or speech impaired subscribers* <http://www.crtc.gc.ca/eng/archive/1987/DT87-4.HTM>.

³⁰ Telecom Order 96-269, <http://www.crtc.gc.ca/eng/archive/1996/O96-269.HTM>

³¹ At the conclusion of this proceeding, the Commission in Broadcasting and Telecom Regulatory Policy RP 2009-430, stated (at paragraph 18) that:

... TTY Relay costs have decreased since the TTY Relay service rates were last adjusted. The record shows that, on average, between the years 2004 and 2008, the ILECs collectively collected \$28.5 million per year and collectively spent \$11.7 million per year to provide TTY Relay. During that period, the amount collected to provide TTY Relay has exceeded the amount required to provide it by an average of \$16.8 million per year. The Commission finds that the recent excess in the rates

[footnote continues on next page]

collected to provide TTY Relay has exceeded the amount required to provide it”, the Commission stated it did “not expect the proposed tariffs to include rate increases”.

It is not expected, however, that the surplus generated by the mandated rate would be sufficient to also cover the long term costs incurred to provide VRS, or should be used for VRS.

A number of precedents have been set in Canada whereby a functionality has been mandated by the CRTC (or by another government entity) and means of providing the mandated functionality have been developed collectively by the Canadian TSPs. Examples include the Canadian Local Number Portability Consortium. (the “LNP Consortium”), the Central Fund Administration Consortium and the Commissioner for Complaints for Telecommunications Services (CCTS).³²

The establishment of an industry consortium to provide VRS would likely require a broad consensus among Canadian TSPs. Arrangements for the management of the consortium may also require CRTC approval.³³

The overriding legal conclusion is that Canadian laws and regulations have established a legal framework for the operation of Message Relay Services by telecommunications service providers, currently in the form of TTY Relay and recently also IP Relay. This existing legal framework should support Video Relay Services as well as the establishment of an industry consortium to provide VRS, although the actual deployment, cost and payment structures may differ significantly from other forms of MRS.

3. VRS in Other Countries

This study’s phase 4, *VRS in Other Countries*, included research on VRS in Australia, Finland, France, Germany, New Zealand, Sweden, Switzerland, the United Kingdom, and the United States. The countries listed were contacted via telephone, email correspondence, and surveys. Specific questionnaires were developed for consumer groups, VRS providers, and government regulatory organizations in each country. Accurate VRS traffic, costs, and user profiles in most countries are not generally published or available to the public. While overall VRS traffic and cost data was available in the United States, the U.S. data is affected by a per-minute reimbursement scheme based on VRS providers’ self-reported costs and minute volumes. As a result, despite a highly competitive market for VRS, the data and overall costs appear to be driven up by inflated provider costs and minute volumes.

collected to provide TTY Relay provides the funding to support the introduction and operation of IP Relay as an adjunct to TTY Relay via the same revenue stream.

³² See the P.C. 2007-533 April 4, 2007 Order requiring the CRTC to report to the Governor in Council on consumer complaints, available at <http://canadagazette.gc.ca/archives/p1/2007/2007-05-26/html/order-decret-eng.html>

³³ It is perhaps worth noting in this respect that at the outset of TTY Relay the Commission expressed the view that telecommunications service providers should have flexibility in selecting the manner in which the service is provided. It is reasonable to expect that the Commission’s views would be consistent in relation to VRS.

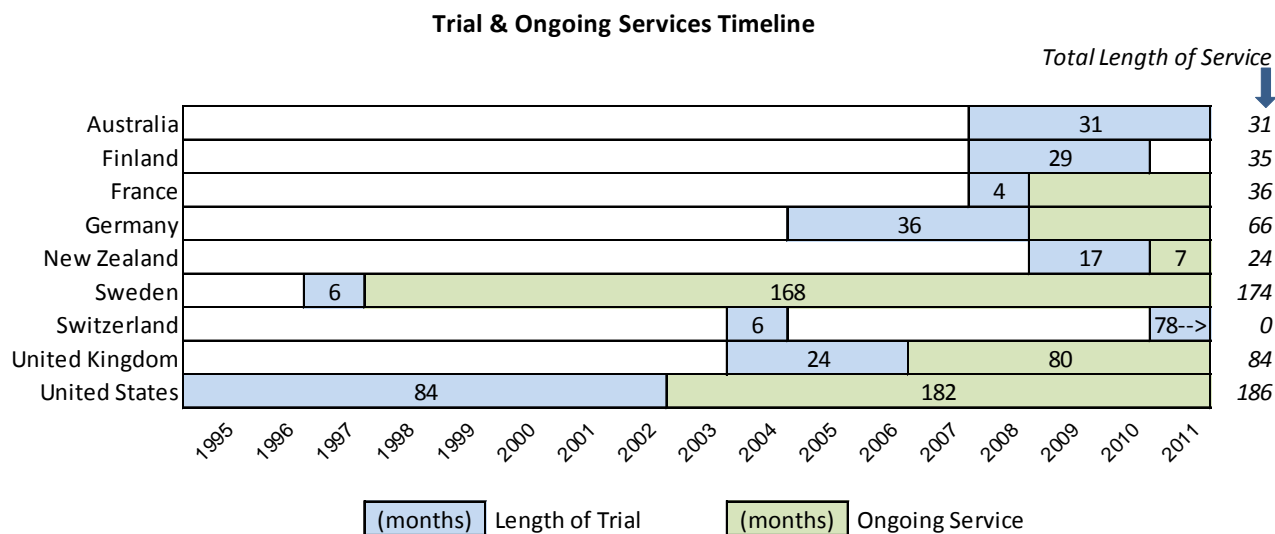
Recently, this has resulted in some U.S. VRS providers having legal problems related to VRS practices, and providers and regulators are very guarded in what they will discuss.³⁴

The following is a brief overview of the availability of VRS in other countries, their approach to solving issues, and a synopsis of each country’s funding sources.³⁵

3.1. Availability of VRS

Each of the nine countries surveyed had some form of VRS trial period and two continue to provide VRS as a trial.³⁶ Seven countries reported having ongoing VRS services. In all countries an initial trial period has been initiated prior to establishing permanent services. The following chart shows the length of each country’s trial, as well as a timeline of VRS trial periods and ongoing services.

Figure 6: Timeline of VRS trial dates and ongoing service by Country



With the exception of the U.S. program, no other country currently provides continuous services 24 hours a day, 365 days a year. All other countries have limitations on VRS availability by restricting the hours of operation, the parties that may be contacted with VRS (e.g., for business/work use or for government contact only); the number of VRS video interpreter positions enabled, limited number of

³⁴ In personal conversations with many of the VRS stakeholders it became apparent that sharing the type of information this study was pursuing, such as VRS call volumes, challenges in test programs, user data, and actual costs, would not be forthcoming. Some subjects agreed to be interviewed and to provide as much help as they could, but only if their comments and experiences were considered from a confidential source.

³⁵ See this study’s phase 4, *VRS in Other Countries*, for detailed information on each of the countries researched.

³⁶ In the U.S., limited VRS trials were authorized in Texas by the Public Utilities Commission and conducted by Sprint from 1995 through 2000. In 2000, VRS officially became available throughout the state of Texas. In 2002 the FCC allowed for the reimbursement of interstate VRS providers via an interstate TRS fund administration and VRS became a nationally available service.

minutes allowed per user, or limited funding. The non-U.S. countries provide examples of how service could be offered on a restricted basis. However, as described in section 7.3.6, all options for restrictions have significant operational, political and management challenges.

Summary statistics are not necessarily comparable between countries.³⁷ Some countries limit access per user, by type of call (e.g., business or government calls only), or by other means. Most countries are in a limited funding mode. Nevertheless the following table offers some contrasts:

Table 4: Summary comparison of countries

Country	Total population (millions)	Availability AM - PM	Hours per week	Primary funding sources	Est. annual program costs (CAD)	Annual VRS minutes	Primary users
Australia	22.3	7 to 7 weekdays	60	TSPs	\$1.1 M	30,000	Public
New Zealand	4.4	9 to 5 weekdays	40	TSPs and Government	\$4.0 M	42,000	Public
France	65.0	8:30 to 7 weekdays	52.5	Business	n/a	n/a private	Business
Finland	5.4	8 to 4 M,T,Th,F 8 to 6 W	42	Government	\$1.8 M	n/a trial	Public
Sweden	9.4	7 to 10 M-F 9 to 5 S-S	91	Government	\$2.0 M	100,000	Public
Germany	82.1	8 to 11 7 days a week	105	Business, TSPs & Gov't	n/a	n/a	Public
Switzerland	7.8	9 to 12 M-F +4PM to 9 T,Th	21	Government & Donors	n/a	n/a trial	Public
United Kingdom	62.2	8 to 6 weekdays	50	TSPs	n/a	90,000	Business & Gov't
United States	310.9	24 hours/day 7 days a week	168	TSPs	\$568.8 M	98.8 million	Public

If countries offering limited access to VRS based on daily or weekly schedules are examined further, other current considerations and limitations are identified:

- Australia’s trial VRS program has a maximum of 2 VRS VI workstations at any time, which results in significant call blockage and delays when reaching the service. Their “trial” funding of \$1 Million AU is extended from year to year, so some consider this the permanent service.
- Finland’s VRS is funded by a government social insurance program. Services are regionally distributed among many small facilities. Finland is currently in the process of transitioning from a limited trial to an ongoing service, but those services are not yet established.³⁸

³⁷ For example, Australia and New Zealand each only fund two interpreter positions, thereby restricting access by creating a VRS busy or wait condition when more than two people wish to use the service at the same time. See phase 4, *VRS Models in Other Countries*, for more information.

³⁸ At the time of this research, December 2011, VRS appears to not be operational in Finland

- France’s disability laws and regulations are focused on business/work communications. A consortium of businesses (Tadeo) was created to provide the access services required by law. Use of VRS is primarily for business/work use. For private use, a credit system has been established requiring the consumer to pay for any desired use. France is planning to extend VRS for public use in 2012.
- Germany’s VRS is a two-tiered system. Business calls are paid for by employers with government reimbursement to the commercial enterprises for the first €1,023 per month. Private use is available at a lower charge and 95% paid by government funds.
- New Zealand’s VRS schedule (like Finland’s) is irregular, during weekdays only, and was only available 20 hours a month until recently, with only two interpreter seats funded. Earlier this year, New Zealand expanded the hours of availability to 40 hours a week.
- The U.K. provides VRS for business/work use and calls to government only. Private use is allowed, but at a charge. VRS is not an “official trial or pilot”, nor is it a permanent component of Universal Services (which covers MRS).

Each country’s situation is unique. In different countries VRS is funded from different sources, may be only for business use (not public), or may have inordinately long wait times due to few funded interpreters resulting in VRS being virtually unavailable even though it is operational. Except for Sweden (and the United States), these other countries are not comparable to the Canadian situation because they are not providing a fully staffed service within their operational hours, open to all consumers.

Unique Characteristics of the U.S. VRS Program

The unique availability of MRS (including VRS) in the U.S. as a continuous service 24 hours a day, 365 days a year, is established in law based upon the Americans with Disabilities Act of 1990 (ADA). The ADA defines relay services as “telephone services that enable people who are deaf or hard of hearing, or who have a speech impairment, to communicate with a person who can hear in a manner that is ‘functionally equivalent’ to the ability of an individual without a disability to communicate by telephone.”³⁹

The Federal Communication Commission (FCC) and the individual states share in the costs of providing TTY MRS based on interstate versus intrastate use. Internet based MRS such as IP-Relay and VRS are the sole responsibility of the FCC. Individual states and the federal government levy surcharges on telecommunications carriers to support relay in the U.S. The FCC pays for the interstate and IP service (including VRS) costs from the Interstate TRS Fund, through a contracted Administrator who receives, reviews, and authorizes payment for associated relay service costs.

As the FCC does not have contracts with any relay providers, it relies on:

- Its own rules to qualify providers for reimbursement from the Interstate TRS Fund

³⁹ See <http://www.ada.gov/pubs/adastatute08.htm> at Sec. 225, Telecommunications services for hearing-impaired and speech-impaired individuals.

- The submission of providers' self-certified monthly invoices and reports

However, FCC VRS authorization was granted before adequate service requirements were defined or safeguards were in place to ensure against misuse and fraud. This resulted in:

- An open market where competing providers aggressively promoted their service to consumers to secure minutes on their network for reimbursement
- Certified providers, successful in their advertising and outreach campaigns, then subcontracting VRS traffic to others
- Entrepreneurs, eager to enter the profitable VRS market, opening relay centers and providing service in a manner that often thwarted competitive market economics (for example, the use of proprietary hardware that blocks VRS users from accessing competing VRS vendors)
- Opportunities for fraudulent billing and abuse of the service

From the consumers' perspective, this environment also:

- Offered choices of service providers
- Satisfied the dramatic growth in consumer demand for VRS

While providing wide availability, unregulated growth of VRS has proven to be very expensive. In efforts to reduce the fraud and waste prevalent in the U.S. model, the FCC has recently established additional regulatory restrictions on VRS providers as well as eliminating the use of uncertified subcontractors.⁴⁰ These efforts have resulted in a reduction of the number of VRS providers operating currently in the U.S. Due to continuing operational, management and cost issues, the FCC is considering significant changes to the structure of the U.S. program.⁴¹

3.2. Identified Challenges and Solutions in Other Countries

Similar challenges affect the VRS programs in the United States and Europe. The following list shows the most significant issues identified, particularly those that apply to challenges identified for Canadian VRS.

- Lack of qualified interpreters to work in VRS and the impact on community interpreting

⁴⁰FCC 11-118, Second Report and Order, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 10-51, released July 28, 2011 at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-118A1.pdf

⁴¹ Potential changes include transition to a per user or historical cost funding mechanism, increased standards for interoperability, and greater authority of a third party administrator. See: FCC-11-184A1- *Further Notice of Proposed Rulemaking*, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 10-51, released December 15 2011 at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1215/FCC-11-184A1.pdf, and FCC 10-111 *Notice of Inquiry*, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 10-51, released June 28, 2010 at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-111A1.pdf

- Technical interoperability issues
- Ongoing funding mechanisms for VRS

3.2.1. Lack of qualified interpreters

Accurate interpretation between signed languages and spoken languages is a complex and difficult task, which requires extensive training. Therefore, finding skilled interpreting professionals can often be a challenge for VRS providers, as is minimizing the impact on community interpreting. Particularly in the U.S., VRS providers have used financial incentives to lure interpreter resources away from community interpreting.⁴² Recruitment efforts are focused on financial competition and individual profit without regard for the impact to community interpreter availability.

France and several of the Nordic countries have developed administrative and regulatory strategies to deal with this issue. Instead of requiring the independent VRS providers to determine staffing solutions, these countries have established partnerships with the interpreter agency industry to provide VRS. This approach emphasizes the engagement of companies that already provide interpreter services and allows them the flexibility of scheduling interpreters for VRS and community interpreting.

3.2.2. Interoperability

Interoperability has been a challenge in the U.S. and although the FCC has ruled that all platforms and devices must work with each other, the issue is still problematic. One way that other countries have avoided this issue is through the acquisition of a single call center platform to be used by an entire country. Once the VRS platform is chosen, any existing or future VRS providers must use the selected platform.⁴³ This model is quite different from having TSPs provide VRS through the addition of interpreter resources, but instead focuses on interpreter organizations adding a technical platform to their operations to successfully manage the interpreting needs of the community via VRS or in-person assignments.

These countries have also addressed issues of technical interoperability by adopting the International Telecommunications Union Standardization Sector (ITU-T) “Total Conversation” standard,⁴⁴ in which

⁴² This situation occurred in Canada when a U.S. provider began hiring Canadian interpreters to serve U.S. customers. See CAD comments to the FCC at FCC 11-54A1, paragraph 10. at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-54A1.pdf and <http://www.canada.com/vancouver/news/story.html?id=5ababb33-12c4-4042-86b3-fb2528793c66>

⁴³ While this report does not attempt to recommend one platform over another, we make note that three commercially available platforms that support interoperability of devices and the “total conversation” standard are currently being used successfully in other countries.

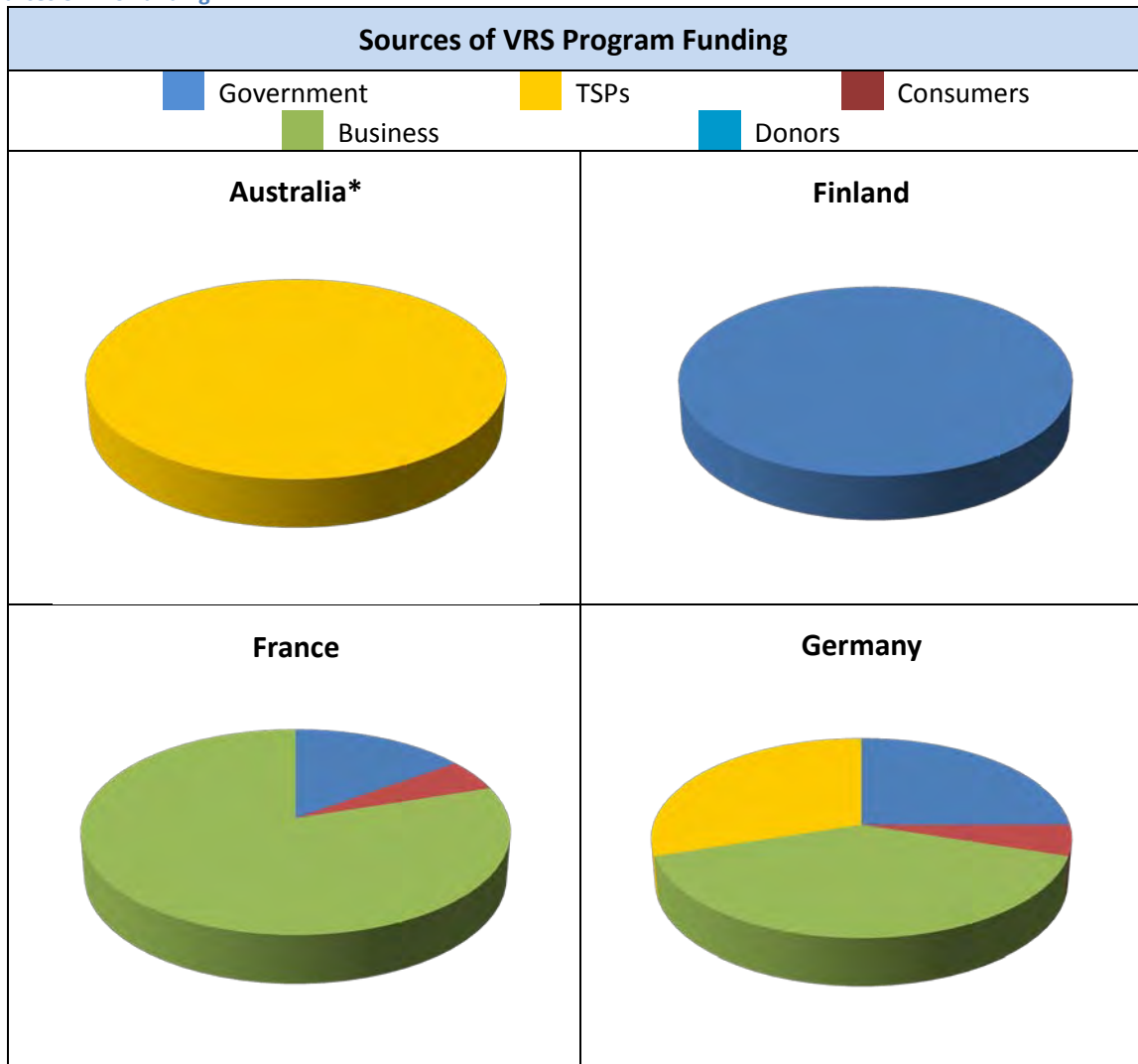
⁴⁴ Total Conversation is “An audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more location.” ITU F.703 Recommendation at <http://www.itu.int/rec/T-REC-F.703-200011-I/en>.

users can choose to use video, speech, and/or text simultaneously via commercially available call center platforms that support connectivity to and from users via a variety of gateway protocols.⁴⁵

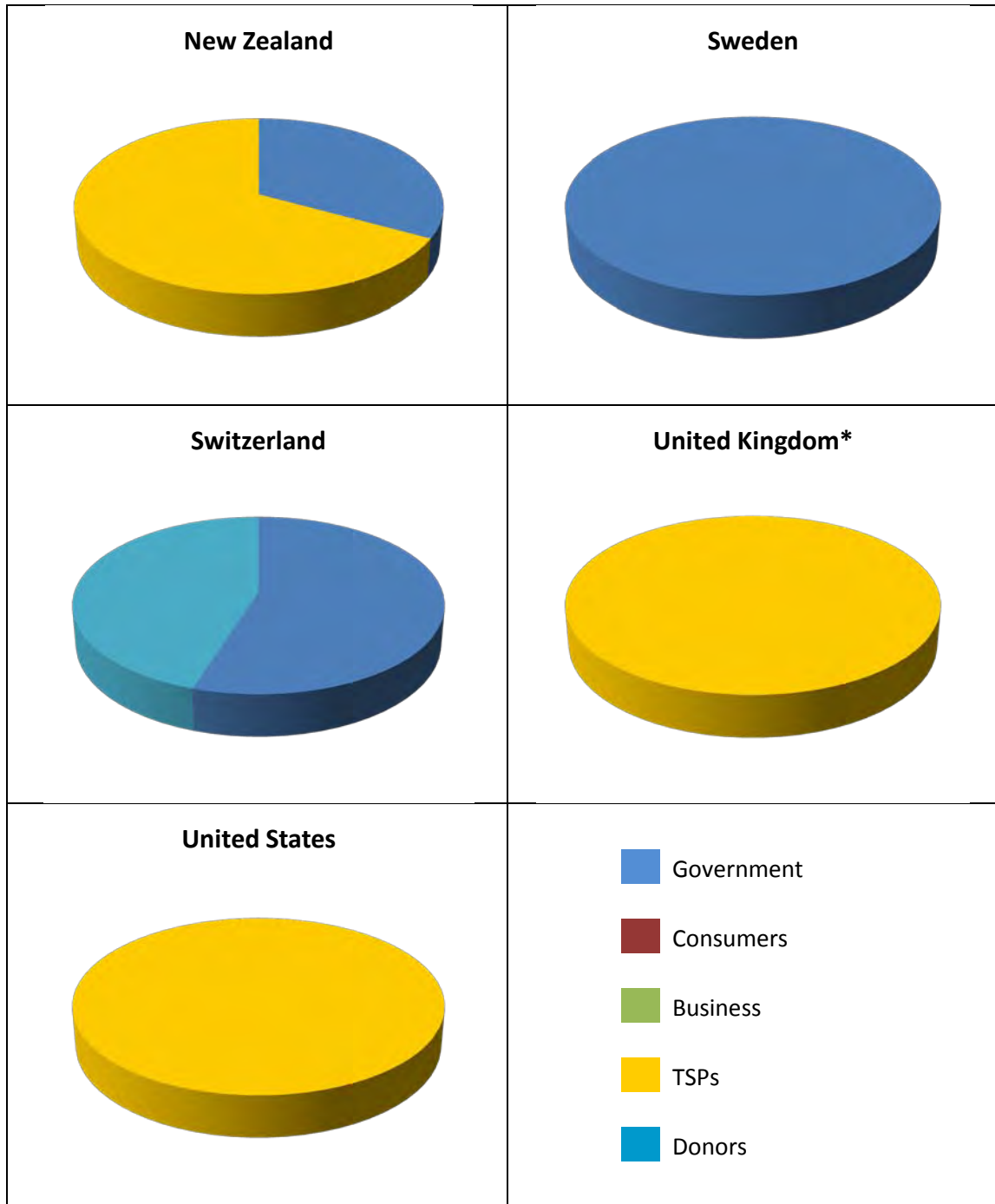
3.2.3. VRS Funding

The following charts demonstrate the different or similar funding mechanisms utilized in each of the countries researched. Segment sizes are approximate.

Figure 7: Sources of VRS Funding



⁴⁵ Including: textphones (Baudot, V.21, EDT, the ITU standard of V.18), Skype video and voice, H.323, H.264 M (3G video), standard API for SIP-enabled equipment such as media gateways, as well as the PSTN, see this study's phase 5, *Technologies and their Forecasts*, and phase 4, *VRS in Other Countries*, for more information.



* Australia and United Kingdom funding sources may change.

The development of commercially available VRS platforms and Total Conversation standards have helped other countries to ensure international consistency of their MRS options and may have helped avoid the pitfalls associated with the U.S. model. It may also be important to note that no instances of fraud or abuse of VRS were indicated in the questionnaire responses of countries researched for this study, with the exception of the well publicized instances in the U.S.

4. Consumer Considerations

A summary of significant factors relating to potential users of VRS is provided below. Forecasts of the number of users and minutes of use, along with the necessary number of interpreters needed to support that level of call volume are presented. A synopsis of the components that identify quality of service are then presented, followed by a summarization of the views and perspectives of Canadian consumer groups.

4.1. Consumer Demographics and Demand

As evidenced in phase 3, *Consumer Interests and Perspectives*, and direct correspondence to the CRTIC from potential VRS consumers, the desire for permanent VRS in Canada is very strong. However, a significant challenge to forecasting VRS demand is the variation of opinions and data regarding the potential populations of VRS users. What is unique to Canada is the need to accurately count two different demographic groups, one for potential ASL users and one for potential LSQ users.⁴⁶ These estimates become more challenging when attempting to account for subsets, such as which potential users are hard of hearing, do not know ASL or LSQ and yet may benefit from using video relay service if speech reading is offered as a mode of communication. The phase 3 online consumer survey indicates that subgroup usage of VRS would be minimal.⁴⁷

In phase 9, *Forecasts of VRS User Demand*, estimates of the number of likely Canadian VRS consumers and their usage at full saturation were calculated by applying reliable traffic and usage data from the U.S. This U.S. based ratio was then adjusted to reduce the effect of potential anomalies in the U.S. data and to better reflect the Canadian user environment,⁴⁸ resulting in the following Canadian forecast of number of users, annual minutes, and part time interpreters required for a 24/7 VRS over ten years to achieve full saturation.⁴⁹

⁴⁶Statistics Canada and other sources cite a ratio between 20.1% to 24.8% of Francophones to the general population. This study applies a 23% Francophone and 77% Anglophone ratio, including the relative percentage of needed LSQ and ASL interpreters. See phase 9, *User Demand* for further details and calculation methods.

⁴⁷ Accurate statistics of the Canadian Deaf population are historically difficult to obtain, as is trying to discover how many of these individuals use signed language as their primary form of communication. The Canadian census does not include statistics for Deaf, hard of hearing, ASL or LSQ users. An in-depth discussion of the populations of potential VRS users is included in phase 3, *Consumer Interests and Perspectives* and phase 9, *Forecasts of User Demand*. Comparative population and VRS user data is also found in phase 4, *VRS Models in Other Countries*.

⁴⁸ Approximately 10% reduction in minutes due to a 10% reduction in users, plus 20% reduction of overall minutes due to the comparative effect of aggressive U.S. marketing resulting from high rates, and due to the timing of the introduction of VRS (in the U.S. before the prevalent adoption of email and texting by the general public; in Canada after the ubiquitous adoption of email and texting). Interpreters are estimated to work an average of 15 hours per week at 25% efficiency (25% or 15 minutes of each hour are relayed conversation minutes). See phase 9, *Forecasts of User Demand*, for greater detail.

⁴⁹ For simplicity of presentation, the tables and figures that forecast adoption over time depict the increasing number of people that will use VRS each year, and use a fixed average number of annual minutes of use per
[footnote continues on next page]

Table 5: Canadian Forecast – VRS minutes and number of part-time interpreters over 11+ years⁵⁰

Year	Number of users (at 50% annual growth)	Annual minutes (ASL & LSQ)	Annual ASL minutes (at 77%)	Annual LSQ minutes (at 23%)	Total VRS interpreters required (ASL & LSQ)	ASL VRS interpreters required (at 77%)	LSQ VRS interpreters required (at 23%)
1	751	282,723	217,697	65,026	24	19	6
2	1,127	424,715	327,031	97,685	37	28	8
3	1,691	637,388	490,789	146,599	55	42	13
4	2,537	956,342	736,383	219,959	82	63	19
5	3,806	1,434,754	1,104,761	329,993	124	95	28
6	5,709	2,152,391	1,657,341	495,050	186	143	43
7	8,564	3,228,623	2,486,040	742,583	278	214	64
8	12,846	4,843,232	3,729,288	1,113,943	418	321	96
9	15,345	6,656,384	5,125,416	1,530,968	574	442	132
10	15,345	6,828,525	5,257,964	1,570,561	589	453	135
11+	15,345	6,828,525	5,257,964	1,570,561	589	453	135

It is important to note that the number of users presented for forecasting purposes throughout this report is only those individuals that sign as their preferred form of communication. All VRS traffic (regardless of who initiates the call) is associated with this group of VRS consumers even though for each VRS user who signs, many more non-deaf, hearing users, receive VRS calls from the signing caller. Thus overall, VRS is a service for both Deaf and hearing parties, and in fact hearing parties also generate VRS calls to people who sign.⁵¹

Since no reliable statistics exist on the actual number of sign language users, it is difficult to predict the actual number of Canadians who will use VRS. Therefore the actual number of VRS users may differ from the 15,345 users forecasted. The following table depicts changes to the forecasted number of minutes and interpreters needed, associated with potential differences in the estimated number of VRS users.

person. However, actual growth will be more complex, with many users not reaching their average maximum usage (number of minutes) until about the third year after signing up for the service. Nevertheless, these forecast adoption tables and figures present workable estimates of total minutes (and in phase 10, costs) and associated VRS interpreter resources.

⁵⁰ The number of users in Table 5 represents the number of people estimated to be served by VRS at the end of each year, starting with 500 users the first month. The number of annual minutes equals the number of users each month, with each user averaging 37 minutes of VRS per month. See phase 9, *User Demand*, for details.

⁵¹ Typically less than ten percent of VRS calls are initiated by hearing people.

Table 6: Canadian Forecast – Changes in interpreter demand for variances in the number of VRS users of a 24x7 VRS

Percent change in number of VRS users	Number of VRS users	Total Annual Minutes	Total VRS interpreters needed (LSQ & ASL)	LSQ VRS interpreters needed (at 23%)	ASL VRS interpreters needed (at 77%)
-20%	12,276	5,456,682	470	108	362
-10%	13,811	6,138,768	529	122	408
0%	15,345	6,820,853	588	135	453
+10%	16,880	7,502,938	647	149	498
+20%	18,414	8,185,024	706	162	544

As there may be other non-VRS technologies (email, SMS, etc.) currently preferred or used by consumers, the Canadian forecast may also vary in the average minutes of use per consumer. Therefore, the following table depicts changes to the forecasted number of minutes and interpreters needed associated with potential differences in the estimated average number of minutes per user.

Table 7: Canadian Forecast – Changes in interpreter demand for variances in minutes per user, for 15,345 users, 24x7

Average Annual Minutes per User	Average Minutes per Month	Total Annual Minutes	Total VRS interpreters needed (LSQ & ASL)	LSQ VRS interpreters needed (at 23%)	ASL VRS interpreters needed (at 77%)
235	20	3,602,023	311	71	239
345	29	5,288,077	456	105	351
445	37	6,820,853	588	135	453
545	45	8,353,629	720	165	555
645	54	9,886,405	852	196	657

There are many variables that potentially affect VRS usage rates. Some of these variables are detailed in phase 9, *Forecasts of VRS User Demand*, while others cannot be quantified at this time. Some variables could be quantified through a carefully planned initial implementation research phase that is specifically designed to measure these and other factors. The information presented herein is intended to provide a baseline number of users in order to accurately forecast the potential VRS usage, the per minute costs of providing VRS, and the needed interpreter resources.

4.2. Quality of Service Considerations

Quality of Service (QoS) considerations begin with the minimum technical specifications for the networks and systems required to support VRS transmission, including both provider and consumer responsibilities for meeting these requirements. Additionally, the perceived success of a VRS program is highly influenced by the consumers’ expectations for the service, and how well the provider(s) satisfy these expectations. These considerations include the skills of the interpreters, service availability (i.e., hours of operation and average speed of answer before a video interpreter is available), and the level of customer support provided. To a significant degree the success of outreach and education efforts by the providers, community stakeholders, and the administrative authorities will help consumers have informed expectations and a higher likelihood of a successful experience when using this new

technology and enabling service. To ensure consumers receive a reliable VRS experience, VRS contracts should:

- include QoS and reporting requirements thereby clarifying the providers' commitment to achieve measured performance standards;
- provide the authority to audit and confirm compliance;
- establish reasonable reporting standards and a problem resolution process;
- provide a defined penalty process for failure to perform contractual commitments; and
- be transparent

The following issues summarize the key considerations for VRS service quality, identified through the research conducted for phase 7, *Quality of Service*.

Technical QoS considerations

- VRS providers should be contractually bound to meet network, technical staff, security, and operational QoS standards.
- VRS provider contracts can include measurable Service Level Agreements to facilitate QoS.
- End user bandwidth, camera resolution and refresh rates are the principal consumer QoS technical factors.
- Minimum bandwidth, hardware, and software requirements must be clearly communicated to VRS end users.
- User technical instructions and communications should be communicated in ASL, LSQ, and jargon-free text whenever possible.
- End user technical support will be a necessary and ongoing component of a successful VRS program.⁵²

Operational QoS considerations

- QoS in operational factors should be required, and monitored by the VRS administering agency.

⁵² The degree and type of technical support required by VRS consumers will be dependent upon a variety of factors including the VRS platform selected, the type of end-user devices supported, and the different ways of providing consumers with adequate technical information. End-user support requirements should be a topic carefully researched during an initial research phase of VRS deployment. The TELUS trial results indicating that in-person field installation support was necessary may be due in large part to implementation based on non-standardized older technologies: connecting VRS through a television set to old proprietary Sorenson end-user equipment to the Internet; an approach not necessarily recommended for modern VRS. Since Sorenson provides its equipment for free, it may also use the field installation as a means to confirm that the user is Deaf; an approach that may not be appropriate for Canada, given the recommendations and final selection of model alternatives (see phase 11, *Potential Canadian VRS Models*).

- Standards should be defined for a variety of operational factors, including reliability, redundancy, security, technical problem resolution, network blockage/throughput, average speed of answer, call queuing, and answering and handling of emergency calls.
- Rules regarding potential fraud and misuse should be defined, and conditions monitored and responded to.
- Providers should be responsive to consumers' communication preferences, including ASL, LSQ, transliteration, voice carry over, etcetera.
- QoS should extend to non-VRS functions such as customer service and technical support.
- Consumers may view equipment interoperability as a QoS factor, and interoperability requirements should be defined with consumer input.

Interpreter QoS considerations

- Minimum certification and training standards including ethical practices should be defined and required for interpreters working in VRS call centers.
- Regular monitoring of interpreter quality of service, and ongoing interpreter professional development are important QoS considerations.
- Special signing vocabulary or other skills may be expected by consumers.
- A variety of interpreter working conditions will affect Quality of Service, and should be defined for optimum service delivery.

Oversight and enforcement

- Minimum QoS standards should be clearly defined within the VRS provider's contract in measurable, reportable thresholds and transparent (auditable) before the implementation of VRS.
- Active QoS reporting, review, notifications to and from the administrative agency, and correction all should be part of normal VRS management operations.
- A VRS provider's non-compliance with agreed upon QoS standards should result in actions designed to cooperatively motivate the provider to improve services.

Consumer outreach and education

- Public outreach and education to both Deaf and hearing populations will be critical to the success of VRS.
- Outreach should engage consumer groups, and should be in a variety of media and formats, including sign language.
- There could be more significant education required in Québec since information in French or LSQ is not readily available on the service, so there may be limited knowledge or exposure to VRS in Québec increasing the need for education.

Feedback and improvement mechanisms:

- Automated QoS measurement and reporting should be required of the VRS provider(s).
- The VRS administering agency should be allowed to request periodic and ad-hoc reporting, perform site visits, and obtain consumer feedback (as collected by the provider or the administrative agency).
- Consumer complaint and feedback mechanisms will be critical to achieve and maintain high quality performance of VRS.
- Advisory committee participation, e.g., to the third party administrator Board, will be a key component of VRS quality of service.

The ongoing success of a VRS system will require continued service level monitoring and possible modification of these QoS standards and requirements. Several of the requirements (such as average speed of answer) have been modified in most country programs as the service progressed from a trial phase to a permanent service, or as service capabilities matured. Consumer feedback and other forms of ongoing performance assessment and providing consumers with updates or feedback to manage expectations (particularly early on) are necessary to ensure quality improvement and customer satisfaction. To guarantee that effective QoS goals and reports are provided by VRS contractors, QoS requirements will need to be specified in a Request for Proposal (RFP) or other procurement document in advance of provider selection or system implementation. None of the Quality of Service factors should pose a significant challenge to the development and implementation of a Canadian VRS, although some will need to be adopted and strengthened over time as the capability of the service and its resources mature. The inclusion of QoS standards in the service will help ensure the best possible Canadian VRS program.

4.3. Summary of Consumer Perspectives

Understanding consumer interests and their perspectives is critical to establishing a Video Relay Service that meets their needs and expectations. In phase 3, *Consumer Interests and Perspectives*, Canadian Deaf and hard of hearing advocacy organizations, and individual consumers provided their feedback through interviews, questionnaires, discussions and surveys. The research for *Consumer Interests and Perspectives* included creation and distribution of a questionnaire specific to consumer advocacy organizations, and administration of a consumer online survey. For the questionnaire, a response rate of 65% was achieved with 22 out of 34 returned for inclusion in this study. The specific number of responses for each type of questionnaire sent and received is summarized in the following table.

Table 8: Consumer Advocacy Group Participation

Type	Number Sent	Number Received
Anglophone Groups	17	10
Francophone Groups	17	12
Total Consumer Advocacy Groups	34	22

The consumer online survey resulted in the participation of 1,299 potential VRS consumers. Geographically, the questionnaires and participants were well distributed including representation from Québec, Ontario, Manitoba, Saskatchewan, Nova Scotia, Alberta, and British Columbia.

The research identified several key considerations and expectations for VRS in Canada from the consumers' perspective. Consumers expect:

- Equal access to telecommunication services as enjoyed by hearing individuals
- A national VRS solution to ensure equal access to all Canadians
- Involvement of the Deaf community and other stakeholders in all stages of VRS
- Access to interpreters that are qualified and trained to accommodate various communication preferences
- Recruitment methods for VRS interpreters that prevent straining the availability of community interpreters
- Provision of VRS in LSQ⁵³
- A choice of providers; and to not be restricted to one phone company, one internet company, or a particular technology in order to use VRS

The responses to the group questionnaires and online survey indicated that the inclusion or exclusion of various modes of communication, in addition to ASL and LSQ, will continue to be a controversial topic within the Deaf and hard of hearing community.⁵⁴ However, there are no significant barriers to including many other forms of visual communication in VRS other than interpreter availability. Impact upon the availability of interpreters for community interpreting is a significant concern. The demand for VRS and the number of potential users indicated by the online survey results suggest that most types of usage can be accommodated by qualified ASL and LSQ sign language interpreters.

⁵³ The TELUS/Sorenson VRS trial only provided VRS in ASL.

⁵⁴ See phase 3, *Consumer Interests and Perspectives*, for details regarding the controversial nature of various communication forms.

Supporters of VRS strongly believe that the service has a direct positive effect on the social and economic well being of the Deaf and hard of hearing communities. Potential economic benefits of VRS as reported by consumers include:

- Increased employment opportunities for Deaf and hard of hearing individuals including upward mobility
- Reduced social welfare and health costs
- Equal access to health and safety resources
- Engagement in the economy as consumers, employers, or employees
- Increased productivity and versatility due to more typical telephone communication

The research conducted for this study indicates that the demand for VRS is high. Consumers feel that the provision of a relay service that utilizes the natural language of the Deaf community reduces the impact of communications and cultural barriers between the Deaf and hearing populations. Video communication represents a vast improvement over text-based communication for people who use signed languages, allowing them to converse naturally, convey emotional context, and share non-verbal cues and information that typically does not occur with text based communication. Removing the obstructions to equal access to information and people allows visual communicators the ability to participate more fully in society, and as such society benefits from that participation. Consumer advocacy organizations consulted for this study may have divergent viewpoints, but all unanimously agree that VRS will have a beneficial impact on their community and society as a whole.

5. Principal Goals for Canadian VRS

The research conducted for each phase as well as feedback from this study's VRS advisory committee identified five primary goals and three secondary goals of a Canadian VRS.

The primary goals of a Canadian VRS should be:

- Acceptable in quality
- Affordable
- Ubiquitous
- Manageable
- Legal

The recommendations presented in this study are based in part on consideration of these goals.

5.1. Acceptable quality

VRS Quality of Service (QoS) is made up of many components, which are discussed in detail in phase 7, *Quality of Service* and summarized in section 4.2 of this report. In brief, VRS QoS may be summarized as

the overall experience of the users of the service – both the Deaf and hearing users. ASL and LSQ are very expressive and nuanced languages. Accurate relaying between an individual using signed language or other form of visual communication, and a hearing and speech user of English or French is not easy. Interpretation that loses meaning, is unclear, or includes wrong meaning is not acceptable. In addition to the need for skilled interpreters, the consumers' experience is also dependent on operations of the VRS provider: adequate numbers of interpreters for an acceptable answer time, appropriate call set-up, processing the call in a manner that allows both parties to control the conversation, customer service, and technical support. Consumer factors, such as minimum broadband speeds and video phone or computer compatibility, are all necessary for the VRS quality to be acceptable. For VRS to be effective, the consumers' overall VRS experience must be of a sufficient quality. Therefore VRS needs to be established and maintained in a manner that will provide a high level of quality of service to the consumer. While QoS is typically defined in more detail within program design and RFP/contract documents rather than in a feasibility study, QoS must be kept in mind when selecting a VRS model because some model options may make QoS more difficult to achieve than other options.

5.2. Affordable

VRS must be affordable to the communications industry that supports it, to the regulators that oversee it, to the administrators that manage it, to the vendors that provide it, and to the consumers who use it. VRS is very expensive, as demonstrated in phase 10, *VRS Cost Variables and Forecasts*. Nevertheless, it must be affordable in order to be ordered, funded, provided, managed, and used. Basic VRS (without consideration of consumer costs) was forecast in the phase 10 analysis to be between approximately \$27 and \$32 million dollars annually including administrative costs for a fully subscribed service, which may take some years to achieve. The actual cost will be significantly influenced by the model of service selected. The recommendations presented in this study endeavor to achieve the goal of an affordable and sustainable VRS for Canada at a variety of funding levels.

5.3. Ubiquitous

Just like a telephone call between two parties who both hear and speak, a VRS call should not be limited by boundaries. Canadian VRS consumers must be able to communicate with each other and with hearing users over a variety of communication devices, and between telecommunications customers of all Telephone Service Providers (wireline and wireless, and Internet service providers), without having to become a customer of a particular provider in order to use VRS. Likewise the service should be national in scope, that is, not limited to a geographic region such as a Province or TSP territory. VRS should serve visual communication users in a ubiquitous and interoperable manner, not less than experienced by hearing consumers who enjoy a variety of telecommunications technologies and services and who are free to choose the manner and mode of call according to individual circumstances.

5.4. Easy to manage

Canadian VRS must be easy to manage from the perspective of all parties. It must be easy and practical for the CRTC to regulate without endless proceedings regarding operational minutia. It must be easy for the providers to understand what is expected of them, and what they must do to provide a satisfactory service; and it must be practical for them to be able to do so. It must be easy for the TSPs to participate to the degree called upon without undue administrative overhead or financial burden. It must be easy for an administrative body to manage the service contracts and VRS providers, balancing the needs of the consumers with those of the providers and other stakeholders (e.g., interpreter training programs, etc.) Finally it must be easy for the consumers to manage their accounts and to use the service.

5.5. Legal

The new Canadian VRS should comport to existing laws and the CRTC's regulatory framework. VRS should not require Parliament to create new law. If possible, the selected VRS model should work within a legal and regulatory design that has already been proven viable for other services. It should not have to test new legal concepts or face court challenges or interpretations. VRS should be readily implementable within Canada's law, regulation and policy as they presently exist.

5.6. Additional Goals and Objectives

There are many additional goals and objectives that may be applied to Canadian VRS. Considerations are discussed in detail in this study's prior phases. However, listed below are three that stand out from the research.

5.6.1. Inclusion of stakeholders in the oversight of VRS

Stakeholders that are directly affected by the operation of VRS should be included in the oversight and guidance of the service.⁵⁵ This includes representatives of the user communities (users of ASL and LSQ, speech readers, and people who hear and speak) and interpreter communities (training programs, professional organizations, and referral agencies). The perspectives and knowledge of these specific communities of interest are both unique and crucial to a successful VRS. These perspectives and knowledge cannot be obtained from outside of these groups, including from VRS vendors, TSPs, or regulators.

5.6.2. Employ people who are Deaf

In addition to stakeholder oversight and guidance, day-to-day operational excellence will be improved by directly employing people who are Deaf in the overall VRS solution. There are many significant roles

⁵⁵ Opportunities for stakeholders include administrative Board membership, hired administrative staff including CEO, third party administrator/Board advisory committee membership, and other venues such as in interpreter training programs and VRS providers.

that Deaf people and other consumers can fulfill that cannot be effectively filled by non-Deaf. For example, Deaf individuals should be used in interpreter screening and hiring practices. Deaf individuals can assist VRS interpreters understand the meaning and context of a Deaf consumer's communication.⁵⁶ Deaf individuals can be employed in functions that have direct contact with Deaf consumers, such as customer service and technical support. Deaf individuals can and should be used for outreach and education of the Deaf community. Finally Deaf individuals can fulfill management and administrative roles as effectively as hearing persons. By employing qualified people who are Deaf throughout the operation and oversight of VRS, VRS will be more sensitive and responsive to the needs of the consumers served by VRS.

5.6.3. Minimize opportunities for fraud, misuse and waste

The service should be set up and operated in a manner that minimizes the potential for fraud, misuse and waste. This consideration includes financial abuse, abuse of the purpose of VRS, and waste of interpreter and other scarce resources. Full transparency and accountability of all aspects of VRS including administrative, platform and provider functions (e.g., reporting, costs, etc.) are essential. Canada can learn from and avoid the mistakes in VRS implementation from the U.S. model, which has been plagued by fraud, abuse and waste.⁵⁷ Learning from the U.S. and properly defining a procurement method for Canadian VRS can possibly result in a VRS that is more cost efficient, affordable, and sustainable.

6. Significant Challenges and Issues of Canadian VRS

Numerous challenges and issues have been presented in the study's prior eleven phases of research. Only those issues identified as the most significant are presented below, for review while assessing the overall feasibility and recommendation for Canadian VRS:

- There are not enough Canadian interpreters for VRS
- The LSQ environment is unique
- VRS should not harm community interpreting
- The U.S. policies will affect Canadian VRS

6.1. Not enough Canadian interpreters for VRS

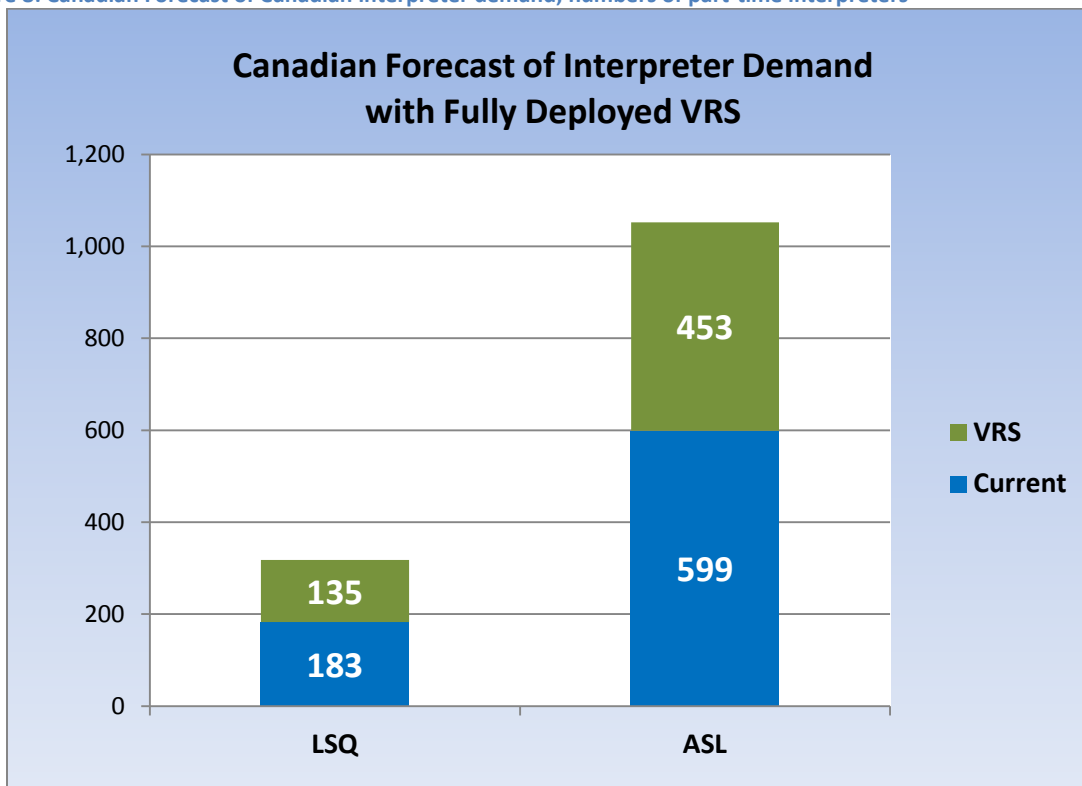
As demonstrated in phase 3, *Consumer Interests and Perspectives*, and phase 6, *Interpreter Considerations*, surveys of consumers, consumer advocacy groups, interpreter agencies all across Canada indicate that there are presently not enough ASL or LSQ interpreters to fulfill the current

⁵⁶ In the U.S. this VRS provider staff role is referred to as a "certified Deaf interpreter".

⁵⁷ *FCC Takes Further Steps to Ensure That Video Relay Service Will Continue as a Vibrant Service*. News Release May 27, 2010; at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-298446A1.pdf

demands for community interpreting. Projections detailed in phase 9, *Forecasts of VRS User Demand*, indicate that a fully subscribed VRS will require approximately twice as many ASL and LSQ interpreters than presently exist. Compared to the estimated number of existing interpreters, the additional qualified VRS interpreters required for fully deployed VRS in Canada are shown in Figure 8, below:⁵⁸

Figure 8: Canadian Forecast of Canadian interpreter demand; numbers of part-time interpreters



In Canada there are five ASL-English interpreter training programs and one LSQ-French interpreter training program. As identified in phase 6, *Interpreter Considerations*, the ASL-English programs graduate about 51 interpreter students annually, and the LSQ-French program graduates about 6 interpreter students annually. Additional students who enter the ASL and LSQ programs begin interpreting without completing the formal interpreter training programs. Many other students drop out of the training due to difficulties in mastering competency in interpreting. VRS is more demanding of interpreter skills than typical community interpreting, so interpreters that are matriculated from an academic interpreter training program are strongly recommended for VRS.

The number of interpreters graduating from the current six programs does not meet the present demand for community interpreters, as demonstrated by shortages experienced by consumers and

⁵⁸The physical demands of interpreting set the expectation that most interpreters will work between 10 and 20 hours a week with an efficiency rate of 25%. Therefore, this calculation is based on the number of additional part time interpreters averaging 15 hours per week needed to fulfill full time VRS positions. See phase 9, *Forecasts of User Demand*, for further information.

interpreter agencies. The five ASL-English programs state they have significant challenges to expanding their programs. Any solution for VRS in Canada must address the significant lack of skilled interpreters that will be needed for VRS.

6.2. The LSQ environment is unique

The ASL professional interpreting organization (Association of Visual Language Interpreters of Canada or “AVLIC”) requires graduation from a recognized ASL-English Interpreting Program in order to obtain membership. However, for LSQ interpreters there is no professional organization, and there are no generally accepted proficiency criteria for LSQ interpreting other than graduation from the only interpreter training program in Québec. Therefore in Québec the professional interpreter agencies that assign interpreters in response to requests, screen their interpreters for proficiency based on their own standards. Additionally, many individuals provide interpreting services freelance, that is, not through any agencies. Thus, in Québec not only is there an interpreter shortage, but many LSQ interpreters that work in the field may not adhere to a uniform standard of proficiency. This together with the very low number of interpreters that graduate from the academic LSQ interpreter training program, place additional stress on the lack of qualified LSQ-French interpreters to serve VRS.

6.3. VRS should not harm community interpreting

VRS is expected to potentially offer significant employment benefits for interpreters compared to community interpreting assignments, including regular hours, higher income, comparatively little travel, a stable and safe work environment, and especially for freelance interpreters, employee benefits (insurance, vacation, etc.) and relief from the pressure of maintaining a financially secure level of assignment work. When VRS employment becomes possible, many existing interpreters are expected to enter the VRS workforce. Even though most interpreters only work part time in VRS, VRS will likely further reduce the availability of ASL and LSQ interpreters for community assignments.

The issue then is how can VRS be modeled to minimize the reduction of interpreter availability to the community and still meet the requirements for a fully functioning VRS?

6.4. U.S. VRS policies will affect Canadian VRS

VRS policies in the United States are established by the Federal Communications Commission (FCC) through federal regulations. These regulations presently allow multiple VRS vendors to be reimbursed at relatively high per minute rates for allowable VRS traffic.⁵⁹ Because the rates are currently high, it is cost effective for the dominant U.S. VRS vendor, Sorenson Communication, to establish multiple VRS call centers in Canada to serve U.S. VRS consumers. These call centers presently employ about a third of the AVLIC ASL members in Canada, contributing to the lack of availability of ASL interpreters for community

⁵⁹ See phase 10, *VRS Cost Variables and Forecasts*, for details.

interpreting, and significantly reducing the availability of ASL interpreters for work within a VRS that will service Canadian consumers.

Any new ASL VRS located in Canada will have to compete with Sorenson for interpreters. The largest cost component of VRS is the interpreter labour.⁶⁰ Therefore even if a Canadian VRS would be able to otherwise acquire VRS at cost rates significantly less than the U.S. rates, the higher U.S. rates will allow Sorenson or any other VRS provider that services U.S. consumers to pay higher wages to its interpreters and make it more difficult for a Canadian VRS to be operationally successful and affordable. This situation will not change until the FCC reduces its reimbursement rates for providers serving the United States, or until the FCC limits its reimbursements to VRS call centers located only in the United States.

7. Proposed Solution for Canadian VRS

7.1. Description

The proposed solution for Canadian VRS is designed to solve the challenges of implementing VRS, and it has been unanimously approved by the consumer and industry representatives of this VRS Feasibility Study's Advisory Committee.

It will:

- Improve the capability of Canadian college and university interpreter training programs (ITPs) to graduate more interpreters in order to meet the demand for VRS and community interpreting.
- Accomplish necessary research to refine the service prior to full deployment.
- Involve ITPs and Interpreter Agencies in providing VRS, both of whom already have relationships with interpreters and the Deaf community, and will be able to initially supply quality LSQ and ASL interpreters to VRS.
- Solicit ITPs, Interpreter Agencies, and commercial VRS companies to all provide VRS for full deployment in response to well crafted quality requirements, thereby ensuring the lowest competitive costs and the best quality of service.
- Provide a single common VRS software and database platform for use by all providers and consumers, which will facilitate common reporting, interoperability, and use of multiple types of consumer devices for VRS.

Deployment of VRS would be accomplished in two phases, an initial research phase followed by a full deployment phase (the extent of which depends on the availability of funding and interpreters). Both phases are supported by a third party administrator that provides a common VRS platform and consumer registration database, as well as other functions. These three deployment elements (administration and each of the two phases) are described below.

⁶⁰ Ibid.

7.1.1. Program Administration

As described in greater detail in phase 11, *Potential Canadian VRS Models*, section 13.2.3, the administration of VRS in Canada would be governed by an independent third-party administrator corporation, created at the direction of the CRTC by the Telecommunications service providers (TSPs). This program administrator would collect and administer VRS funds from the TSPs, set VRS operational standards, acquire and operate a VRS platform and database that would be required to be used by all VRS providers, contract for VRS services, monitor services for quality and other considerations, and periodically report to the CRTC.

The program administrator would operate with the following five guiding principles:⁶¹

Linguistic and Cultural Balance

In order to ensure that all potential users of VRS have meaningful input with all major interests represented, the VRS program administrator agency would strive to have balance in regard to linguistic preference (e.g., ASL, LSQ, speech-reading) as well as cultural identification (e.g., French Canadians, culturally Deaf, hard of hearing, deafened, etc.). The CEO, staff, Board members, and advisory committee should all have awareness of the linguistic and cultural factors existing in the various communities that VRS serves, and to the extent possible, the agency should hire and be composed of individuals directly from these communities.

Accountability and Transparency

The agency should be an independent, accountable, not-for-profit corporation with a public purpose of administering a national Canadian VRS. To this end, the CEO, staff, and board members must not have conflicts of interest related to the provision of VRS services and should not be affiliated in any way with VRS providers. The intent being that the operations and policy objectives of the agency would be completely transparent.⁶²

Manageable and Efficient

The agency should operate in accordance with its objectives and should do so in a manner that is easily managed and efficient, particularly in regard to fiscal responsibility. Experienced staff and a board with proper expertise will ensure that the goals of manageability and efficiency are achieved.

⁶¹ These guiding principles were determined in a working session with this study's VRS Advisory Committee on November 4, 2011.

⁶² Full transparency and accountability of all aspects of VRS including administrative, platform and provider functions (e.g., reporting, costs, etc.) are essential.

Accessibility

The operations and related data of the agency should be accessible to consumers and stakeholders. This requires implementing minimum standards of accessibility to the agency's information and procedures. In order to be accessible to the majority of VRS users this means that the agency should produce information in ASL and LSQ, as well as written communication.

Independence

In order to truly be an independent agency, no one interest can control the board or agency. Therefore, the makeup of the board needs to be balanced in such a way that ensures equality and independence from outside influence. The makeup of the board and its voting thresholds should be designed with these goals in mind.

The operations of the administrator would be subject to oversight by a Board of Directors, which would have significant responsibility and authority. The Board could be designed similarly to the Commissioner for Complaints for Telecommunications Services (CCTS) board;⁶³ for example a nine member board consisting of:

- 4 Consumer representatives (appointed by consumer groups)⁶⁴
- 2 Independent directors with expertise in running corporations/organizations without ties to the TSP industry, VRS industry, or consumers (nominated through an independent process and/or a third party ad hoc nominating committee selected by an independent firm)
- 3 TSP industry representatives (appointed by the TSPs)

In order to ensure consumer perspectives are included, quorum and majority voting thresholds (e.g., three of the four consumer representatives) could be set for significant VRS policy and practices. Likewise to ensure that approvals reflect funding obligations and accountability, thresholds for decisions regarding budget and cost could be separately set (e.g., unanimous approval by the 3 industry representatives).

The Board of Directors would be supported by a Chief Executive Officer and permanent staff. The CEO and staff should under best of circumstances all be VRS users and members of the Deaf community, with a balance of ASL and LSQ representation.⁶⁵ For example, staff positions may include a financial officer,

⁶³ CRTC Telecom Decision CRTC 2007-130; "Establishment of an independent telecommunications consumer agency"; December 2007; available at <http://www.crtc.gc.ca/eng/archive/2007/dt2007-130.htm>

⁶⁴ It may also be useful to consider an interpreter or interpreter training program representative: e.g., three consumer representatives and one interpreter representative.

⁶⁵ Some positions such as a financial officer or accountant ostensibly may not in and of themselves need signing skills. However for fluid communication within the management team, all members would be encouraged to have such skills. If the necessary skills and talents are not readily available from the Deaf community for all positions, then the program should build capacity so that a larger pool of Deaf individuals is developed who can take on the necessary roles.

an accountant, an IT person, a customer support person, and an analyst. Additional consideration should be given for ASL/English and LSQ/French interpreters and an English/French translator as staff member capabilities, as well as consideration for a receptionist/coordinator/secretary for Board meetings, public/advisory meetings and subcommittee meetings.

Because multiple stakeholders are involved in VRS, the governing Board will need to consult with an advisory committee. The representative categories and subcategories suggested for a VRS program advisory committee (without consideration for how many representatives per category) are as follows:

- Consumer Representatives
 - ASL Deaf users
 - LSQ Deaf users
 - Hard of Hearing individuals
- Sign Language Interpreters
 - ASL interpreters and interpreter trainers
 - LSQ interpreters and interpreter trainers
- TSP Industry Representative(s)

The advantages of this approach for a third party administrator include:

1. Accountability of a Chief Executive to the Board and, in turn, accountability of VRS suppliers to the Chief Executive focuses responsibility for the performance of the organization and its suppliers upon a clear chain of authority.
2. Responsibility of the members of the Board who are TSPs for approval of the Annual Budget and Business Plan ensures that ultimate direction and funding obligations reside in a single location, namely, TSPs upon whom the Commission has imposed (directly or indirectly) the obligation to make VRS available.
3. Use of periodic RFP's, RFI's or equivalent procurement processes ensures cost effectiveness and flexibility to reflect changing market conditions, and provides incentives for suppliers to improve cost effectiveness and service quality over time.
4. Establishes an independent entity to monitor VRS performance and costs, and to ensure LSQ VRS consumers are served equally to ASL VRS consumers.
5. This approach reflects elements of models already in existence in relation to functions such as the operation of LNP NPAC-SMS databases and the operations of the CCTS.⁶⁶
6. This approach establishes a long term solution for day-to-day management of the Canadian VRS program.

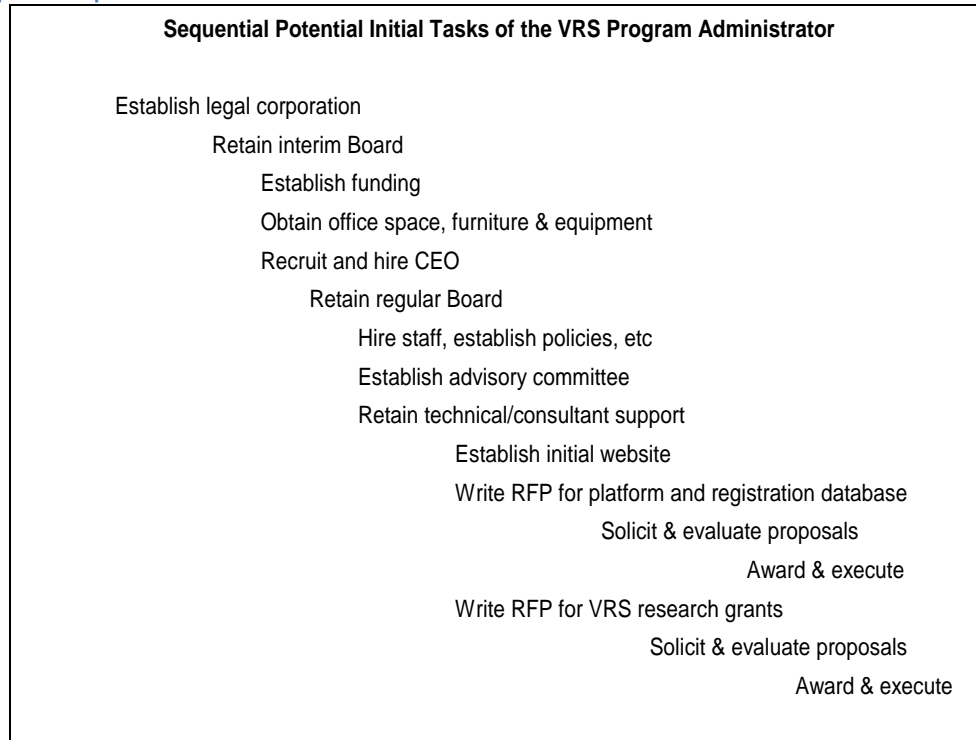
Suggested primary responsibilities of the third party VRS program administrator are listed in section 13.2.3 of phase 11, *Potential Canadian VRS Models*. In summary, these tasks are:

⁶⁶ Local Number Portability (LNP) Number Portability Administration Center Short Message Service (NPAC-SMS); Commissioner for Complaints for Telecommunications Services (CCTS)

- Establish budgets, and annually recommend appropriate program funding levels to the CRTC.
- Collect and manage the VRS funds from the TSPs, and handle all fiscal transactions including VRS disbursements.
- Acquire, manage and operate the common VRS technical platform, consumer registration database (with ten-digit numbering assignments), and VRS program website.
- Establish minimum standards for VRS (including interpreting, ethics, and quality of service), contract for VRS, and monitor and manage contract performance.
- Contract for VRS related research that may improve the program, and monitor and manage contract performance.
- Monitor and collaboratively contribute to the resolution of program issues as they arise, including interoperability issues with vendors.
- As warranted, support and coordinate public education, and provide advice and consultation for VRS technical and customer service education with the TSPs and VRS providers.
- Manage the VRS program for cost efficiency, equity, and quality of service, and improve outcomes.
- Listen to the public, and ensure that VRS needs are being met equally for all constituent groups, and be responsive to identified program issues.
- Report to the CRTC, stakeholders and the public.

Suggested primary implementation tasks of the third party VRS program administrator are listed in section 16.3 of phase 11, *Potential Canadian VRS Models*. A sequential listing of the Administrator's initial start-up tasks is offered below in Figure 9:

Figure 9: Sequence of potential initial VRS administrator tasks⁶⁷



7.1.2. Initial Research Phase

After a period to allow the third party administrator to become functional (as suggested above) and to acquire a VRS platform and consumer registration database and award VRS research and service grants, then the first phase of actual VRS deployment is recommended to be a three to four year phase of national VRS rollout and integrated research.⁶⁸ This initial research phase is anticipated to begin with the implementation of combined research and service grants potentially to all six of the Canadian college and university interpreter training programs (ITPs). These grants will:

- Allow an initial expansion of the ITPs in order to increase their capacity to graduate more interpreters to meet the demand for VRS.
- Provide VRS with limited availability, e.g., 8:00 AM to 8:00 PM Monday through Friday, limited subscribers and/or minutes or combination.
- Accomplish necessary research prior to full deployment, including but not limited to:
 - identification of standards for LSQ and ASL interpreter skills appropriate for VRS;

⁶⁷ The purpose of this timeline is not to establish schedules, but instead to suggest that the Administrator’s initial tasks will take necessary time before VRS actually begins with the following initial research phase. Note that the “Award and execute” task of the VRS research grants, allows a month for Board approval and contract award, followed by three months for the grant awardees to prepare for VRS research and service.

⁶⁸ Also see phase 11, *Potential Canadian VRS Models*, sections 16.2.3 and 16.3 for a more complete description and tasks associated with the initial research phase.

- technical and functional compatibility with local 9-1-1 call centers (PSAPs) for relaying emergency VRS calls;
- identification of the requirements and demand for other potential visual communication modes such as speech reading;
- identification of the types of consumer support needed for technical implementation using a variety of consumer devices and software; and
- identification of practical quality of service measures.
- Incentivize more students to enter the ITPs and to continue through graduation:⁶⁹
 - for the opportunity for VRS employment when their skills are sufficiently developed both pre and post graduation; and
 - to achieve the higher level of interpreter proficiency that should be applied to VRS, and to receive its potential certification.

By placing the initial deployment of VRS within academic settings, the research can be unbiased, bound by ethics, transparent, methodologically sound, and collaborative. Additionally the ITPs can cost effectively involve other college programs, professors and students to support the goals of the research and VRS operations. For example, university information technology departments or support services can participate in researching and addressing the technical challenges experienced by new VRS consumers who may use various types of end-user devices such as mobile tablets, smart cell phones, computers, video-specific devices, etc. Marketing or social studies departments and students can participate with the ITP in identifying the types of education and outreach that are most needed for efficient VRS. The scientific and academically sound research facilitated by the ITPs will involve participating consumers who are using the ITPs' live VRS. VRS users will understand that their use of VRS is as a part of ongoing research and will be expected to participate in surveys and other forms of constructive feedback for the betterment of VRS.

As part of this initial research phase of service, the ITPs would also be expected to collaborate with each other. For example, the sharing of findings and best practices, including the identification and recommendation of appropriate interpreter skill levels, should be done in an academically collaborative manner through conferences and ongoing communication between the ITPs. The experiences of other universities that are not directly involved in the research phase may also be acquired through professional academic outreach and collaboration. For example, Gallaudet University in Washington DC had significant experience with VRS, and may be willing to share useful information.⁷⁰

The ITPs would also be expected to collaborate with local interpreter agencies to identify potential interpreters that have the necessary high level of skill and experience that should be required for VRS. Most ITPs already have relationships with agencies in which additional skill levels are fostered by the agency. For example the Canadian Hearing Society in Toronto has a formal mentoring program with the

⁶⁹ As noted in phase 6, Interpreter Considerations, a challenge faced by the ITPs is the high attrition rate.

⁷⁰ Gallaudet had a large VRS call center contracted to Sorenson until FCC regulations prohibited subcontracting in November of 2011.

ITP at George Brown College in Toronto to improve skills of recent ITP graduates. This type of relationship offers the experience and management expertise of the agencies to support the research and operations of the ITPs. Some ITPs may wish to subcontract the VRS operations to interpreter agencies and to also collaboratively involve them in the research.

Not all research topics need to be awarded to every ITP. For example, only one university or college may be awarded the research to identify and resolve the issues associated with the compatibility of VRS with emergency relay calls to 9-1-1 public safety answering points (PSAPs). Likewise, one university may be contracted to coordinate and facilitate the collaboration of research across all awarded research awardees. These types of decisions can be decided by the third party administrator in its development of the RFP for the initial research phase grants.

If a VRS with some form of limited access is required for the second deployment phase (for example, to meet specific funding ceilings or ongoing shortage of interpreters), the initial phase will provide practical experience with the most effective methods of restricting access in a cost-effective manner while minimizing the impact on users.

After the research is well under way and initial results and recommendations are provided or anticipated, the first phase can be expanded to award the remaining grant funds to selected interpreter agencies for VRS. For example in the third year five agencies might be awarded grants, and in the fourth year five more agencies (for a total of ten) might be grant recipients. The primary focus of these awards will be to assist interpreter agencies in their efforts to begin providing VRS with the knowledge gained and collaboration of the ITPs. The award of grants to the interpreter agencies will allow these agencies to offer VRS in a controlled environment in which they will have access to the ITPs and the third party administrator for assistance in resolving start up issues that may be experienced by organizations without VRS experience, such as VRS interpreter qualifications, staffing to meet call traffic demands, technological issues, user registration and support, etcetera.

Most significantly the interpreter agencies already have established relationships with quality interpreters, and many agencies screen and test interpreter qualifications before acceptance and placement because of the lack of certification in both the ASL and LSQ environments.⁷¹ It is because the ITPs and interpreter agencies already have these relationships and processes, and because the agencies are also responsible for meeting the public's need for community interpreting, that they are ideally suited to provide VRS with minimal impact on community interpreting. Unlike independent for-profit VRS industry firms whose business interest would be to hire away most qualified interpreters from community interpreting, Canadian interpreter referral agencies will be required, for their own self interest and ongoing relationship with their clientele, to balance their interpreter resources for both VRS and community interpreting so that neither is unduly harmed. These existing relationships with local quality interpreters together with their ability to balance resources with needs, will allow VRS to initially

⁷¹ For a complete discussion of the lack of ASL and LSQ certification see this study's phase 6, *Interpreter Considerations*.

support approximately twice the level of service growth (users and minutes of VRS) than would be possible using outside for-profit VRS firms.⁷² Agencies also have established relationships with the Deaf community, which can be used for education and outreach about VRS. In fact a number of interpreter agencies are part of or associated with Deaf advocacy organizations, such as the Canadian Hearing Society (CHS for ASL), or the Centre Québécois de la Déficience Auditifve (CQDA for LSQ).

All grant awardees (ITPs and interpreter agencies) will be required to use the VRS platform and consumer registration database provided by the third party administrator.⁷³ Restricted hours of operation and other possible limitations will be necessary during the first phase as described in section 7.3.7, *Potential restrictions for Phase 1 deployment*. Additionally, the awardees will be required to regularly report to the administrator on VRS and research issues and performance. The administrator will coordinate awards, information learned, and some public announcements.

7.1.3. Full Deployment Phase

Prior to the conclusion of the first phase, the third party administrator should develop an RFP for a full deployment (geared to available funding and interpreter resources) and competitively awarded VRS. This VRS should be open to any organization that has experience with interpreting, specifically ITPs, interpreter agencies, and to the extent that interpreters are available for VRS without significantly harming community interpreting, experienced video relay companies. This approach underscores two principles unique to VRS: 1) the core service is provided by the interpreters and experience with quality interpreting is essential in order to provide VRS; and 2) because VRS is dependent upon the availability of interpreters to work in call centers, VRS must accommodate many VRS call centers located where the interpreters live.

This second phase should accommodate those ITPs and interpreter agencies that may wish to continue to provide VRS after their research is completed in the first phase, and assuming they are competitively successful. This second phase will also allow new entrants to provide the service, including other interpreter agencies and experienced VRS companies who may wish to provide services to Canada.

As presented, the full deployment phase anticipates that VRS will be awarded for 24 hours of operations every day of the year. In order to gain maximum efficiencies and lowest cost, the third party administrator may wish to offer tiered pricing based on day of the week and time of day, and may not require all providers to offer VRS on nights and weekends as long as some providers agree to handle those calls. This phase can be adapted to provide VRS on a restricted basis, to address limitations in funding, interpreters or other factors.

During the second phase, enrolment and consumer use of VRS is expected to grow over time, increasing about fifty percent annually from the end of the first phase until maximum usage is attained.

⁷² See figure 10 in section 5.3 of phase 9, *Forecasts of VRS User Demand*.

⁷³ Very little equipment will be required of the ITPs and interpreter agencies, e.g., a computer with camera at each workstation, and a network router and broadband access.

All awarded entities will again be required to use the VRS platform and consumer registration database provided by the third party administrator. However, unlike in the first phase grants, the awardees of this second phase will be required to pay for their use of the VRS platform and database licensing. Additionally, the awardees will be required to regularly report to the administrator on VRS issues and performance. The administrator will coordinate awards, information and some public announcements.

7.2. Interpreter Supply and User Demand

As previously noted, the success of VRS will in large part be dependent upon the availability of qualified interpreters. Phase 9, *Forecasts of VRS User Demand*, details the many assumptions and variables related to estimating user demand. Assuming an initial award of permanent services to one, two or multiple entities, a fifty percent annual growth rate was projected beginning with 500 users the first month. In these scenarios the growing awareness of VRS and the expanding interpreter pool achieves market saturation of all people who wish to use the service in the tenth year. The low initial number of users and the 50% growth rate were forecast primarily because of the lack of availability of interpreters for VRS. To suggest higher initial and ongoing rates would be to remove interpreters from community interpreting, thereby damaging the ability of people who are Deaf to receive critical community interpreting services.⁷⁴

The two-phased approach recommended as a result of this study and its phase 11, *Potential Canadian VRS Models*, significantly mitigates the challenge of the lack of interpreters in two ways:

- Because the ITPs and interpreter agencies have existing relationships with interpreters and can identify interpreters with the necessary skills for VRS, these organizations will be able to employ and schedule the interpreters for VRS with minimal impact on community interpreting.⁷⁵
- By implementing VRS with an ITP focused research and service phase, the expansion of ITPs to attract and graduate more qualified students, both initially and ongoing, is achieved.

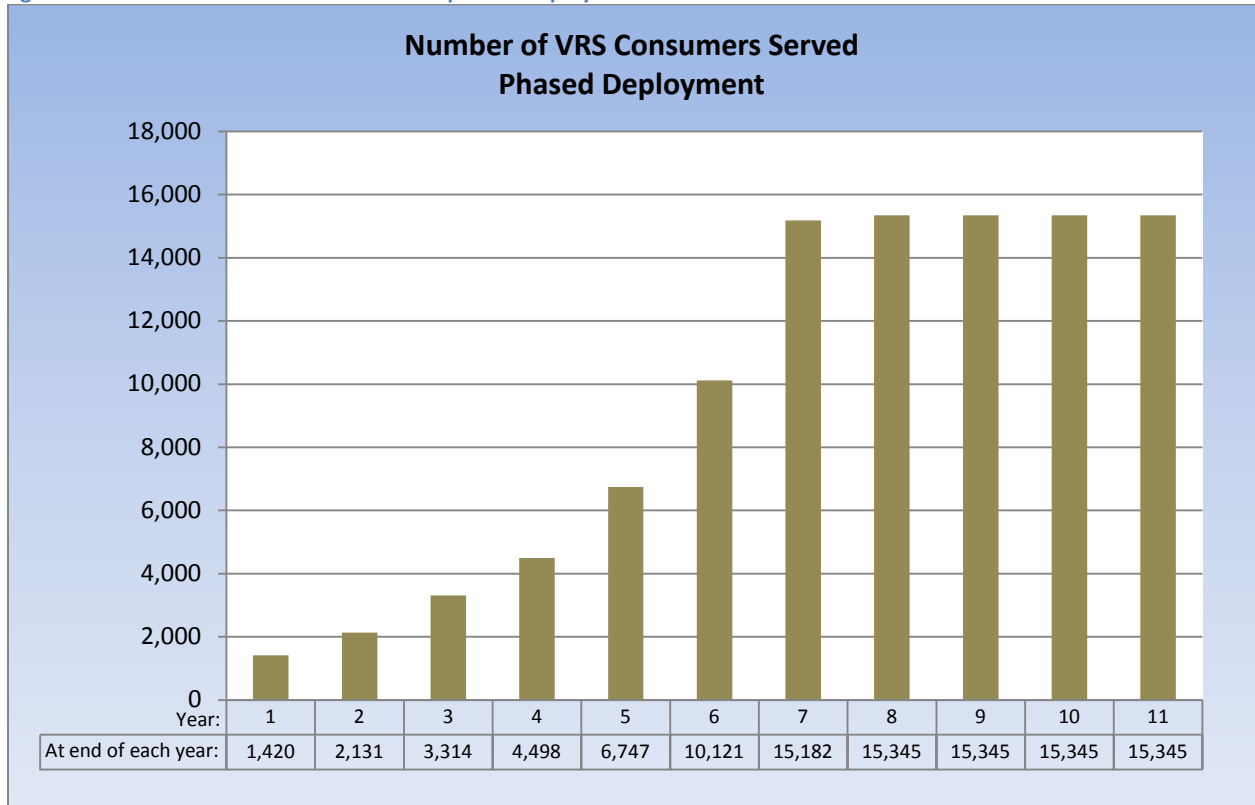
Thus the recommended phased approach, supported by a third party administrator, is forecast to result in the highest number of consumers being initially served by VRS, and for the maximum expected usage to be achieved in the seventh year as shown in Figure 10, below.⁷⁶ In both of the following two figures, the first phase of the phased deployment occurs during years 1 through 4, and the second fully deployed phase is during years five and beyond.

⁷⁴ In the phase 9 report this level of initial and ongoing growth was also suggested to be aggressive based on the reported difficulties of the ITPs to increase their interpreter graduation rates.

⁷⁵ Alternatively, initiating VRS through VRS companies that do not provide community interpreting or ITP services would likely result in significant removal of interpreters from the community.

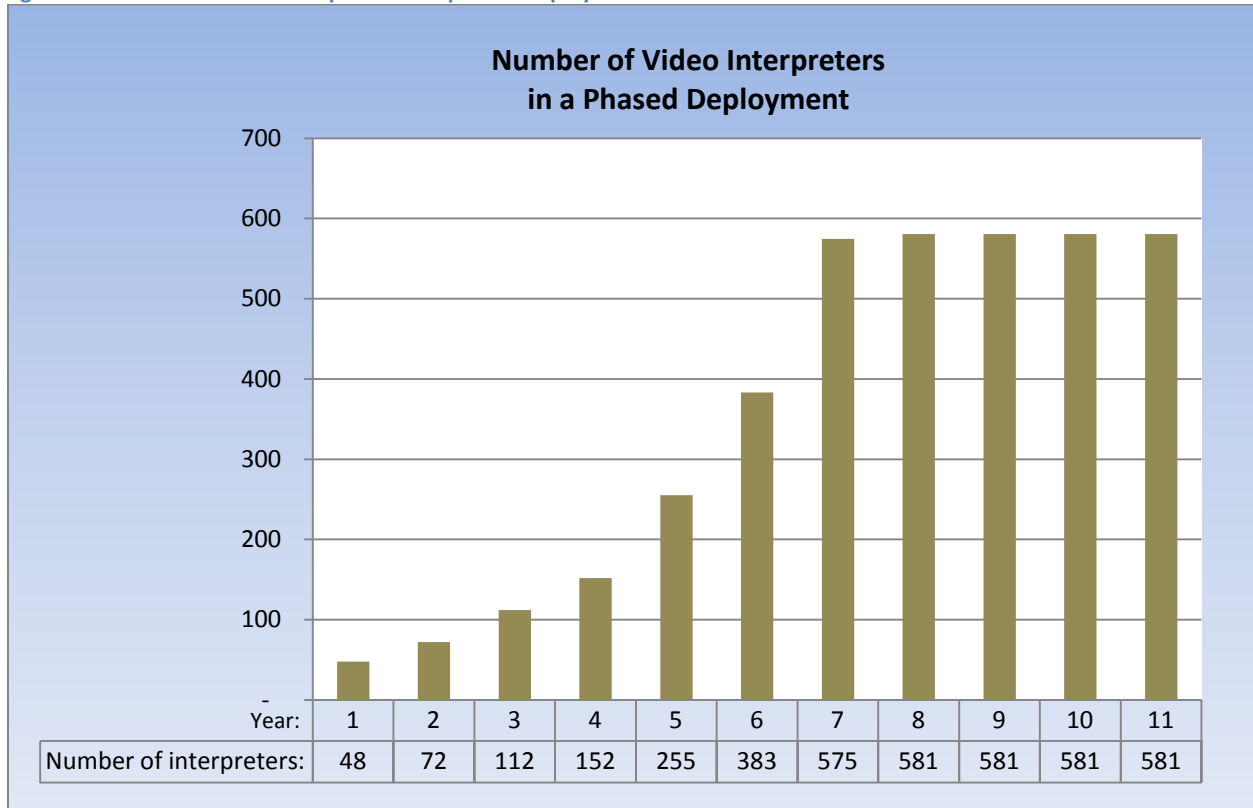
⁷⁶ This is in contrast to the fewer number of consumers served in a non-phased approach as described in this study's phase 9 *Forecasts of VRS User Demand*. The number of users continues to assume an average of 444.5 annual minutes of use per VRS user as described in phase 9.

Figure 10: Number of consumers served in a phased deployment



This approach also provides a greater availability of interpreters, as forecast below:

Figure 11: Number of video interpreters in a phased deployment



7.3. Cost Forecasts

As previously noted, there are a number of items that make up the total costs for a VRS program, including:

1. Costs to administer the program
2. Costs to reimburse VRS providers for the service
3. Costs for training interpreters
4. Costs for consumer VRS equipment
5. Costs for consumer broadband access and usage
6. Costs for consumer education and outreach
7. Costs for consumer technical support

However, as identified below in section 7.3.2 and as recommended in phase 11, *Potential Canadian VRS Models*, not all costs are recommended to be borne by the program directly. For example the consumer related costs (items 4 through 7) are generally not recommended to be paid for directly by the VRS program funds, or potentially for items 6 and 7 only to a very limited extent. Costs to administer the

program have been estimated in phase 10, *Cost Variables and Forecasts*, to be approximately \$2.5 million annually after an initial implementation of \$3.5 million. Costs for training interpreters necessary for VRS are not directly funded, but are only potentially incorporated within an initial research phase in which Canadian college and university interpreter training programs may propose solutions to providing interpreter training for VRS and interpreters within a setting of initial VRS. Once the research phase is concluded, the cost for full deployment of VRS is not expected to supplement training program costs since increased interpreter enrolment as a result of market demand should continue to fund and expand the ITPs.

The initial research phase is expected to provide for approximately three to four years of funded research services, at approximately \$5.4 million to \$8.5 million per year, plus third party administrator costs. After the research phase, deployment will increase with forecast use of VRS reaching its maximum around the 7th year after the beginning of service (e.g., 4 years of research phase, followed by 3 years of full deployment). Potentially the maximum annual usage, and therefore maximum annual costs, may be reached in less than ten years. In any case, after being achieved, a fully deployed VRS with unrestricted 24 hour 7 day a week availability is expected to cost approximately \$29.3 million annually. Together with the ongoing \$2.5 million in administrative costs, the total budget for a fully deployed and utilized VRS is expected to be about \$32 million annually. More information about these costs is provided below.

7.3.1. Program Administration Costs

Program administrative costs, including licensing of a VRS platform for use by providers, are estimated to be as follows:

Table 9: Program administrative costs

Cost Category	Initial Annual Costs	Ongoing Annual Costs
Board member reimbursements	\$250,000	\$250,000
Staff costs (e.g., 6 people), loaded ⁷⁷	\$640,000	\$640,000
Facilities and furniture	\$350,000	\$200,000
Legal, CPA, interpreters and consultants ⁷⁸	\$2,500,000	\$500,000
Operational equipment and services	\$300,000	\$200,000
VRS platform and database costs	\$1,000,000	\$800,000
Network costs	\$50,000	\$50,000
Miscellaneous expenses	\$250,000	\$250,000
Subtotals:	\$5,340,000	\$2,890,000
Less VRS provider charge backs:		
Platform and database	\$0	\$360,000
Network costs	\$0	\$40,000
Totals:	\$5,340,000	\$2,510,000

The above costs are based on CRTC approval of an independent third-party administrator as described above in section 7.1.1, and in phase 11, *Potential Canadian VRS Models*, section 13.2.3. Initial annual costs are for the period before relay services actually begin. Ongoing annual costs are after VRS has begun. See section 7.1.1 above for a potential one-and-a-half year timeline of initial administrator tasks.

7.3.2. Consumer Costs

In phase 11, sections 9, 10 and 11, the recommendations are that VRS program costs not include payment for consumer related costs such as VRS equipment or software, broadband access, broadband usage, consumer technical support, and consumer education and outreach. The recommendations are that costs for these items be paid for as follows:

- Consumer VRS equipment or software – paid for by the consumer
- Consumer broadband access and usage – paid for by the consumer
- Consumer technical support – provided and paid for by a variety of types of organizations through their self interests, as well as some coordination of communication by the third party administrator as part of its normal operations.

⁷⁷ See section 7.1.1 for suggestions of staff resources that may be needed.

⁷⁸ Initially legal counsel will be required to draw up the corporate papers, operating agreements, and similar documents. An independent Certified Public Accountant (CPA) should be required to perform an annual audit of the program funds. Subject matter expert consultants will be required to develop the initial RFPs and for detailed program design expertise and support as necessary.

- Consumer education and outreach – provided and paid for by a variety of types of organizations through their self interests, as well as by government social programs.

7.3.3. Provider Costs - Initial Research Phase Costs

The recommended approach is that VRS should be implemented in two phases. The initial research phase has two primary cost elements: 1) the cost to establish and operate a VRS third party administrator, and 2) the cost to provide grants to Interpreter Training Programs (ITPs) for research and VRS and grants to Interpreter Agencies for VRS. The estimated annual costs for the third party administrator are provided above in 7.3.1. Estimated annual costs for grants are shown below, per awarded ITP and per awarded Interpreter Agency.

Table 10: Forecast of grant budgets

Grant Cost Category	Average Annual Costs for Year 1	Average Annual Costs for Year 2	Average Annual Costs for Years 3 & 4
ITP Expansion/development for VRS	\$275,000	\$275,000	\$225,000
ITP VRS research	\$175,000	\$175,000	\$70,000
ITP VRS operational support	\$125,000	\$125,000	\$105,000
ITP VRS operations	\$325,000	\$455,000	\$455,000
Average VRS grant per ITP:	\$900,000	\$1,030,000	\$855,000
Interpreter agency VRS research			\$30,000
Interpreter agency operational support			\$15,000
Interpreter agency VRS operations			\$290,000
Average VRS grant per Interpreter agency:			\$335,000
Totals:	\$900,000	\$1,030,000	\$1,190,000

The above grant costs are estimates. Actual grant awards would be determined by overall funding and responses to an RFP (or RFPs) for research and services issued by the third party administrator.⁷⁹ The above ITP cost categories should be considered to support the following types of functions:

ITP Expansion/development for VRS

- Program manager, part-time
- Instructor, full-time
- Curriculum development
- Deaf consultant/staff, part-time

ITP VRS research

- Collaboration with other ITPs
- Consumer education
- Participant surveys
- VRS interpreter qualifications

⁷⁹ See sections 13.2.3 and 16.3 of phase 11, Potential Canadian VRS Models, for more detail on the potential functions of the Third Party Administrator and of the grant awardees.

- Other related services
- QoS assessment
- Reporting

ITP VRS operational support

- Collaboration with interpreter agencies
- Participant registration
- End user technical support

ITP VRS operations

- Operations manager, part-time
- Interpreters/mentors
- Network and equipment costs

The first year cost for ITP VRS operations of \$325,000 assumes that during the first year each ITP will operate VRS from 8:00 AM to 8:00 PM five days a week, filling two video interpreter seats (stations) utilizing eight part-time video interpreters each averaging 15 hours per week and relaying at 28% efficiency.⁸⁰

The second, third and fourth year annual cost for ITP VRS operations of \$455,000 assumes that during these years each ITP will operate VRS from 8:00 AM to 8:00 PM five days a week, filling three video interpreter seats (stations) utilizing twelve part-time video interpreters each averaging 15 hours per week and relaying at 28% efficiency.

The Interpreter Agency cost categories of Table 10 should be considered to support the following functions:

Interpreter Agency VRS research

- Consumer education
- Participant surveys
- QoS assessment
- Reporting

Interpreter Agency VRS operational support

- Participant registration
- End user technical support

Interpreter Agency VRS operations

- Operations manager, part-time
- Interpreters/mentors
- Network and equipment costs

The annual cost for Interpreter Agency provided VRS operations of \$290,000 assume that each agency will operate VRS from 8:00 AM to 8:00 PM five days a week, filling two video interpreter

⁸⁰ See phase 9, *Forecasts of VRS User Demand*, for an analysis of how VRS minutes and number of subscribers (users) may be supported using the assumptions for the VRS operations of the ITPs and the Interpreter Agencies.

seats (stations) utilizing eight part-time video interpreters each averaging 15 hours per week and relaying at 28% efficiency.

The estimated total grant costs assumes that all six Canadian ITPs will receive grants over four years, and that five Interpreter Agencies will receive grants during year three, and ten Interpreter Agencies will receive grants during year four. Thus a forecast budget for grants during the first phase is:

Table 11: Grant totals by year

Agency type	Grant totals Year 1	Grant totals Year 2	Grant totals Year 3	Grant totals Year 4
Interpreter Training Programs:	\$5,400,000	\$6,180,000	\$5,130,000	\$5,130,000
Interpreter Agencies:	\$0	\$0	\$1,675,000	\$3,350,000
Totals:	\$5,400,000	\$6,180,000	\$6,805,000	\$8,480,000

The cost projections for these grants assume the tasks and roles as described above in section 7.1.2.

Based on the above operational and funding assumptions, the number of minutes of VRS achieved during a four year initial phase is as follows:

Table 12: Phase 1 forecast VRS minutes of use

Grant Recipients	Minutes of VRS Relayed			
	Year 1	Year 2	Year 3	Year 4
ITP VRS minutes:	631,411	947,117	947,117	947,117
Interpreter Agency minutes:	-	-	526,176	1,052,352
Total minutes:	631,411	947,117	1,473,293	1,999,469

7.3.4. Provider Costs – Full Deployment

Provider costs for full deployment, e.g., for years five and beyond, are estimated for forecasting purposes at a VRS provider reimbursement rate of \$4.30 per conversation minute of relayed VRS calls. Actual costs are expected to be based on a reimbursement rate that is established through a competitive solicitation and applied to the actual number of minutes relayed. No separate provider costs are forecasted for research, training, outreach, technical support or other cost categories, as the necessary provider expenses for these items are anticipated to be included within the \$4.30 per minute rate.

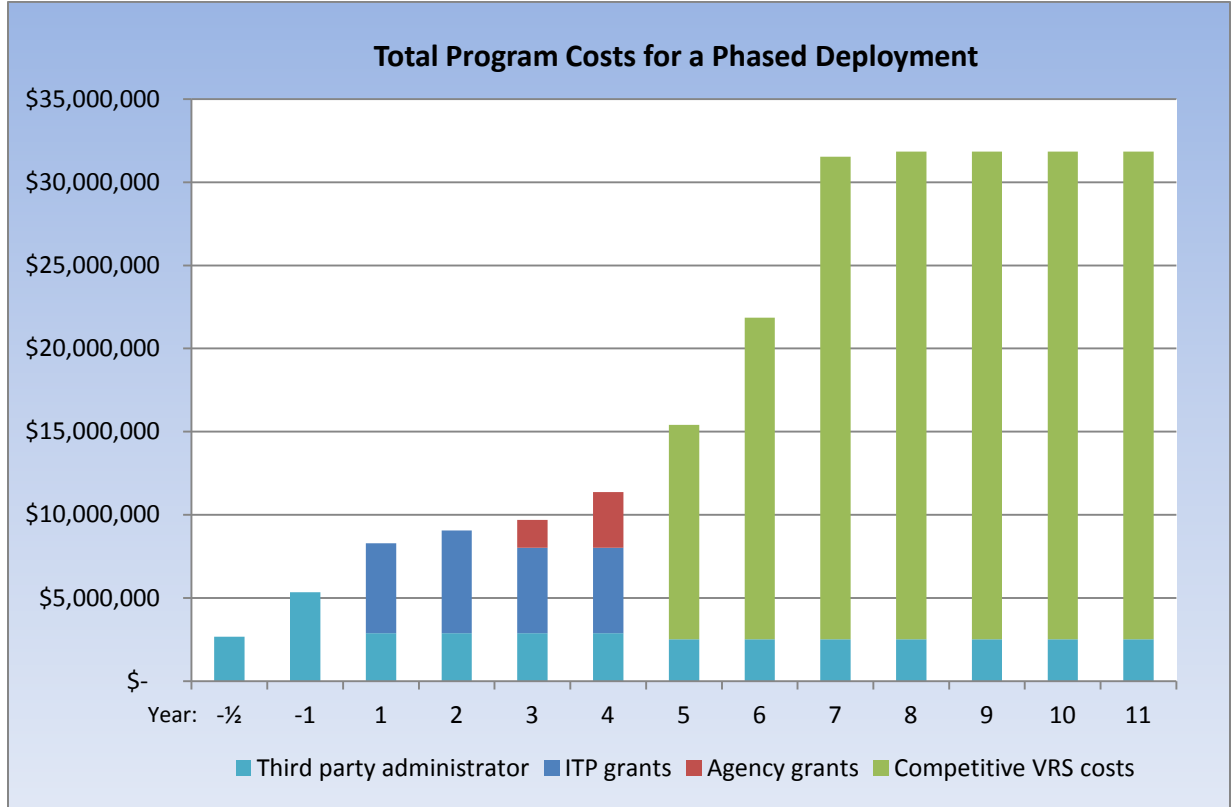
The third party administrator costs are expected to continue throughout the phase 2 full deployment. The administrator’s costs are reduced during this phase by charge backs to the VRS providers for their use of the VRS platform, database and networks as indicated above in Table 9. Actual charge backs for these services will be dependent upon actual costs and usage.

For cost forecasting purposes, the minutes of use for phase 2 are estimated to grow at the 50% annual growth rate used in this study’s phase 9 and 10, except that the estimate of the first year of minutes of this full deployment phase is based on a 50% increase of the previous year (the last year of the first phase), e.g., year 5 will be 50% more than the estimated minutes for year 4.

7.3.5. Total Program Costs

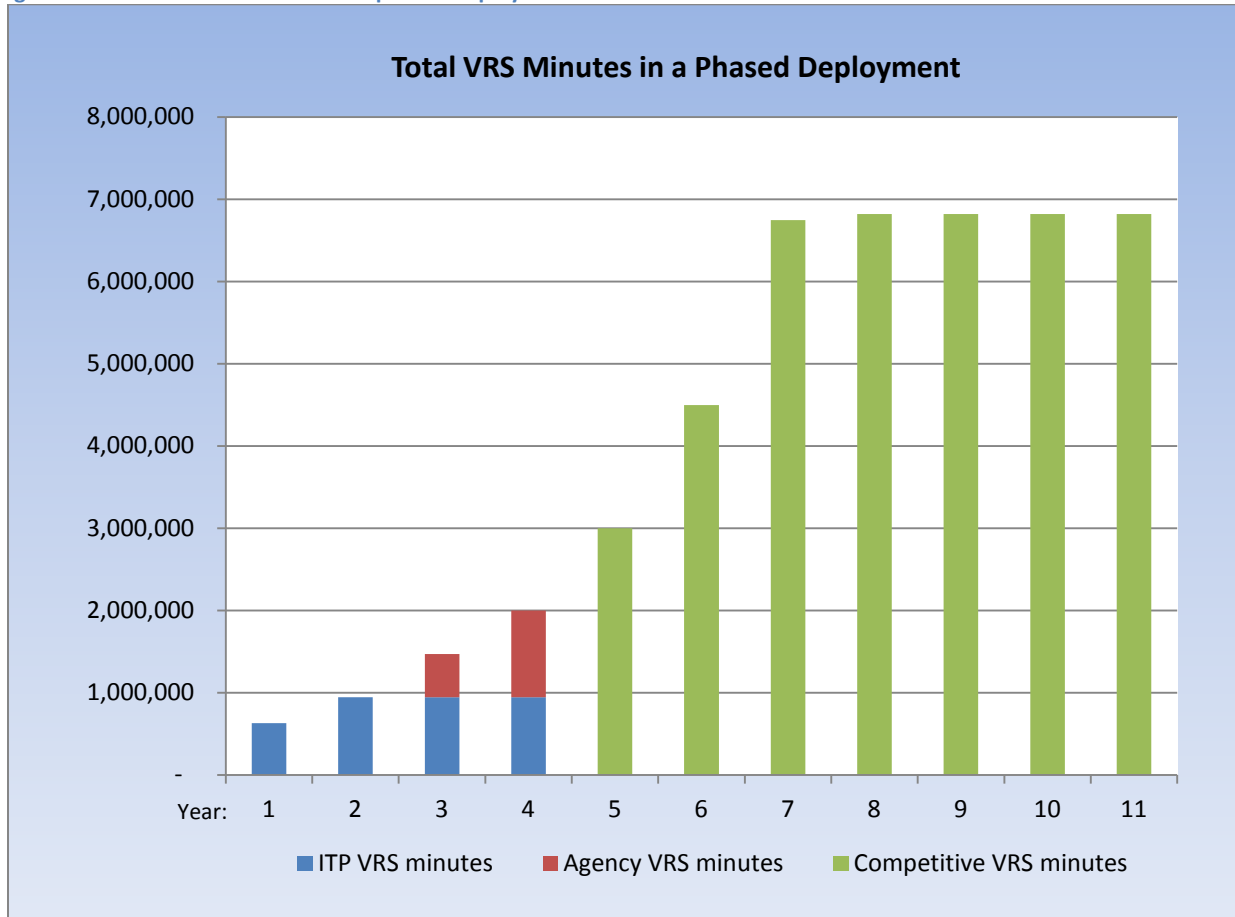
By combining the recommended phase 1 and phase 2 forecasted costs and number of minutes, the combined total costs per year are shown below in Figure 12.

Figure 12: Total VRS program costs for a phased deployment



While the recommended solution initially costs more than the non-phased approach, it is primarily due to the additional minutes of use that the recommended solution allows. Thus it initially costs more because existing user demand is being met earlier, as shown below in Figure 13.

Figure 13: Annual minutes of VRS in a phased deployment



7.3.6. Phase 2 Alternative Cost Options

The above forecast annual cost of \$31,839,666 is for a fully deployed and fully subscribed VRS operating 24 hours a day seven days a week including administrative costs and serving all consumers who wish to use the service (estimated at 15,345). This cost figure also includes the estimated \$2,510,000 annual cost for program administration and oversight.

While the \$32 million forecast is potentially still more than what the actual costs may be, alternative program cost scenarios have been prepared, including at \$20 million and \$10 million annually. Funding scenarios below \$10 million (such as \$5 million), are not considered feasible and are not considered since annual administrative costs would rise, e.g., \$3 to \$4 million, to deal with the extraordinary challenges of managing a service that falls so short of meeting the public’s demands, and little funding would be left for the service.⁸¹

⁸¹ If under a greatly reduced funding level (e.g., \$5 million) VRS was outsourced without strong administrative oversight, the level of service provided would be very low since the cost could easily be 50% higher due to U.S. VRS
[footnote continues on next page]

One such alternative was presented in this study’s phase 9 and 10 based on the fact that seventy-nine percent of the U.S. VRS traffic occurs between 8:00 AM and 8:00 PM Monday through Friday. If, Canadian VRS user demand were reduced by 17% due to restricted operational hours (and no other restrictions upon users), annual total VRS fully subscribed VRS costs may be reduced from about \$32 million to \$27 million as depicted in Table 13, below.⁸²

Table 13: Annual VRS provider and administrative forecast costs, at full subscription

Forecast ongoing VRS annual program costs	24 x 7 VRS	Restricted Hours VRS 8-8, M-F
Annual provider costs:	\$29,329,666	\$24,343,624
Annual administrative costs:	\$2,510,000	\$2,510,000
Total costs:	\$31,839,666	\$26,853,624

When considering the potential for further program cost reductions, a number of variables must be taken into account, including but not limited to:⁸³

- The population size of potential VRS consumers
- Number of consumers that sign up and use VRS
- Average number of minutes of VRS needed per user
- The actual reimbursement rate, e.g., per minute rate
- The availability of interpreters to meet the demand for VRS
- The availability and affordability of broadband and VRS equipment to consumers
- The influence of the quality of the service on VRS’s cost and demand

However, the two basic variables are how much it costs per minute and how many minutes are relayed.⁸⁴ If costs per minute are primarily determined by market prices and competitive factors outside the control of government, then from a VRS program management perspective, the ability to influence costs (other than simply limiting funding) is primarily related to the number of minutes of VRS

rates with potentially another 20% to 30% spent on fraud and waste. The result would be that very few authentic VRS minutes would be purchased for the money spent.

⁸² See section 7 of phase 9, *Forecasts of VRS User Demand*, and section 4.6 of phase 10, *Cost Variables and Forecasts* for an analysis of demand and costs by time of day.

⁸³ See sections 6, 7 and 8 of phase 9, *Forecasts of VRS User Demand*, and sections 4 and 5 of phase 10, *Cost Variables and Forecasts*, for details on this alternative.

⁸⁴ While other cost measurements are possible, such as cost per interpreter hour or cost per VRS user, the premise remains the same that the two overriding variables are operational costs and consumer demand.

relayed annually.⁸⁵ Annual VRS minutes can be reduced to correspond to available funding limits, such as \$20 or \$10 million annually, primarily by restricting the number of minutes of VRS available to consumers. The primary available options to reduce the number of VRS minutes relayed are:^{86 87}

- Restricting the availability hours of VRS operations.
- Limiting the average number of minutes per registered VRS user.
- Limiting the number of individuals allowed to use VRS.
- Limiting the number of funded VRS interpreters.
- Charging consumers to use the service.

Each of these options to reduce the number of VRS minutes is discussed below.

Limiting hours

By limiting the operational hours of VRS, such as from 10 AM to noon and 1 PM to 3 PM non-holiday weekdays, many consumers who need to make calls when VRS is not operating will rely upon non-VRS means of communication such as TTY relay, IP relay, email and SMS text. Some consumers will delay their VRS calls to conform to when VRS is available, placing greater demand upon resources during the hours that VRS is operational. Nevertheless, the overall effect will be a reduction in the total number of annual minutes of relayed VRS minutes. As noted in this report's section 3.1, all countries studied, except the United States, limit consumer access by time of day and day of the week. Sweden is an example where limiting of hours appears to work, when the provider also has the staff resources to meet consumer demand.⁸⁸

Important advantages of limiting are its administrative simplicity and fairness. There is no need for detailed, per user tracking and/or billing. The restriction of hours impacts most users in a similar manner and does not discriminate on social factors such as income.

⁸⁵ This assumes that other cost factors within the VRS program's influence are maximized, such as administrative and management oversight, minimum program fraud and abuse, program design efficiencies, etc.

⁸⁶ Other secondary options that can affect the number of minutes relayed include not funding consumer VRS costs such as for broadband availability and use, consumer VRS equipment, consumer education and outreach, and consumer technical support.

⁸⁷ As stated in section 3.1, the types of restrictions used in other countries except for Sweden, are not comparable to the Canadian situation because they are not providing a fully staffed service within their operational hours, open to all consumers. Therefore the types of restrictions listed herein will be assessed for the Canadian environment.

⁸⁸ VRS call volumes in Sweden are very low compared to the U.S. and forecasts for Canada. It has been suggested that this low volume is due to people in Sweden having readily adopted other forms of instant communication such as email, SMS (text), and social media.

The primary effects of limiting hours are:

- Consumers will not be able to make calls outside of VRS operating times. If a reduction in hours is constrained to only those times of the day and days of the week when VRS demand is exceptionally low (e.g., 8:00 PM to 8:00 AM Monday through Friday, and all day Saturday and Sunday), the impact on most VRS users will be minimal. Nevertheless, the negative impact upon those consumers who actually need the service at those times can be significant.
- It will not be easy to further restrict the hours of availability without affecting most consumers.⁸⁹ The negative impact upon those consumers who need the service when it is not available or when there are long wait times will be significantly increased as the operating hours are further restricted. (See the *\$20M* and *\$10M Funding Scenarios* below for details.)

Limiting the minutes per user

The forecast average number of VRS conversation minutes for a fully deployed VRS operating 24 x 7 is 37 minutes per month per VRS user.⁹⁰ With a common VRS platform, it is possible to set limits on the number of minutes for each registered VRS user. While enforcement will have its own challenges, overall the number of minutes per user can be artificially constrained.

The primary effects of limiting the minutes per user are:

- It will be very difficult to establish equity while meeting consumers' needs. Under normal conditions most consumers will use less than the average 37 minutes per month, while a fewer number of consumers will use significantly more. Administratively restricting all users to the same minutes will not affect all consumers equally. Those consumers that require a higher than average number of VRS minutes for their work or for important personal or social reasons will be negatively impacted more than the average consumer. Determining what is fair for everyone while also potentially establishing priorities of allowances will have political challenges.
- It will be difficult to enforce, and will be easily subject to abuse. Registration of users and automatic monitoring of their individual use can easily be accomplished by a common registration database and VRS platform. However, if registration will be based on each consumer's user name and password or other consumer controlled information, potential to abuse the limitation will exist. Since many consumers are not expected to reach their monthly limits, many consumers will simply give (or sell) their user name and password or other registration information to other consumers who need access. Likewise, those who need more access will be incented to register friends

⁸⁹ See figures 13 and 14 in section 7.1 of phase 9, *Forecasts of VRS User Demand*.

⁹⁰ See section 2.3 of phase 9, *Forecasts of VRS User Demand*.

or family who would not otherwise use the service,⁹¹ but who can then provide access for individuals who need more minutes. These types of “workarounds” will be very difficult to identify or prevent.

- Operational policy decisions could impact consumer response to limitations. For example, what will be the best way to notify a consumer that they have reached their allotted number of minutes? If VRS interpreters are required to stop relayed conversations before they are finished when individuals’ time limits are reached, what will be the consumers’ public response? If a call is somehow critical to the consumer, e.g., call with a doctor, priest, employer or government, should it be given more flexibility than a social call? How much additional public education, and at what cost, will be required to successfully mitigate a potentially angry public response?

Limiting the number of VRS users

The number of consumers who are forecast to use VRS if access were unrestricted is 15,345 people. One way to reduce usage is to artificially limit the number of people who are allowed to sign up for the service.

The primary effects of limiting the number of VRS users are:

- It will be difficult to establish equity of access. Limiting the number of people who may register for VRS means that some people who require VRS will not have it available while other people will have it available. By definition, equity will not be established.
- Methodologies to allow some people to register and not others all have challenges. For example, if registration is simply based on first come first served, some people will be unable to register early because they may not have the necessary bandwidth to their location or they may not be able to initially afford a broadband service. These types of constraints will not affect all people equally. If a registration methodology was adopted that gave priority to people who needed VRS for employment, government participation or other social program values, how would those values be defined and prioritized, and who would do so? How much additional administrative time and costs would be involved, and how much additional effort and cost would be required for public education?

Limiting the number of funded VRS interpreters

If program funds were simply restricted without additional restrictions, VRS providers will establish their own restrictions, essentially focused on limiting their operational hours and limiting the number of video interpreters that they can afford to hire. Without regulatory or third party mandates, it is unlikely that VRS providers would engage in other forms of restriction

⁹¹ Note that only 45% of the number of Canadians who use ASL and LSQ as their primary language are forecast to register and use VRS under normal conditions. See Phase 9, *Forecasts of VRS User Demand*.

that would require them to prioritize access among different consumers. Caller demand for VRS would not be met and consumers would experience frequent “VRS busy” or very long wait time conditions. The result would be that with fewer interpreters paid to relay calls, a reduced number of minutes of relayed conversations would take place.

The primary effects of limiting the number of funded VRS interpreters are:

- The public would experience significant periods of time when the service was not available, and/or would experience excessive busy conditions or long wait times. Consumer frustration over lack of availability and long wait times (e.g., an hour or more) will likely result in significant public negative reaction, which would need to be managed both administratively and politically. The result would be increased administrative costs, political program uncertainty, consumer aggravation, and VRS vendors put in a compromised position of desiring to provide quality service but unable to do so.
- The type of restrictions implemented by the VRS providers would be selected based on the business interests of each provider instead of the common interest of the consumers, would be unique to each provider, and may be confusing to the public.

Charging consumers to use VRS

Another approach to reducing VRS minutes is to charge consumers to use the service. This could be for all VRS calls, or only for calls that individual consumers make that are over their allowable limit of free calls as is partially done in Germany.⁹² In any case, requiring consumers to pay for some portion of VRS would undoubtedly reduce the overall number of VRS minutes.

The primary effects of charging consumers to use VRS are:

- Many consumers expect the service to be at no additional cost beyond their personal costs for broadband access and usage, and costs for personal VRS terminal equipment.
- Not all consumers will be able to equally afford the service. Consumers who cannot afford it may feel that they are being unfairly denied accommodation for their disability based on income instead of being treated with social equity.
- Charging consumers could be administratively burdensome, especially depending upon the account management and billing methodology. For example, if the billing were to be through the TSPs, the coordination of effort between the third party VRS program administrator, the TSPs and the VRS providers could be extensive and ongoing, with significant challenges. If the billing was performed directly by the VRS providers or the VRS program administrator, these entities would experience significant time and

⁹² Germany bills VRS consumer for a reduced portion of the cost per minute after the consumer has reached their monthly allocation of minutes, but then allows most of those consumer payments to be reimbursed to the consumer via a different government program/funding mechanism.

expense for customer service and account management functions not presently included within any VRS cost projections.

While any of the above options may be employed, they may also be combined. If annual program costs are limited to \$20 or \$10 million, the VRS administrative agency could determine the best mix of options and how to implement them. The third party administrator can do so with the benefit of community involvement through the Board member and Advisory Committee participation, which may partially mitigate a potential angry public response. In any case the outcome would be reduced minutes of use. Using the \$20 or \$10 million program limits, and assuming the program administrative costs remain the same,⁹³ the average number of VRS conversation minutes per VRS user (assuming equal access among all 15,345 anticipated users) would be as follows.

Table 14: Average minutes per user at different program funding levels

Total VRS annual funding:	\$32 Million (24x7 unrestricted)	\$27 Million (8 to 8 M-F)	\$20 Million (restricted)	\$10 Million (restricted)
VRS operational costs:	\$29,329,666	\$24,343,624	\$17,490,000	\$7,490,000
VRS admin costs:	\$2,510,000	\$2,510,000	\$2,510,000	\$2,510,000
VRS total costs:	\$31,839,666	\$26,853,624	\$20,000,000	\$10,000,000
Minutes at \$4.30 each:	6,820,853	5,661,308	4,067,442	1,741,860
Percent decrease from unrestricted 24x7:	0%	-17%	-40%	-75%
Minutes per user per year:	444.5	368.9	265.1	113.5
Minutes per user per month:	37.0	30.7	22.1	9.5

Even if funds were not limited, some restrictions will need to be employed until there are enough VRS interpreters to support a fully subscribed VRS without harming community interpreting. However the degree of these restrictions will be offset in part by the VRS adoption rate of consumers, since consumers are expected to register and fully use VRS over a period of years. For example it is expected to take time before all 15,345 anticipated VRS users obtain the necessary end-user equipment and broadband services, and sign up (register) for VRS. Also the average registered consumer may take about three years before they reach their maximum average number of monthly minutes.⁹⁴

It is also important to note that the costs of the recommended phased approach depicted in Figure 12: *Total VRS program costs for a phased deployment*, indicate that an overall \$20 million annual program cost is not expected to be reached until the end of the sixth year of VRS service (or 7½ years after a CRT

⁹³ Notwithstanding that some restrictions will cause administrative and education costs to increase as noted above.

⁹⁴ Based on VRS consumer experience reported in Scandinavia.

VRS proceeding order). A \$10 million cost is reached at the end of the fourth year of service (5½ years after a CRTC order). During these times the first phase of deployment will include VRS operations, research and monitoring to determine actual costs, adoption rates, and other factors that can be used to more accurately determine long-term program usage and cost estimates, which can facilitate decisions associated with overall program funding.

It is also important to note that non-funding restraints may require the imposition of some restrictions on VRS availability. If the supply of sign interpreters cannot be rapidly increased as part of the Phase 1 activities, access to VRS will need to be limited regardless of available funding.

It would be premature to recommend actual methods of restricting program usage and costs of a full deployment before initial data is available from the first phase of deployment and before a competitive price for VRS is established for the second deployment phase. However, the following advice concerning which limitation methodologies may be employed to achieve \$10M and \$20M funding caps is offered.

\$20M Funding Scenario

To meet a \$20M annual limit, VRS operating hours could be established from 9:00 AM to 11:00 AM and from 1:00 PM to 5:00 PM, Monday through Friday and closed on national holidays. The registration of VRS users would allow operating hours to be established equally for VRS users in all Canadian time zones. In an unrestricted service 44% of the call traffic would occur during the suggested restricted hours. If half of the 56% unfulfilled callers re-time their calls to occur during the restricted operating hours, and half elect to fulfill their need by means other than VRS, then the total demand for VRS will be 72% of unrestricted usage ($56\% / 2 + 44\% = 72\%$). 72% of unrestricted usage is 4,911,014 annual minutes ($0.72 \times 6,820,853$). \$20M would fund \$2.5M of administrative costs and \$17.5M of VRS minutes, or 4,067,442 VRS minutes at \$4.30 per minute. If demand is 4,911,014 minutes but only 4,067,442 minutes are funded, then 843,572 annual minutes will be unfulfilled.

If consumer demand even with the restricted hours cannot be met (e.g. 843,572 annual minutes), it may be necessary to further restrict hours of operation, or let wait times for an available VRS interpreter for all calls extend past what would be desired for a fully funded service. Longer wait times will further reduce the number of calls, as some people will choose not to wait, and will find other means of communicating in lieu of VRS. For example if 17% of all callers elect not to wait, then the number of calls answered will be at the \$20M funding level of approximately 60% of the demand of unrestricted VRS ($72\% - 17\% = 60\%$, [$4,911,014 - (4,911,014 \times 17\%) = 4,076,142$]). In this scenario the average wait time is unknown, as it is unknown how long callers will wait before abandoning their attempts to make a VRS call. It is possible that wait times could be quite long.

\$10M Funding Scenario

For the \$10M annual limit, the same operating hours as for the \$20M scenario could be used (from 9:00 AM to 11:00 AM and from 1:00 PM to 5:00 PM, Monday through Friday and closed

on national holidays). The registration of all VRS users would allow operating hours to be established equally for VRS users in all Canadian time zones. VRS call wait times would be allowed to extend as stated above. As noted above this could result in about 4,067,442 annual VRS minutes with long wait times if no other restrictions are applied. Further reduction in costs could be achieved by funding at the \$10M level and paying for the remainder of all costs by charging all VRS consumers to use the service. The consumer charge should be equally applied to all individuals and for all purposes of all calls and should be a per-minute cost. \$10M of funding would be expected to pay for only 25% of the demand of unrestricted VRS.

The amount of the per-minute cost charged to consumers could be set periodically according to the total number of VRS program minutes forecast to be relayed. For example if a total of 4,067,442 annual minutes of VRS are processed, and \$10,000,000 pays for \$2.5 million for administrative costs and \$7.5 million for VRS minutes (at \$4.30 per minute 1,744,186 minutes would be funded), leaving 2,323,256 minutes needing to be paid for by the consumers. At \$4.30 each, the 2,323,256 minutes would cost \$9,990,000. The \$9,990,000 in unfunded VRS expense would then be applied to all 4,067,442 minutes of use, so that ostensibly consumers would be billed \$2.45 per minute for all VRS calls ($\$9,990,000 / 4,067,442 \text{ minutes} = \2.45 per minute).

In actual practice the imposition of a consumer cost per minute for all VRS calls (compared to free calls) would be expected to significantly dampen the number of minutes used by consumers. For example a \$2.45 per-minute charge might further reduce demand by half or more. When this demand reduction is added to the reduction that will occur by limiting the hours of VRS operations, the total number of minutes may come down to about 2,033,721 annual minutes ($4,067,442 \text{ minutes} \times 0.5$). With the reduced number of minutes, the overall program costs will decrease, and the number of minutes that will need to be funded by consumers will also drop, thereby further reducing the per minute consumer VRS rate. For example if \$10,000,000 of funding were applied to \$2.5M of administrative costs and \$7.5M for 1,744,186 minutes, the remaining unfunded minutes would be 289,535 minutes ($2,033,721 - 1,744,186 \text{ minutes}$). The 289,535 minutes would cost \$1,245,000 ($\$4.30 \times 289,535$). Divided by a total of 2,033,721 minutes, rate paid by consumers for all VRS calls would be \$0.61 per minute ($\$1,245,000 / 2,033,721 \text{ minutes}$).

The actual per-minute rate charged to consumers would be as a result of its own natural levelling or balancing of demand and consumer cost after the \$10M program subsidy is realized. If a funding cap was anticipated that could not be met by simply restricting hours of operations, then the potential effect of different consumer rates upon reducing actual demand for VRS could be measured by implementing consumer costs as part of the last year of research during the fourth year of the initial research deployment phase.

The method of consumer billing will probably best be achieved by credit card rather than through TSP billing. The VRS platform and database should be able to retain the consumer's credit card information without requiring the video interpreter to have access to the credit card account information, even if account verification is required or requested. Credit card account set up and management can be provided by VRS providers' customer service departments.

Although the above premature analysis is offered for the \$10M and \$20M funding levels, these are not recommendations. The selection of options should not be made until usage, competitive costs and funding levels are known in the third or fourth year of the first phase of deployment. Recommendations for what constraints to impose if necessary for different funding levels should be made by the third party VRS program administrator with public input, and confirmed through a CRTC public process.

Regardless of the availability of the above restricted options, they are all based on an assumption that in the long-term it is not practical or possible to fund all of the consumers' needs and demands for VRS. The validity of such an assumption is outside the scope of this study. However, based on this study's phase 3 findings, such an assumption is not expected to be acceptable by the Deaf constituent communities. Similarly, advocates for disability equal rights may also challenge a restricted access.

7.3.7. Potential restrictions for Phase 1 deployment

Implementation of the recommended Canadian VRS solution will be dependent not only upon available funding, but also upon the availability of enough qualified video interpreters to meet the consumers' demands for VRS. In fact, if too much pressure is placed upon video interpreter resources, not only will VRS fail to meet the call volume requests, but the cost of interpreters for both VRS and community interpreting will escalate, potentially significantly increasing the cost of VRS. While the recommended two-phased approach is intended to increase the training and availability of interpreters, and while it also will create incentives for interpreter agencies to balance interpreter availability between community interpreting and VRS, there still will not be enough interpreters to meet the initial consumer demand for VRS. Therefore some restrictions of the number of minutes of VRS will be needed at least for the first four years (the first phase of VRS deployment).

A recommended approach for reducing minutes for this phase is to allow consumers to apply to be *VRS users and research participants* based on a detailed application, and let the grantees select the mix of participants according to their ability and funding to provide VRS and objective data through this research. An application would identify a number of things such as:

1. Personal information: name, address, forms of communication, age, education, income, level of familiarity with technology, etc.
2. Expectations for the person to participate in surveys of their VRS experiences, and other VRS research such as focus groups, etc.
3. Agreement that the person may have their number of monthly minutes limited, or other constraints imposed if necessary.
4. Agreement that the person is not to allow others to use the service, and will not create an artificial demand by placing more calls than normal for their situation.⁹⁵

⁹⁵ In the U.S. and in the Telus/Sorenson trial, consumers reported that they have often been misinformed that if they do not artificially inflate usage (make VRS calls that otherwise would not be made), VRS would be taken away or not implemented.

Research grantees that will conduct the research, e.g., ISPs, would select individuals according to the research methods that they are contracted to carry out. For example they may require participation of individuals from a cross section of age or income groups in order to establish a statistically valid sample of potential VRS consumers. Once selected, the grantee would register the individuals and provide VRS on their behalf.

The VRS providers of this phase (ITPs and interpreter agencies) would also be expected to not offer service 24 hours a day, seven days a week. Different grant applicants may propose and be awarded different hours of service and different number of estimated VRS minutes based upon their ability to provide interpreters.

Thus the primary recommended methods of restricting minutes of use for this phase are a combination of limiting the number of users (by selection) and limiting the hours of operation, both determined in response to a Request for Proposals (RFP) for the initial research phase of national deployment. Other forms of limitation may be also used if necessary, but by implementing service and registration together and measuring and responding to actual demand, the providers should be able to determine and accept the optimum number of participants without using other forms of restrictions.

While these forms of usage restriction may appear to be unduly restrictive, in actuality the use of ITPs and interpreter referral agencies for the service is expected to service twice as many users (or twice as many minutes) without greatly impacting community interpreting, compared to the amount of service provided by independent for-profit VRS companies competing for interpreter resources, as noted in section 7.1.2.

7.3.8. Comparison to U.S. rates

It is informative to note that the per minute reimbursement rates for VRS providers in the United States are higher than the rates forecast for competitive VRS in Canada. Current U.S. rates are tiered according to the monthly minutes of use as follows:

Table 15: VRS tiered rate structure, U.S.⁹⁶

Tier	Minutes of Use	Rate per Minute
Tier I	< 50,000	\$6.3688 CAD (\$6.2390 USD)
Tier II	50,001 – 500,000	\$6.3632 CAD (\$6.2335 USD)
Tier III	> 500,000	\$5.1722 CAD (\$5.0668 USD)

Because the basis of the U.S. rates have significant anomalies and lack of reliable data, competitively established rates for reimbursement of Canadian VRS providers are estimated based on a Canadian VRS

⁹⁶ U.S. dollars converted to Canadian dollars at the exchange rate of 1.0208 to the Canadian dollar, as reported by the Bank of Canada at the close of 11/15/2011, at <http://www.bankofcanada.ca/rates/exchange/us-can-summary/>.

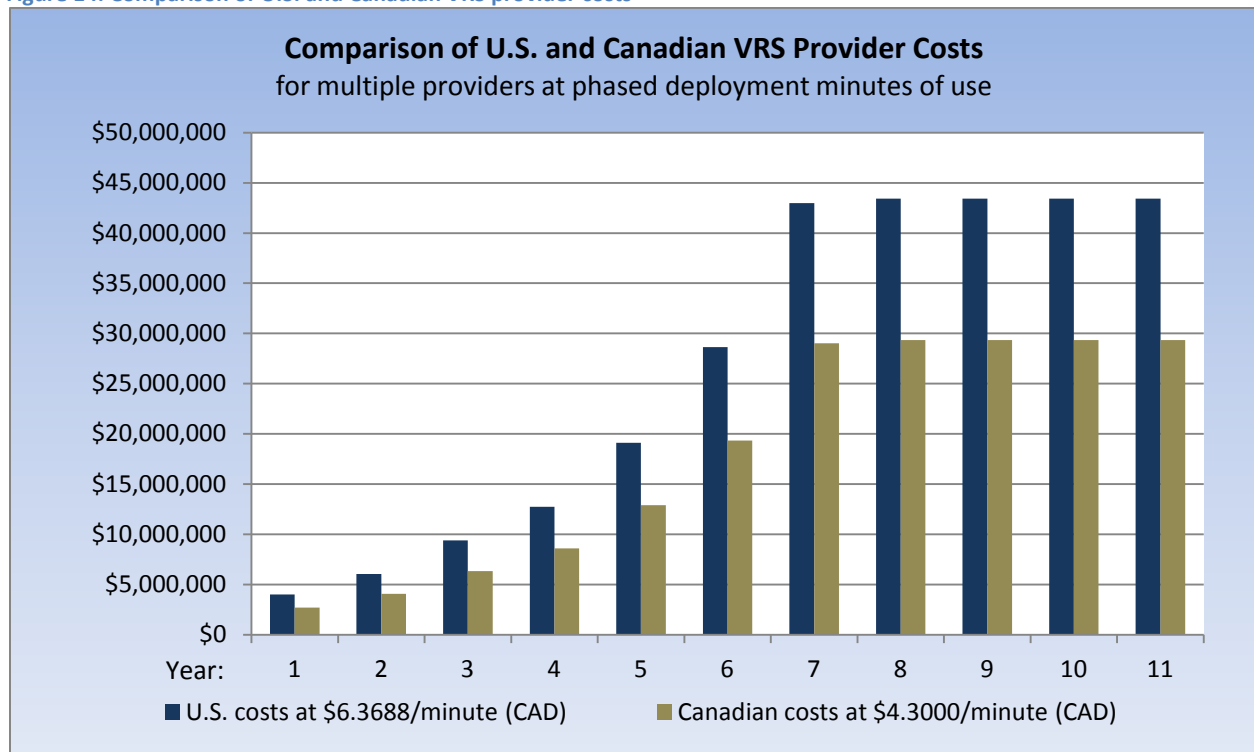
cost and profit analysis.⁹⁷ The resulting estimate of VRS provider costs for Canada, with different monthly tiered thresholds, is as follows:

Table 16: Estimated VRS tiered rates structure, Canada

Tier	Minutes of Use	Rate per Minute
Tier I	< 100,000	\$4.3000 CAD
Tier II	100,001 – 200,000	\$4.1000 CAD
Tier III	> 200,000	\$3.8500 CAD

The chart below contrasts the provider reimbursement costs at the U.S. rates, to the Canadian rates for multiple providers (tier 1). The chart uses the number of VRS conversation minutes that are forecast to be relayed in the recommended Canadian phased deployment. Similar differences in costs occur if applied to single-provider or two-provider solutions. In all scenarios it is assumed that the estimated administrative costs will remain as forecast, and therefore those costs are not depicted. Neither are the additional costs associated with the research portion of the first phase of the Canadian deployment.

Figure 14: Comparison of U.S. and Canadian VRS provider costs



The above chart is for illustrative comparative purposes, and demonstrates the significant relative difference in forecast costs between the U.S. VRS model and the recommended Canadian VRS model. Further details of the Canadian model are summarized in section 9, below.

⁹⁷ See phase 10, *Cost Variables and Forecast*, for a detailed analysis of U.S. rates and the causes for their high value. Also discussed is the cost basis of the estimated Canadian VRS provider rates.

7.4. Equity for LSQ

As noted in section 6.2 the provisioning of LSQ/French VRS will have unique challenges. One such challenge is ensuring that LSQ does not receive discrimination due to its smaller population size and forecasted use. Since 77% of the use and money for VRS is forecast to provide ASL/English VRS, there may be a tendency to not place equal emphasis on all facets of LSQ/French VRS, including service, outreach, technical support, and so forth. It would be a disservice to Canadian LSQ/French consumers if the money and attention provided to ASL/English VRS had the effect of diminishing the attention and work needed to equally support LSQ/French VRS consumers. Therefore, equity between LSQ/French VRS and ASL/English VRS should be firmly supported in policy, funding and operations.

To ensure that an English/ASL monetary and user emphasis does not diminish LSQ/French services, the following are recommended:

1. Providers of VRS should be allowed but not required to provide both ASL and LSQ services. If English/ASL providers were required to provide LSQ/French VRS, they would likely only develop LSQ VRS at some minimal level and provide inferior LSQ/French services. To ensure that LSQ/French VRS receives an equally high level of attention and focus, those providers that have the relationships within the LSQ/French communities should be allowed to place all their attention on developing and providing LSQ/French VRS, and non LSQ/French companies should not be required to provide LSQ/French VRS.⁹⁸
2. For phase 1 deployment, Université du Québec à Montréal (UQAM) should be offered a leadership role in the coordination of research among all ITPs since UQAM is the only university with an ITP program.
3. The third party administrator office should be located in a major metropolitan area in Québec, such as Montréal. Staff resources should include fluency in LSQ, ASL, French and English among different staff members.^{99 100}
4. Third party administrator Board membership and Advisory Committee membership should have adequate LSQ representation.
5. Public education, outreach, website, technical support, customer service support, and VRS provider and user interfaces should all be equally available in LSQ and French, as it is in ASL and English.
6. The levels of service to consumers (e.g., percent of minutes offered) and quality of service should be the same for LSQ VRS as it is for ASL VRS.

⁹⁸ To ensure that at least one noteworthy LSQ/French provider is available for the phase 1 deployment, Mission Consulting confirmed that the Université du Québec à Montréal (UQAM) is looking forward to partnering with a local interpreter referral agency to offer LSQ/French VRS from Montréal.

⁹⁹ Compared to other regions in Canada, Québec also offers the greatest number of bilingual (French/English) and bi-sign (LSQ/ASL) people for potential employment with the third-party VRS administrator.

¹⁰⁰ One of the three potential VRS platform providers also has offices and hosted platform services in Montréal. If that provider ends up receiving the award for VRS platform, the location of the third party administrator office in Montréal could facilitate communication and support of VRS platform technical development for Canada.

8. Outsourcing VRS to the United States

An option for consideration would be to outsource all ASL/English VRS to the United States. In the United States there are over 8,000 qualified (RID certified) ASL interpreters,¹⁰¹ and the U.S. VRS providers should be able to accommodate the slight increase in VRS traffic that Canadian ASL will represent (about 5% of U.S. VRS traffic). Outsourcing would be in lieu of the recommended phased deployment described above in section 7.

8.1. Advantages of Outsourcing

The advantages to outsourcing ASL/English VRS include:

1. Outsourcing could speed up the availability of VRS to ASL consumers.
2. Outsourcing could eliminate the potential harm to ASL community interpreting.
3. Outsourcing ASL is not dependent upon developing ASL interpreters

These advantages are discussed below.

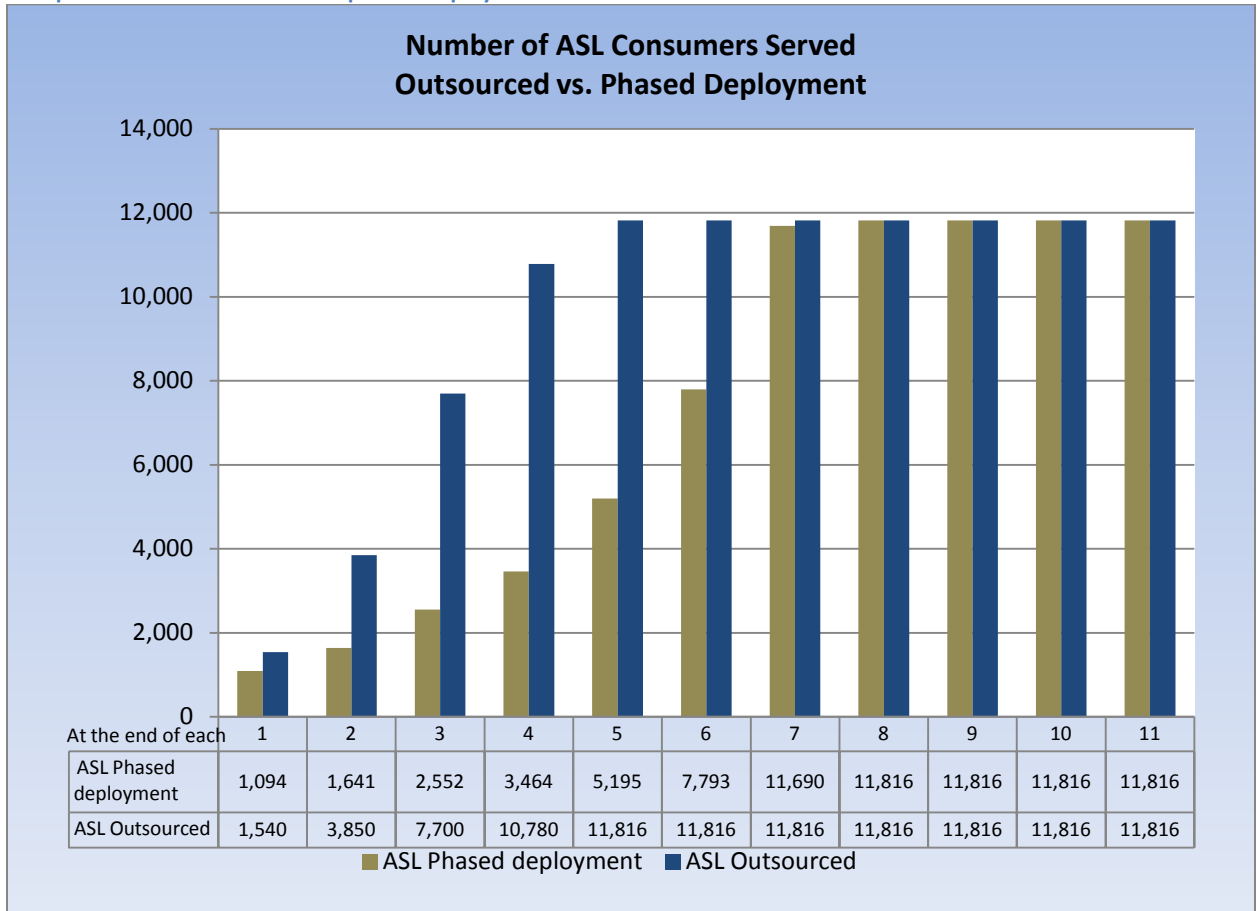
Outsourcing could speed up the availability of VRS to ASL consumers

The availability of ASL interpreters in the U.S. means that VRS uptake or adoption rates of Canadian ASL consumers need not be constrained. Estimated uptake rates for outsourced ASL VRS are estimated annually at 300%, 150%, 100%, 40%, and 20%, with all ASL consumers subscribed in the fifth year.¹⁰² This forecasted growth is contrasted with the ASL adoption rates of the recommended phased deployment shown below.

¹⁰¹ Registry of Interpreters for the Deaf (RID), at <http://rid.org/aboutRID/media/index.cfm>.

¹⁰² See sections 5 and 8.5 of phase 9, *Forecasts of VRS User Demand*, for a discussion of adoption rates.

Figure 15: Comparison of outsourced ASL to phased deployment



Outsourcing could eliminate the potential harm to ASL community interpreting

If ASL VRS were outsourced to VRS call centers located in the United States, then the Canadian labour pool of ASL interpreters would not be affected by the outsourcing. Canadian interpreters would continue to serve Canadian community interpreting, without any local stress applied to the Canadian resources in order for ASL VRS to be provided to Canada.¹⁰³

Outsourcing ASL is not dependent upon developing ASL interpreters

Outsourcing ASL does not require the further development of Canadian ASL interpreter training programs. The efforts associated with the first phase of the phased deployment associated with the ASL ITPs and their increased capacity for attracting and training interpreting students is removed.

¹⁰³ This ignores the fact that U.S. firms, e.g., Sorenson, has VRS call centers located in Canada employing about 200 ASL interpreters serving U.S. ASL VRS consumers.

8.2. Disadvantages of Outsourcing

While the option to outsource ASL VRS initially appears attractive, it was rejected for the following primary reasons:¹⁰⁴

1. Outsourcing is expected to cost up to 50% more than a Canadian solution.
2. Outsourcing will be subject to potential fraud and abuse, and will be very difficult to manage.
3. Outsourcing will establish significant disparity between VRS provided to ASL users compared to LSQ users.
4. Outsourcing will create a long term dependency upon U.S. firms.
5. Outsourced VRS firms could also establish call centers in Canada, thereby aggravating the shortage of local interpreters for community interpreting.

These reasons are discussed below.

Outsourcing is Expected to Cost up to 50% More

As seen in section 7.3.8 above, the U.S. reimbursement rates are about 50% more than the forecasted competitive Canadian reimbursement rates. U.S. VRS providers are not expected to lower their rates for Canada because to do so would jeopardize their FCC approved U.S. rates (and revenues) set through cost-plus reimbursement claims.¹⁰⁵ While the FCC has stated that they wish to reduce U.S. reimbursement rates, there is no indication that they will be able to be successful.

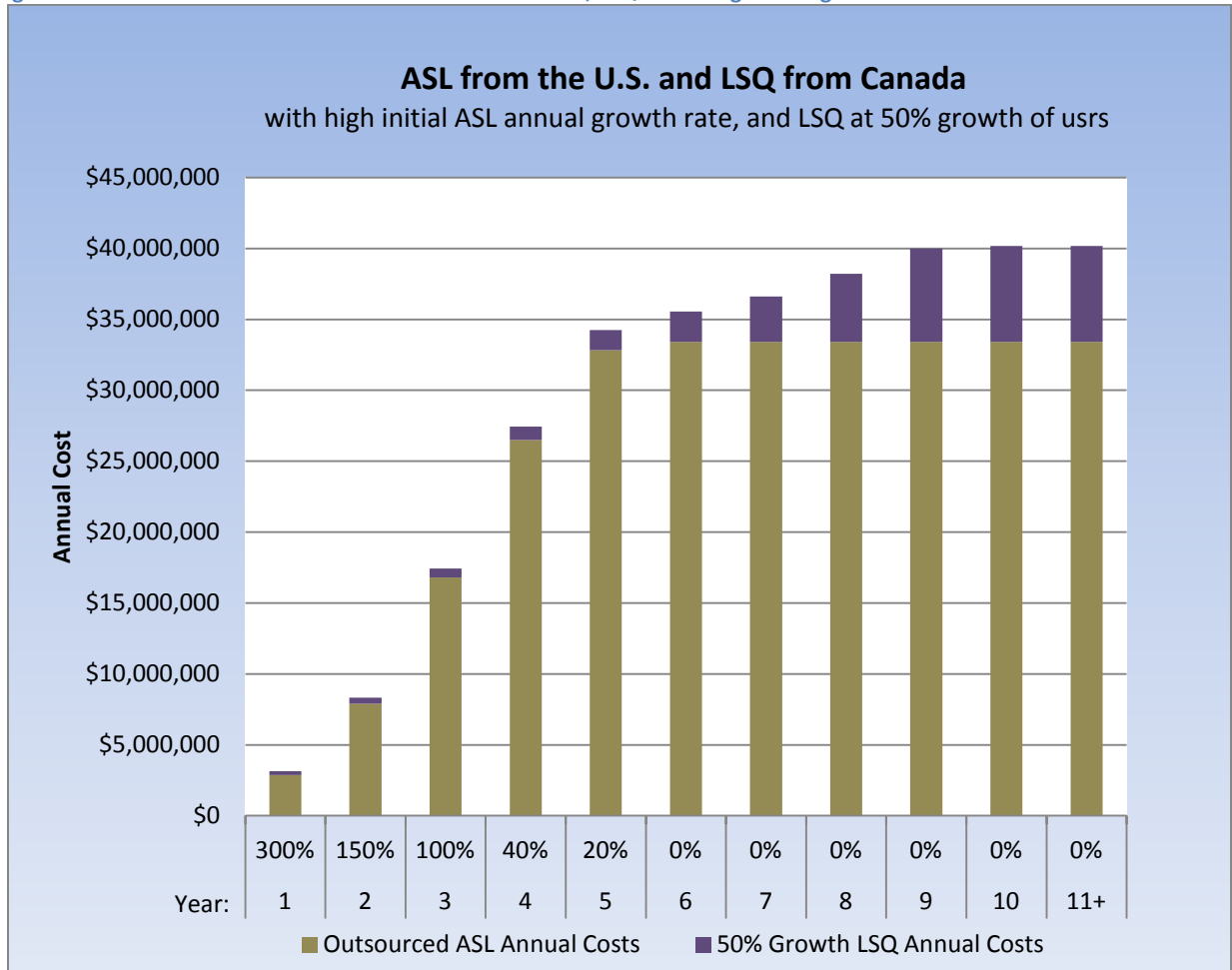
If Canadian ASL VRS were outsourced to the U.S., the primary factor limiting ASL growth or adoption, the shortage of interpreters, would be removed. In this case a more aggressive adoption rate for ASL VRS would be expected. A suggested VRS adoption rate for outsourced ASL and non-outsourced LSQ is shown over eleven years in Figure 16 below, along with associated costs. Because the ASL traffic will be handled in the U.S., for this forecast the ASL costs are derived from the Canadian Forecast minutes but using the U.S. tier thresholds and U.S. per minute rates (in Canadian dollars), and *with a single ASL provider representing the lowest possible U.S. ASL costs* (more expensive U.S. tiers are very possible but are not included in the chart). Since the LSQ VRS traffic cannot be outsourced, the LSQ costs are forecast using the Canadian Forecast minutes of use at 50% annual growth with multiple LSQ VRS providers, and using the Canadian Forecast tiers and per minute rates. Note that this outsourced solution is significantly more expensive than any Canadian Forecast scenario (one, two, or many providers).

¹⁰⁴ Also see section 6 of phase 11, *Potential Canadian VRS Models*, and section 4.5 of phase 10, *VRS Cost Variables and Forecasts*, for details regarding potentially outsourcing ASL VRS to the United States.

¹⁰⁵ For an extensive analysis of the U.S. VRS rate reimbursement methodology, see section 3.1.1 of phase 10, *Costs Variables and Forecasts*.

None of these costs include any expenses for program administration or research, which could be significant.

Figure 16: ASL outsourced to the United States at U.S. rates; LSQ remaining at 50% growth



Outsourcing will be Subject to Potential Fraud and Abuse, and will be Difficult to Manage

VRS providers operating in the United States may not want to use a common VRS platform from Canada. VRS providers already have their own proprietary platforms. Without a common Canadian platform, it would be very difficult to monitor U.S. providers to verify the number of calls or minutes relayed, or to monitor the aspects of quality of service such as answer times. The FCC has found it impossible to successfully audit most U.S. VRS providers, including those that provide over 90% of the U.S. VRS traffic.¹⁰⁶ There is no reason to assume that Canada would be able to successfully audit or mitigate fraud and abuse where the U.S. government has

¹⁰⁶ The FCC has identified its inability to audit VRS providers and to eliminate significant fraud and abuse by U.S. VRS providers over the years. Among many FCC documents, the most current, FCC 11-184, continues to identify this as a major problem. See http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-184A1.doc.

failed. The additional costs illustrated above under *Outsourcing will Cost up to 50% More* do not include the cost of any additional minutes of use due to fraudulent behavior, abuse or waste, which could increase the costs by another 20 to 30 percent.¹⁰⁷

If for some unexpected reason, U.S. VRS providers did offer Canadians VRS at any discount from the U.S. rates, the U.S. providers would likely give Canadian VRS calls their lowest priority over U.S. VRS calls since U.S. consumers would generate payments at substantially higher rates. Canadian calls would always be at the end of the queue, and would receive the lowest cost interpreters (interpreters with the lowest level of education and training). It would be virtually impossible to independently identify such practices from Canada. U.S. interpreters serving Canada would also need training in differences in ASL found in the U.S. and Canada, and training in spelling and pronunciation of place names and personal names in Canada (including Canadian French names).

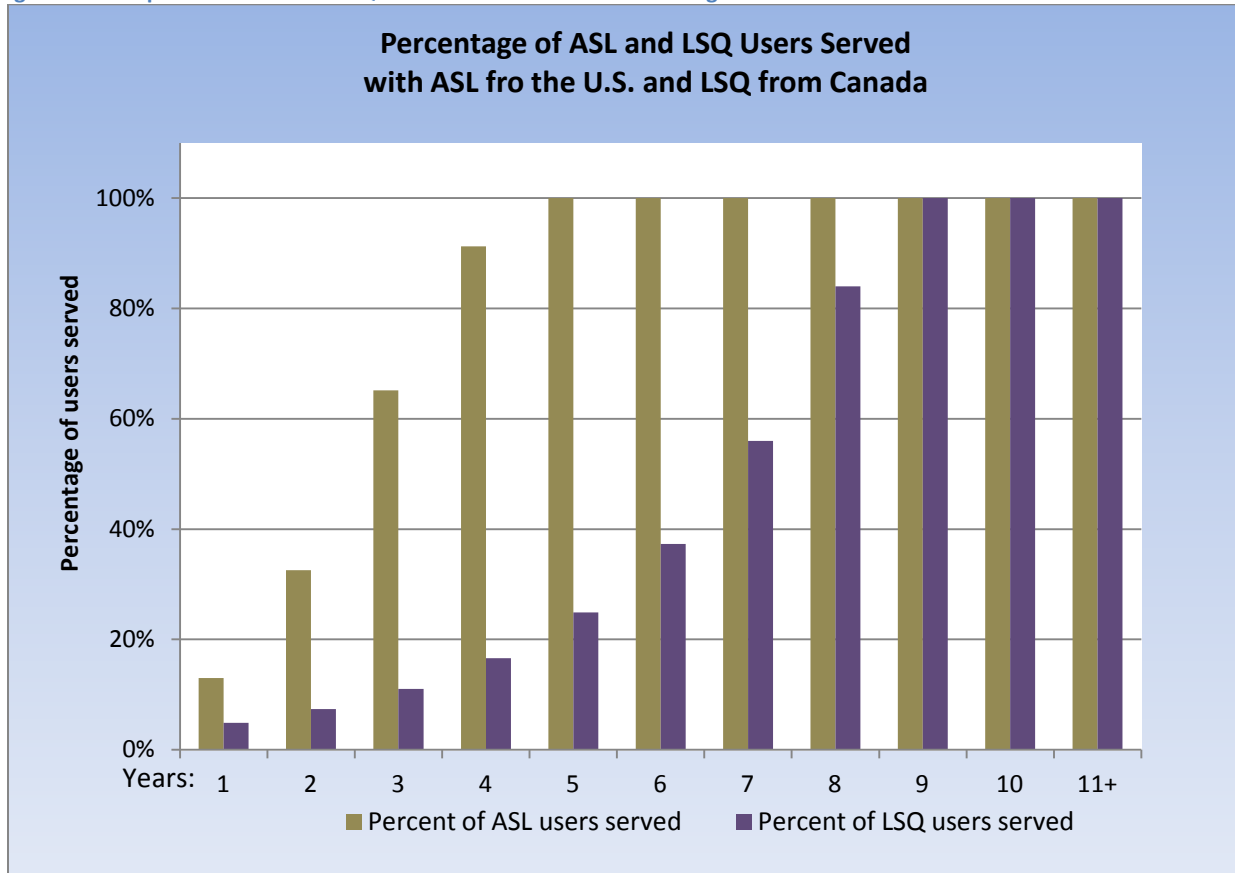
Other aspects of VRS program oversight and management of U.S. providers would also be problematic. Multinational legal systems, regulatory systems and other factors could potentially be significant.

Outsourcing will Create Significant Disparity between ASL and LSQ VRS Users

While it may be possible to outsource ASL/English VRS to the United States, outsourcing LSQ/French VRS is not possible since LSQ interpreters are only available in Québec. Demand for VRS from ASL consumers will be met at a higher adoption rate than in either a phased approach or at a 50% growth rate. Thus outsourcing ASL would allow Canadian ASL users to achieve maximum use of VRS earlier than would be achieved by Canadian LSQ users, thereby creating significant disparity of the percentage of potential users served, as illustrated in the following chart. Equity of services discussed in section 7.4 above would not be provided.

¹⁰⁷ As noted throughout the FCC's document 11-184 some types of prevalent fraud committed by U.S. VRS providers operating within the U.S. system have not yielded to regulations. As new regulations are issued, providers find new ways to defraud the system. Some of these types of U.S. provider activities may not necessarily be exposed with a common VRS platform.

Figure 17: Comparison of ASL and LSQ consumers served via outsourcing



Outsourcing will Create a Long Term Dependency on U.S. Firms

This option creates no incentive to develop a robust ASL interpreter labour pool to serve VRS and community interpreting in Canada. ASL community interpreting shortages would be expected to prevail over the long term, and Canadian ASL VRS would always be required to be provided from the United States. Furthermore, the health of the U.S. VRS industry and competitive market will always be dependent on the regulations and statutes of the U.S. government, not the Canadian government.

Outsourcing may Still Create Community Interpreting Shortages in Canada

If U.S. VRS firms did open call centers in Canada (i.e., not actually outsourcing), these firms would hire local interpreters. This has already been done by Sorenson serving U.S. VRS consumers. If these or additional VRS call centers were to provide service to Canadians, more Canadian interpreters would be removed from community interpreting, aggravating an already short supply of interpreters without regard or balance for community interpreter needs.

9. Component Recommendations for Canadian VRS

The principal areas of consideration for a recommended model of VRS for Canada are:¹⁰⁸

- Types of providers
- Number of providers
- Location of providers
- VRS platform and interoperability
- Provider reimbursement
- Consumer costs
- Consumer technical support
- Education and outreach
- Other related services
- Program governance and management
- Funding
- Acquisition
- Implementation

There may be many other possible areas of consideration when determining the optimum VRS for Canada. However, as the purpose of this study is to establish the *feasibility* of VRS, instead of an operational and technical design, the areas for consideration herein are those identified above.

9.1. Types of Providers

VRS is a managed combination of call center activities, technologies (network, hardware and software), and interpreting. When qualifying organizations that might provide VRS to Canada, there may be a tendency to assume that only companies that have this combination of VRS experience should be permitted to offer VRS. However, this is not the model used by most other countries. In fact, even in the United States anyone, with or without any VRS experience, can set up a VRS company and receive FCC certification if certain organizational and operational minimum standards are met. Most of these providers' VRS operations are small and highly skilled.

The primary qualification options offered for consideration in Canada include:

1. Only companies with VRS experience (e.g., present VRS vendors).
2. Any organization meeting a minimum level of contact center experience.

¹⁰⁸ See phase 11, *Potential Canadian VRS Models*, for detailed information about the advantages and disadvantages for each option offered for consideration in this section 7.4.

3. Any organization meeting a minimum level of ASL or LSQ interpreting experience.
4. A new national non-profit VRS entity created specifically for Canadian VRS.

The recommendation for the type of VRS provider(s) for Canada:

- Limit the potential VRS providers to organizations with experience in ASL or LSQ interpreting.

Qualified interpreters are the most crucial component of any VRS. Organizations that already focus their energy on ASL or LSQ interpreting are the best suited to provide VRS. Additionally, the involvement of interpreter agencies can facilitate a balance between VRS and community interpreting needs, while the involvement of interpreter training programs will, in the long term, facilitate the development of more Canadian interpreters to serve both community interpreting and VRS.

9.2. Number of Providers

Most countries that have a public VRS are served by only one VRS company. Countries in which VRS is restricted to work-related calls may have one, two or three VRS providers. In the United States, before recent additional restrictions were implemented restricting the use of subcontracted services, there were over sixty VRS providers. According to the FCC, the U.S. currently has twelve VRS providers.¹⁰⁹

The primary options for considering the number of VRS providers in Canada:¹¹⁰

1. One VRS provider for the country, serving all consumers.
2. Two VRS providers, each serving all consumers nationwide.
3. Two VRS providers, one serving ASL consumers nationwide, and one serving LSQ consumers nationwide.
4. Multiple experienced VRS providers, serving ASL, LSQ or any other visual language consumers.
5. Multiple interpreter agencies and college/university interpreter training programs, providing ASL or LSQ VRS.
6. A combination of multiple experienced VRS providers, interpreter agencies and college/university interpreter training programs, providing VRS.

The recommendation for the number of VRS providers:

¹⁰⁹ See: FCC-11-184A1- *Further Notice of Proposed Rulemaking*, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 10-51, paragraph 24, released December 15 2011 at http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db1215/FCC-11-184A1.pdf

¹¹⁰ Note that no options are being considered for regionally restricted providers. All options are for nationwide services, that is, consumers from anywhere in the country should be able to access a VRS provider. For example if there were only one LSQ VRS provider, LSQ consumers should be able to access that provider from anywhere in Canada and reach any French speaking/hearing telephone user in Canada.

- Begin with an initial research phase with multiple interpreter training programs only, and then expand the program to include multiple interpreter agencies. After the research phase when fully deployed VRS is implemented, allow multiple interpreter training programs and interpreter agencies, as well as experienced VRS providers to contribute to VRS in Canada.

This option makes maximum use of the entities with pre-established relationships with Canadian interpreters (who are in short supply) in the communities where they live, encourages the development of more interpreters and the development of necessary VRS interpreter standards, and will also result in LSQ-French VRS provider(s) that will focus on the needs of the LSQ community.

9.3. Location of Providers

The nature of VRS requires that vendors place their call centers where the interpreters are located. This usually means multiple small call centers in different cities. However as demonstrated in this study's phase 9, *Forecasts of VRS User Demand*, there are presently not enough interpreters in Canada to supply both community interpreting and VRS.

The primary options for consideration for the location of VRS providers:

1. Source all VRS from within Canada.
2. To the degree possible, outsource VRS to the United States.
3. Adopt a blended approach.

The recommendation for the location of providers:

- For the long term benefit of consumers who will rely upon both community interpreting and VRS, and to ensure the lowest costs, select a model that emphasizes VRS provided from locations within Canada.¹¹¹

This solution endeavors to place ASL VRS and LSQ VRS on parity, with specific goals and timelines understood at the outset.

9.4. VRS Platform and Interoperability

The selection of, or requirements for, the VRS operational software (the VRS platform) used by the VRS provider will impact the degree of interoperability experienced by the VRS consumers. In VRS there are two different types of compatibility or interoperability:

1. Compatibility of different consumer end-user video devices with the platforms of different VRS providers. Some VRS platforms may only work with certain consumer equipment or software.

¹¹¹ See section 8.

2. Compatibility of different consumer end-user video devices to communicate point-to-point directly with other end-users through the VRS provider's user interface and network. Some VRS platforms do not support video communication between different types of consumer devices.

VRS platform selection/requirements will also affect the ability to manage multiple locations, consumer registration, different options with VRS such as voice and text, and relaying of emergency calls to 9-1-1 centers.

The following options are considered for VRS platform and interoperability:

1. Allow all VRS providers to use any VRS platform they desire.
2. Require all VRS providers to use any VRS platform that meets minimum interoperability standards.
3. Require all VRS providers to use the same VRS platform, which also must meet minimum interoperability standards.

The recommendation for VRS platform interoperability and functionality:

- Require all VRS providers to use the same ubiquitous and interoperable platform during an initial research phase and monitor results to determine if one platform is suitable for Canadian VRS.

With this recommended option, the Canadian third party VRS program administrator would acquire and operate the common VRS platform as well as the consumer registration database with ten-digit numbering assignments. This recommended option greatly simplifies the management and growth of the services, provides equal functionality to all consumers and VRS providers, offers the potential of networked call distribution across different VRS providers, can assure maximum interoperability, provides transparent and common reporting, and can assure that advanced VRS features such as the ITU's Total Conversation, are available to all consumers.

9.5. Provider Reimbursement

Different countries have established different methods to pay their VRS vendors. Some assign a fixed total amount of annual funds, and the vendor provides the services it can afford with the budget provided. Other options include reimbursement at a set cost per VRS call regardless of how long the call is, how much time it takes to set the call up, how much idle time there is between VRS calls, or how much time is spent on customer service or technical support non-relayed calls. One country (France) pays a set rate per hour per VRS interpreter. Most countries pay the provider for the minutes of VRS.

The primary options for VRS provider payment:

1. Payment per relayed conversation minute.
2. Payment per session minute.
3. Payment per relayed call.
4. Payment for each registered VRS consumer.

5. Payment for each hour of VRS interpreter time.
6. Payment of a total fixed annual amount for the service.

The recommendation for provider reimbursement is:

- For an initial research phase, pay fixed amounts for a specific level of service awarded by each grant. For fully deployed VRS, adopt a payment methodology that is either based on relayed conversation minutes, or is based on payment for each hour of VRS interpreter time.¹¹²

These payment methodologies offer the most value for services performed.

9.6. Consumer Costs

As with any telecommunications service, consumers of VRS may be expected to pay for certain elements of their calling experience. Costs typically borne by consumers can include:

1. The cost of consumer VRS equipment or software
2. The cost of broadband service that connects the consumer to the Internet (both fixed monthly costs and usage costs)
3. The wireline or wireless carrier usage costs of the inbound or outbound voice portion of the call
4. A cost per minute or per call for using VRS

Rather than identifying every potential option for each type of consumer cost, general consumer costs will be addressed as a single topic. Primary options for consideration include:

1. All VRS consumer costs (equipment, access and usage) are free.
2. Consumers are responsible to obtain their own VRS equipment or software, and pay for their access to VRS. Consumers pay for the VRS call at an amount equivalent to a direct (non-operator) voice call from the consumer to the called party.
3. Consumers are responsible to obtain their own VRS equipment or software, and pay for their access to VRS. There is no additional cost to consumers to use VRS, i.e., all calls are free.

Additionally, consumer costs for non-relayed VRS calls (e.g., point-to-point calls, customer service and technical support) can also be considered:

4. Non-relayed VRS calls are free to consumers.
5. Non-relayed VRS calls are paid for by the consumers.

For this area of consideration of consumer costs, the following are recommended:

¹¹² The determination of which payment methodology to use for the full deployment phase, should be made during the initial research phase when the full deployment RFP is being created.

- Consumers are responsible to obtain their own VRS equipment or software, and pay for their broadband access to VRS.¹¹³ There is no additional cost to consumers to use VRS, i.e., calls are free, including those to VRS providers' customer service and technical support if necessary.
- Non-relayed VRS calls are free to consumers.

The cost and operational and administrative overhead associated with complex reimbursement and bill back scenarios is excessively burdensome and frequently non-functional. The program should be kept operationally simple, designed to encourage consumer participation, aligned to CRTC policies, and be within the expectations of usual VRS provider operations. These two recommendations achieve those purposes.

9.7. Consumer Technical Support

Some level of VRS customer support will be necessary in order to assist consumers implement VRS with their end-user video devices. Consumers who are not comfortable communicating in English or French will need technical assistance provided in their sign language. This type of technical support will be required in the field for installation assistance, and remotely by video (e.g., via Skype), by text (via IP chat, SMS and TTY), and by voice (for at home or work assistance provided by a hearing person on behalf of the Deaf person).

The following options for consumer technical support are offered for consideration:

1. Offered by the consumer equipment suppliers
2. Offered by the TSPs¹¹⁴
3. Offered by the VRS providers
4. Offered by the VRS platform provider
5. Offered by a third party or parties
6. Offered by a hybrid of entities

For this area of consideration the recommendation is:

- The providers of each part of the service are responsible to offer their own consumer technical support (i.e., offered by a hybrid of entities).
- During the initial research phase, conduct research on exactly what type and how much consumer technical support is needed.

¹¹³ Consumer representatives request that the CRTC consider discounted usage based broadband fees for VRS users similar to the current 50% discount applied to long distance TTY calls.

¹¹⁴ As used herein, "TSPs" includes wireless and wireline telephone companies and Internet service providers.

This approach maximizes the existing available technical support and product/service knowledge without creating new costs for that support. It also offers the possibility of a third party that can provide the knowledge transfer from the Deaf consumers to the manufacturers/service providers, and feedback for common issues to the Deaf community. The costs associated with this third party can be controlled through the management of roles, responsibilities and funding.

9.8. Education and Outreach

All potential users of VRS (Deaf, deaf, hard of hearing and hearing) will need to know: how VRS works; the compatibility requirements for consumer equipment, software, and broadband; how to acquire the equipment and software; how to make and receive calls; how to sign up for the service and what functional options are available; how to reach customer service; how to get technical help; and other related information.

Five primary options offered for consideration are that education and outreach should be provided:

1. By the VRS vendors.
2. By the nonprofit groups that represent consumers.
3. By the telecommunication service providers (TSPs).
4. By public social service agencies.
5. By a mixture of the above.

Different organizations have different purposes, resources and motivations. No single approach will likely meet all of the requirements for education and outreach. Therefore the recommendation is for:

- Different organizations to offer education and outreach according to their expertise and constituents.

9.9. Other Related Services

Related services described in phase 8, Potential Related Services, are considered from the perspective of an optimum VRS model. Recommendations are as follows:

- VRI should not be paid for from VRS funds as a part of VRS. However, the VRS platform should be made available to VRS providers at cost so they may offer VRI independently of VRS and without cost to VRS.
- Video mail should be a normal part of VRS.
- All of the forms of visual communication discussed, including VCO, HCO and supporting real-time text, should be included in VRS to the extent that interpreter resources are available.
- All of the specialized interpreter functions should be allowed, not required.
- French-ASL and English-LSQ translation should not be included within VRS.

- Relaying of emergency calls to 9-1-1 call centers should be a CRTC mandated requirement of VRS.

9.10. Program Governance and Management

Rules defining the VRS program will need to be developed and maintained. The program will then need to be managed to those rules. VRS is a very complex service and program with many different involved parties.

The primary options for consideration are:

1. CRTC provides total management through regulation.
2. TSP and ISP managed in response to CRTC orders.
3. By a third party administrator agency.

For VRS program governance and management, the recommendation is:

- Manage the program by a third party administrator as described earlier in section 7.1.1 and in phase 11, *Potential Canadian VRS Models*.

This option assumes that the best governance and management approach would be one in which the industry (TSPs and ISPs), at the direction of the CRTC, creates a third party VRS administrator agency to which it provides funding, and through its Board, direction. The agency would be an independent, accountable corporation responsible for Canadian VRS.

9.11. Funding

The overall VRS program has different cost components. By far the largest cost component is 1) the reimbursement of the VRS providers for their service. Other lesser cost components are 2) the cost to provide or subsidize consumer VRS hardware or software, 3) the cost to provide or subsidize consumer network access and network usage in order to access and use VRS, 4) the cost for VRS education and outreach, 5) the cost for consumer technical support, and 6) the cost to administer the program. All six of these cost areas can be funded by the same source, or different components can be funded by different sources, or some may not be funded at all. The choices are influenced by cost of services and availability of funds, as well by established MRS or related funding policies.

The following primary funding options are:

VRS consumer devices

1. No special CRTC mandated funding or subsidies.
2. CRTC mandated funds subsidize VRS device purchases.
3. VRS providers are required to offer devices at no cost to the consumers.

Consumer broadband services

4. No special CRTC mandated funding or subsidies for network services.
5. CRTC mandated funds subsidize network services.

VRS provider services, VRS platform, VRS consumer technical support, and VRS program administration

6. Provide CRTC mandated funds from TSP and ISP customer fees.
7. Provide CRTC mandated funds as a percent of all TSP and ISP revenue.
8. Provide CRTC mandated funds as a percent of all TSP and ISP profits.

Interpreter training program expansion

9. No CRTC mandated VRS funds for interpreter training.
10. Interpreter training programs provide VRS
11. Interpreter training is funded or offered by the VRS providers
12. CRTC mandated VRS funds support interpreter training programs
13. CRTC mandated VRS funds support students of interpreting

For funding the different VRS program elements, the recommendations are:

VRS consumer devices

- No special CRTC mandated funding or subsidies for consumer video devices.

This option matches the other MRS programs, preserves limited VRS funds, and avoids the significant expense, delays, administration, and potential fraud associated with a VRS equipment subsidization program. Advocacy groups should seek other funds and programs to help with VRS consumer device costs.

Consumer broadband services

- No special CRTC mandated funding or subsidies for consumer network services.

This option matches the other MRS programs, preserves limited VRS funds, and avoids the significant expense, delays, administration, and potential fraud associated with a VRS broadband network subsidization program. Advocacy groups should seek other funds and programs to help with broadband VRS access and usage costs.

VRS provider services, VRS platform, VRS consumer technical support, and VRS program administration

- The VRS program should be funded by telecommunications service providers, wireless service providers, and Internet service providers (collectively referred to herein as "TSPs") as a percent of their telecommunications operations revenues, as mandated by the CRTC.

This method of funding has previously been used by the CRTC. An initial funding mechanism and amount will need to be established for the development of the program during the first phase of

implementation (prior to full deployment) to ensure the program has the financial resources to form and carry out its responsibilities.

Interpreter training program expansion

- As an initial stimulus to increase the capacity and capability of the college and university ITPs, provide VRS research and service grants from VRS program funds that requires both program expansion and offering of VRS as a service to consumers. When the ITPs are self sustaining and robust enough to meet the training needs for interpreters, discontinue the grant program.

9.12. Acquisition

VRS provider services must be acquired and paid for, ideally through a fair methodology that results in a combination of lowest costs and best services.

The acquisition options for consideration are:¹¹⁵

1. Acquire VRS as a CRTC regulated service based on a providers' allowed costs plus profit
2. Acquire VRS as a competitively bid, single vendor fixed rate service
3. Acquire VRS as a competitively bid, multi-vendor flexible rate service
4. Acquire VRS as a competitively bid, multi-vendor service at a pre-established rate

For consideration of the potential acquisition models for VRS, the recommendation is:

- Initially award VRS provider services as part of a competitively bid RFP for multiple grant awards based on the evaluated value of the offered VRS research and services. During the research phase determine if a fully deployed VRS would best be competitively acquired through an adjusted fixed rate, multi-vendor RFP, or by a multi-vendor flexible rate RFP.¹¹⁶

9.13. Implementation

Implementation of a successful VRS program will require coordinated planning and execution including the cooperation and commitment of many stakeholder organizations. Implementation is a process, not

¹¹⁵ In addition to these options for VRS acquisition, it is assumed that other potential procurements will be necessary for other services, and these will be acquired using best procurement and contracting practices most suitable to the duration and type of service being acquired.

¹¹⁶ At present the assumption is that due to the wide variance of potential providers' cost estimates for untested services and the probability of large VRS firms eliminating competing small vendors through a low bid process, a fully deployed service following an initial research phase will best be acquired through a competitively bid or pre-established reimbursement rate for awarded hours of interpreter time or for relayed conversation minutes, with limits in place. Information gathered during the initial research phase (such as variances in availability and costs of interpreters by city or region, thresholds or barriers to consumers' take up rates and minutes of use, effect of then current U.S. rates on interpreter availability and costs, etcetera) can assist in making these decision.

an event. The VRS provider element of the implementation is only one part of many that are all necessary for program success. The orientation will need to be on total program development, not simply VRS provider services.

The options associated with implementation have to do with the development of a VRS program that is tailored to the needs and conditions in Canada. The primary options are:

1. Order fully deployed services and let the VRS providers determine the implementation process.
2. Order fully deployed services, and put controls in place to manage the vendors and the program.
3. Order an initial research phase of services and other matters, put controls in place, and based on the research results, plan for and award fully deployed services.

The primary implementation process recommendation is:

- Order an initial research phase of the services and other VRS matters, put controls in place, and based on the research phase results, plan for and award fully deployed services.¹¹⁷

10. Conclusion

The recommended solution for a fully deployed Canadian VRS is to allow interpreter agencies, interpreter training programs, and VRS companies the ability to compete to offer VRS. Awarded provider organizations should be required to use a single VRS technical call center platform and consumer registration system (software and hardware) licensed to the VRS providers, thereby assuring transparency, accountability, scalability, and interoperability. VRS should be national in scope; that is, not regional or by operating company; although it must equally service LSQ and ASL consumers.

Because there is a lack of qualified ASL and LSQ interpreters necessary for VRS, and because appropriate standards for interpreter qualifications do not exist for either ASL or LSQ VRS interpreting, it will be necessary to increase the number of qualified interpreters in Canada. The most practical way to do so is to include the Canadian college and university interpreter training programs in an initial research phase of VRS deployment, prior to full deployment. This initial research phase will provide grants to the universities to not only provide limited VRS, but to also increase their capability for graduating more interpreters, and to also conduct necessary research on VRS that will ensure that the program is defined for the long-term in a manner that will result in the lowest program costs for the necessary level of quality of service.

If it is necessary to restrict access to VRS in Phase 2, due to interpreter availability, funding or some other factor, limiting the hours of operation may be the most simple and effective restriction.

¹¹⁷ See section 16 of phase 11 for details regarding the recommended implementation tasks.

Canadian provider reimbursement costs and VRS usage rates are forecast to be less than half of what they would be if the model and usage patterns of the United States were adopted. The Canadian VRS program should be funded by telecommunications service providers, wireless service providers, Internet service providers (i.e., TSPs) as a percent of their telecommunications operations revenues.

The VRS program should be managed by an independent third party administrator corporation with a balanced board comprised of representatives of consumer organizations, telecommunications services providers funding VRS, and independent directors. This corporation should be supported by a staff and a consumer advisory committee. The corporation should develop the program budget, report to the CRTC, establish VRS requirements, and award grants and contracts for services. It should also acquire and license the VRS platform for use by the awarded VRS providers.

VRS is a complex service with many initial challenges. It is very feasible, but it must be designed and implemented with careful planning in order to maximize benefit and minimize cost and potential waste, and to minimize potential harm to current levels of community interpreting. Planning and oversight should involve consumer representatives, as well as TSP representatives. The recommended two-phased approach, together with the ongoing management support of an independent third party administrator, should provide the basis for a very successful VRS, eventually serving all Canadians who will benefit from the service.

EXHIBIT A – ACRONYMS

Acronym	Description
AAD	Alberta Association of the Deaf
ACE	Australian Communication Exchange
ACMA	Australian Communications and Media Authority
ACRID	Alberta Registry of Interpreters for the Deaf
ADA	Americans with Disabilities Act
ADSL	Asymmetric Digital Subscriber Line
AEC	Attestation d'études collégiales (Certificate of Collegiate Studies)
AEIP	ASL-English Interpreting Program
AFR	Avon Fire and Rescue (United Kingdom)
AGEFIPH	L'Association de Gestion du Fonds pour l'Insertion des Personnes Handicapées (The French Association of Fund Management for the Professional Integration of People with Disabilities)
AGG	Allgemeines Gleichbehandlungsgesetz (General Equal Treatment Act) - (Germany)
AGT	Alberta Government Telephones
ALI	Automatic Location Information
ANI	Automatic Number Identification
ANR	Agence Nationale de la Recherche (French National Research Agency)
ARLIS	Association Romande del Interprètes en Langue des Signes (Swiss-French Sign Language Association)
ASA	Average Speed of Answer
ASL	American Sign Language
ASLIA	Australian Sign Language Interpreter's Association
ASP	Avon and Somerset Police (United Kingdom)
AUT	Auckland University of Technology (New Zealand)
AVLIC	Association of Visual Language Interpreters of Canada
BC Tel	British Columbia Telephone Company
BDA	British Deaf Association (United Kingdom)
BDU	Broadcasting Distribution Undertakings
BGD	Berufsvereinigung deer GebärdensprachdolmetscherInnen der deutschen Schweiz (Swiss-German Sign Language Association)
BGG	Behindertengleichstellungsgesetz (Federal Act on Equal Opportunities of Disabled People) - (Germany)
BSL	British Sign Language
BSO	Basic Service Objective
BT	British Telecom

Acronym	Description
CA	Communications Assistant
CA IDs	Communication Assistant Identification Numbers
CACDP	Council for the Advancement of Communication with Deaf People (United Kingdom)
CAD	Canadian Association of the Deaf
CCD	Council of Canadians with Disabilities
CCSD	Canadian Cultural Society of the Deaf
CCTS	Commissioner for Complaints for Telecommunications Services
CDR	Call Detail Record
CEAR	Consumers, Estate Agents and Redress (United Kingdom)
CES	Canadian Evaluation System
CEO	Chief Executive Officer
CGI	Computer Graphics Interface
CHHA	Canadian Hard of Hearing Association
CHIP	Communicaid for Hearing Impaired Persons
CHRA	Canadian Human Rights Act
CHS	Canadian Hearing Society
CI	Certificate of Interpretation from RID
CIF	Common Interface Format
CISC	Canadian Interconnection Steering Committee
CLEC	Competitive Local Exchange Carrier
CMR	CRTC Communications Monitoring Report
CODA	Children of Deaf Adults
COI	Certificate of Interpretation
ComCom	Swiss Federal Communications Commission (Switzerland)
CPA	Certified Public Accountant
CQDA	Centre Québécois de la Déficience Auditive
CRB	Criminal Records Bureau (United Kingdom)
CRTC	Canadian Radio-television and Telecommunications Commission
CSC	Comprehensive Skills Certification from RID.
CT	Certificate of Transliteration from RID.
CVM	Cégep du Vieux, Montreal
DA	Deaf Australia
DBCDE	Department of Broadband, Communications and the Digital Economy
DC	Douglas College, British Columbia
DDA	Disability Discrimination Act
DETEC	Department for the Environment, Transport, Energy and Communications (Switzerland)

Acronym	Description
DHHS	Deaf and Hard of Hearing Services
DHHSI	Deaf, Hard of Hearing, and Speech Impaired
DI	Deaf Interpreter
DOJ	Department of Justice
DSL	Digital Subscriber Line
DTMF	Dual-tone multi-frequency signaling
DWEB	Deaf Welfare Examining Board (United Kingdom)
EC	European Commission
EFSLI	European Forum of Sign Language Interpreters
EISEC	Enhanced Information Service for Emergency Calls (United Kingdom)
ESIT	l'École Supérieure d'Interprètes et de Traducteurs - one of the universities in France that offer 2 and 3 year sign language interpreting training.
ESWG	Emergency Services Working Group
ETSI	European Telecommunications Standards Institute
EU	European Union
EU	Unit of Education
EUD	European Union of the Deaf
FBED	Federal Bureau for the Equality of People with Disabilities
FCC	Federal Communications Commission (United States)
FICORA	Finnish Communications Regulatory Authority (Finland)
FPS	Frames Per Second
FTE	Full Time Equivalent
GB	Gigabyte
GBC	George Brown College, Toronto, Ontario
GVAD	Greater Vancouver Association for the Deaf
HCO	Hearing Carry Over
HI	Hearing Interpreter
HoH	Hard of Hearing
HSPA	High Speed Packet Access
ICED	International Congress on Education of the Deaf
ICT	Information Communication Technologies - (France)
ICT	Information and Communication Technologies (United Kingdom)
IEP	Interpreter Education Diploma Program
IIP	Interpreter Internship Program
ILEC	Incumbent Local Exchange Carriers
ILISSI	Interpreti della Lingua dei Segni Svizzera Italiana (Swiss-Italian Sign Language Association)

Acronym	Description
IM	Instant Messaging
IP	Internet Protocol
IPSOS	Research contractor
IPTV	Internet Protocol, Television
IRP	Independent Registration Panel Professional Code of Conduct (United Kingdom)
ISDN	Integrated Services Digital Network
ISL	Inuit Sign Language
ISP	Internet Service Providers
ITP	Interpreter Training Program
ITU	International Telecommunications Union
ITU-T	International Telecommunications Union - Total Conversation
KBps	kilobytes per second
kbps or Kbps	kilobits per second
Kela	Social Insurance Institution of Finland
KSO	Kiwi Share Obligations (New Zealand)
LCD	Liquid Crystal Display
LEC	Local Exchange Carrier
LED	Light-emitting diode
LNP	Local Number Portability
LPC	Langage Parlé Complété - Cued Speech
LREC	Language Resources and Evaluation Conference
LREC	International Conference on Language Resources and Evaluation
LSF	Langue de Signes Français - French sign language.
LSPs	Lipspeakers (United Kingdom)
LSQ	Langue des Signes Québécoise - Sign language of Quebec
LSS	Act concerning Support and Service for Persons with Certain Functional Impairments, (Sweden)
Mbps	Megabit per second
MCE	Manually Coded English
MED	Ministry of Economic Development (New Zealand)
MMR	MultiMedia Response - a proprietary script software program
MMX	Multi Media Exchange
mocap	Motion Capture (France)
MRID	Manitoba Registry of Interpreters for the Deaf
MRS	Message Relay Services
MSL	Maritime Sign Language
MVNOs	Mobile Virtual Network Operators
NABS	National Auslan Interpreter Booking Service (Australia)

Acronym	Description
NAD	National Association of the Deaf (United States)
NAD III	National Association of the Deaf - Generalist training (through RID)
NAD IV	National Association of the Deaf - Advanced (through RID)
NAD V	National Association of the Deaf - Master (through RID)
NADP	National Association of Deafened People (United Kingdom)
NAFTA	North American Free Trade Agreement
NANP	North American Numbering Plan
NBN	National Broadband Network (Australia)
NECA	National Exchange Carriers Association
NIC	National Interpreter Certification (United States)
NOSI	National Occupational Standards in Interpreting (United Kingdom)
NPAC	Number Portability Administration Center
NRCPD	National Registers of Communication Professionals working with Deaf and Deaf blind People (United Kingdom)
NRS	National Relay Service (Australia)
NSCC	Nova Scotia Community College
NTS	National Testing System
NVQ	National Vocational Qualifications (United Kingdom)
NZSL	New Zealand Sign Language
OAD	Ontario Association of the Deaf
OECD	The Organisation for Economic Co-operation and Development
OFCOM	Federal Office of Communications (United Kingdom)
OIS	Ontario Interpreting Services
ONS	Office for National Statistics (United Kingdom)
OTS	Ordinance on Telecommunications Services (Switzerland)
OTTIAQ	Order of Recognized Translators, Terminologists and Interpreters of Québec
POTS	Plain Old Telephone Service
PSAP	Public Safety Answering Point
PSE	Pidgin Sign English
PSP	Policy Support Program
PSTN	Public Switched Telephone Network
PTS	Post – och Telestyrelsen - National Post and Telecom Agency (Sweden)
PTT	Post, Telefon, and Telegramm - National Postal and Telecommunications organization (Switzerland)
QoS	Quality of Service
RAD	Royal Association for Deaf People (United Kingdom)
RAMQ	Régie de l'assurance maladie du Québec - Quebec Health Care Agency
RBI	Rural Broadband Initiative (New Zealand)

Acronym	Description
RFP	Request for Proposal
RID	Registry of Interpreters for the Deaf (United States)
RNID	Royal National Institute for Deaf People (United Kingdom)
RRC	Red River College, Manitoba
RTT	Real-Time Text
SAIDE	Cégep du Vieux-Montréal – service d’aide à l’intégration des élèves
SAMU	Services d’Aide Médicale Urgente (Emergency Medical Services) (France)
SDGS	Swiss German Sign Language
SDR	Swedish National Association of the Deaf (Sweden)
SEE	Signed Exact English
SGB FSS	Schweizerische Gehörlosenbund/Swiss Federation for the Deaf (Switzerland).
SGB IX	Sozialgesetzbuch IX (Social Security Code IX) - (Germany)
SILECs	Small Incumbent Local Exchange Carriers
SIP	Session Initiation Protocol
SIPSE	Service d’interprétation pour personnes sourdes de l’Estrie - (Interpretation Service for Deaf People in the Eastern Townships), Quebec
SIVET	Service d’interprétation visuelle et tactile (Interpretation Service Visual and Tactile), Québec
SLA	Service Level Agreement
SLI	Sign Language Interpreter
SLIS	Swiss Italian Sign Language
SLSF	Swiss French Sign Language
SMP	Significant Market Power (Sweden)
SMS	Short Message Service
SOS	SOS Alarm (Sweden)
SQM	Service Quality Measure (New Zealand standard)
SRC	Sign Relay Canada
SRIAT	Service régional d’interprétariat de l’Abitibi-Témiscamingue (EAS Interpretation of the Abitibi-Témiscamingue), Quebec
SRIL	Service régional d’interprétariat de Lanaudière (EAS Interpreting Lanaudière), Quebec
SSL	Svenskt Teckenspråk (Swedish Sign language)
STTF	Sveriges Teckenspråkstolkars Förening (Swedish Sign Language Interpreters Association)
TALS 2010	Workshop Traitement Automatique des Langues des Signes (Montréal, July 2010)
TCC	Telus Communications Company
TDD	Telecommunications Device for the Deaf
TDM	Time Division Multiplexing
TOI	Test of Interpretation

Acronym	Description
TRP	Telecommunications Regulatory Policy
TRS	Telecommunications Relay Service
TSO	Telecommunications Service Obligations Deed (New Zealand)
TSP	Telecommunications Service Provider
TTY	Teletypewriter
UEC	Unit of Continued Education
UFB	Ultra-Fast Broadband Initiative (New Zealand)
UN	United Nations
UQAC	Université of Québec at Chicoutimi
UQAM	Université du Québec à Montréal
UQAT	Université of Québec in Abitibi-Témiscamingue
UQTR	Université of Québec at Trois-Rivieres
USB	Universal Serial Bus
USO	Universal Service Obligation (United Kingdom)
VCC	Vancouver Community College, British Columbia
VCO	Voice Carry Over
VI	Video Interpreter
VoIP	Voice over Internet Protocol
VPAD	A proprietary tablet videophone
VRI	Video Remote Interpreting
VRS	Video Relay Service
WAVLI	Westcoast Association of Visual Language Interpreters, British Columbia
WSP	Wireless Service Providers
WWS	Westwood Spice Pty Ltd. (Australia)