

mission

CONSULTING, LLC

February 24, 2012

Mr. John Traversy
Secretary General
Canadian Radio-television and
Telecommunications Commission
Ottawa, Ontario, K1A 0N2

Subject: Telecom Decision CRTC 2008-1, Use of deferral account funds to improve access to telecommunications services for persons with disabilities and to expand broadband services to rural and remote communities – VRS Feasibility Study Final Report

Dear Mr. Traversy:

Mission Consulting is very pleased to submit to the CRTC our Final Report of the Feasibility of Video Relay Service (VRS) for Canada. This study is composed of a Final Report and eleven supporting research papers in both English and French. This in depth study was contracted through Bell Canada, as approved by the CRTC under the Deferral obligation, and was conducted over a period of 15 months, with participation by many Canadians and others through interviews, questionnaires, surveys, research and discussions. Throughout the study, oversight and ongoing review were provided by a VRS consumer Advisory Committee with representation by the Canadian Association of the Deaf (CAD), the Canadian Hearing Society (CHS), the Ontario Association of the Deaf (OAD), and the Centre québécois de la déficience auditive (CQDA). Mission Consulting's objective throughout the study was to be unbiased, fair and balanced as information became available to ensure recommendations were most appropriate for Canada. We are pleased that the report's findings and recommended solutions are unanimously supported by this VRS Advisory Committee.

We would like to take this opportunity to thank all interested parties who added to the research and study results, including Canadian consumers, professional interpreters and their organizations, interpreter referral agencies, interpreter training programs, and numerous subject matter experts. We would also like to extend our appreciation to the many individuals and organizations in other countries that contributed significant information about their VRS programs. Lastly, we thank Bell Canada for sponsoring the study on behalf of the CRTC, and for providing ongoing project support as well as providing the French translations.

Mission Consulting remains available to the CRTC to answer questions related to the study, or to provide additional support. Please let us know how we may be of further assistance.

Sincerely,



Bill Stobbe
Partner

Phase 1:
Project Confirmation

VRS Feasibility Study

Mission Consulting

February 24, 2012

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PROJECT CONFIRMATION

1. Overview

This *Project Confirmation* document is part of a study commissioned by Bell Canada in response to a request from the Canadian Radio and Telecommunications Commission (CRTC) for more information about Video Relay service (VRS) within the Canadian environment. The CRTC requested the information to facilitate informed decisions regarding potential regulations and implementation of Canadian VRS. Bell Canada (Bell) engaged Mission Consulting to conduct an independent and comprehensive study of the feasibility of VRS for Canada.

This document, *Phase 1 – Project Confirmation*, summarizes the:

- project's management relationships;
- study components (scope of work); and an
- initial high-level project plan/timeline.

2. Project Management Relationships

2.1. Bell Canada / Mission Consulting

Assigned project roles are as follows:

- For Bell Canada, the project sponsor is Mr. Bill Abbott, Senior Counsel, Regulatory Law
- For Bell Canada, the project manager is Ms. Cindy Jones-Sherk, Bell Residential Services
- For Mission Consulting, the project manager is Mr. Bill Stobbe, Managing Partner

In discussions between the Bell Canada project sponsor, project manager, Bell procurement, and Mission Consulting, various administrative requirements and project arrangements have been confirmed, including in the areas of:

- Project communication
- Contractual administrative requirements
- Confirmation of project scope and objectives
- Background documents or information germane to the project
- Confirmation of the project's initial schedule

Mission Consulting has assigned a multi-disciplined project staff to provide comprehensive research and analysis of all project phases. Staff members include one subcontractor, Mr. Jean-Francois Leger, a Canadian telecommunications and regulatory attorney.

2.2. Canadian Consumer Leadership

Mission Consulting and Bell Canada recognize that consumer input is crucial to ensuring that the study considers the diverse needs of people with communication disabilities that may utilize future Canadian Video Relay Services. Various Canadian advocacy groups have worked diligently over a significant 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 of a variety of Canadian consumer organizations. The study includes two panels of experts: an Advisory Committee and a VRS Study Workgroup.

Advisory Committee Participants

Bell Canada worked with the leadership of specific organizations that provide support services and advocacy to 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, to conduct the study. Bell will convene these same leaders from three to five times during the study (approximately every two months) to review the interim study deliverables resulting from phases 1 through 11, and the final report (phase 12) comprised of material from phases 1 through 11. These Advisory Committee leaders do not have authoring, editing or research responsibilities, but will review progress, provide oversight, suggest direction or considerations, and offer feedback. The organizations and principal individuals of this ongoing project Advisory Committee are:

- Canadian Hearing Society (CHS) – Gary Malkowski, Special Advisor to the President, Public Affairs; and Jim Hardman, Director, Information Technology
- Canadian Association of the Deaf (CAD) – James Roots, Executive Director
- Centre Québécois de la Déficience Auditive (CQDA) – Monique Therrien, Exécutive Director; and Daniel Péloquin, Treasurer
- Ontario Association of the Deaf (OAD) – Dean Walker, Executive Director

VRS Study Workgroup Participants

In addition to the Advisory Committee, Mission Consulting has proposed that a VRS study workgroup of Canadian consumer subject matter experts be available to call on for advice as needed, which is likely to be more frequently than the bimonthly schedule of the roundtable. The concept of the workgroup is that it is comprised of volunteers who may individually respond to requests from Mission Consulting for ongoing advice and feedback on particular subjects that may arise during the course of the study. The workgroup is not a standing committee designed to periodically meet. It is more of a project resource that can be drawn upon and can share ideas and discussion. Nor is the workgroup designed to replace the project's field research that will be performed by Mission Consulting. The workgroup will be supported by a private online project portal for member communication and sharing.

The individual workgroup participants have not yet been invited or confirmed. The size of the workgroup is anticipated to be between ten and fifteen people. All of the Advisory Committee members will be invited to also be workgroup participants. In addition, participation will be extended to

representatives of diverse Deaf, deaf, late deafened, and interpreter organizations, and interpreter educational programs. Select participants will be invited as subject matter experts are identified through the course of the study.

3. Study Components

There are many critical factors to consider when evaluating an appropriate model for potential Video Relay Services in Canada. With the contribution of the leaders of the Deaf organizations named above, Bell Canada was therefore careful in its RFP to require a comprehensive study that would provide the CRTC with significant useful information for rulemaking. In response Mission Consulting proposed a study is comprised of twelve phases:

- 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
- Phase 12 VRS Feasibility Study Report

These twelve phases comprise the scope of work codified in Bell's contract with Mission Consulting. This scope of work is attached to this Project Confirmation document as Exhibit A.

4. Initial Project Plan/Timeline

4.1. Timeline Overview

As proposed by Mission Consulting, the twelve project phases were initially designed to span nine months. During the course of the project this was expanded to fifteen months as depicted below with approximate durations of each phase. Advisory Committee meeting times are also as indicated.

Project phase	2011												2012		
	'10 Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1 Project confirmation															
2 Legal background for VRS															
3 Consumer perspectives															
4 VRS in other countries															
5 Technologies & forecasts															
6 Interpreter considerations															
7 Quality of service															
8 Other related services															
9 Forecasts of user demand															
10 Cost variables & forecasts															
11 Potential VRS models															
12 Final Report															
Advisory Committee meetings:															

4.2. Project Plan/Timeline Details

In support of the above overview of the project timeline, Mission Consulting has prepared an initial high-level project plan with timeline details in the form of a project Gantt chart. The durations and dates of the timeline are estimates and subject to change to best meet the evolving needs of the project. Nevertheless, the timeline provides an important overview of the anticipated methodology and task relationships as well as anticipated timeframes.

5. Conclusion

This *Phase 1 – Project Confirmation* document and its exhibit provides an overview of the *VRS Feasibility Study Report* project. It confirms the project’s management relationships; the study components (scope of work); and provides an initial high-level project plan/timeline.

Project Confirmation – Exhibit A:

Bell Canada VRS Feasibility Study – Scope of Work

The Bell Canada *VRS Feasibility Study Outline* requirements are replicated below without modification in blue coloured font. Mission Consulting's response is provided after each requirement in black font.

1. INTRODUCTION

Bell Canada (Bell) is issuing this RFP to obtain proposals for a neutral and objective feasibility study of the technical and administrative options for implementing and funding Video Relay Service (VRS) in Canada. The study will be based on the assumption that the Canadian Radio-television and Telecommunications Commission (CRTC) will order the introduction of VRS in some form in Canada. The resulting study will analyze the positive and negative impacts of the various options and analyze options for managing the overall cost (upfront and ongoing) and maintenance of any potential VRS options. The feasibility study should be an impartial assessment of the costs and impacts of various options. The study should result in recommendations on the most cost effective and beneficial options for VRS in Canada.

2. CONTEXT

Under Broadcasting and Telecom Regulatory Policy CRTC 2009-430, the CRTC determined

“The Commission considers that the record of this proceeding is insufficient to determine whether TSPs should be required to provide Video Relay. In particular, the record did not establish critical information such as the costs of providing this service, the size of the individual ASL or LSQ Video Relay user markets, or projected use. The record does indicate that the costs of providing a Video Relay service would be high, considering the need for high bandwidth and highly-skilled language interpretation in two sign languages.

Therefore, the Commission considers that further investigation into this matter is necessary to acquire accurate information pertaining to cost, user market size and projected use of this service...”

VRS has been implemented in other jurisdictions and the technical viability of the service has been generally established. However, implementing VRS in Canada may present additional issues, such as the presence of 2 distinct sign languages. A key consideration is the overall cost of providing VRS in Canada, so the feasibility study must analyze the key factors that influence VRS costs and how the costs of VRS could be controlled under different options.

3. OBJECTIVE

The feasibility study should provide a comprehensive analysis of VRS options, including:

1. existing VRS options in different jurisdictions (including, but not limited to the US, UK, France, Germany, Sweden), including advantages, disadvantages and costs,
2. the Canadian environment and market for VRS (especially user demand for VRS)

3. the extent and availability of interpreters to provide VRS in Canada (Langue des Signes Québécoise (LSQ) and American Sign Language (ASL)) and the impact of VRS on other services in the deaf community that depend on sign interpreters
4. options for implementing, administering and funding VRS
5. costs of different models (both per minute of service and overall gross annual cost)
6. key variables influencing cost in the Canadian context
7. the need for and nature of quality of service requirements or thresholds for VRS in Canada
8. best model (competition or monopoly) for each language that should be adopted that will provide nation-wide access to VRS

Mission Consulting understands and will comply. In addition, we offer the following response: (Please see our response to item 4, *Feasibility Study*, for our proposed methodology for *how* these objectives will be met.)

- 3.1 *Existing VRS Options, including advantages, disadvantages and costs:* We are very pleased that Bell has asked for a comprehensive study to consider all aspects of potential VRS in Canada, including consideration of various models of how the service might best be provided. We are very familiar with the U.S. model and are aware of its considerable shortcomings, including in the areas of costs, accountability, and compliance with TRS regulations. We are pleased that Bell is requesting consideration of other countries' VRS models, and we look forward to their assessment. In addition to U.S., U.K., France, Germany and Sweden, we also propose to research Finland, Czech Republic, New Zealand, Australia and Switzerland. These countries offer a variety of VRS/VRI models, issues, languages and technologies. In at least one instance a country has been unable to successfully implement VRS, and we believe it will be instructive to determine what obstacles have prevented success.
- 3.2 *The Canadian environment and market for VRS:* We are aware that the population of potential VRS users in Canada is made up of people with a variety of specialized communications abilities and preferences, such as Deaf, late-deafened, hearing impaired, and so on. Members of these potential VRS user groups will have differing affinities for using VRS. For example, some groups will have a high percentage of people who sign, while others will not. Additionally we are aware that estimates of the number of people who are Deaf and hard of hearing vary significantly, especially depending upon who is promoting the estimate and to what purpose. And as just mentioned, these numbers do not equate to the number of people who use sign language. We will develop the estimates of potential VRS user demand, including VRS calls initiated by people who can hear to signers, by combining a variety of analytical methods. Additionally, the market for VRS and the amount of use that it will incur will also be affected by a variety of other factors that are also subjects of this VRS feasibility study. These factors include items such as the availability of wired and wireless broadband access and emerging network technologies, the new types of wired and mobile user equipment and interfaces, public education of potential users (both signers and people who can hear), and cultural factors.

- 3.3 *The extent and availability of ASL and LSQ interpreters, and the impact of VRS on their availability to the deaf community (outside of VRS):* We are very aware of the immense concern that the deaf communities have had in the United States regarding the impact of VRS on the availability of sign language interpreters both before and during implementation of VRS. We appreciate that these concerns are shared by Canadian deaf communities. Market shortages of interpreters has resulted in some very unique impacts, including very high costs of VRS and VRI services, increased costs of non-relay interpreter services, unavailability or delayed availability in non-VRS interpreter services, reduction in availability of language technical skills, and distributed VRS business models based on available labour pools. We concur that understanding the extent and availability of ASL and LSQ interpreters for VRS, the role that VRS providers can take to address this issue internally and externally, and the potential impact of VRS on interpreters' non-VRS availability to the deaf community, is an important study objective. We will ensure that this is adequately researched and addressed in the study and report.
- 3.4 *Options for implementing, administering and funding VRS:* We are particularly pleased that Bell is requesting new considerations for implementing, administering and funding VRS in Canada. At this point we do not know what the solution should be, but we do know that the U.S. model has serious drawbacks on many levels. It is possible that it is the best model available, but we would be disappointed if it were. We will research and develop the various options based on what other countries are doing, as well as new considerations or options that may be available that have not yet been implemented, or that may be necessitated by Canadian law or conditions. While the potential models discussed will be correlated to Canadian telecommunications regulations, they will not be restricted to the current regulations. It is possible that the most useful funding model(s) will require new funding regulations or even new statutes. These legal issues will be factors for consideration.
- 3.5 *Costs of different models:* We concur that the identification of an appropriate cost model will be a crucial component of the operational and regulatory models for VRS in Canada. We will assess the various types of cost models, including per minute and total gross costs, and their sub-elements. These models will be assessed for their benefits and shortcomings, as well as how they pertain to different overall VRS models.
- 3.6 *Key variables influencing cost in the Canadian context:* Cost analysis must include the primary factors that would pertain to VRS solutions for Canada. We are aware that VRS costs in the U.S. have been subject to significant and often conflicting controversy from a range of vested stakeholder parties. We are in an ideal position to provide impartial overall program cost analysis. Our cost analysis will include items such as broadband availability options and costs; user terminal equipment types and costs; user acceptance and demand; public outreach and education; potential costs of fraudulent use; Quality of Service requirements; system/services initial and ongoing costs (e.g., database, ASL

and LSQ interpreter labour, hardware/software, etc); and regulatory overhead and administrative costs. Cost factors can also consider possible requirements such as the degree of integration with Canadian public safety agency 9-1-1 services; ancillary related services such as video mail, video relay interpreting (VRI)¹, and French-to-ASL video translation and English-to-LSQ video translation, availability of optional specialized vocabularies (e.g., medical, legal, etc.), varieties of signing and non-signing options or augmentations (e.g. lip reading, transliteration, finger spelling, text enabled VRS, speech enabled VRS), etcetera. Some of these additional factors may have minimal costs while others may be significant. Identifying the variables that may influence costs will allow Bell to make informed choices and recommendations for VRS in Canada.

- 3.7 *VRS Quality of Service thresholds:* There are many factors that should be accounted for when considering VRS Quality of Service. It is tempting to take the path used by many jurisdictions that only considers those items that can be easily measured, or have been traditionally measured in the TRS environment, such as network blockage rates and average speed of answer. For VRS these should be expanded to include video requirements such as camera and video refresh rates and resolution, and broadband transmission rates – while also acknowledging that some of these factors will be outside the control of the providers. However, the VRS user experience is also highly dependent upon numerous nuanced interpreter capabilities and functions. These are more difficult to measure but no less important to the consumer. Some of these interpreter Quality of Service factors may be best addressed via regulations, while others may be better addressed within contracts for services, while still others may be best addressed in a competitive environment (if competition is the adopted model). Quality of Service can also be potentially expanded to non-interpreter activities such as customer service and billing. Quality of Service requirements must also be balanced by their operational costs, risks (e.g., penalties for non-performance) and difficulty of achievement on the part of the VRS service providers, and the potential negative impact on service providers from entering the Canadian VRS market. We are very aware that this necessary balance for overall success is crucial, and that it has not always been accepted by the different stakeholder communities of consumers and vendors. Our analysis and report will endeavour to provide a balance of Quality of Service considerations, including options, viewpoints and potential outcomes.
- 3.8 *Best VRS model for ASL and LSQ for nationwide access:* Considering all of the above objectives, the final objective is to provide an assessment and recommendation regarding the best model(s) for ASL VRS and LSQ VRS for Canada. While we concur that this objective is to define the best model, we also realize that in the regulated environment that this study is meant to inform, the recommendation of the best model will also need to be supported by demonstration of the advantages and disadvantages of alternative models so that the regulatory authorities will have the information they

¹ Referred to as Video Remote Interpreting (VRI) in the U.S.

need to confirm the model of choice and its associated costs. Therefore we propose to provide the best model in light of the most reasonable alternatives and considerations, including competitive versus monopoly. We believe that this objective more than any other, will require a close and collaborative working relationship with the Bell Canada VRS project team to ensure that the analysis and outcome address all necessary issues and considerations.

4. FEASIBILITY STUDY

The feasibility study should reflect an understanding of VRS and its potential users, as well as a rigorous business analysis. As such, any successful vendor will have to demonstrate their experience in detailed business analysis of telecommunications services and in accessibility issues. Bell is willing consider proposals that involve vendors partnering to provide the desired analysis. Bell is also of the view that the study process should include consultation with affected groups and potential users of the service.

The feasibility analysis should comprehensively address VRS options, including but not limited to the following issues:

- User market size
 - User demand
 - Demographics
 - Sign language growth
 - Volume
 - Initial demand
 - Growth demand
 - Volume ASL
 - Volume LSQ
 - Male / Female interpreter demand
 - Usage patterns
 - Average call length/duration
 - Average frequency of calls
 - Load variations – 24 hour period, seasonal
 - Impact on IPRS/traditional relay services
- Technology Forecast
- Cost
 - Equipment
 - Marketing / Communication
 - Training
 - Per minute, per second, per call
 - Per minute, per second, per call of ASL
 - Per minute, per second, per call of LSQ
 - Projected gross annual costs of each option
 - Installation/Technical support
 - Equipment costs/standards
 - Set up installation / maintenance / support of users
 - Affordability of equipment
 - Marketing and communication costs

- Interpreter
 - Availability
 - Estimated number of agents required
 - Standards / Training requirements
 - Employment and Labour pool
 - Growth, people entering the profession
 - Wage, benefits and growth / cost (including the ability of VRS operators in Canada to attract interpreters in light of competition for interpreters from federal and provincial governments, service organizations and foreign VRS operations)
- Educational Program availability
 - Time to ramp up
 - Requirement, if any, for an apprenticeship program to ensure an adequate pool of interpreters
- Impact on availability for community and other services
- Ability to support one or multiple vendors / suppliers and the appropriate VRS framework (monopoly v. competitive supply models) for LSQ and ASL
- Video Relay Interpreting
 - Cost
 - Misuse
 - Integration and offering
 - Federal obligation impact on interpreting services /use
- Fraud and Security issues and recommendations for fraud prevention
- Bandwidth availability / reach (within and across provinces) / costs
- Emergency services issues
- Quality of Service

Mission Consulting understands and will comply. In addition, we offer the following response:

This section of our proposal will identify at a high level the proposed project scope/ methodology for achieving the Objectives of section 3. A modified or more detailed scope/methodology can be collaboratively developed with Bell Canada upon notice of Bell's intent to award to Mission Consulting, or after award at Bell's option.

This portion of our proposal should be considered a combined Scope/Methodology/ Timeline and may be used for evaluation of the Timeline (see section 7, *Vendor Selection Matrix*), as well as Bell's evaluation of our knowledge and expertise. In this context we suggest that the timeline evaluation consider our proposed scope and detail as well as how reasonable the

duration fits this scope and detail in order to allow for optimum study results, including the opportunity for ongoing Bell project team review and participation.

OVERALL APPROACH

We propose to develop the VRS Feasibility Study in phases of research, each associated with a topic area. Each project phase will result in an interim draft deliverable that documents the findings associated with the phase. These draft deliverables will be provided in English. The Bell project manager and Bell project team will have the opportunity to review the interim draft deliverables and request modifications. We also offer a hosted, secure online project portal to share documents with authorized Bell staff throughout the project. This portal is offered free of charge, is compatible with all browsers, and does not require any software download. Additionally, we expect to periodically discuss study findings with the Bell project team in person as a normal course of the project.

As proposed above in response to Bell's item 2, Context, at the conclusion of all of the interim findings reporting (phases 1 through 11 below), we will again discuss the findings with the Bell Canada project manager and team to jointly ascertain what information should transition from the interim deliverables into the final comprehensive VRS Feasibility Study Report, and in what arrangement. It is the intent that this approach will include, but may not necessarily be limited to: all requirements listed by Bell under item 2, Context; all requirements listed by Bell under item 3, Objective; and all requirements listed by Bell under item 4, Feasibility Study. The final VRS Feasibility Study Report (see phase 12, below) will be provided in English.

PHASE 1 – PROJECT CONFIRMATION

This preliminary phase allows Bell Canada to confirm with Mission Consulting its project expectations and desired outcomes. In this phase the project methodology and schedule are jointly confirmed and project information retained by Bell that may be useful to the success of the project can be shared with Mission. This phase includes the following topics:

1. Meeting of key participants from Bell and Mission Consulting.
2. Establishment of project communications practices both internal to the Bell-Mission project team, and with outside stakeholders.
3. Review of any contractual or project administrative requirements.
4. Review and confirmation of the project's objectives and outcomes.
5. Review of any documents or other information that Bell may wish to share with Mission Consulting that Bell feels is germane to the project and is appropriate for Mission to have or know. Examples might be past research, pertinent regulations, issues, confirmation of Canadian industry or consumer group stakeholders, etcetera.
6. Review and modification as necessary of the proposed methodology and schedule.

PHASE 2 – LEGAL BACKGROUND FOR CANADIAN VRS

The Legal Background for Canadian VRS will define the current Canadian mandates and regulatory framework that VRS will be required to conform to. This research will identify the legal basis and constraints for establishing VRS in Canada in a summary manner. Establishing this context early in the project will help identify what factors and services will affect the viability of various other study elements. Topics to be addressed in this phase shall include, but are not necessarily be limited to:

1. Current CRTC TRS regulations and their implications for VRS:
 - a. Established TRS regulations.
 - b. Pending TRS issues, waivers, notices, etcetera germane to VRS.
 - a. Funding, cost and reimbursement regulations germane to TRS and VRS.
 - c. The Canadian telecommunications regulatory environment.
 - d. Monopoly, competition, regulation and the role of the CRTC.
 - e. Telecommunications versus Internet regulation (an issue in the U.S.)
 - f. Federal versus Provincial jurisdiction.
2. Canadian law relative to discrimination and equal access as it pertains to communications (TRS/VRS).
 - a. Anti-discrimination law (e.g. is there a Canadian equivalent to the ADA?)
 - b. International agreements that may bind Canada or suggest political or policy standards. (For example on March 11 2010 Canada ratified the United Nations Convention on the Rights of Persons with Disabilities and its Optional Protocol.)
3. Other Canadian law that may affect the establishment of VRS in Canada, for example:
 - a. Privacy law (an issue with VRS in the U.S.)
 - b. Fraud law or regulation that may pertain to VRS.
 - c. Public versus private communication access rights.
 - d. Special requirements of Provincial laws that may pertain to VRS.

PHASE 3 – CONSUMER INTERESTS AND PERSPECTIVES

The primary purpose of VRS is to facilitate telecommunications between people who use sign language as their primary language (e.g., ASL, LSQ), and people who hear in another language (e.g., English or French). These prospective users are in fact made up of diverse and nuanced groups of potential VRS users, with potentially different communication requirements, issues and cultural perspectives. Topics to be addressed include, but are not necessarily limited to:

1. Identification of the potential VRS user groups, their population and demographics, including use of ASL and LSQ.
2. Identification of user group representative organizations.²

² Examples include: Canadian Hearing Society (CHS), Canadian Association of the Deaf (CAD), Centre Quebecois de la deficiance auditive (CQDA), Canadian Hard of Hearing Association (CHHA), Ontario Association of the Deaf (OAD), Canadian Cultural Society of the Deaf (CCSD), Council of Canadians with Disabilities (CCD), Deaf and Hard of Hearing Services (DHHS), Alberta Association of the Deaf (AAD), Neil Squire Society, Greater Vancouver Association for the Deaf (GVAD), DeafBC/BC Video Relay Services Consultative Committee.

3. The common and unique communication requirements of these groups (e.g., ASL, LSQ, transliteration, lip reading, etc.)
4. Cultural attitudes that may affect adoption:
 - a. Empowerment/functional equivalency versus disability/charity model.
 - b. Adoption versus aversion of new technologies.
 - c. Barriers from hearing parties (e.g., denial of calls).
5. User group viewpoints and perspectives regarding potential VRS in Canada, and their issues and concerns.

For this phase 3, Mission Consulting proposes to conduct structured face-to-face meetings with major user group organizations of Canada. Mission Consulting will solicit input and discussion from their representatives and potentially from town hall meetings arranged by those organizations. This phase will be sufficiently long to ensure that interested representative stakeholder organizations have sufficient opportunity to engage with Mission Consulting to assure that their views and requirements are addressed. Additionally Mission Consulting will participate in Bell sponsored consumer roundtable discussions throughout the project's duration, presently anticipated to be approximately every two months, but subject to Bell's arrangements.

PHASE 4 –VRS MODELS IN OTHER COUNTRIES

The assessment of VRS models of other countries will be a particularly interesting part of the project. As we stated in section 3.1, we are very familiar with the U.S. model and are aware of its considerable shortcomings, including in the areas of costs, accountability, and compliance with TRS regulations. In addition to the U.S., U.K., France, Germany and Sweden, we also propose Finland, Czech Republic, New Zealand, Australia and Switzerland. These countries offer a variety of VRS/VRI models, issues, languages and technologies. At least one of these countries with multiple languages (Switzerland) has been unable to successfully implement VRS, and we believe it will be instructive to determine what obstacles have prevented success. For this phase we intend to research much more than just each country's basic VRS model (e.g., monopoly/competitive, cost/funding/reimbursement). We believe that there are many factors that affect the success or failure of how well VRS works in each country, and in order to provide comparative value to Canada, these factors will also need to be assessed. Thus our survey of VRS in other countries will include, but will not necessarily be limited to:

1. Identification of topic areas to be covered, such as:
 - a. Number of signed languages, user demographics and user demand.
 - b. Regulatory and administrative oversight responsibilities.
 - c. Administrative or regulatory involvement of people with communication disabilities.
 - d. Funding and cost reimbursement methodology.
 - e. Types of user services provided (e.g., end user equipment, installation, training, network, etc.)
 - f. Population demographics.
 - g. VRS education and outreach programs.

- h. VRS usage volumes and costs.
 - i. Fraudulent call volumes and fraud controls.
 - j. The VRS provider market.
 - k. Communication technologies broadly employed (availability of broadband, high speed mobile networks, etc.)
 - l. Challenges and lessons learned (e.g., impact on interpreter availability, cost escalation and containment, risk and failure points, etc.)
2. Research and communication with VRS regulatory and/or program authorities in other countries, primarily of the above factors.
3. Research and communication with sample VRS providers in other countries. (Are there many providers? From their point of view are they thriving? Are they having difficulty providing the services? What are their challenges? What would they want done differently?)
4. Research and communication with sample VRS consumer advocacy groups in other countries. (For example if the VRS model is thought to work well from the administration's point of view, but the service delivery is considered to work poorly from the consumers' point of view, we believe it would be instructive to find out why.)

PHASE 5 – TECHNOLOGIES AND THEIR FORECASTS

This phase will describe the current and forecast general availability of technologies that are necessary to deliver VRS to the consumer: broadband networks and consumer terminal equipment suitable for VRS. This phase will not research the proprietary systems of VRS and VRI providers. We assume that whatever VRS model is selected, the VRS providers will be able to create or obtain their proprietary internal hardware and software in support of their contracted services. However, consumers will be highly dependent upon the availability of public and private networks to deliver VRS to their locations. Similarly there are a variety of terminal equipment types that can support VRS at the user end. Identification of these types and their costs and complexity will be important factors to consider when assessing the viability of any VRS model. This phase will research:

1. Minimal two-way transmission speeds necessary for functional VRS.
2. The availability of broadband to the consumer at the necessary speeds from telephone company wired networks, cable companies, wireless providers (cellular and local WiFi), and satellite communications providers, compared to demographics.
3. National and corporate plans or initiatives to expand the reach of broadband within and across provinces.
4. Average costs of broadband, by type, to the consumer.
5. The types of terminal devices that support VRS, and their general availability, including wired and mobile.
6. Average terminal equipment costs, their complexity to install (e.g., consumer install or professional required?), and complexity to use (e.g., is consumer training necessary?)
7. Other considerations (e.g., some VRS models may require more complex terminal equipment than other VRS models in order to support a VRS model's potential for

limiting VRS fraud, tracking VRS demand and ASA, type of special interpretive skills or sign language requested by the consumer, etc.)

PHASE 6 – INTERPRETER CONSIDERATIONS

This phase will consider a variety of information pertaining to potential VRS interpreters critical to ensuring a Canadian VRS model that will work for regulators, providers and consumers. We might point out that many other operational factors of interpreter services would need to be defined within a more detailed RFP or contract for services that do not need to be included in this study, that is, for the purpose of recommending a functional VRS model.³ The interpreter considerations of phase 6 will include, but are not necessarily limited to, the following:

1. Minimum interpreter qualifications for VRS (e.g., education/training, standards/certifications, experience, etc.)
2. The estimated numbers of ASL interpreters and LSQ interpreters, plus the:
 - a. Estimated employment wages, benefits, costs.
 - b. Estimated labour pool and forecasted growth (e.g., Canadian scholastic programs, numbers entering the profession, turnover, etc.)
 - c. Ability of VRS operators in Canada to attract interpreters in light of competition for interpreters from federal and provincial governments, service organizations, and foreign (U.S.) VRS operators.
3. Based on forecast demand (the subject of phase 9), the estimated numbers of ASL and LSQ interpreters required for Canadian VRS.
4. The availability of the required interpreters, and the impact that Canadian VRS interpreter demand will have on:
 - a. Availability of interpreters for community needs.
 - b. Availability of interpreters for government and business requirements.
5. Potential responses to a forecast shortage of qualified interpreters:
 - a. Stimulation of interpreter educational programs (including time to ramp up, apprenticeship programs, etc.)
 - b. Financial incentives (grants, loans, etc.)

PHASE 7 – QUALITY OF SERVICE

This phase will research and identify those factors that individually and together will be considered by consumers, program administrators/regulators and vendors to be important for VRS Quality of Service. Not all factors will be easy to measure, and the ability to measure other factors may be dependent upon the technologies and VRS model selected. Final adoption and detailed definitions of the Quality of Service factors will need to be balanced between importance, costs and vendor reaction. As mentioned above in section 3.7, depending upon

³ Examples of RFP/contract factors include ergonomics for the work station, appropriate timing of work vs. breaks, rules and regulations for confidentiality, content and average length of time needed for training, appropriate incentives for compensation and retention, in-service training, internal career paths for advancement, etc.

the model selected, different Quality of Service factors may be best addressed via regulations, in contracts for services, or via vendor competition (if competition is the adopted model). For this phase 7, Quality of Service will be addressed in an overall conceptual manner rather than technical specifics. Quality of Service considerations will include, but will not necessarily be limited to:

1. Technical factors, such as:
 - a. Network throughput/bandwidth speeds.
 - b. Camera and screen resolution and refresh rates.
2. Consumer factors, such as:
 - a. Equipment set up and training.
 - b. Public education.
3. Interpreter factors, such as:
 - a. Training, standards, certification and experience.
 - b. Special signing vocabulary skills (e.g., medical, legal, etc.)
 - c. Minimum auditory standards.
4. Operational factors, such as:
 - a. Average Speed of Answer (ASA) and network blockage rates.
 - b. Minimum and maximum times for interpreter engagement.
 - c. Identification of fraudulent VRS calls, related security issues, and means of fraud protection.
 - d. Ability to be responsive to diverse user communication preferences.
 - e. Extension of Quality of Service to non-VRS functions such as VRI and customer service/billing.
5. Rules, oversight and enforcement factors of the public agency and the providers, such as:
 - a. Clearly defined and specific Quality of Service requirements.
 - b. Active reporting, review and notification of Quality of Service status.
 - c. Consequences for non-compliance that promote voluntary correction rather than punishment whenever possible.
6. Feedback and improvement mechanisms, such as:
 - a. Automated measurement and reporting.
 - b. Periodic Quality of Service site audits and remote testing/measurement.
 - c. Establishment of a complaint/improvement reporting system.
 - d. The possible role of consumer advisory committee(s).

PHASE 8 – POTENTIAL RELATED SERVICES

There are a number of service enhancements that are possible. Bell Canada's request has identified two significant subjects: Video Relay Interpreting and Emergency Services. For each related service we will research the need or application, cost, capability of vendors to provide, administrative oversight, and TRS regulatory congruency. For this phase 8, the topic of potential related services will be addressed in a more summarized or abstracted manner. Potential VRS related service enhancements to be considered will include:

1. Video Relay Interpreting [also called Video Remote Interpreting] (VRI). (Including cost, misuse/fraud, integration and offering, federal obligation and impact on interpreting services/use, etc.)
2. Video voice mail, IVR, and related message answer and playback services.
3. Non-ASL and non-LSQ forms of video communication (e.g., transliteration, lip reading, video speech-to-speech relay, VRS with text, and finger spelling.
4. Ability to select specialized vocabulary interpreters and gender (e.g., medical, legal, etc.)
5. French-ASL video translation service and English-LSQ video translation service.
6. Integration or interface with emergency services (e.g., E9-1-1 inbound, E9-1-1 outbound, Next Generation 9-1-1, and emergency broadcast notification services).

PHASE 9 – FORECASTS OF VRS USER DEMAND

This phase will endeavour to estimate the VRS user market size in Canada both in terms of population and forecasted VRS traffic (e.g., minutes of use). We will do this through an assessment and comparison of available Canadian demographic data; estimates of potential user demographics offered by consumer advocacy groups, education or other entities; analysis of Canadian TRS volumes, and comparison with similar data of other countries and/or states and provinces. We have access to significant TRS data for the U.S. including TTY, captioned telephone relay, IP-Relay, and VRS; and especially for California. Other data will be gathered from other countries in project phase 4. This phase 9 research will include:

1. Identification of factors that will affect Canadian user demand, such as:
 - a. Potential VRS consumer populations/demographics.
 - b. Availability of broadband to the consumer (see phase 5).
 - c. Availability of end user equipment (see phase 5).
 - d. Consumer ease of entry (cost, complexity, culture – see phase 5).
 - e. VRS Quality of Service, including security and fraud prevention measures (see phase 7).
 - f. Availability of related services (see phase 8).
 - g. Public education and outreach (see phase 10).
2. Estimates of Canadian user demand, including:
 - a. Volume (initial demand, growth demand, ALS, LSQ, gender demand.)
 - b. Usage patterns (average call length/duration, frequency of calls, and load variations in an average 24 hour period and seasonal.)

PHASE 10 – VRS COST VARIABLES AND FORECASTS

There are many potential factors that may impact costs to provide VRS to Canadians. This phase will identify those cost elements and estimate their cost impact. Not all elements may end up being incorporated into the selected VRS model. For example if a cost for public education is estimated, the final model or regulations may not include education. Internal cost elements of VRS providers (i.e., operational costs, overhead, research, etc.) will not be estimated, but will be assumed to be reflected in their anticipated per minute rates based on projected volumes. Nevertheless, costs will be grouped into three general categories:

Consumer costs, Program costs, and Usage costs. Some category costs may end up being borne by another category when the specific model or regulations are adopted. Regulatory costs (e.g. administrative costs of CRTC) and vendor costs will not be estimated. Potential costs within the Canadian context will be estimated for:

1. Consumer costs:
 - a. Terminal equipment, installation and training.
 - b. Broadband access and usage costs.
2. Program costs:
 - a. Administrative program costs (i.e., additional costs to administer the VRS program).
 - b. Anticipated impact of VRS usage on the volume and costs of traditional TTY relay, IP-Relay, and potentially on other forms of relay.
 - c. Public education and outreach campaigns (marketing/communication):
 - i. TRS program outreach.
 - ii. VRS consumer advocacy group outreach.
 - iii. General public mass media outreach.
3. Usage costs:
 - a. Costs related to Quality of Service, including fraudulent VRS calls (see phases 7 and 9).
 - b. Related VRS services such as VRI, emergency services, etcetera, congruent with phase 8's summary approach (see phase 8).
 - c. VRS vendor rates, for example:
 - i. Total per minute, per second, and per call.
 - ii. Per minute, per second, and per call of ASL.
 - iii. Per minute, per second, and per call of LSQ.
 - d. Vendor rates over time (anticipated cost trends by year).
4. Overall costs – Logical combinations of the above Consumer, Program and Usage costs within the Canadian context (e.g., maximum, minimum, etc.)

PHASE 11 – POTENTIAL CANADIAN VRS MODELS

Based on the findings of phases 1 through 10 above, for this phase we will identify the major elements and choices pertaining to potential models of VRS in Canada. From these we will create the most promising models for comparison and discussion with the Bell Canada project manager and project team.

1. Models presented will address at a summary level a number of crucial factors that are discussed in detail in the other phases:
 - a. Conformance with legal and regulatory environment (see phase 2).
 - b. Consumer needs and perspectives (see phase 3).
 - c. Experience of other countries (see phase 4).
 - d. Technologies to be employed (see phase 5).
 - e. Interpreter considerations (see phase 6).
 - f. Quality of Service considerations (see phase 7).
 - g. Related services (see phase 8).

- h. Forecast user demand (see phase 9).
 - i. Cost forecasts (see phase 10).
 2. Selection of models for this phase will also consider:
 - a. The ability to support one or more vendors and the appropriate framework (monopoly vs. competitive supply models) for LSQ and ASL.
 - b. The estimated costs of the different models (including per minute of service and overall gross annual cost).
 - c. Options for implementing, administering and funding VRS.
 3. Recommendations for the VRS model most suited to the Canadian context, per language (ASL/English and LSQ/French), for nationwide access.

PHASE 12 – VRS FEASIBILITY STUDY REPORT

This last phase is the creation of the final VRS Feasibility Study Report. This report will be compiled from information presented in the interim draft deliverables (phases 1 through 11 above). This final report is intended to be a research source document submitted by Bell to the CRTC. This report is not anticipated to be Bell's actual VRS filing, but is anticipated to accompany that filing.

It will be very important for Mission Consulting to work closely with Bell Canada in preparing for this final report. Before we create this final report we will meet with the Bell project manager and team to discuss the phase 11 interim draft deliverable; issues and considerations; and the potential outline, content, and design of this final report. We expect that not all of the information in the interim draft deliverables will need to be included in this final report. No new research is anticipated for this final report. This report will be delivered in draft form in English, and in final form in English after the Bell project team has an opportunity for review and feedback.

ANTICIPATED TIMELINE

Please refer to suggestions for timeline evaluation at the beginning of this section 4.

As proposed by Mission Consulting, the twelve project phases were initially designed to span nine months. During the course of the project this was expanded to fifteen months as depicted below with approximate durations of each phase. Advisory Committee meeting times are also as indicated.

Project phase	'10	2011												2012		
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
1 Project confirmation	█															
2 Legal background for VRS		█														
3 Consumer perspectives				█	█	█	█	█	█	█			█			
4 VRS in other countries			█	█	█	█	█					█				
5 Technologies & forecasts			█	█	█	█				█						
6 Interpreter considerations			█	█	█	█	█	█					█			
7 Quality of service								█	█	█						
8 Other related services						█	█	█								
9 Forecasts of user demand								█	█	█	█	█	█			
10 Cost variables & forecasts											█	█	█	█		
11 Potential VRS models											█	█	█			
12 Final Report														█	█	█
Advisory Committee meetings:				Δ	Δ			Δ			Δ	Δ		Δ		Δ

Phase 2:
Legal Background
for Canadian VRS

VRS Feasibility Study

Mission Consulting

February 24, 2012

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LEGAL BACKGROUND FOR CANADIAN VRS

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the second of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 2 research summary, *Legal Background for Canadian VRS*, provides a synopsis of the legal and regulatory environment in which telecommunications, and more specifically relay services, operate in Canada. This synopsis includes:

- an overview of the telecommunications regulatory environment;
- the rights of people with disabilities;
- consumer privacy and confidentiality considerations;
- relay obligations of telecommunications providers;
- access to emergency services; and
- market structure of services to people with disabilities.

2. Summary Findings

Salient points of this analysis of Canada's legal background for VRS include the following:

- All telecommunications service providers (TSPs) are required by the CRTC to provide Message Relay Service (MRS) in the form of TTY Relay and recently IP relay.¹
- TSPs affected include providers of virtually all types of voice telephony services, including ILECs, LECs, CLECs, wireless carriers, and VoIP providers.²

¹ CRTC Decision 85-29, and more recently TRP 2009-430 available at <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>. For definitions of TTY Relay and IP Relay, see this report's sections 3.1 and 3.2. At the time of this Phase 2 report (Jan 2011), IP Relay is just becoming operational for Canadians.

- TSPs may provide the MRS service directly, i.e., themselves; may contract out the service to a third party; or may use the MRS service of other TSPs, e.g., ILECs.
- MRS services are currently paid for by a per line charge of 13 cents per month. This rate is presently frozen by the CRTC.
- Telecommunications law and regulation is virtually the exclusive jurisdiction of the federal government and CRTC respectively. Provincial and local governments have little, if any, authority.
- Canadian law precludes most forms of discrimination against people with disabilities. This mandate for non-discrimination has also been incorporated into telecommunications regulations established by the CRTC.
- Canadian laws and CRTC regulations also include consumer privacy and confidentiality protections.
- Access to 9-1-1 emergency services are available through TTY Relay and IP Relay, although the CRTC has stated that this method of access for persons with hearing disabilities is not equivalent to that of hearing people.
- Access to 9-1-1 emergency services directly from the consumer via TTY is not assured equally throughout Canada as not all Canadian 9-1-1 call centers have TTY functionality.
- Access to 9-1-1 emergency services directly from the consumer via IP texting is presently not possible, as Canadian 9-1-1 call centers do not have IP texting functionality.
- The current market structure for telecommunications services in Canada provides a legal framework to support the implementation of Video Relay Service.
- The framework suggests that VRS, if ordered, will likely be required of all TSPs, as it presently is for TTY Relay and IP Relay.
- The framework offers a variety of possibilities of how VRS may be ordered and implemented.

3. Conclusion

Canadian laws and regulations have established a legal framework for the operation of Message Relay Services by telecommunications service providers (TSPs), currently in the form of TTY Relay and recently also IP Relay. This legal framework should support VRS as well, although the actual deployment, cost and payment structures may differ significantly. The deployment and cost models appropriate to VRS may include a number of possibilities, which will be subject to additional study as part of Bell's VRS Feasibility Study project and final report.

² ILEC = Incumbent Local Exchange Carrier; LEC = Local Exchange Carrier; CLEC = Competitive Local Exchange Carrier; VoIP = Voice over Internet Protocol.

Legal Background for Canadian VRS

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the second of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 2 research summary, *Legal Background for Canadian VRS*, provides a synopsis of the legal environment in which telecommunications, and more specifically relay services, operate in Canada. This synopsis includes:

- an overview of the telecommunications regulatory environment;
- the rights of people with disabilities;
- consumer privacy and confidentiality considerations;
- relay obligations of telecommunications providers;
- access to emergency services; and
- market structure of services to people with disabilities.

2. Legal Background

2.1. General Regulatory Context in Canada

Under Canada's *Constitution Act*³, 1867 (the "*Constitution Act*"), telecommunications networks and facilities in Canada which extend beyond the limits of a province are subject to exclusive regulation by the federal government. TSPs, to the extent that the networks they operate or utilize permit communication with points beyond the borders of a Canadian province or are interconnected to other networks which permit communications to extend beyond the boundaries of any of the Canadian provinces, are subject to the jurisdiction of the federal government.⁴

This does not mean that communications undertakings are immune from all provincial laws. However, communications undertakings are not subject to provincial laws, as one leading scholar states "to the extent that those laws affect the undertakings in what makes them specifically of federal jurisdiction, such as working conditions, labour relations, management of the undertaking, and, more particularly, the availability and quality of their services and the rates they charge for their services."⁵

There is also no authority in Canada for municipalities or provincial governments to establish franchises governing or limiting (or otherwise regulating) the eligibility of service providers to offer telecommunications services in Canada.

The *Telecommunications Act*⁶ 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. Additionally, Bell which serves portions of the provinces of Quebec and Ontario is subject to a specific statute which governs certain aspects of that company's operations.⁷

The *Telecommunications Act* sets out the powers the CRTC exercises and the duties it performs. The Act directs⁸ the CRTC to exercise these powers and perform these duties with a view to implementing the

³ (U.K.) 30 & 31 Vict., ch 3. A copy can be found at <http://www.canlii.org/en/ca/const/const1982.html>.

⁴ *Alberta Government Telephones v. Canada (CRTC)* [1989] 2 S.C.R. 225 (<http://scc.lexum.umontreal.ca/en/1989/1989scr2-225.html>); *Téléphone Guèvremont Inc. v. Québec (Régie des Télécommunications)* [1994] 1 S.C.R. 878 (<http://scc.lexum.umontreal.ca/en/1994/1994scr1-878/1994scr1-878.html>)

⁵ Ryan, Michael H. *Canadian Telecommunications Law and Regulation* Carswell, (1993, periodic updates) (2010 2nd release edition), paragraph 106.

⁶ S.C. 1993, c.38 as amended (the Act can be found at <http://laws.justice.gc.ca/en/T-3.4/>).

⁷ *Bell Canada Act*, S.C. 1987, ch. 19.

⁸ In section 47 of the Telecommunications Act.

Canadian telecommunications policy objectives set out in section 7 of the Act. Those objectives are as follows:

- (a) to facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions;*
- (b) to render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada;*
- (c) to enhance the efficiency and competitiveness, at the national and international levels, of Canadian telecommunications;*
- (d) to promote the ownership and control of Canadian carriers by Canadians;*
- (e) to promote the use of Canadian transmission facilities for telecommunications within Canada and between Canada and points outside Canada;*
- (f) to foster increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective;*
- (g) to stimulate research and development in Canada in the field of telecommunications and to encourage innovation in the provision of telecommunications services;*
- (h) to respond to the economic and social requirements of users of telecommunications services; and*
- (i) to contribute to the protection of the privacy of persons.⁹*

Under the Act, the offering and provision of any telecommunications service by a Canadian carrier¹⁰ are subject to any conditions imposed by the CRTC or included in a tariff approved by the Commission.¹¹ Canadian carriers are prohibited from offering a telecommunications service except in accordance with a tariff filed with and approved by the CRTC.¹² The rates charged by a Canadian carrier for a telecommunications service must be “just and reasonable”.¹³ 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.¹⁴ 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

⁹ Ibid., section 7 at http://laws.justice.gc.ca/eng/T-3.4/page-1.html#anchorbo-ga:l_l-gb:s_7.

¹⁰ Canadian carrier is defined in section 2 of the *Telecommunications Act*.

¹¹ Telecommunications Act, section 24.

¹² Ibid., section 25.

¹³ Ibid., section 27.

¹⁴ Ibid.

unreasonable disadvantage have occurred, as matters of fact.¹⁵ As discussed later, 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.

The *Act* further sets out eligibility rules for Canadian carriers, in the form of Canadian ownership and control requirements.¹⁶ These requirements apply solely to Canadian carriers and not to resellers (provided they are not also Canadian carriers) or to the suppliers of services to Canadian carriers (who are not themselves Canadian carriers).

The *Telecommunications Act* empowers the CRTC to "forbear" or refrain from exercising certain of its powers¹⁷ associated with the offering of telecommunications services by a Canadian carrier under certain circumstances. The ability to forbear in certain circumstances enables the Commission to, in effect, deregulate telecommunications services of a given class (in other words, exempt certain Canadian carriers from the application of some of the provisions of the *Act*, as defined by the Commission and subject to such conditions as the Commission may consider appropriate).

In most instances in which it has forborne, however, 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*).

In the proceeding it conducted to consider granting forbearance to the ILECs for their local telephony rates and conditions, the Commission addressed concerns raised by some parties regarding access to services by customers with disabilities. The Commission confirmed that one of the reasons it was retaining its authority under section 27(2) and its powers under section 24 of the *Act*, was to address potential problems in this area:

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 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

¹⁵ *Telecommunications Act*, section 27(3). Findings of fact are final, *Telecommunications Act* section 64.

¹⁶ Which are set out in section 16 of the *Telecommunications Act*

¹⁷ Those set out in the *Telecommunications Act*: sections 24 (conditions may be set by the Commission), 25 (telecommunications services subject to the prior approval of tariffs by the Commission), 27 (rates must be just and reasonable, no unjust discrimination, undue preferences), 29 (prior approval by CRTC of certain agreements with other telecommunications common carriers) and 31 (approval of carrier limitations of liability).

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....

The Commission notes that, in Decision 97-8, it retained its powers and duties under subsection 27(2) of the Act so that it could respond to complaints alleging unjust discrimination and undue preference in relation to services provided by CLECs to both end-users and other carriers. The Commission did so to ensure access to CLEC facilities to enhance the efficiency and effectiveness of the Canadian telecommunications industry. The Commission considers that the concerns expressed in Decision 97-8 with respect to the need to retain subsection 27(2) of the Act in the case of CLECs apply with equal force in the case of ILECs in forborne markets established pursuant to the local forbearance framework.¹⁸

The CRTC is required to exercise its powers in accordance with any orders made by the Governor in Council¹⁹. In December 2006, the Governor in Council made an *Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives*²⁰ (the “Policy Direction”).

Under the Policy Direction, the Commission in the exercise of its powers and the performance of its duties under the Act, has been directed to implement the Canadian telecommunications policy objectives set out in the Act and to rely on market forces to the maximum extent feasible as the means of achieving those policy objectives.

The Commission has also been directed to use measures that are efficient and proportionate to their purpose and that interfere with the operation of competitive market forces to the minimum extent necessary to meet the telecommunications policy objectives.

When it relies on regulation, the Commission has been directed to use measures that:

- a) specify the Canadian telecommunications policy objective that is advanced by those measures and demonstrate their compliance with the Policy Direction;
- b) if they are of an economic nature, neither deter economically efficient competitive entry into the market nor promote economically inefficient entry,
- c) if they are not of an economic nature, to the greatest extent possible, are implemented in a symmetrical and competitively neutral manner, and
- d) if they relate to network interconnection arrangements or regimes for access to networks, buildings, in-building wiring or support structures, ensure the technological and competitive neutrality of those arrangements or regimes, to the

¹⁸ Telecom Decision CRTC 2006-15 *Forbearance from regulation of retail local exchange services*, <http://www.crtc.gc.ca/eng/archive/2006/dt2006-15c.htm>, paragraphs 458-460.

¹⁹ Telecommunications Act, section 47.

²⁰ P.C. 2006-1534 December 14, 2006 <http://laws.justice.gc.ca/en/showdoc/cr/SOR-2006-355/>.

greatest extent possible, to enable competition from new technologies and not to artificially favour either Canadian carriers or resellers;

Further to the issuance of the Policy Directive, the Commission has conducted a review of its regulatory measures. Among the measures the Commission has reviewed are those which relate to accessibility to telecommunications services by persons with disabilities.²¹

2.2. Rights of People with Disabilities

This section reviews the rights of people with disabilities as pertains to the Constitution Act's *Charter of Rights and Freedoms*, the *Canadian Human Rights Act*, and the *U.N. Convention on Rights of Persons with Disabilities*. The Commission's application of these three instruments is discussed following their definitions.

2.2.1. Charter of Rights and Freedoms

Canada's Constitution Act also sets out a Charter of Rights and Freedoms (the *Charter*)²². Section 15 of the Charter states that:

(1) Every individual is equal before and under the law and has the right to the equal protection and equal benefit of the law without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.

(2) Subsection (1) does not preclude any law, program or activity that has as its object the amelioration of conditions of disadvantaged individuals or groups including those that are disadvantaged because of race, national or ethnic origin, colour, religion, sex, age or mental or physical disability

2.2.2. Canadian Human Rights Act

The Canadian Human Rights Act ("CHRA") prohibits:

*... discriminatory practices based on race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, family status, disability or conviction for an offence for which a pardon has been granted.*²³

The legislation's application is limited to "matters coming within the legislative authority of Parliament".²⁴ On at least one occasion, the Commission has observed that the impact of the CHRA

²¹ The outcome of this review was Telecom Regulatory Policy 2009-430, discussed below.

²² Schedule B to the Canada Act 1982, (U.K.) 1982, c. 11

²³ R.S.C. 1985, c. H-6 (as am.), section 2

²⁴ Ibid.

upon telecommunications services it regulates must be assessed within a broader context.²⁵ The Commission adopted this broader context on the basis that the *Telecommunications Act* sets out a range of policy objectives specifically focused upon telecommunications services -- which the Commission must balance, whereas CHRA sets out general prohibitions against discrimination based on a list of grounds. Section 47 of the Telecommunications Act specifically requires the Commission to “exercise its powers and perform its duties under this Act and any Special Act [such as the Bell Canada Act] with a view to implementing the Canadian telecommunications policy objectives.”

2.2.3. U.N. Convention on the Rights of Persons with Disabilities

Canada is a signatory to and has ratified the United Nations’ *Convention on the Rights of Persons with Disabilities*.²⁶ Article 9 of the Convention addresses accessibility.

Article 9 provides that “State Parties” undertake to “take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, ... to information and communications, including information and communications technologies and systems....”²⁷

²⁵ See, for example, Telecom Decision CRTC 2006-15, paragraph 459.

²⁶ UN General Assembly, *Convention on the Rights of Persons with Disabilities: resolution / adopted by the General Assembly, 24 January 2007, A/RES/61/106*, (available at: www.unhcr.org/refworld/docid/45f973632.html). Canada, however, has not ratified or signed the *Optional Protocol to the Convention on the Rights of Persons with Disabilities* (available at: www.un.org/disabilities/default.asp?id=311).

²⁷ Article 9 in its entirety provides as follows:

1. To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:
 - a) Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;
 - b) Information, communications and other services, including electronic services and emergency services.
2. States Parties shall also take appropriate measures:
 - a) To develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public;
 - b) To ensure that private entities that offer facilities and services which are open or provided to the public take into account all aspects of accessibility for persons with disabilities;
 - c) To provide training for stakeholders on accessibility issues facing persons with disabilities;
 - d) To provide in buildings and other facilities open to the public signage in Braille and in easy to read and understand forms;
 - e) To provide forms of live assistance and intermediaries, including guides, readers and professional sign language interpreters, to facilitate accessibility to buildings and other facilities open to the public;
 - f) To promote other appropriate forms of assistance and support to persons with disabilities to ensure their access to information;

[footnote continues on next page]

2.2.4. Commission application of *Canadian Human Rights Act, Charter, and Convention*

In Telecom Decision CRTC 2004-47, the Commission set out its approach to the protections set out in the *Charter* and in the *CHRA* regarding discrimination based on physical disability in relation to the supply of telecommunications services. The Commission described its approach as follows:

The Commission notes that, unlike other bodies responsible for administering human rights codes whose mandates are exclusively human rights in nature, the Commission's mandate under the Act is to regulate the telecommunications system in Canada. Part of that mandate, as expressed in subsection 27(2) of the Act, includes an anti-discrimination provision which obliges the Commission to ensure that Canadian carriers provide telecommunications services in a manner that is not unjustly discriminatory. Given the breadth of the Canadian telecommunications policy objectives contained in section 7 of the Act and the direction contained in subsection 47(a) of the Act, regulation of the telecommunications system necessarily involves the balancing of competing objectives. Thus, in determining whether the discrimination is unjust and in developing an appropriate regulatory response, the Commission must make a polycentric policy decision that balances multiple objectives and competing interests. The Commission would not be fulfilling its mandate if it engaged solely in a human rights analysis divorced from consideration of the full range of Canadian telecommunications policy objectives.

Accordingly, the Commission's polycentric approach to determining what constitutes "unjust" discrimination in the provision of a telecommunications service utilizes leading Canadian human rights principles that recognize that equality is a fundamental value and central component of the public interest and further considers an application of those principles within the broader policy framework imposed by section 7 of the Act.²⁸

In Broadcasting and Telecom Regulatory Policy 2009-430 *Accessibility of telecommunications and broadcasting services* ("TRP 2009-430")²⁹ the Commission determined that its findings set out in that Regulatory Policy (which is discussed further below) 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.

-
- g) To promote access for persons with disabilities to new information and communications technologies and systems, including the Internet;
 - h) To promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost.

²⁸ Telecom Decision CRTC 2004-47 *Access to pay telephone service*, (<http://www.crtc.gc.ca/eng/archive/2004/dt2004-47.htm>), paragraphs 134, 135.

²⁹ <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>.

Given the breadth of the broadcasting and telecommunications policy objectives contained in section 3 of the Broadcasting Act and section 7 of the Telecommunications Act and the directions contained in section 5 of the Broadcasting Act and section 47 of the Telecommunications Act, regulation of the broadcasting and telecommunications systems necessarily involves the balancing of competing objectives.

Thus, in assessing the reasonableness of the accommodations proposed in this proceeding, the Commission has considered the extent to which resources are available in the context of paragraph 3(1)(p) of the Broadcasting Act and whether or not discrimination in the provision of or the charging of a rate for a telecommunications service is "unjust" within the meaning of subsection 27(2) of the Telecommunications Act.

The Commission has done so within the broader policy framework imposed by the governing legislation and, in the case of telecommunications, with reference to the Order Issuing a Direction to the CRTC on Implementing the Canadian Telecommunications Policy Objectives [P.C. 2006-1534, 14 December 2006] (the Policy Direction). In considering whether or not the proposed accommodations are reasonable, the Commission has also utilized leading Canadian human rights principles that recognize that equality is a fundamental value and central component of the public interest.³⁰

Regarding the reasonable character of proposed arrangements to meet the expressed needs of persons with disabilities, the Commission has stated that a service arrangement provided to customers with a disability need not be equivalent to services provided to non-disabled customers. In Telecom Decision CRTC 2007-20, the Commission stated that:

... in certain circumstances, access to a service may not be provided on an equivalent basis. For example, accommodation via a third person, which could raise privacy issues, might not constitute an equivalent alternative. On the other hand, the use of an additional piece of terminal equipment such as a telephone set adjunct may be a reasonable accommodation that provides suitable equivalency in certain circumstances.³¹

The approach to *Charter* obligations set out in Decision 2004-47 and in TRP 2009-430 would also likely apply to undertakings set out in the *Convention*. It is worth noting in this respect that the obligations and undertakings set out in section 9 of the *Convention* refer to the taking of "appropriate measures". The decision as to what constitute "appropriate measures" appears to be left to the State Parties themselves. The reference to "appropriate measures" also implies that it is appropriate (and consistent with the provisions of the *Convention*) for the Commission when it renders a decision regarding the

³⁰ Paragraphs 3-6.

³¹ Telecom Decision CRTC 2007-20 *Access to certain telecommunications services by persons who are blind* <http://www.crtc.gc.ca/eng/archive/2007/dt2007-20.htm>, paragraph 43.

rights of persons with disabilities to balance all of the objectives of Canada’s telecommunications policy (set out in section 7 of the Act) and to reflect the directions issued in the Policy Direction.

2.3. Telecommunications Customer Privacy and Confidentiality

Virtually all Canadian carriers and telecommunications service providers that rely upon underlying services or facilities to provide telecommunications services are subject to basic requirements set by the CRTC regarding customer privacy and confidentiality.³²

The Commission’s requirement is that, subject to certain exceptions (discussed below) unless disclosure is made pursuant to a legal power, a TSP is prohibited from disclosing any customer information to any person other than the customer without the written consent of the customer, other than for the customer's name, address and listed telephone number.³³

The restrictions regarding the disclosure of confidential customer information are subject to exceptions. Customer information may thus not be disclosed to anyone **other** than:

- 1) *the customer;*
- 2) *a person who, in the reasonable judgment of the Company, is seeking the information as an agent of the customer;*
- 3) *another telephone company, provided the information is required for the efficient and cost effective provision of telephone service and disclosure is made on a confidential basis with the information to be used only for that purpose;*

³² With the exception of mobile wireless services that are not switched, such as paging providers.

³³ These privacy and confidentiality requirements were initially approved by the Commission in Telecom Decision CRTC 86-7 *Review of the general regulations of the federally regulated terrestrial telecommunications common carriers* (available at: <http://www.crtc.gc.ca/eng/archive/1986/DT86-7.HTM>). In Decision 97-8, applicability of the requirements was extended to all competitive LECs and resellers. For all local exchange carriers, the rule was modified in Order CRTC 2001-279 *Provision of subscribers’ telecommunications service provider identification information to law enforcement agencies*, (available at <http://www.crtc.gc.ca/eng/archive/2001/o2001-279.HTM>) and in Telecom Decision CRTC 2002-21 *Provision of subscribers’ telecommunications service provider identification to law enforcement agencies*, (available at <http://www.crtc.gc.ca/eng/archive/2002/dt2002-21.htm>). In Telecom Decision CRTC 2004-27 *Follow-up to Telecom Decision CRTC 2003-33 - Confidentiality provisions of Canadian carriers*, (available at <http://www.crtc.gc.ca/eng/archive/2004/dt2004-27.htm>), the Commission directed all Canadian carriers “as a condition of providing telecommunications services, to include in their service contracts or other arrangements with resellers the requirement to abide by the confidentiality provisions established in Decision 86-7, as modified from time to time”. In Telecom Decision CRTC 2005-15 Part VII application to revise Article 11 of the Terms of Service (available at <http://www.crtc.gc.ca/eng/archive/2005/dt2005-15.htm>), the Commission modified its requirements regarding customer consent to *expand the list of methods which may be used to obtain a customer’s consent for the disclosure of confidential customer information*. In Telecom Regulatory Policy CRTC 2009-723 *Regulatory measures associated with confidentiality provisions and privacy services*, the Commission revised its rules to permit the disclosure of confidential customer information to affiliates that provide telecommunications or broadcasting services. The Commission also requires all LECs, resellers who provide local telephone service and VoIP service providers who offer local voice service, to offer services designed to protect customer privacy, namely call display, call display blocking, and call trace.

- 4) *a company involved in supplying the customer with telephone directories, provided the information is required for that purpose; or*
- 5) *an agent retained by the Company in the collection of the customer's account, provided the information is required for that purpose.*

Items 2) and 3) above, could presumably include relay (including VRS) operators, provided these service providers are themselves subject to contractual confidentiality requirements.

Canada's Criminal Code³⁴ ("the Code") sets out restrictions regarding the "interception" of "private communications. Section 184 (1) of the Code states that:

Everyone who, by means of any electro-magnetic, acoustic, mechanical or other device, wilfully intercepts a private communication is guilty of an indictable offence.

Interception under the Code includes the following activities: to "listen to, record or acquire a communication or acquire the substance, meaning or purport thereof".³⁵ A private communication is defined as:

any oral communication, or any telecommunication, that is made by an originator who is in Canada or is intended by the originator to be received by a person who is in Canada and that is made under circumstances in which it is reasonable for the originator to expect that it will not be intercepted by any person other than the person intended by the originator to receive it, and includes any radio-based telephone communication that is treated electronically or otherwise for the purpose of preventing intelligible reception by any person other than the person intended by the originator to receive it.³⁶

It appears highly unlikely, however, that these provisions could be invoked to restrict the provision of TTY Relay, IP Relay or VRS since section 184 (2) provides, as an exception to section 184(1), that the offence of interception in section 184(1) does not apply to:

(a) a person who has the consent to intercept, express or implied, of the originator of the private communication or of the person intended by the originator thereof to receive it.

³⁴ R.S., 1985, c. C-46 as am.

³⁵ Criminal Code, section 183.

³⁶ Ibid.

3. Relay Services: Background, Obligations, Rating and Pricing

3.1. TTY Relay Service

3.1.1. Policy and rationale

A requirement to provide access to TTY Relay Service³⁷ was first established by the Commission in Telecom Decision CRTC 85-29 (“Decision 85-29”). This decision, which focused upon British Columbia Telephone Company (“B.C. Tel”, subsequently (in 1999) merged with AGT Limited (serving the province of Alberta) to form what is now Telus Communications Company (“TCC”)), directed B.C. Tel to provide TTY Relay to its customers in British Columbia. In Decision 85-19, the Commission set out the following rationale underlying the direction:

In providing telephone service, B.C. Tel is providing a means by which subscribers who pay primary exchange service rates can communicate with other subscribers. Hearing impaired subscribers pay full rates to B.C. Tel for primary exchange service and, as well, incur expenses for their own special terminals, the TDD's. They should, therefore be provided by B.C. Tel with the same ability as any other subscriber to communicate with any and all other subscribers. The Commission believes that the [TTY Relay Service Centre operated and funded by B.C. Tel] is the best method currently available to provide the hearing impaired with this ability and considers that it is B.C. Tel's responsibility to provide it.

The Commission wishes to emphasize that this is not a question of ordering a telephone company to provide a service enhancement or a discount, at its own cost, due to the disability of a particular class of customer. Rather, it is the provision by a telephone company, to rate paying subscribers, of the means to use the telephone on a basis that attempts to provide access comparable to that of other subscribers.³⁸

In subsequent decisions and orders, the Commission reiterated this rationale. More recently, in Telecom Regulatory Policy 2009-430, the Commission set out its rationale in the following terms:

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.

³⁷ In this document the term “TTY” (Teletypewriter) is used instead of “TDD” (Telecommunications Device for the Deaf), as TDD is now obsolete. The exception to this is when TDD is found in a passage cited in a document from a third party, in which case the original wording has not been altered.

³⁸ Decision 85-29, section II: Responsibility to provide VRSC. The decision can be found at <http://www.crtc.gc.ca/eng/archive/1985/DT85-29.HTM>.

3.1.2. Functional scope of the obligation to provide TTY Relay

In its initial decisions regarding TTY Relay, the Commission set out the functional scope of the obligation to provide the service. In Decision 85-29, the Commission described the functionality provided as:

...the means by which hearing impaired subscribers, who must use telecommunications devices for the deaf (TDD's) to use the telephone network, can send messages to, and receive them from, other telephone subscribers. These messages are relayed by specially trained operators located at the [TTY Relay Service Centre].

The Commission noted in this decision as well as in subsequent ones that “24 hour operation of the VRSC to handle all calls to and from the hearing-impaired is consistent with the Commission's view that the hearing-impaired should have telephone access which closely approximates that of other subscribers”. More recently, the Commission reiterated this requirement in TRP 2009-430.³⁹

In Decision 85-29 and in subsequent decisions, the Commission has stated that TTYs would be supplied by the subscriber.⁴⁰

In Decision 85-29, the Commission also determined that the LEC with responsibility to provide TTY Relay should have the ability to choose the location from which the service is provided.⁴¹ More generally, the Commission also stated that the LEC with responsibility to provide the service should control the manner in which the service is provided:

The Commission considers that B.C. Tel's responsibility to provide the VRSC requires that the company have sufficient control over the service to enable it to discharge this responsibility. Accordingly, the company should have the discretion with respect to the method of providing the VRSC that it does with any of its other services.⁴²

3.1.3. Who must provide TTY Relay service

In a series of decisions and orders following Decision 85-29, the Commission extended the requirement to all of the other ILECs⁴³. Furthermore, in Telecom Decision 1997-8 *Local Competition*, the Commission extended the obligation to provide TTY Relay to include all Local Exchange Carriers (“LECs”), namely, all

³⁹ Para. 11.

⁴⁰ Decision 85-12, Section II Responsibility to provide VRSC: “Hearing impaired subscribers pay full rates to B.C. Tel for primary exchange service and, as well, incur expenses for their own special terminals, the TDD's.”

⁴¹ Decision 85-29, section III: VSRC Operations, para. B.

⁴² Decision 85-29, Section VI, BC Tel's role in the VRSC.

⁴³ For example, Telecom Decision CRTC 86-17 Bell Canada – Review of Revenue Requirements for the Years 1985, 1986 and 1987 (<http://www.crtc.gc.ca/eng/archive/1986/DT86-17.HTM>); Island Tel and Maritime Telephone and Telegraph in CRTC Telecom Letter Decision 90-17 (<http://www.crtc.gc.ca/eng/archive/1990/90-17.HTM>); in Telecom Decision CRTC 90-15 Newfoundland Telephone Company Limited – Revenue Requirements for the Years 1990 and 1991 and Attachment of Customer-Provided Multi-Line Terminal Equipment (<http://www.crtc.gc.ca/eng/archive/1990/DT90-15.HTM>).

Small ILECs (“SILECs”) and Competitive Local Exchange Carriers (“CLECs”), as well as the ILECs. The Commission extended the obligation to provide TTY Relay to wireless CLECs in Telecom Order CRTC 98-1.⁴⁴ In Telecom Decision 2005-28 *Regulatory framework for voice communication services using Internet Protocol*, the Commission required all VoIP service providers (fixed as well as nomadic VoIP services) to provide TTY Relay. Resellers who resell other LECs’ services to provide local exchange telephony are also required to provide TTY Relay, pursuant to the serving obligations set out in the underlying LECs’ contractual arrangements⁴⁵ when such LECs provide underlying services to resellers. Service providers meet their obligation to provide TTY Relay by supplying the relay operator service functionality themselves or by outsourcing the supply of this functionality to another provider (potentially a third party TTY Relay operator service provider or an ILEC).

TTY Relay is also part of what the CRTC has referred to as the “basic service objective” (“BSO”)⁴⁶. The BSO sets a basic level of telephone service that the CRTC requires the ILECs to meet. CLECs who want to have access to the CRTC’s local service subsidy regime⁴⁷ (which provides a subsidy for retail rates in higher cost locations) must also meet the BSO.

3.1.4. Rating and pricing of TTY Relay

TTY Relay is provided at no charge to users of the service.⁴⁸ In Decision 85-29, the CRTC mandated BC Tel to recover its TTY Relay costs from its rate base. In Telecom Decision CRTC 86-17,⁴⁹ the CRTC directed Bell to fund TTY Relay from its general body of telephone subscribers and rejected a request from Bell to set out a separate levy in customer bills on a per access line basis. This approach has been subsequently maintained. Costs (and rates) incurred to provide access to TTY Relay are bundled in the

⁴⁴ And to competitive pay telephone service providers in Telecom Decision CRTC 98-8 *Local Pay Telephone Competition* (<http://www.crtc.gc.ca/eng/archive/1998/DT98-8.HTM>).

⁴⁵ In accordance with Telecom Decision CRTC 97-8 *Local competition*, paragraph 279 (<http://www.crtc.gc.ca/eng/archive/1997/DT97-8.HTM>). For a more recent example, see paragraph 70 of Broadcasting and Telecom Regulatory Policy CRTC 2009-430 *Accessibility of telecommunications and broadcasting services* (<http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>) regarding the implementation of the Commission’s directives.

⁴⁶ Telecom Decision CRTC 99-16 *Telephone service to high cost serving areas* (<http://www.crtc.gc.ca/eng/archive/1999/DT99-16.HTM>).

⁴⁷ Established in Decision CRTC 2000-745 *Changes to the contribution regime* (can be found 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* (<http://www.crtc.gc.ca/eng/archive/2007/ct2007-15.htm>).

⁴⁸ 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>).

⁴⁹ <http://www.crtc.gc.ca/eng/archive/1986/DT86-17.htm>.

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 in Telecom Order 96-269, this was also extended to lines provided by independent telephone companies and cellular telephony providers⁵⁰ which interconnect to the ILECs' networks. In Telecom Order 96-269, the Commission also rejected a request by Bell Canada seeking to increase its TTY Relay rate from 13 cents per month per subscriber to 15 cents per month. In Decision 97-9, the Commission froze rates for TTY Relay services at the 13 cents level.⁵¹

As a result of forbearance, ILECs' retail telecommunications services rates have been forborne in a substantial proportion of locations.⁵² Their competitors' retail rates have been forborne from the outset.⁵³ While long distance rates have been forborne, nonetheless, certain long distance calls placed using TTY Relay are subject to a discount (typically 50%) on applicable long distance charges.⁵⁴ Certain discounts also apply to long distance calls using TTY Relay placed from a pay phone. Registered TTY users are also eligible for a rebate on Canada-to-Canada long distance calls that are billed to their Bell Canada/Bell Aliant residential telephone service.

3.1.5. Wholesale obligations

The ILECs' TTY Relay services are required to be offered to other service providers under tariffs as "public good" services. Wholesale rates are identical to the retail rates and are also frozen.

⁵⁰ Telecom Order 96-269, <http://www.crtc.gc.ca/eng/archive/1996/O96-269.HTM>

⁵¹ Rates were initially set based on incremental costs and a regulated mark-up. Rates were frozen at current levels in Telecom Decision CRTC 97-9 *Price cap Regulation and Related Issues*, paragraph 153 (<http://www.crtc.gc.ca/eng/archive/1997/DT97-9.HTM>). The freeze was continued in Telecom Decision CRTC 2002-34 *Regulatory framework for second price cap period*, (<http://www.crtc.gc.ca/eng/archive/2002/dt2002-34.htm>), paragraph 452 and in Telecom Decision CRTC 2007-27 *Price cap framework for large incumbent local exchange carriers* (<http://www.crtc.gc.ca/eng/archive/2007/dt2007-27.htm>).

⁵² Additionally, re out-of-territory services: see Decision CRTC 2001-534 *Forbearance from regulation of incumbent local exchange carriers' out-of-territory services* (<http://www.crtc.gc.ca/eng/archive/2001/DT2001-534.htm>) and Telecom Decision CRTC 2006-15 (as amended) *Forbearance from the regulation of retail local exchange services* (<http://www.crtc.gc.ca/eng/archive/2006/dt2006-15c.htm>).

⁵³ I.e. for local exchange voice telephony service, in Decision 97-8. More generally, in Telecom Decision CRTC 95-19 *Forbearance – Services provided by non-dominant Canadian carriers* (<http://www.crtc.gc.ca/eng/archive/1995/DT95-19.HTM>)

⁵⁴ This discount was first established by the Commission in Telecom Decision CRTC 80-14 *Bell Canada, General Increase in Rate*. When it removed the last constraints regarding the ILECs' long distance rates, the Commission retained the discount, see Telecom Decision CRTC 2007-56 *Review of the regulatory constraints that apply to the basic toll schedules* (available at: <http://www.crtc.gc.ca/eng/archive/2007/dt2007-56.htm#n5>). The discount also applies to calls billed to a business line, see Telecom Order CRTC 2000-17 (available at: <http://www.crtc.gc.ca/eng/archive/2000/O2000-17.HTM>).

3.2. IP Relay Service

3.2.1. Functional scope of IP Relay

In Broadcasting and Telecom Regulatory Policy CRTC 2009-430 (TRP 2009-430) the Commission directed all⁵⁵ service providers who are currently required to provide TTY Relay to also⁵⁶ provide IP Relay service. The Commission described the functionality provided by IP Relay service as follows:

In an IP Relay call, the relay operator transmits messages via Internet Protocol (IP)-based text conversation with a person with a hearing or speech disability and via voice conversation with a person without such a disability. The person with a hearing or speech disability communicates using text with the relay operator via the Internet and accesses the IP Relay service through the IP Relay provider's Web page or an Instant Messaging application using IP-based text messaging supported on a web-enabled device (mobile wireless phone, smartphone, web-capable telephone, etc.).

From the perspective of a relay service user with a hearing or speech disability, IP Relay is a logical evolution of TTY Relay. Both TTY Relay and IP Relay are text-to-voice relay services; however, IP Relay is not subject to the same technological limitations as TTY Relay. IP Relay enables faster communication between the user with a disability and the relay operator (including calls to 9-1-1). IP Relay enables users to make relay calls using a web-capable device where there is Internet access. IP Relay allows users to see significantly more of the conversation on their computer screens than they can see with a TTY liquid crystal display (LCD) window. IP Relay allows users to print out and save conversations. IP Relay users can initiate multiple calls simultaneously and make conference calls. In light of the above, the Commission considers that the provision of IP Relay would provide significant benefit to TTY Relay users.⁵⁷

In TRP 2009-430, the Commission also confirmed that service providers may meet their obligation to offer IP Relay by providing the service themselves or by “outsourcing the provision of the service to a third-party”⁵⁸.

⁵⁵ To this end, the Commission required Canadian carriers to include in their contracts with wholesale customers who resell their services (typically known as resellers) to provide voice telephony a condition requiring resellers to meet the same requirement (TRP 2009-430, paragraph 23).

⁵⁶ The Commission stated (TRP 2009-430, paragraph 20) that:

The Commission further finds it appropriate to continue to require the provision of TTY Relay to meet the specific needs of certain Canadians - particularly those who are DeafBlind, those without Internet access and those who access relay services using payphones.

⁵⁷ TRP 2009-430, paragraphs 16-17.

⁵⁸ *Ibid.*, paragraph 21.

3.2.2. Rating, pricing and availability of IP Relay

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.⁵⁹ On the basis of its finding that “the amount collected to provide TTY Relay has exceeded the amount required to provide it”,⁶⁰ the Commission stated it did “not expect the proposed tariffs to include rate increases”.

In TRP 2009-430, the Commission directed “all LECs, including wireless CLECs, and VoIP providers that are required to provide TTY Relay” to make IP Relay available by 21 July 2010.⁶¹

Further to requests received from a number of service providers early in 2010, the Commission on 25 June 2010 issued a revised timeline for the deployment of IP Relay service.⁶²

Telus Communications Company filed a tariff for wholesale IP Relay service on 17 December 2010. As further explained in its filing letter, Telus chose to provide the service by way of a customer specific special facilities tariff, on the basis that, due to the presence of alternative operator service providers in the marketplace, wholesale IP Relay service should be offered based on customer-specific negotiated arrangements.⁶³

⁵⁹ 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 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.

⁶⁰ However, see also Telecom Decision 2010-679 *TELUS Communications Company – Request for an additional drawdown from its deferral account for accessibility initiatives* (<http://www.crtc.gc.ca/eng/archive/2010/2010-679.htm>).

⁶¹ TRP 2009-430, paragraph 21.

⁶² Commission letter issued 25 June 2010, <http://www.crtc.gc.ca/eng/archive/2010/lt100625.htm>.

⁶³ TELUS, Tariff Notice 403 (filed on 17 December 2010), amended by Tariff Notice 403A (filed on 5 January 2011) (<http://www.crtc.gc.ca/8740/eng/2011/T66.htm#201100023>) In TN 403, TELUS notes that the proposed wholesale tariff contains “ terms, conditions and rates of an arrangement which provides for IP Relay Service with service features that meet the specific requirements of a single large customer application”. TELUS’s wholesale tariff includes a one-time “set-up” charge (\$2.28M) and a per second usage component which sets out two rates (one for the use of “onshore operators” and one for “offshore operators”). TELUS states that it is providing IP Relay service in this tariff “through a combination of “onshore” and “offshore” IP Relay service agents and the proposed [serving arrangement] includes different onshore and offshore rates.”

By letter dated 8 December 2010,⁶⁴ Bell Canada and Bell Aliant⁶⁵ notified the Commission of their expectation that they would deploy retail and wholesale IP Relay services by 30 January 2011. In subsequent letters⁶⁶ a number of service providers notified the Commission that they would also require additional time and, more particularly that they would require up to 90 days following the availability of the Bell companies' wholesale IP Relay service to deploy IP Relay functionality to their own retail customers. By letter dated 22 December 2010,⁶⁷ the Commission set out revised dates for the deployment of IP Relay service. In a letter issued 11 January 2011 the Commission extended those dates to additional carriers who had requested delays. It also reiterated its direction to carriers to ensure that they file tariffs for IP Relay no less than 30 days prior to implementation and that they "report to the Commission via letter once they are providing access to IP relay services to their retail customers".⁶⁸

3.3. Video Relay Service

3.3.1. Policy and rationale

In Telecom Decision CRTC 2008-1, the Commission gave its approval to separate proposals put forward by a number of ILECs, including Bell Canada, to enhance accessibility by persons with disabilities of their telecommunications services, notably their voice telephony services. These proposals included the development and launch of VRS. The Commission described the functionality to be provided by VRS in the following terms:

*a service that would allow a person using sign language and another person using voice to communicate through a relay agent via high-speed Internet and a video camera.*⁶⁹

The Commission found that the VRS proposals were consistent with its earlier directions regarding disposal of ILEC deferral account balances. These directions were set out in Telecom Decision CRTC 2006-9.⁷⁰

⁶⁴ The letter can be found at: http://www.crtc.gc.ca/PartVII/eng/2008/8665/c12_200807943.htm. In addition to the request from Bell Canada and Bell Aliant, MTS Allstream requested an extension until 31 March 2011.

⁶⁵ The letter was also filed on behalf of KMTS, NorthernTel, Limited Partnership and Telebec, Limited Partnership. Implementation dates requested for these companies was 1 March 2011.

⁶⁶ The various requests are reproduced out in section 2a) of the CRTC's website associated with the following proceeding: Broadcasting Notice of Public Hearing 2008-8 - Telecom Public Notice CRTC 2008-8 - *Unresolved issues related to the accessibility of telecommunications and broadcasting services to persons with disabilities* (http://www.crtc.gc.ca/PartVII/eng/2008/8665/c12_200807943.htm).

⁶⁷ The letter can be found at <http://www.crtc.gc.ca/eng/archive/2010/lt101222.htm>.

⁶⁸ See <http://www.crtc.gc.ca/eng/archive/2011/lt110111b.htm>.

⁶⁹ Decision 2008-1, paragraph 6.

⁷⁰ Further to the implementation, in the mid 1990s of price cap regulation in relation to the regulated services of the ILECs (in Telecom Decision CRTC 94-19 *Review of Regulatory Framework* (<http://www.crtc.gc.ca/eng/archive/1994/DT94-19.HTM>) and Telecom Decision CRTC 97-9 *Price Cap Regulation* [footnote continues on next page]

The Commission also found, however, that:

... while the ILECs sought Commission approval to set aside deferral account funds for future accessibility initiatives, their proposals in respect of these future initiatives contained little information about the initiatives themselves. The Commission considers that reports alone will not allow interested parties an opportunity to understand, assess, and comment on the proposals. The Commission considers that a public proceeding is the appropriate vehicle to ensure that the future accessibility proposals meet the requirements of persons with disabilities and Telecom Decision 2006-9. Accordingly, the Commission directs Bell Canada, MTS Allstream, and TCC to submit their future accessibility proposals for Commission approval.⁷¹

In Broadcasting Notice of Public Hearing CRTC 2008-8 and Telecom Public Notice CRTC 2008-8 *Unresolved issues related to the accessibility of telecommunications and broadcasting services to persons with disabilities* (PN 2008-8), the Commission initiated a public proceeding to seek public comments regarding, *inter alia*, its findings regarding VRS in Decision 2008-1.⁷²

At the conclusion of the PN 2008-8 proceeding, the Commission issued its determinations in TRP 2009-430.

In TRP 2009-430, the Commission noted the views expressed by some parties in the proceeding regarding TTY Relay:

At present, the Commission's requirement on TSPs to provide relay service applies to TTY Relay exclusively. Parties to this proceeding representing the interests of persons with hearing and speech disabilities submitted that due to the limitations and obsolescence of teletypewriter (TTY) technology, the provision of TTY Relay alone is no longer the best method for persons with hearing and speech disabilities to access telephone services. These parties submitted that IP Relay and Video Relay offer significant improvements

and Related Issues), the Commission in 2002 established a deferral accounts mechanism (in Telecom Decision CRTC 2002-34 *Regulatory framework for second price cap period*). Under this mechanism, the Commission directed the ILECs to establish deferral accounts. Under a deferral account mechanism, an amount equal to a revenue reduction which would otherwise have been required under the Commission's price caps regulatory regime a basket is set aside by each of the ILECs and assigned to the deferral account. Such amount is retained in the deferral account. The balance in the deferral account is available for use, as determined by the Commission. In Decision 2008-1, the Commission directed the ILECs to submit for its approval proposals to improve accessibility by persons with disabilities.

⁷¹ Decision 2008-1, paragraph 23.

⁷² The proceedings leading to Decision 2008-1 and following PN 2008-8 gave rise to a number of proposals/comments regarding the standards and/or functionality which should apply to VRS. See for example on the proceeding which led to Decision 2008-1: from the Canadian Hearing Society, filed 14 February 2007: http://www.crtc.gc.ca/public/partvii/2006/8678/c12_200615578/727456.PDF; comments from the Centre Québécois de la déficience auditive *et al.*, filed 31 July 2007 (available at http://www.crtc.gc.ca/partvii/eng/2006/8678/c12_200615578.htm).

*over TTY Relay and requested that the Commission require TSPs to also provide IP Relay and/or Video Relay.*⁷³

Later in TRP 2009-430, the Commission found that Video Relay service as proposed by the ILECs “provides significant benefit to those persons with hearing and speech disabilities who communicate via sign language (e.g. American Sign Language (ASL) or *Langue des signes québécoise* (LSQ))”.⁷⁴

The Commission also found, however, that the record of the proceeding was insufficient for it to render a determination whether or not to require the ILECs (or more generally, TSPs) to offer VRS. More particularly, the Commission determined that it lacked “critical information such as the costs of providing this service, the size of the individual ASL or LSQ Video Relay user markets, or projected use”. The Commission also found, however, that “the record does indicate that the costs of providing a Video Relay service would be high, considering the need for high bandwidth and highly-skilled language interpretation in two sign languages”.⁷⁵

The Commission also provided the following service description for VRS:

*Video Relay is a sign language-based relay service. In a Video Relay call, the relay operator communicates with the person with a disability via sign language and the person without a disability via voice. The person with a disability accesses the service by using any device capable of both high-speed (broadband) Internet access and video conferencing to reach the relay provider's website and/or video conferencing application to reach the relay operator. The person without a disability dials a toll free number to reach the relay operator using any telephone service. While access to a high-speed Internet connection and an Internet Protocol (IP) video camera enabled device capable of high-speed Internet access are necessary for the person with a disability to communicate with the Video Relay operator, these items are not part of the relay service offering.*⁷⁶

In letters released the same day as TRP 2009-430 was issued, the Commission directed Bell and Telus to report back on an annual basis, providing the certain specified information regarding trials for VRS which each of Bell and Telus had identified as potential means of advancing the development of VRS service offerings. The information Bell and Telus were directed to provide is as follows:

- a) Whether Bell [or TELUS, as the case may be] is providing the VRS directly or through a third-party provider. If using a third-party, provide the name of the third party;
- b) The number of trial users/participants;
- c) The number of VRS minutes provided per each month;

⁷³ TRP 2009-430, paragraph 14.

⁷⁴ TRP 2009-430, paragraph 24.

⁷⁵ Ibid., paragraph 25.

⁷⁶ TRP 2009-430, Appendix 1.

- d) The total amount (\$) spent for each month to support the VRS trial;
- e) The number of ASL and/or LSQ translators required to support the number of users/minutes in the trial;
- f) The cost of the sign language translators (per minute, hour, or month);
- g) The cost of the Internet bandwidth required to support the trial.

The Commission also made the offering of VRS by any TSP subject to the filing of tariffs.⁷⁷

3.3.2. Functionality provided

Based on the service description developed by the Commission in TRP 2009-430 (set out above), a VRS offering should provide access to a relay operator who can communicate with a person with a hearing disability via ASL or LSQ sign language. In the arrangement described by the Commission, the person without a disability accesses the operator via a voice line. Under current TTY Relay serving arrangements, this capability can be provided via a local call (or via a toll free number). It is reasonable to expect that this aspect would not change for VRS.

Access to the video relay operator by a hearing impaired user is established via a high speed Internet connection. For the customer with a hearing disability, it is the customer's responsibility to supply the high speed Internet connection as well as terminal equipment (and associated software) capable of transmitting and receiving video in order for the customer with a disability to reach the VRS operator and to communicate via ASL (English) or LSQ (French) sign language.

Depending upon demand in their respective serving territories, the ILECs today provide access to TTY Relay service operators in one or both official languages. In TRP 2009-430, the Commission did not specifically address the extent of TSPs' obligation to provide access to VRS in each of Canada's official languages. The Commission noted that the record of its proceedings at the time it issued TRP 2009-430 did not provide sufficient evidence regarding "the size of the individual ASL or LSQ Video Relay user markets, or projected use".⁷⁸ As mentioned above, when the Commission directed Telus and Bell to provide certain information on an annual basis, it included in its request information on the "number of ASL and/or LSQ translators required to support the number of users/minutes in the trial".

3.3.3. Rating and cost recovery

As noted earlier, in TRP 2009-430 the Commission determined that the record of the proceeding was insufficient for it to render a determination on whether or not to require the ILECs (or more generally, TSPs) to offer VRS. The Commission found that the record of the proceeding lacked "critical information such as the costs of providing [Video Relay] service, the size of the individual ASL or LSQ Video Relay

⁷⁷ In paragraph 27, the Commission stated that: "... any TSP may choose to provide Video Relay, on a regional or national basis, subject to Commission approval of a Video Relay tariff."

⁷⁸ TRP 2009-430, paragraph 25.

user markets, or projected use”. The Commission directed Bell Canada and TELUS to develop more evidence on this aspect of the service functionality.

There are currently no specified rating or cost recovery models mandated by the Commission for VRS.

As mentioned earlier, the Commission has acknowledged that based on the information placed on the record of the proceeding which led leading to TRP 2009-430,⁷⁹ costs associated with VRS “would be high, considering the need for high bandwidth and highly-skilled language interpretation in two sign languages”. That being said however, the Commission has also observed that inadequate data has been provided to enable it to determine whether the service should be mandated.

To date, the costs associated with TTY Relay have been recovered through a rate collected from service providers’ general body of subscribers. The Commission has set what might be termed as a “deemed” or proxy rate which has been frozen for some time. As discussed earlier, 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. Where local exchange service remains regulated, the charge authorized by the Commission has been set at 13 cents per month per subscriber since the 1990s.

For service providers’ whose basic service rates have been forborne (including wireless service providers), there does not appear to be any restriction on the rate the service provider charges its subscribers, provided that the same rate is charged consistently to all of the service provider’s subscribers.⁸⁰ Even this may not necessarily constitute a requirement. Provided a service provider does not set its rate in a manner which targets customers with a disability, it is conceivable that a service provider could, for example, set a higher or lower rate for residential versus business customers. This issue has not arisen before or been determined by the Commission.

In any event, however, it appears unlikely that a usage-based rate charged to retail users of VRS (or of any of the other relay services) would survive challenge before the Commission⁸¹ as such a rating mechanism would likely be found to unjustly discriminate against users of the service.

⁷⁹ See paragraph 25.

⁸⁰ In Decision 97-8 in which it forbore from regulating the services local exchange telephone service rates for the ILECs’ competitors, the Commission retained its powers under section 27(2) “so that it can respond to complaints alleging unjust discrimination and undue preference in relation to services provided by [competitive LECs] both to end-users and to other carriers” (paragraph 266). The Commission also retained its powers under section 24” in order to impose on [forborne LECs] a variety of terms and conditions (e.g. consumer safeguards) set out in this Decision as well as those that may prove necessary in the future” (paragraph 265). While this matter is not entirely free from doubt, it appears unlikely that the Commission would permit LECs to set rates for TTY Relay, IP Relay or VRS which seek to recover costs associated with these services in a manner which discriminates against the users of these services.

⁸¹ This may be less certain, however, in relation to service features of an optional or “premium” which a service provider might choose to make available (i.e. beyond the basic functionality specified by the Commission which all telephony service providers must provide). A potential example of such features might be the supply of operators
[footnote continues on next page]

Telus, late in 2010 (see discussion above), filed a usage-based IP Relay rate for its wholesale customers. The rate does not appear to primarily target users of the service but instead targets TELUS's wholesale customers. It is arguable that, in principle, a usage based rate charged to wholesale customers would present a number of advantages. Such a rate may be more symmetrical and competitively neutral than a fixed per subscriber rate by ensuring that the overall charge for the service paid by a service provider corresponds to the usage of the service made by its own end-customers. Such a rate may also provide a safeguard against fraud or misuse of the service by ensuring that each TSP who makes use of TELUS's service pays for the service on the basis of the actual usage its end-customers generate.

As discussed above, given the Commission's expectation that relay service costs should be recovered from service providers' general body of subscribers, it seems highly unlikely that a usage based rate could be extended to retail subscribers. This would apply whether the rates for the telephony service provided to retail subscribers are regulated or forborne since the Commission has retained its jurisdiction in relation to forborne telephony services under sections 24 and 27(2) of the Act.

Evidence submitted in the proceeding initiated by PN 2008-8 suggested that revenue generated by the mandated TTY Relay rate significantly exceeded the cost of providing TTY Relay. It is unclear at this point, however, whether the surplus (actual or deemed) generated by the mandated rate would be sufficient to cover costs incurred to provide TTY Relay, IP Relay, as well as VRS.

In the proceeding initiated by PN 2006-15 (leading to Decision 2008-1) one party raised a number of concerns⁸² regarding certain cost recovery models, notably that in place in the U.S. In the U.S. VRS is offered by a number of third party suppliers. These suppliers' services are funded through access to a Federal Communications Commission-established fund supported by telecommunications service providers based on call volumes and usage. The party in question's concerns focused upon the alleged offering by U.S.-based VRS providers of video relay service to Canadian users (who would not be eligible for funding from the fund in question). Retention in Canada of the CRTC's policy whereby telecommunications service providers fund relay service and select the supplier used to provide the

capable of translating between ASL or LSQ used by the customer with a disability and a language other than one of the two Official Languages (English or French) used by the party who does not have a disability. Similarly, translation between ASL and LSQ may be determined to be beyond the scope of basic VRS and therefore may be subject to an additional charge, potentially to reflect the higher cost associated with use of operators who can translate between ASL and LSQ.

⁸² See comments of the Canadian Association of the Deaf filed 31 July 2007 in the proceeding initiated by PN 2006-15, (available at http://www.crtc.gc.ca/partvii/eng/2006/8678/c12_200615578.htm), paragraphs 14 and following. See also comments by TELUS Communications Company filed 12 January 2009 in the proceeding initiated by TNC 2008-8 (available at http://www.crtc.gc.ca/PartVII/eng/2008/8665/c12_200807943.htm#a2c) wherein TELUS expressed support in principle for the U.S. funding model but also stated (at paragraph 8) that: *prior to the implementation of such a fund in Canada, the Commission would need to determine which services are eligible for funding, the applicable qualifications of service providers eligible to receive payment and the base of telecommunications services providers that are required to contribute to the fund and at what rate. These are all complex questions that require discussion in a public forum.*

underlying relay operator services may alleviate the risk of replicating the alleged instances of fraud which have arisen in the U.S.

In the proceeding initiated by PN 2006-15, some parties put forward the suggestion that a single video relay service serving arrangement provided on a national basis may be desirable in Canada and may be preferable to the serving arrangement currently in place for TTY Relay Service whereby each telecommunications service provider supplies (directly or through a third party) the relay service.⁸³ It may be appropriate to note that 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 LNP Consortium inc. (the “LNP Consortium”), the Central Fund Administration Consortium and the Commissioner for Complaints for Telecommunications Services (CCTS)⁸⁴.

The LNP Consortium⁸⁵ is charged with operating certain databases needed to support local number portability. Telecommunications service provider membership in the LNP Consortium is mandated by the CRTC.⁸⁶ Funding of the LNP Consortium is provided by the members and is based on a mechanism developed by the members and approved by the CRTC. The LNP Consortium does not itself manage and operate the databases in question but contracts with a supplier selected as the result of a periodic competitive process.

The CCTS was established by TSPs as the result of a direction in which the Governor-in-Council expressed the view that an “independent agency with a mandate to resolve complaints from individual and small business retail customers [...] should be an integral component of a deregulated telecommunications market”. The CCTS was created as a not-for-profit corporation and provides a complaint resolution service managed by a Commissioner (and his staff) who operates pursuant to the terms of an agreement between TSPs designed to ensure the CCTS’s independence in the disposition of complaints.⁸⁷

The establishment of an industry consortium to provide VRS would likely require a broad consensus among Canadian telecommunications service providers. Arrangements for the management of the consortium may also require CRTC approval. It is perhaps worth noting in this respect that at the outset

⁸³ Ibid.

⁸⁴ 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>

⁸⁵ Regarding the early development of the LNP Consortium, see for example Telecom Order CRTC 97-1243 (available at <http://www.crtc.gc.ca/eng/archive/1997/O97-1243.HTM>); Telecom Order 98-962 (can be found at <http://www.crtc.gc.ca/eng/archive/1998/O98-962.HTM>) in which the Commission approved a shareholder agreement (filed in confidence) setting out the operation and organization of the LNP Consortium.

⁸⁶ Decision 97-8, Telecom Decisions 2005-72 *Implementation of Wireless Number Portability* (available at: <http://www.crtc.gc.ca/eng/archive/2005/dt2005-72.htm>).

⁸⁷ See <http://www.ccts-cprst.ca/>

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.⁸⁸ It is reasonable to expect that the Commission's views would be consistent in relation to VRS.

Unless the VRS supplier is a Canadian carrier, there would likely be no legal constraints against the firm in question being non-Canadian owned or controlled. As discussed earlier, restrictions in the *Telecommunications Act* regarding Canadian ownership or control apply to Canadian carriers but not to their suppliers of facilities or services (unless such suppliers are themselves Canadian carriers).⁸⁹

4. Access to Emergency Services

4.1. Availability and Functionality

At present access to emergency services for customers with a speech or hearing disability is available through use of TTY Relay. A caller with a disability can reach a 9-1-1 operator through a TTY-to-TTY call or through a TTY Relay operator (using a TTY device). In TRP 2009-430, the Commission noted that this technology has shortcomings:

Canadians who cannot communicate clearly via a voice call, because of a hearing or speech disability, must establish 9-1-1 communications either through a direct TTY-to-TTY call or through a TTY Relay call. The record of the proceeding indicates that both of these approaches have certain limitations that affect the ability of persons with hearing and speech disabilities to communicate clearly, quickly, or directly with 9-1-1 operators. First, reliable direct TTY-to-TTY access to 9-1-1 service is not guaranteed in all regions of Canada, largely because not all Public Safety Answering Points (PSAPs) are TTY-equipped. Second, there are inherent delays in using a TTY Relay operator to contact 9-1-1. Third, the caller's location and phone number are not automatically transmitted to the PSAP during a relay call as it is the relay operator who makes the call.⁹⁰

The Commission then went on to note that some parties in the proceeding leading to TRP 2009-430 had suggested that IP Relay might provide improved access to emergency 9-1-1 operators. In TRP 2009-430, the Commission expressed concern, however, regarding IP Relay, observing that the record of the proceeding:

⁸⁸ See Decision 85-29, section I

⁸⁹ See also comments submitted by the department of Foreign Affairs and International Trade of the Government of Canada ("the Department") to the FCC in a proceeding regarding the terms and conditions applicable to suppliers of VRS interpreter services in the United States. The document can be found at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020911390>. In its comments, the Department expresses the view that a proposed restriction before the FCC "to require that all VRS call centers be located in the United States" would be unnecessary and "overly trade restrictive" (see page 2) and may be inconsistent with the provisions of the North American Free Trade Agreement (see page 3)

⁹⁰ TRP 2009-430, paragraph 30.

shows that 9-1-1 IP Relay calls are likely to be subject to significant limitations of access to 9-1-1/Enhanced 9-1-1 services. These include the effects of power and Internet outages on the ability to access 9-1-1 services, as well as the requirement for callers to provide location information to the IP Relay operator.⁹¹

The Commission also noted that some parties to the proceeding had suggested that access to emergency 9-1-1 operators could be improved if callers with hearing and speech disabilities could communicate with emergency operators via text messaging “including short message service (SMS), Instant Messaging (IM) or Real-Time Text (RTT)”.

In response to suggestions made during the public proceeding regarding the use of IP Relay and text messaging, the Commission requested the CRTC Interconnection Steering Committee⁹² (“CISC”) to investigate the matter and to report by the end of January 2010.

The Emergency Services Working Group (“ESWG”) of CISC submitted a report to the Commission in January 2010.⁹³ In its report, CISC concluded that text messaging⁹⁴ to 9-1-1 operators were not “viable solutions at this time for people with hearing or speech disabilities to access 9-1-1 call centres”.⁹⁵ The ESWG concluded that:

...in the long term, next-generation 9-1-1 standards and technologies that are currently in development could enable users to access PSAPs via multiple methods of texting to 9-1-1. The implementation of these capabilities will depend on the maturation level of IP networking and next-generation 9-1-1 networks and platforms. The CISC ESWG indicated that it would monitor these technologies and make recommendations on them when they meet enhanced 9-1-1 service criteria.

⁹¹ Ibid., paragraph 31.

⁹² CISC is composed of representatives from the TSP community and its activities are overseen by Commission staff. Its purpose is to address operational and technical issues associated with the interconnection of networks and the implementation of competition in Canadian telecommunications. CISC investigates issues identified by the Commission and attempts, through discussions to develop solutions to issues, as requested by the Commission. By common agreement, CISC does not develop or propose policies or policy changes. In TRP 2009-430 the Commission directed CISC to “conduct an investigation and evaluation of the benefits, uses, and limitations of access to 9-1-1 services via various forms of text messaging, including SMS, IM, and RTT, as well as IP Relay” (paragraph 33).

⁹³ Report to the CRTC by the Emergency Services Working Group (ESWG) *Text Messaging to 9-1-1 (T9-1-1) Service*, Report Number ESRE0051, filed with the CRTC 21 January 2010 (available at <http://www.crtc.gc.ca/cisc/eng/cisf3e4g.htm>).

⁹⁴ Using SMS, IM, RTT, and IP Relay technology.

⁹⁵ Telecom Decision CRTC 2010-224 *CRTC Interconnection Steering Committee – Improving access to emergency services for people with hearing and speech disabilities* (<http://www.crtc.gc.ca/eng/archive/2010/2010-224.htm>), paragraph 3, citing ESRE0051. Report to the CRTC by the Emergency Services Working Group (ESWG) *Text Messaging to 9-1-1 (T9-1-1) Service*, Report Number ESRE0051 (available at <http://www.crtc.gc.ca/cisc/eng/cisf3e4g.htm>).

It should be noted that there is currently no equivalent in Canada to the use of ten-digit telephone numbers, which in the U.S. facilitate the routing, caller location, and processing of messages destined to 9-1-1. As noted by the ESWG in its report:

In the United States, the FCC has established the Telecom Relay Service (TRS), which consists of IP Relay and the Video Relay Service (VRS). In FCC DA 09-2389 (released November 5, 2009), the FCC clarified the use of TRS Communications Assistant Identification Numbers (CA IDs). On June 24, 2008, the FCC released the first TRS Order in which it adopted a uniform system for assigning users of VRS and IP Relay ten-digit numbers linked to the North American Numbering Plan (NANP). The numbering system was designed to further functional equivalency by ensuring that Internet-based TRS users can be reached by voice telephone users in the same way as voice telephone users are reached, as opposed to assigning dynamic (changing) IP addresses. The numbering system was also intended to ensure that emergency calls placed by Internet-based TRS users will be routed directly and automatically to designated emergency services authorities by Internet-based TRS providers. It is important to note this method for achieving direct and automatic routing to the designated emergency authority.⁹⁶

In its report, the ESWG proposed “further investigation of a potential work-around solution referred to as “SMS T9-1-1 via silent wireless voice call.”⁹⁷ The ESWG proposed undertaking a technical trial of this functionality. The trial was expected to span 12 to 18 months.⁹⁸

In Decision 2010-224, the Commission directed CISC to conduct the trial, file status reports at 6 months intervals during the trial and, at the conclusion of the trial, file a report setting out the outcome of the trial and “...any further actions that would be required to implement the service.”

Rating and cost recovery issues are considered to be outside the scope of CISC’s activities and no rating or cost recovery proposals for a wireless SMS service were discussed or proposed by the ESWG.

⁹⁶ ESRE 0051, page 12.

⁹⁷ Decision 2010-224, paragraph 5.

⁹⁸ The ESWG proposed (in ESRE 0051, page 10) that trial include the following activities:

1. Determination of the most efficient method for “flagging” a silent T9-1-1 to a PSAP;
2. Determination of a SMS T9-1-1 registration process and architecture;
3. Development of a detailed technical specification for the service;
4. Development of a verification test plan;
5. Validation of the technical specification in a controlled telecommunications environment;
6. PSAP determination of the technical means, costs, funding, budgeting, and timing of implementing the T9-1-1 service;
7. Cost estimation to launch the service nationally, and proposing methods to fund same;
8. Determination of a reasonable rollout plan for all parties involved;
9. Identification of specific PSAP staff training requirements;
10. Identification of specific DHHSI community education requirements, e.g. how to register, how to place a T9-1-1 call, how to switch from voice to SMS;
11. Preparation of a technical trial concluding report to the Commission.

5. Market Structure of Services to People with Disabilities

As discussed earlier, in Canada telecommunications service providers are subject to defined requirements regarding the services they must make available to users who have hearing and/or speech disabilities. All local exchange carriers and wireless service providers (as well as service providers who resell these carriers' underlying services to provide voice telephony) are required to meet these requirements.

From the outset of relay service in the mid-1980s, the Commission's role has been to set basic or minimum requirements for the functionality telecommunications service providers must make available to users of their telecommunications services but has determined that the service providers themselves should determine how the functionality the regulator has defined should be provided. Service providers also determine whether such services are to be supplied through the use of their own personnel and equipment or by hiring third party operator services suppliers (for relay operators, for example). Canadian telecommunications service providers choose who will perform relay operator functions and they negotiate with their supplier the price for such service.

The ILECs have been required by the regulator to make their relay services available to other telecommunications service providers at CRTC-approved rates, terms and conditions. The ILECs have, in effect, been made suppliers of last resort.

From the outset, telecommunications service providers who are required to provide TTY Relay have been required to fund the service from their general body of subscribers.

Although the public record of relevant CRTC proceedings provides little information regarding operator service and equipment suppliers used by service providers to meet their relay service obligations, it appears that a number of service providers utilize the services of third party operator service providers to support TTY Relay service. Correspondence from the industry addressed to the CRTC in relation to delays in the implementation of IP Relay in 2010 also suggests that many telecommunications service providers (including some of the smaller ILECs) rely upon the largest ILECs (Bell Canada and TELUS Communications Corporation) to provide the service.

6. Conclusion

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 legal framework should support Video Relay Services as well, although the actual deployment, cost and payment structures may differ significantly. The deployment and cost models appropriate to VRS may include a number of possibilities, which will be subject to additional study as part of Bell Canada's VRS Feasibility Study project and final report.

Phase 3:

Consumer Interests and Perspectives

VRS Feasibility Study

Mission Consulting

February 24, 2012

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CONSUMER INTERESTS AND PERSPECTIVES

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the third of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 3 research summary, *Consumer Interests and Perspectives*, provides a synopsis of information pertaining to potential Canadian VRS consumers. This synopsis includes:

- ☑ Background history of Deaf culture and communication forms
- ☑ Cultural attitudes and public education/outreach for VRS
- ☑ Identification of potential VRS consumers, population and demographics
- ☑ User group viewpoints and perspectives of VRS
- ☑ Overview of individual consumer population

The research for Phase 3, *Consumer Interests and Perspectives*, included creation and distribution of a questionnaire specific to consumer advocacy organizations. The questionnaires were sent via email to the respective organizations with instructions to collect information from all interested parties within the organization, but to return only one completed questionnaire representative of the entire organization. Several of these organizations were then contacted for interviews and consultations regarding a variety of information pertaining to VRS for Canada. The opinions and concerns of these stakeholders are summarized in this report to provide information about potential areas of significance regarding consumer perspectives for VRS in Canada. In order to obtain information directly from consumers an online survey was administered and significant findings are also summarized in this report. The information in this research summary is meant to express the opinions of the Deaf and hard of hearing and their advocacy groups, as gathered from interviews, questionnaires, discussions and surveys.

2. Summary Findings

Salient points of this analysis of consumer interests and perspectives for VRS include the following:

- Potential VRS consumers make up a diverse group of individuals, often with divergent viewpoints.
- Sign language users are a linguistic and cultural minority desiring equal access to communications enjoyed by hearing individuals.
- No accurate estimates of the Canadian Deaf and hard of hearing communities exist.
- Education, cultural identity, type of hearing loss, and age of onset of hearing loss are all factors influencing communication preferences of potential VRS users.
- Different forms of communication are controversial amongst various stakeholders.
- Consumers desire a VRS that balances access with the availability of community interpreting.
- Stakeholders believe community education and outreach will be needed for VRS.
- Stakeholders report a shortage of qualified interpreters across Canada.

3. Conclusion

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.

As indicated by the group questionnaires and online survey responses, the inclusion or exclusion of various modes of communication in addition to ASL and LSQ will continue to be a controversial topic. 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 survey results suggest that most types of usage can be accommodated by qualified sign language interpreters (ASL and LSQ).

VRS is a service that is primarily provided to the Deaf community, which means that their involvement is crucial for successful deployment. Again, the advocacy groups all agreed on the importance of involving the users in the Canadian VRS implementation and operations.

Consumer Interests and Perspectives

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the third of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 3 research summary, *Consumer Interests and Perspectives*, provides a synopsis of a variety of information pertaining to potential VRS consumers and is closely related to the research from Phase 6 *Interpreter Considerations*. This synopsis includes:

- Background history of Deaf culture, education, and communication forms
- Identification of potential VRS consumers, population and demographics
- Cultural attitudes and public education/outreach
- User group representative organizations viewpoints and perspectives

2. Background and Methodology

The understanding of consumer interests and their perspectives is critical to establishing a Video Relay Service to meet their needs and expectations.

This phase 3 research summary, *Consumer Interests and Perspectives*, provides a brief background into the Deaf culture and the feedback provided by Deaf Canadians who use ASL and LSQ, those who are hard of hearing, and also includes some who have had experience with VRS. The information in this research summary is meant to express the opinions of the Deaf and hard of hearing and their advocacy groups, as gathered from interviews, questionnaires, discussions and surveys. To obtain the consumers' feedback, a twofold data gathering methodology was employed.

The first approach involved the creation and distribution of a questionnaire specific to consumer advocacy organizations. A list of appropriate organizations and their contacts was developed with the assistance of the VRS Advisory Committee. To complement the distributed surveys, many organizations also participated in consultations and discussions conducted in ASL or spoken language throughout the research. Furthermore, on-site interviews were also conducted with consumer organization representatives, in both one-on-one and in group meetings. Twenty-two questionnaires were received out of 34 resulting in a 65% response rate from these advocacy organizations across Canada, representing the vast majority of potential VRS users. A synopsis of the advocacy organizations' completed questionnaire responses is provided in section 5 of this research phase. Appendix A lists those consumer organizations and individuals who participated in the questionnaires, meetings and discussions.

The second approach gathered information directly from potential individual VRS consumers via an online survey provided by Bell Canada through its research contractor, IPSOS. The survey gathered data related to potential user demographics, current communication forms, and interest in VRS, among other topics. In order to qualify, respondents were required to identify themselves as deaf, hard of hearing, or speech impaired. In total 1,299 Canadians participated in the survey. An overview of the information collected from the online survey is provided in section 6 of this research phase.

This phase of the VRS Feasibility Report, *Consumer Interests and Perspectives*, references and relies upon information contained in other research phases. These include phase 4 – *VRS Models in Other Countries*, phase 6 – *Interpreter Considerations*, and phase 7 - *Quality of Service*. As with these other research summaries, any relevant issue related to consumers' perspectives that is subsequently identified as being applicable to a Canadian VRS model may be incorporated into the final phase 12 VRS Feasibility Report.

While the Deaf community is a diverse culture, with well informed consumers who often disagree with one another, this report is intended to provide their experiences, requirements and opinions so that they may be considered in the planning discussions related to the future of VRS in Canada.

3. Deaf Culture and Communication

The natural language of Deaf people all over the world is Sign language. Different sign languages exist in all parts of the world and although not all are recognized as official languages, the trend is evolving towards official language status. Sign language users are a linguistic minority because signed languages possess linguistic features that differ from the spoken language of the majority population. The spoken language/ hearing majority population tends to identify people who are Deaf as disabled instead of as a linguistic and cultural minority.

When a majority population marginalizes a minority population based on race or skin color it is often referred to as racism. For the Deaf community, when they feel their language or culture is being marginalized they refer to the experience as *Audism*:

*Audism appears in the form of people who continually judge deaf people's intelligence and success on the basis of their ability in the language of the hearing culture. It appears when the assumption is made that the deaf person's happiness (quality of life) depends on acquiring fluency in the language of the hearing culture.*¹

3.1. History of Signed Language and Deaf Education

While VRS may be used to assist in speech reading² and other communications, its primary application is for sign language communications with the Deaf. In order to understand the significance of VRS to the Deaf community and VRS's enabling them to communicate in their primary language, one should consider the history of Deaf education and the challenges of linguistic minorities.³ The following is an abbreviated summary of the complex evolution of Deaf educational communication methodologies and the use of sign language.

In Canada there are two recognized sign languages: American Sign Language (ASL) and Langue des Signes Québécoise (LSQ). The history of these two languages dates back to the 1800s. Both are derivatives of French Sign Language (LSF). Due to the success of LSF in educating the Deaf in France, educators from the United States became interested in these methods. A U.S. minister, Thomas Hopkins Gallaudet, went to France in the early 1800's to learn methods for teaching the Deaf. He brought back Laurent Clerc, a teacher who was himself deaf and was trained in LSF. In 1817, the first school for the Deaf was opened in Hartford, Connecticut, where Clerc adjusted the "manual French" to English and began teaching this to all the hearing teachers at the school. The language he taught was then combined and influenced by the home signs and manual representations that the Deaf students

¹ Bauman, H-Dirkesen. *Audism: Exploring the Metaphysics of Oppression*. 2004.

² Speech reading is also referred to as "lip reading".

³ Ladd, Paddy. *Understanding Deaf Culture: In Search of Deafhood*. 2007 Pg. 11-17.

coming to the school brought with them. Most Deaf people that came to school were already using some form of sign language with other Deaf individuals. These influences generated new signs and furthered the development of the language into American Sign Language. Meanwhile, the Education Committee of the House of Assembly of Lower Canada sent a hearing individual named Ronald MacDonald to the Hartford school to learn current methods for educating the Deaf. MacDonald then founded the first Canadian school for the Deaf in Québec in 1831. The children were educated in the language they used at home, either French or English. However, the school experienced financial challenges and due to lack of funding closed in 1836.⁴

The Catholic Church then led the effort to educate Deaf children from francophone families in Québec by establishing two schools.

“Boys and girls were educated in separate residential schools...some teachers obtained texts on the Langue des Signes Francaise (LSF) that was used in France to educate deaf children. The deaf children also taught the clergymen and nuns the sign language of the Québec French Deaf community...In contrast to the religious brothers who taught the deaf boys, many of the first nuns who taught at the girls’ school had been educated in the United States and had picked up some of the signs used there as well; they tended to modify the French language with some ASL. Thus, the boys were enrolled in what could be called an “unofficial” LSF-LSQ environment, while the girls lived in a setting that more frequently (at least in the early days) used a combination of LSQ and ASL.”⁵

Schools for the Deaf flourished in Europe, America, and Canada during the 19th century, which is sometimes referred to as the golden era of Deaf education. For the first time many Deaf children were completing elementary education via instruction in their natural and innate visual languages. In 1864, Abraham Lincoln signed a law founding the first college in the world for Deaf students, which eventually became Gallaudet University. Several students would graduate and become teachers of the Deaf themselves, thus passing on and preserving their languages.⁶ At the time of Clerc’s death in 1869 over 1,500 students had graduated from Hartford, and approximately 30 residential schools for the Deaf were operating in the U.S. with a combined total of 3,246 students, and 187 teachers of which 42% were Deaf.⁷ As schools for the Deaf were established in Canada, many former Hartford students became teachers at the Canadian schools.⁸

⁴ Carbin, Clifton. *Deaf Heritage in Canada*. 1996. Pg.52-54.

⁵ Ibid. Pg 322-323.

⁶ Lane, Harlan, and Robert Hoffmeister, and Ben Bahan. *A Journey into the DEAF-WORLD*. 1996. Pg.59-61

⁷ Ibid. Pg.55-59.

⁸ Carbin, Clifton. *Deaf Heritage in Canada*. 1996. Pg.52-54.

However, during the late 19th century hearing educators became convinced that Deaf children should learn speech in order to benefit from what they considered the advantages of the majority language. This marked the beginning of polarization between those who support sign language (manualists) and those who support spoken language (oralists). Hearing educators at the time believed that sign language lacked proper grammar, and in order to fully integrate Deaf persons into society, only spoken language should be taught. The debate over the superiority of oral instruction over manual instruction for the Deaf continued and culminated in 1880 at the Milan Conference. This was an international conference organized to analyze the differences between teaching methodologies and to determine which was superior. 165 educators of the Deaf from all over the world were in attendance, all of whom were hearing individuals. The majority (87.5%) of delegates were from Italy and France where the oral methods were most popular. Everyone except the American delegates voted in favour of the following resolution, which bestowed superior status to the oral method and discouraged or removed the use of sign language in Deaf education.⁹

“The Convention, considering the incontestable superiority of speech over signs, for restoring deaf-mutes to social life and for giving them greater facility of language, declare that the method of articulation should have preference over that of signs in the instruction and education of the deaf and dumb;

Considering that the simultaneous use of signs and speech and lip reading and precision of ideas, the convention declares that the pure oral method ought to be preferred.”¹⁰

The ramifications of the Milan Conference were felt immediately in Canada.

“Oralism became the mandated policy in Canadian deaf education, and teacher and children were prohibited from signing in most classrooms. Deaf teachers lost their jobs as more and more hearing instructors, who could teach “articulation”, were hired.”¹¹

In 1867, thirteen years before the Milan Conference, the U.S. had 26 schools for the deaf using ASL and with a majority of Deaf teachers. By 1907, there were 139 U.S. schools for the Deaf with none using sign language. These schools focused on speech training taught by hearing teachers. Many hearing educators at the time believed that signing interfered with the ability to learn speech.¹²

In the U.S. a leader of the oralist movement was Alexander Graham Bell, who in 1890 founded the “American Association to Promote the Teaching of Speech to the Deaf” (now the Alexander Graham Bell

⁹ Lane, Harlan, and Robert Hoffmeister, and Ben Bahan. *A Journey into the DEAF-WORLD*. 1996.. pg. 61.

¹⁰ Ibid.

¹¹ Carbin, Clifton. *Deaf Heritage in Canada*. 1996. Pg.322

¹² Lane, Harlan, and Robert Hoffmeister, and Ben Bahan. *A Journey into the DEAF-WORLD*. 1996. Pg.59-61

Association). A goal of this association was to incorporate Deaf people into the hearing society.¹³ One of the motivations at this time was Nativism, the belief that immigrants threatened the American culture. Those who used a different language and subscribed to different cultural customs were seen as a threat and should be assimilated into the culture of the general population. Integration into the general population was of paramount importance and considered even more important than the child's academic achievement. This focus led to reduced numbers of Deaf students achieving academic success.

*"The academic and occupational achievements of Deaf people declined in tandem with the loss of Deaf teachers and Sign-based instruction. This decline is literally visible in the business and casual correspondence and in the publications of, for example, the Canadian Association of the Deaf. Papers from its leaders – who were educated at Deaf schools up to the time of World War II reveal a formidable vocabulary and a perfect command of English with impeccable grammar, punctuation, and spelling. A study of papers produced by its leaders educated after World War II uncovers a Grade Three or Four level of literacy skills and an impoverished vocabulary."*¹⁴

The effects of the Milan Conference and oralism are still reflected today in the high unemployment, underemployment, and illiteracy rates amongst the Deaf population.¹⁵

In spite of these challenges sign language has persevered as the natural language of the Deaf. Deaf people continued to use and learn sign language in their homes, outside of the school environment, and from other Deaf signers. They also continued to marry Deaf spouses and socialize with each other, enjoying each other's company, the ease of communication, and thus preserve their culture and language. The benefits of a natural language and the recognition of sign language as an official language with linguistic and grammatical properties similar to all other languages has helped bring about changes to the education system; however these changes are slow and challenged by audist systems.¹⁶ Studies have shown that the Deaf child who learns sign language in the home and begins school fluent in sign language consistently surpasses those Deaf students who have not been exposed to a visual language at an early age.¹⁷

In 2010, the International Congress on Education of the Deaf (ICED) held their 21st conference. The resolutions of the 1880 Congress that removed sign languages 130 years earlier were officially rejected and an apology was issued acknowledging the detrimental effects of those resolutions. Parents of Deaf

¹³ Ibid. Pg.62

¹⁴ Roots, James. *The Politics of Visual Language* 1999. Pg.31.

¹⁵ Ibid. Pg. 46. At page 31 Roots quotes a source stating that the 1998 rate of functional illiteracy [reading and writing] among Deaf Canadians may be as high as 65 percent.

¹⁶ Lane, Harlan, and Robert Hoffmeister, and Ben Bahan. *A Journey into the DEAF-WORLD*. 1996. Pg.93

¹⁷ Lane, Harlan. *The Mask of Benevolence*. 1999. Pg 138.

children have received variable advice on how to educate their children for over a century. Methods of education have changed over the years and while many educators have acknowledged the benefits of visual language, others still cling to the notion that visual language is detrimental to the development of speech. Sign language is still banned in some schools that educate the Deaf. Due in part to linguistic research on the properties of ASL in the 1960s, signed languages have recovered some lost ground in the education process. However, the signing that was brought into the classroom tended to be simultaneous speech and sign, which is not a true representation of the native ASL.

“When signing did return, what commonly occurred was the simultaneous use of speech and sign vocabulary rather than the “combined method” of the 1800s (in which the two languages – spoken English and ASL – were kept separate). In addition, artificially contrived, English-based sign systems that developed in the 1960’s and 1970’s found their way into the Canadian classrooms in place of ASL. These manually coded English (MCE) systems were intended to help deaf students learn to read and write English...In the 1970s, artificial, English based signing systems were promoted at schools for Canadian deaf children from Anglophone families. These manual codes for English were imported from the United States. Likewise, Signed French systems were promoted for Québec’s francophone students. Today, the controversy over the use of natural sign language or an artificial system in the classroom still exists among educators of French-using deaf children.”¹⁸

In the early 1990’s an educational philosophy developed that promoted using ASL or LSQ as the primary language for teaching while also teaching English or French in written form, as opposed to an emphasis on spoken form. This philosophy is referred to as the bilingual/bicultural educational environment.

Current educational approaches to communication include the following:¹⁹

Table 1: Educational and Communication Options Summary²⁰

Educational and Communication Options Summary
<p>Auditory-Oral Method</p> <ul style="list-style-type: none"> • Focus is on learning to speak well enough to communicate clearly • Goal is to learn speech and ability to read lips • Child will have hearing aids or cochlear implants as these are important to oralism • Success depends on level of hearing ability and enhanced technology

¹⁸ Carbin, Clifton. *Deaf Heritage in Canada*. 1996. Pg.323

¹⁹ Schwartz, Sue. *Choices in Deafness; A Parent’s Guide to Communication Options*. 2007.

²⁰ <http://www.raisingdeafkids.org/help/>

Educational and Communication Options Summary

Auditory-Verbal Method

- Focus is on teaching child to listen and learn speech through listening
- Goal is to listen effectively without lip reading
- Child must have hearing aids or cochlear implants as these are critical components
- Success depends on amount of residual hearing, effectiveness of listening aids, and early diagnosis of hearing loss

Cued Speech

- Focus is on teaching speech through visual representation of speech sounds (i.e. phonemes)
- Goal is to understand and produce speech and enhance lip reading ability
- Uses 8 hand shapes combined with position to cue pronunciation. Cannot stand alone must be accompanied by mouth movements.
- Not a language, but a tool to transmit spoken language and improve literacy

Bilingual-Bicultural

- Focus is on teaching Sign language (e.g. LSQ, ASL) as a first language and French or English as a second language
- Goal is to provide a solid foundation in Deaf child's natural language and provide access to second language through the first language
- Spoken language may be incorporated if appropriate

These options show the variation that still exists when deciding how to educate a child with hearing loss. Furthermore, the environment a child is educated in and the communication options that child is exposed to will have an effect on the way that individual chooses to communicate, and what group he or she identifies with.

3.2. Cultural Group Identification

One of the challenges Deaf people face in preserving their culture is that approximately 90% of Deaf children are born into hearing families, and most Deaf parents have hearing children. Furthermore, not all Deaf individuals are born Deaf, some become deaf later in life, thus acquiring some spoken language ability. Also, many hard of hearing people, with varying levels of residual hearing and differing ages of onset, are often included in population statistics of the Deaf community. The inclusion of all these individuals often leads to confusion over communication preferences, cultural identification, and definition of deafness.

The marginalization of the Deaf through attempts to assimilate them into spoken language culture is often done by well intended hearing individuals. These hearing individuals are unwittingly acting as

instruments of a system that perceives deafness as an inferior state of being compared to hearing. For example, the invention of cochlear implants is seen by non-deaf people as a way to fix or cure deafness. In contrast, for many Deaf people attempts to fix or cure deafness represent a threat to their language, culture and identity. The problem lies in perspectives of what it means to be deaf, which typically refers to the inability to hear or a deficit in hearing.²¹

The hearing view of deafness is directly related to hearing loss and deaf people are categorized based on the degree of hearing loss (e.g. severe to profound), while the term “hard of hearing” refers to someone with mild to severe hearing loss.²² The focus is on the medical definition related to decibel loss and is determined to be a disability. On the other hand the Deaf viewpoint is quite different with an emphasis on the cultural and linguistic aspects of being Deaf. Deaf with a capital “D” refers to the cultural identity and deaf with a lower case “d” refers to the medical or disability definition.²³

“From a Deaf perspective an individual can refer to himself or herself as Deaf while having enough residual hearing to converse on the telephone. Conversely, someone who has a profound hearing loss may refer to himself or herself as hard of hearing. How, you might ask, is that possible? When people refer to themselves as Deaf, they are usually indicating the presence of a hearing loss (ranging from mild to profound), a preference to socialize with members of the Deaf community and a desire to adhere to Deaf cultural values and norms. When people refer to themselves as hard of hearing they are usually indicating a hearing loss (ranging from mild to profound) and a preference to identify with hearing cultural norms and values.”²⁴

The terms “hearing impaired” and “hearing deficiency” are viewed by culturally Deaf individuals as negative labels that emphasize a definition of normal that is entirely based on a non-Deaf perspective. Provincial chapters of the Canadian Hard of Hearing Association have also objected to being identified by these terms for similar reasons.²⁵

Understanding the differences in cultural identity and group membership helps to clarify the multilingual environment of the Deaf and hard of hearing communities. For example, communication preferences are greatly influenced by which group an individual identifies with, as well as how that person was educated (e.g. oralism or manualism). Another important factor affecting group identification is the age at which hearing loss occurred. If the person was born deaf or became deaf prior to developing spoken language, they will typically have more difficulty acquiring speech than those

²¹ Ladd, Paddy. *Understanding Deaf Culture: In Search of Deafhood*. 2007 Pg. 127-134.

²² Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 84.

²³ Ibid.

²⁴ Ibid Pg.84-85.

²⁵ Ibid Pg. 88.

who experience hearing loss after exposure to spoken language. This is often referred to as pre-lingual or post-lingual onset. These factors also have an influence on the individual’s ability to read and write, which is a skill set that varies greatly within the population.

The following table provides a brief summary of the various labels and distinctions used by individuals to identify themselves and the characteristics associated with each label. It is important to note that this list is a generalization and many individuals may choose more than one of these labels to identify themselves. Furthermore, some individuals may have characteristics from multiple categories, while others may have none. It is impossible to account for all of the nuances and characteristics of such a diverse population, and the intention is to present a general overview of some of these nuances.

Table 2: Identity Labels and Characteristics²⁶

Label	Characteristics
Culturally Deaf	<ul style="list-style-type: none"> • People who are born deaf or become deaf early in life, usually before language acquisition (i.e. pre-lingual) • Rely mainly on sign language to communicate (e.g. ASL, LSQ), typically educated in Deaf residential schools or with ASL/LSQ as first language • Prefer to use sign language interpreters and visual assistive technology (e.g. video, text messaging, captioning, etc) • Deafness is a cultural and linguistic distinction requiring an accommodation, rather than a disability
Oral deaf	<ul style="list-style-type: none"> • People who are born deaf or become deaf early in life, usually before language acquisition (i.e. pre-lingual) • Educated in the oral method and rely mainly on oral communications (e.g. speaking, speech-reading) • Generally depend on a visual representation of spoken language (e.g. written text, captioning, speech-reading, cued speech, sign supported speech) • Typically identify with the hearing culture, but may have ties to deaf culture, or choose to be bi-cultural and identify with both • As adults may choose to use signed English/French as a supplement to speech-reading

²⁶ <http://www.blossomschool.org/resources/Glossary.htm>

Schwartz, Sue. *Choices in Deafness; A Parent’s Guide to Communication Options*.2007

Label	Characteristics
Deafened	<ul style="list-style-type: none"> • People who became deaf post-lingually (after learning speech) and have now lost the ability to understand speech with or without assistive listening devices (e.g. hearing aids, cochlear implants, wireless transmitters, etc.)²⁷ • Typically well educated in the spoken language (e.g. English or French) • Generally depend on a visual representation of spoken language for communication (e.g. written text, speech-reading, captioning, sign supported speech) • Typically identify with the hearing culture, but may have ties to deaf culture, or choose to be bi-cultural and identify with both
Hard of Hearing	<ul style="list-style-type: none"> • People with partial hearing loss ranging from mild to profound, may have been born with the condition or developed it later, are able to understand speech with or without assistive listening devices (e.g. hearing aids, cochlear implants, wireless transmitters, etc.) • Primarily relies on auditory communication utilizing any residual hearing • Prefer to use auditory devices to maximize residual hearing (e.g. hearing aids, amplified telephones, etc.), captioning devices (e.g. captioned telephones, real time captioning services) and may also utilize speech-reading. • Most identify with hearing culture and very few use any kind of sign language
Deaf-Blind	<ul style="list-style-type: none"> • People who have significant, but not necessarily total, loss of both vision and hearing • Rely mainly on tactile signing (signing in the palm of the deaf-blind person's hands), close-up signing, or close-up speech reading • May be culturally Deaf, deafened, oral deaf, or hard of hearing and communication preference will vary accordingly

3.3. Communication Preferences

The Deaf and hard of hearing population²⁸ is a diverse group of subgroups and individuals with varying communication preferences, which originate from a variety of sources including education, exposure to

²⁷ http://www.alda.org/index.php?option=com_content&view=article&id=45&Itemid=71

²⁸ For simplification purposes the term Deaf and hard of hearing population will be used to represent all of the groups, however it is not an accurate representation and distinctions will be made for clarification.

language, and age when hearing was affected. The following discussion separates these preferences by Canadian Anglophone and Canadian Francophone communications.

3.3.1. Anglophone Communication Forms

A spectrum of sign language exists in Canada and moves from a pure form of American Sign Language towards a manually coded form of English (MCE) now referred to as Sign Supported Speech or sign systems. The middle of the spectrum where ASL meets Sign Supported Speech results in a mix between ASL based signing and English based signing often referred to as Pidgin or contact variety.²⁹

American Sign Language

American Sign Language (ASL) is a naturally occurring visual gestural language with distinct grammar, syntax, and vocabulary that is not based on or derived from a spoken language. As such, hearing people's perspectives of ASL have typically been to mislabel it as poor English or grammatically incorrect. This is due in part to the fact that ASL does not follow English word order and uses facial expression for grammatical markers. In addition, physical affect markers, spatial linguistic information and fingerspelling are all incorporated into the unique syntax and linguistic features of the language. Similar to other languages, ASL is comprised of arbitrary symbols brought together by "syntactic, phonological, semantic and pragmatic rules."³⁰ The main users of ASL are the culturally Deaf; however other groups may also prefer this language.

ASL users will account for the majority of VRS sessions and will be accommodated by ASL-English visual language interpreters.

Sign Supported Speech and Manually Coded English

Manually Coded English (MCE) refers to any of several forms of signing systems invented by hearing educators to assist Deaf children with spoken language development. These systems are derived from spoken language and attempt to represent it in a manual or visual form. As mentioned earlier these systems are not an official language, but are ways to make English accessible through a visual medium.

Sign supported speech makes use of simultaneous communication, which refers to signing and speaking English at the same time. It is impossible to sign ASL and speak English at the same time. Sign systems use ASL signs for corresponding English words and concepts but use them in English word order. The most prevalent form of sign supported speech is signed English, which is a word for word representation of spoken language. Typical users of signed English are those individuals who have a strong mastery of the English language and prefer to use English in their communications (e.g. post-lingual deaf). Some

²⁹ Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 84.

³⁰ Ibid. Pg. 90.

individuals who prefer this form will request transliteration³¹ rather than ASL interpretation because they want a verbatim rendition of the speaker's choice of words.

ASL-English interpreters should be able to accommodate requests for this type of transliteration, if they possess strong language skills in both of their working languages. According to Canadian interpreter trainers, graduates from any of the five ASL-English programs are prepared to meet the needs of Deaf people who prefer transliteration.

Pidgin Sign English or Contact Varieties

Pidgin Sign English (PSE) is a form of signing that has developed from the long and sustained contact between ASL and English. Linguistic features of each language begin to mix together and influence each other over time.

“Linguistic variations start to emerge in which words, phrases, grammatical structures and other features of each language are mixed with the other. Some of the processes behind this phenomenon include code switching, code mixing and lexical borrowing.... PSE has been defined as a natural blending of English and ASL which has developed over the years to provide rudimentary communication between Deaf and hearing people.... The deaf community communicate with hearing people in a “foreigner talk” register of ASL and members of the hearing community communicate with Deaf people in a foreigner talk register of English. The variation along the ASL-English continuum can be accounted for by the dynamic interplay of “foreigner talk,” mutual judgments of each other’s proficiency, and learners’ attempts to master the target language – whether this is ASL for hearing users or English for Deaf users.”³²

Some people see this as a natural evolution of ASL in a bilingual community, while others view it as an inferior form of ASL used by those who have not mastered the language. Many Deaf individuals choose to use PSE when signing with hearing signers and use pure ASL with Deaf signers. Hearing signers typically learned English as their first language and cannot master the complexities of ASL without extensive training. Many of these hearing signers without proper training are teachers or interpreters for Deaf children, therefore becoming the only model for sign language that the Deaf child is exposed to.³³ This fact along with several other possible circumstances (e.g. cultural identification, exposure to ASL or SSS, familiarity with English, etc.) all contribute to the wide variations encountered within contact varieties and the Deaf community.

³¹ See this study's phase 6, *Interpreter Considerations*, section 2.2 for description of interpretation and transliteration.

³² Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 96-97.

³³ Lane, Harlan. *The Mask of Benevolence*. 1999. Pg 121

Again, qualified and properly trained ASL-English interpreters are able to satisfy interpreting requests for contact varieties. Contact variety encompasses features of both ASL and English, therefore a mastery of both enables interpreters to satisfy requests for this form.

Regional Dialects

Similar to spoken languages, ASL has regional dialects where some signs have become common in a certain geographical location. Maritime Sign Language (MSL) is a signed language used by Deaf people in Canada's Maritime Provinces. Currently the majority of Deaf Anglophone Canadians use ASL, but some elderly Deaf people continue to use MSL, which is believed to have originated from British Sign Language (BSL). The predominance of ASL has impinged on MSL in the provinces of New Brunswick, Nova Scotia and Prince Edward Island and has become the majority language. Estimates place the number of MSL users at slightly below 100.³⁴

The Inuit Deaf community in the northern regions of Canada use Inuit Sign Language (ISL), which is not technically a regional dialect, but rather another sign language. However, as ISL has not yet been recognized as an official sign language, it is included as a regional dialect for the purposes of this study. The language is described as a personal sign language that is used within the family, but many of the Deaf Inuit across the region report using similar hand signals leading to the recognition that it is more than just home signs³⁵ or gestures within a family. There are an estimated 155 to 200 Deaf Inuit people in Nunavut, and although most learn ASL in southern schools some do not.³⁶

According to an AVLIC interpreter who works within the Deaf Inuit population, the need for interpreting services is great. Access to interpreters is very limited and mostly provided by friends or family members knowledgeable in the language but not in the process of interpreting. In this interpreter's experience most ISL signs are produced interchangeably with ASL and resemble more of a contact variety³⁷ of sign language. The interpreter reports that she has yet to meet an ISL *only* user and instead encounters a contact variety, combining ISL, ASL, and home signs.³⁸

³⁴ Abstract:Canada's Maritime Sign Language, Yoel, Judith, Ph.D., University of Manitoba (Canada), 2009
<http://gradworks.umi.com/NR/64/NR64276.html>

³⁵ Home signs: system of pantomime, gestures and manual signs used within a family to support communication in place of formal sign language.

Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 105.

³⁶ <http://www.cbc.ca/news/canada/north/story/2008/09/17/inuit-sign.html>

³⁷ Signing that reflects a mixture of structures as a result of prolonged contact between languages.

Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 105.

³⁸ AVLIC Email correspondence with Mission Consulting 05/17/2011

For the purposes of VRS, it may be helpful to utilize the services of a Deaf interpreter as an intermediary when relaying calls with these populations.

Oral Communication Systems

People who are oral deaf or hard of hearing typically do not use sign language, and instead rely on speech and speech-reading abilities to communicate in addition to any residual hearing, aided or unaided. Speech-reading is a way of deciphering lip, cheek, and throat movements to determine what is being spoken. For further clarification, contextual clues and descriptive gestures can be used to help establish meaning. In most settings these individuals do not require an interpreter. However in certain settings where speech reading is difficult (e.g. distance from speaker, poor lighting, rapid turn taking, etc.) they may use the services of an oral transliterator to silently re-voice what is being spoken in a way that is more adaptable to speech-reading.

Some people who rely on speech-reading make use of a manual coding system called “cued speech” which represents individual language phonemes for the purpose of aiding speech discrimination and/or speech reading, typically in educational settings as a tool for young deaf children. Specific hand shapes in several positions about the face combine to manually represent every syllable being spoken. Cued speech transliterators sometimes work in the classroom to represent the spoken word for children who are still learning speech reading.

It is unclear what the demands for VRS will be from this population. Much variance exists within this sub-community in regard to communication preferences. For example some people who prefer oral communication also prefer text and written word relay services, as they are more comfortable with English.

Others may prefer oral transliteration with or without gestural support or cued speech and for these individuals VRS may be beneficial. ASL-English interpreters will typically have achieved competence through continuing education classes specific to oral transliteration. ASL-English interpreters typically will not have training in cued speech.³⁹

It should be noted that oral transliteration training is not covered in much depth at any of the five Canadian ASL-English training programs and cued speech is not included at all. Ontario Interpreting Services does not offer oral or cued speech transliteration, and instead reports that most oral deaf, deafened, and hard of hearing consumers prefer text and written language based services (e.g. TTY, Internet, CART).⁴⁰

³⁹ Mission Consulting interviews with Interpreter Training Programs. See this study’s phase 6, *Interpreter Considerations*.

⁴⁰ http://chs.ca/index.php?option=com_content&view=article&id=40&Itemid=54&lang=en

Deaf-Blind Variations

The largest percentage of people who are Deaf-Blind were born Deaf and lost their vision later, usually due to Usher's Syndrome. People born with Type 1 Usher's Syndrome are born with severe or profound hearing loss and slowly experience deteriorating vision. These people usually learn sign language and are members of the Deaf community prior to their visual deterioration. Those with Type 2 Usher's Syndrome are born with mild to profound hearing loss and usually use speech and speech-reading prior to losing their sight. The means of communication for Deaf-Blind people vary depending on how much residual vision is left. Sign language, sometimes incorporating a larger space, is effective for those who still have some vision and have learned it prior to the decline of their vision.⁴¹

The needs of the Deaf-Blind in reference to VRS are dependent on how much vision the person has left. Their needs should be satisfied by ASL-English interpreters combined with possible technical enhancements, such as close up signing.

3.3.2. Francophone Communication Forms

Langue des Signes Québécoise

Langue des Signes Québécoise (LSQ) is the natural sign language of the Deaf Francophone community. As with other signed languages LSQ is a naturally occurring language with grammar, syntax, vocabulary, and lexical information that is conveyed visually and manually.

The majority of LSQ users are people who are culturally Deaf, but other groups may also have this preference. LSQ-French visual language interpreters will be able to meet the needs of this group.

Signed French or Manually Coded French

Signed French incorporates some LSQ signs combined with signs invented by hearing teachers. The signing follows French grammatical structure and makes heavy use of initialization (e.g. FOREST is signed with an F hand shape). This type of signing is also characterized by invented signs for French words that do not have an LSQ sign (e.g. la, le, les, etc.). Signed French is not used as frequently in the western part of Québec, but is still used in the east.⁴²

LSQ-French interpreters with proper training and mastery of both LSQ and French should possess the skills necessary; however some continued education courses on the specific non-LSQ signs may be needed.

⁴¹ Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 100-101.

⁴² Suzanne Villeneuve (UQAM) email correspondence with Mission Consulting, 04/21/2011

Pidgin Sign French

Similar to the development of Pidgin Signed English, this form of communication has developed from sustained contact between LSQ and French. LSQ signs are used and follow a French structure as opposed to pure LSQ structure. Conceptually accurate signs are used and lexical units such as articles are omitted.

Again, qualified and properly trained LSQ-French interpreters are able to satisfy interpreting requests for Pidgin Signed French. Features of both LSQ and French are used; therefore a mastery of both languages enables interpreters to satisfy requests for this form.

Regional Dialects

Regional dialects exist in Québec and can be accommodated by knowledgeable LSQ-French interpreters. Some training or exposure to the dialects may help interpreters adapt to the small differences in signing style. Regional dialects do not appear to be a significant concern for VRS.

Deaf-Blind Variations

The largest percentage of people who are Deaf-Blind were born Deaf and lost their vision later, usually due to Usher's Syndrome. People born with Type 1 Usher's Syndrome are born with severe or profound hearing loss and slowly experience deteriorating vision. These people usually learn sign language and are members of the Deaf community prior to their visual deterioration. Those with Type 2 Usher's Syndrome are born with mild to profound hearing loss and usually use speech and speech reading prior to losing their sight. The means of communication for Deaf-Blind people vary depending on how much residual vision is left. Sign language is effective for those who still have some vision and have learned it prior to the decline of their vision.⁴³ Québec has a higher percentage of people with Usher's Syndrome than in other parts of Canada.

The needs of people who are Deaf-Blind in reference to VRS are dependent on how much vision the person has left. Their needs should be satisfied by LSQ-French interpreters combined with possible technical enhancements, such as close up signing.

Oral Communication Systems

Oral deaf, deafened, and hard of hearing individuals who rely on speech and speech-reading abilities may prefer oral transliteration. In Québec, oral transliteration is defined as re-voicing the message in such a way to maximize speech reading and may or may not include gestural support. The gestural support can be natural gestures, LSQ signs, or Langage Parlé Complété⁴⁴ (LPC).

⁴³ Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 100-101.

⁴⁴ French cued speech.

Since 2007 the *Université of Québec at Trois-Rivieres* (UQTR) has offered continuing education training in oral transliteration.⁴⁵ LSQ-French interpreters may take this training as a way to incorporate oral transliteration into their skill set and therefore be able to accommodate the needs of the oral deaf population. There are also individuals who specialize only in oral transliteration; these interpreters do not interpret in LSQ, but only in oral French.

École St-Jude offers courses in the training of Langage Parlé Complété (LPC). These courses offer a basic training in LPC and can last four days or seven evenings with some additional support training lasting three to four days. Typically, these courses are provided to parents of children in the school program using LPC, special education teachers and speech therapists. Interpreters who work in the school system are also involved in learning LPC for the purpose of working with these children. No certification exists for LPC and instead assessments are performed privately on a contract basis. If LPC were included in VRS, then LSQ-French interpreters and oral transliterators could be offered the training to accommodate cued speech users.

4. Identification of Potential VRS Users

Culturally Deaf, oral deaf, deafened, hard of hearing, and deaf-blind individuals are all potential users of Video Relay Services. However, many factors affect the likeliness of certain groups to adopt and readily use this technology.

4.1. Estimated Population of Potential VRS Users

Accurate population statistics of Deaf and hard of hearing people are extremely difficult to quantify. Much of this difficulty is due in part to the different ways that individuals in this diverse community choose to identify themselves. As stated earlier, many culturally Deaf people do not identify as disabled or as having any kind of impairment, therefore these people would not be counted in a survey that asks about deafness as a disability. Another issue in collecting information about this population is the way that surveys are administered. Written text surveys or any other form of communication that is not ASL or LSQ may not be understood by a large percentage of Deaf people. The Canadian Association of the Deaf states:

"It is the opinion of the Canadian Association of the Deaf that no fully credible census of Deaf, deafened, and hard of hearing people has ever been conducted in Canada.

So, what statistic does the CAD cite when asked how many Deaf people live in Canada? We continue to follow the standard comparison model between Canada and the United States, which assumes that statistics for Canada will be one-tenth of statistics for the

⁴⁵ Unit of Continued Education (UEC) is a method of acknowledging non-credited advanced education that corresponds to ten hours of work and attendance.

U.S. (based on the fact that Canada has one-tenth the population of the U.S.) By this measure, Canada in the year 2006 would have roughly 3.1 million people with some degree of hearing loss. Of those 3.1 million people, one-tenth or roughly 310,000 would be culturally and linguistically Deaf.”⁴⁶

“Culturally and linguistically Deaf” implies that these 310,000 individuals use signed language (ASL, LSQ, etcetera) as their primary form of communication. However, the distinctions for communication preferences within this CAD estimate are not identified or estimated by CAD.

The most current census of Canada⁴⁷ from 2010 identifies a total population of approximately 34.1 million people. Using the CAD’s estimate that ten percent of the population equates to the number of Deaf individuals, the 2010 equivalent would be 341,000 Deaf. Since Québec’s population of 7.9 million⁴⁸ accounts for about 23% of the total population, applying CAD’s formula, the number of potential Deaf in Québec would be approximately 79,000.⁴⁹ However, CQDA and other reports state Québec has 7,500 Deaf LSQ users (not necessarily all Québec Deaf); a significantly different estimate.⁵⁰

Deaf sign language users will be the primary users of Video Relay Services. However other groups including oral deaf and cued speech users may also benefit from VRS. Additionally, consumer advocacy organizations have repeatedly stated that all people, hearing or not, are potential users of VRS. For example, hearing individuals wishing to do business or communicate with others who prefer visual communication should also be considered potential users. In fact, each deaf VRS consumer calls multiple hearing users, thus expanding the overall VRS user population exponentially.

4.2. Cultural Attitudes Affecting Adoption

The degree to which Deaf and hard of hearing individuals will adopt VRS is also difficult to quantify. As shown earlier many factors exist that affect an individual’s communication preference. These factors also affect the likeliness of any group to use VRS as a preferred mode of relay. Other considerations include how VRS is offered, degree of ease with technology, and barriers from hearing parties.

Simply stated, the preference for oral communication over visual communication will affect the degree to which an individual uses VRS. Largely dependent on the degree of hearing loss, those who are hard of hearing differentiate themselves from those who are Deaf by their ability and choice to use spoken or

⁴⁶ Canadian Association of the Deaf’s Position Paper on Statistics at www.cad.ca/statistics_on_deaf_canadians.php

⁴⁷ <http://www40.statcan.gc.ca/l01/cst01/demo02a-eng.htm>

⁴⁸ Ibid

⁴⁹ However, this is not a full assessment of LSQ users as they are not exclusive to Québec and are found throughout Canada.

⁵⁰ CQDA Correspondence 07/05/2011. Additional analysis of the potential VRS user population is discussed in this VRS Feasibility Study’s phase 9, *Forecasts of User Demand*.

written language. Many of these people may prefer to use text based relay (TTY-relay or IP-relay) or other forms of text communication (SMS, email, Facebook, etc.) due to their familiarity with the written language. Conversely, those who not only prefer sign language, but also do not have fluency in written language will be more likely to use Video Relay Services. It is possible that many Deaf individuals will be accessing relay services for the first time through VRS, due to the fact that text-based telephone conversations have never been accessible to them.

The way in which Video Relay is introduced may also have an effect on how likely potential users are to adopt the service. For example, mandating Video Relay Service as a way for Deaf people to achieve equality and accessibility will be more favourable than a model that provides the service as a charitable function designed to aid the disabled. Another factor may be the way that VRS is funded, as consumers may or may not be willing or capable to pay for the service themselves, and therefore may or may not become users.

As is true for the general population, the degree to which potential VRS users are comfortable with new technologies varies. Variables that affect adoption include, age, adaptability, technical competence, and self esteem.⁵¹ The most consistent factor affecting the adoption of VRS is whether training is provided, which has a direct effect on user's competence and adaptability.

In fact, several of these adoption factors can be correlated to the amount of public education and outreach conducted regarding the roll out of VRS in Canada. Public education will definitely be needed and should be for everyone, including hearing parties. A common problem with relay services for users is the barriers from hearing parties when receiving relayed calls. With good public education hearing people and the general business community will be less likely to deny these calls and therefore Deaf users will be more inclined to use the service.

4.3. Benefits of VRS

Supporters of VRS strongly believe that the service has a direct positive effect on the social and economical well being of the Deaf and hard of hearing community. VRS helps visual communicators have access to the telephone in their natural language, removing a significant barrier that has existed since the telephone was invented. Accessibility is key to equal opportunity and therefore barriers that prevent accessibility need to be removed. VRS removes the barrier to the telephone that many Deaf and hard of hearing people face. In their opinion, the TTY does not provide full access and has many significant limitations.⁵² An important evident difference is the speed of communication, which is significantly improved through Video Relay:

⁵¹ Saladin, Shawn. *Psychosocial Variables Related to the Adoption of VRS Among Deaf or Hard of Hearing Employees at the Texas School for the Deaf*. 2008.

⁵² A full analysis of the inadequacies of TTY communication can be retrieved at http://www.chrc-cddp.ca/proactive_initiatives/tty_ats/toc_tdm-eng.aspx

Table 3: Average Speed of Communication⁵³

Measure	Voice Telephone	Text Relay	Video Relay
Conversation Speed (wpm)	170	30	150

The faster speed of conversation allows users to respond to time sensitive phone calls (e.g. school registration, contests, etc.) as well as communicate more naturally.

Economic Benefits

According to a study administered by the Canadian Association of the Deaf in 1998⁵⁴ on the employment rates of Deaf Canadians of working age:

- 20.6% are fully employed
- 41.9% are under-employed
- 37.5% are unemployed

In contrast, only 8.9% of all Canadians at that time were unemployed. The combined unemployment and underemployment rate for Deaf Canadians has remained unchanged over a six-year period (1992-1998), despite improvements and growth in the overall Canadian employment rate.⁵⁵

Unemployment and underemployment are major issues for Deaf and hard of hearing people, due in part to inaccessibility to the telephone in their natural language. Promotions and advancement in a career are often dependent in part on the ability to communicate with co-workers, managers, and clients. With VRS, users can conduct business over the telephone at anytime as opposed to scheduling meetings and booking interpreters.⁵⁶ Additionally, VRS can also provide new avenues for employment of Deaf and hard of hearing people.

Other economic benefits for people who are deaf or hard of hearing include:

- 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

⁵³ <http://sites.google.com/site/nrscampaign/resources/vrs-benefits>

⁵⁴ Roots, J. & Kerr, D. *The Employment and Employability of Deaf Canadians*. 1998.

⁵⁵ http://www.cad.ca/employment_and_employability.php

⁵⁶ Mission consulting interviews with Consumer Advocacy Groups. The application of this benefit is broadened if Video Remote Interpreting (VRI) as described in this study's phase 8, section 2, will be included as a VRS function.

Social Benefits

Social benefits of VRS include increased independence, active participation in society, and increased self esteem. For example, advocacy group constituents shared the following comments regarding the social benefits of VRS.

“Imagine a young Deaf boy of 15 who invites his friends (some hearing) over to have a pizza party. When the time comes to order the pizza, if the boy must ask a hearing friend to make the call then that creates the stigma of being disabled. The boy is dependent upon the hearing boy and the helplessness cycle is perpetuated. On the other hand, imagine that the boy can order the pizza himself through VRS and everyone sees him as capable and on equal ground as the hearing. The boy will have good feelings and sense of pride in himself and not see himself as disabled or dependent. VRS makes that happen and takes the barrier away. It becomes easy to see that VRS is much more than another form of relay, it is in our natural language and guarantees greater success for us.”⁵⁷

“My family holds weekly Sunday phone calls to catch up and connect with all of us who live away from home. I am unable to participate in these meetings in any effective way because a TTY relay operator cannot keep up. VRS will allow me to have more connection to my family and less isolation.”

5. User Group Representative Advocacy Organizations

The research for this Phase 3, *Consumer Interests and Perspectives*, included creation and distribution of a questionnaire specific to consumer advocacy organizations. The questionnaires were sent via email to the respective organizations with instructions to collect information from all interested parties within the organization, but to return only one completed questionnaire representative of the entire organization. A response rate of 65% was achieved with 22 out of 34 questionnaires 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.

⁵⁷ Mission Consulting interview with BC VRS committee.

Table 4: Organizations Surveyed

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

Several organizations were interviewed in person and provided ongoing consultation throughout the research process. Although all organizations contacted do conduct advocacy work, some also provide services and therefore have more financial resources than the organizations that perform 100% consumer advocacy.⁵⁸The list of organizations included for this research phase can be found in Appendix A.

Analysis of input received directly from consumers via an online survey is in this phase’s section 6.

The following discussion of consumer group perspectives is separated into Anglophone (ASL/English) and Francophone (LSQ/French) categories.

5.1. Anglophone User Group Perspectives on Video Relay Services

Representative Anglophone (primarily ASL/English) user organizations’ primary constituents are summarized below.

Table 5: Constituents Represented

Anglophone Constituents	Number
All inclusive (no distinction)	7
Culturally and Linguistically Deaf	2
Hard of Hearing (distinct from Deaf)	1

Geographically, these questionnaires were well distributed with responses from Québec, Ontario, Manitoba, Saskatchewan, Nova Scotia, Alberta, and British Columbia. The responses were categorized by topic and are summarized in this section.

5.1.1. Personal Experience with VRS and Perspectives

Ninety percent of those Anglophones surveyed had direct experience with VRS as they had all used the U.S. services before the FCC terminated access from Canada. In addition, organizations in British

⁵⁸ Canadian Association of the Deaf Correspondence

Columbia and Alberta are currently using VRS as part of the Telus trial. Communicaid for Hearing impaired Persons (CHIP) did not have any experience of VRS, but did report familiarity with CapTel.⁵⁹

Those with VRS experience unanimously stated that the service was incomparable and expressed enthusiasm for VRS to be implemented in Canada. The overall theme for those who had experience was that the flow of conversation was similar to a real telephone conversation.

Questions were asked regarding each organization's goals or views pertaining to VRS. The responses are summarized below.

- Equal telecommunication access comparable to that enjoyed by hearing persons.
- Implementation of a professional and national service of the highest quality.
- Accessibility to information that has previously been inaccessible to Deaf people.
- Facilitation of speech comprehension through VRS.

The Canadian Cultural Society of the Deaf (CCSD) is interested in becoming a VRS provider and through their partnership with the Canadian Association of the Deaf has established an organization, Sign Relay Canada (SRC). SRC's original objective was to provide VRS as a pilot program in Ontario, but after applying to the CRTC they were denied the ability since they do not qualify as a licensed telecom company. CCSD had the following comments in regard to their goals and perspectives on VRS:

"We would like to see VRS occur on a national level. We picked the name SRC (Sign Relay Canada) because it is an appropriate acronym in both English and French. We would like to apply as a service provider and/or provide training for interpreters and Deaf community and hearing counterparts. The Video Relay Service proposal is unique in that it draws on the collaboration of Deaf leading organizations to implement a business plan that would be run by the Deaf community for the Deaf community where the benefits for the Deaf community are both in the outcome as well as in its process establishing a Deaf run business."⁶⁰

Other organizations also expressed interest in being actively involved in the provision of VRS through partnerships for the organizations that have interpreting services and in-depth consultation with the others. The involvement of the Deaf and hard of hearing community in VRS is of paramount importance to all stakeholders.

⁵⁹ CapTel is a proprietary captioned telephone service provided in the U.S. by Ultratec Corporation; www.ultratec.com.

⁶⁰ All quotes throughout section 5 are from advocacy group organization questionnaire responses and interviews.

5.1.2. VRS Service Considerations and Expectations

According to consumer advocacy organizations the most important considerations for VRS are:

- Involvement of Deaf community and other stakeholders in all stages of VRS (implementation, operation, performance reviews, etc.).
- Cost and stable long-term funding to pay for the service.
- Recruitment of interpreters and methods to prevent a drain on availability of community interpreters.
- National service to ensure equal access for all.
- Choice of provider (not limited to one VRS or Internet/telecom company).
- Broadband limitations in rural areas, cost of broadband.

In regard to choice, one stakeholder organization stated:

“Do not have the VRS directly tied to a phone company, that’s like arm twisting to force you to stay with a phone company. It becomes monopoly. While many hearing people can choose from so many Internet or wireless service providers, why can’t Deaf consumers of VRS choose to do so too?”

An important consideration of Deaf advocacy groups is whether the VRS provider has Deaf employees at all levels of the organization and/or is a Deaf-run business. Many stakeholders consulted during the research stated that they would more likely use the services of a Deaf-run VRS or at least one that had over 50% Deaf employees, particularly in high level positions.

“It is VITAL that VRS providers employ Deaf and hard of hearing persons in management and tech support roles simply for the purpose of providing good customer service. They are able to communicate with customers and supervise VRS interpreters as well as sensitizing the corporate structure of the entity operating the VRS to the needs of this segment of the population.”

Interpreter representative organizations contacted for phase 6 of this study, *Interpreter Considerations*, had similar views on the importance of VRS providers being Deaf-operated and staffed.

Responses varied regarding questions referencing the most common consumer expectations for VRS. Some groups stressed the importance of 24/7/365 availability, while others stated that evolution of services is expected. They report that the community will understand the lack of interpreters and will be patient with longer wait times. However the eventual goal for all organizations is 24/7/365 availability with minimal wait times when resources are available to support that goal.

Other common expectations were:

- Professional qualified interpreters (AVLIC certified or at minimum membership)
- Choice of providers (for VRS and for Internet or phone line)

- Interoperability of equipment (equipment must work with all potential providers and internationally)
- Confidentiality
- Single phone number
- Access to 9-1-1
- National service
- Deaf community involved in all stages of VRS (implementation, operation, evaluation, etc.)
- Complaint department and resolution procedures
- Protocols for handling calls (e.g. announcing the call)

Stakeholders' opinions regarding which communication forms are appropriate for use in VRS are varied, due in part to the controversial nature of these preferences and the cultural sensitivities of certain user groups as discussed earlier in this research paper. Fifty percent reported that all forms should be included under ideal circumstances and with adequate interpreter resources. The other 50 percent report that only signed languages should be allowed, especially in the beginning stages. Furthermore, these groups report concerns that the inclusion of several communication modes will strain the already insufficient community interpreter resources. They also consider that if too many forms are included, the CRTC will determine VRS to be excessively problematic and further delay implementation. A few groups also mentioned that these forms should be added later as VRS evolves and resources become more available, but in the beginning the focus should be solely on signed language. Examples of stakeholder comments pertaining to communication forms for VRS are:

“ASL and LSQ communities are the ones most in need of VRS; they are the priority and the prime users of the service.”

“ASL/LSQ should be the predominant vehicles while contact varieties (with ASL/LSQ signs presented in English/French syntactical structure with English/French lexicon visible on the lips) can be managed by many interpreters. Other varieties such as Cued speech, signed Exact English, etc. are non-starters and would lead only to a nightmarish mishmash, and most certified interpreters neither have the training nor the skill for such varieties.”

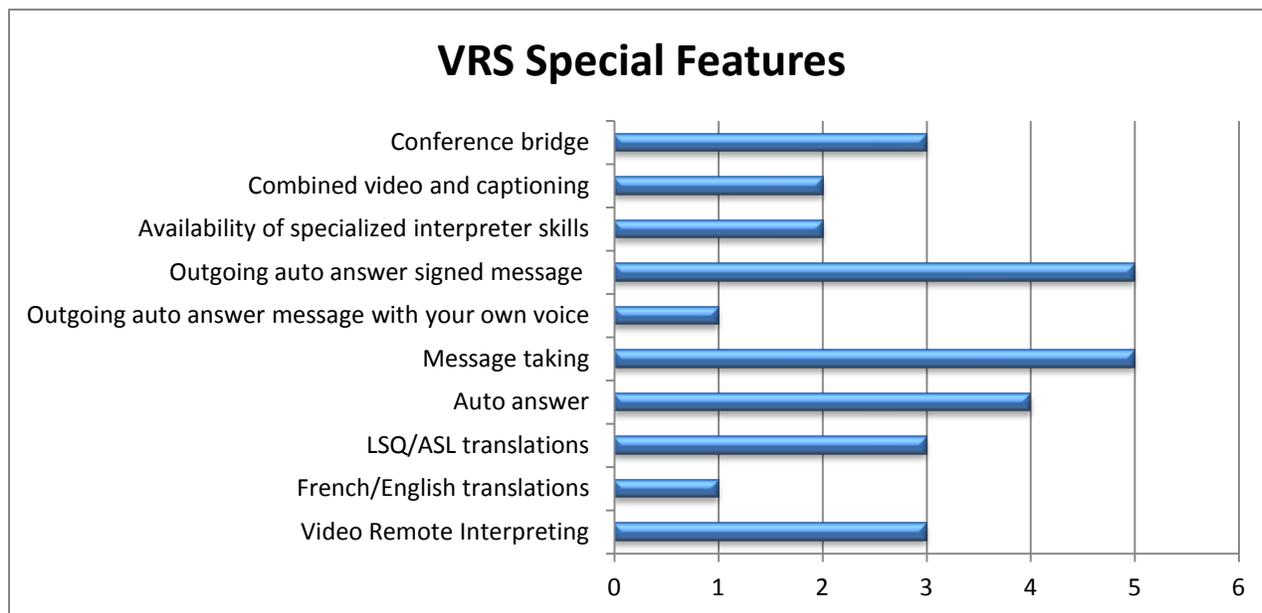
“Begin with ASL/LSQ interpreting first until it is in place, and then gradually add to other features. This would be the priority. We have IP-Relay now so there are other options. It would help reduce costs.”

Advocacy organizations from Nova Scotia would also like to see Maritime Sign Language included for Canadian VRS.

Consumer groups were asked to prioritize selections from a list of potential VRS features by relevance and importance.

The most popular responses are summarized in the following figure.

Figure 1: Importance of Special Features



Features of most importance are those that are equivalent to normal telephone features such as message taking and outgoing auto answer. Some features are more important to different constituents; for example, combined video and captioning and outgoing message with voice were more appealing to hard of hearing individuals. Constituents are interested in these features but believe that initial service is most important and extra features can be introduced later. Many report that Video Remote Interpreting would be beneficial to many users in the North and rural areas, where access to interpreters is limited. It also may allow interpreters who do work in rural areas the ability to have more work. It should be noted that many of these features would not be very difficult to provide in an initial offering, while others, such as ASL/LSQ translations and speciality interpreters may be more complex.

Most organizations report that Voice Carryover, Hearing Carryover, and user profiles to indicate communication preferences would also be useful services, although answers varied whether this should be an included service or an enhanced offering. The rationale for inclusion being that these services are currently offered in traditional MRS and consumers will want to enjoy the same features they are accustomed to. Several groups stated that VRS for Canada should be similar to the U.S. and whatever features are offered there should also be included for Canada.

5.1.3. VRS Interpreter Considerations

Questions pertaining to interpreter considerations for VRS were asked to gather information about interpreter availability, certifications and minimum standards, and other factors related to VRS from the perspective of advocacy organizations.

Interpreter availability is crucial to a successful deployment of VRS for Canada. Most organizations reported that a nationwide shortage of interpreters is prevalent in Canada, especially because many Canadian interpreters are working in call centers that serve the U.S. Some organizations stated that

interpreter resources in their local municipal areas are adequate, but not for rural areas or areas outside of the metropolitan regions. British Columbia's VRS Committee made the following comment in reference to interpreter availability:

"Availability of interpreters has been impacted. We keep having to request or book interpreters in further and further advance since the Sorenson call centres have been established. I see VRS as essential, but at the same time don't want to see VRS centres as detrimental to the availability of interpreters for community needs, e.g. medical interpreting, etc. And the best way would be to consider the model of supportive interpreting communities."

Some stakeholders do not believe that ASL-English interpreters are a problem for VRS as many Canadian interpreters are currently working in Sorenson call centres serving the U.S. and the Telus trial. They are of the opinion that if VRS is approved in Canada, those interpreters will begin serving Canada.

Consumer groups suggest a model of VRS where interpreters sign contracts limiting the amount of time they can work as VRS interpreters and requiring them to spend a percentage of their time in the community.

Responses were mixed regarding whether interpreters should be permitted to work at home for VRS.⁶¹ The majority of responses (70%) stated that working from home would be permissible as long as clear protocols were in place and confidentiality was guaranteed.

"It is fine if they adhere to professional standards. It is also good when there are inclement weather conditions affecting the ability of interpreters to get to the call center. Confidentiality is the biggest concern as well as how to regulate that. Legal implications and remote access issues are also factors."

Those who stated that working from home should not be permitted (30%) cited confidentiality, lack of support, and technological factors as grounds for their view.

According to those surveyed interpreter certification should be required for VRS, however the standard does not need to be as high as AVLIC's Certificate of Interpretation (COI). Suggested alternatives to the COI as reported by Canadian advocacy organizations are:

- AVLIC membership
- Graduation from an ASL-English interpreter training program plus community experience
- VRS provider training to recent graduates of ITP

⁶¹ It may be important to note that in the U.S., the FCC has ruled against permitting interpreters from relaying calls from home.

- Minimum standards of quality set by VRS providers, but with input from Deaf community members
- Provincial referral agency internal evaluation screenings

In addition to minimum standard qualifications for interpreters, organizations stressed the importance of hiring interpreters with good attitudes and knowledge of Deaf culture. Specifically constituents from British Columbia, who are currently using VRS as part of Telus' trial, stated that the current VRS hired some interpreters with very poor interpersonal skills and that interpreters with a friendlier disposition were highly valued by the community.

Many also reported a strong need for clear protocols for complaint handling. Consumers felt comfortable with AVLIC membership as a requirement for VRS work because of the dispute resolution process available through AVLIC, but because not all interpreters currently working in VRS have AVLIC membership, additional complaint procedures should be available. Consumers reported that complaints should be able to be filed with VRS providers, CRTC, and telephone companies.

All ten Anglophone organizations surveyed were asked whether VRS call centres located in the U.S. should be allowed to serve Canada. Approximately 50% of respondents answered no, 40% answered yes, and 10% did not answer.

Common reasons given for affirmative answers were:

- First preference is for call centres to be located in Canada serving Canadians, but would be acceptable if quality standards and assurance are in place
- Both use ASL, however may experience regional vocabulary and language styles as potential challenges
- May help alleviate interpreter shortages in the beginning

Themes for the negative answers were:

- U.S. interpreter standards are not sufficient for Canada
- ASL and regional dialects are significantly different and warrant Canadian only VRS
- U.S. culture is different from Canadian culture
- Canadians prefer to do business with other Canadians

All organizations expressed difficulty answering whether quality or availability was more important in regard to when VRS first begins providing service. They stated that ideally both should be equally implemented. Those who want quality cite the importance of qualified interpreters and those who want availability feel Canada has waited long enough for VRS.

A summary of their responses is provided in the following chart.

Figure 2: Importance of Quality vs. Availability



All surveyed agreed that both quality and availability are important and that both can and should be considered for VRS in Canada. They would like to see the service start as soon as possible and have quality issues (e.g. minimum interpreter qualifications) addressed during the implementation and throughout the initial offering.

“It is like asking a hungry person to choose between quality and availability of food. This tends to begin with availability, and down the road, quality will become an issue, based on customer feedback and input.”

5.1.4. Equipment and Technology

Consumer groups were unanimous in reporting that VRS equipment must be interoperable (i.e. required to work with any other VRS service) even if the equipment is distributed for free by the VRS provider. They also state that the equipment should allow for video calls to others (i.e. point-to-point) in addition to relay calls. Point-to-point calls will allow users who may be less comfortable with new technologies become more familiar with it.

Responses from groups participating in the Telus VRS trial stated a preference for the availability of other types of VRS equipment, such as downloadable software for their computers or smart phones. They report that mobility is an important consideration for VRS and they would like to be able to connect through wireless devices as opposed to being tied to a modem or router. Additionally, they expressed concern that the current VRS is tied to one Internet provider and that in order to partake in the trial, many individuals had to switch carriers. Other groups expressed similar concerns and prefer that VRS not be tied to one telephone or Internet company.

5.1.5. Costs and Funding Considerations

The majority of groups indicated that VRS should be a free service funded by a surcharge on all telephone bills. Ideally, any cost should be equivalent to that of phone calls made by hearing people. However, concessions should be made for the fact that video calls require significant broadband usage. Comments regarding cost and funding are:

“Actual VRS service should be free of charge, paid by phone bill surcharges. The users should not pay for any software to create VRS calls. However, to generate further funding, VRS companies may want to sell the equipment, and a random survey told me the maximum people could pay is \$150. However, applications for those who are on supported assistance, (i.e. welfare, disability assistance, retired, students) should be allowed to apply for subsidized equipment.”

“Ideally, it should be free to the consumer. If not, then it has to be cost equivalent for any calls that would be the same as a hearing person making a call via their telephone.... Cost consideration needs to be factored in to make sure that consumers would not be punished financially for having to use more broadband than allocated based on their account.”

“We must not be limited due to funding. Canadian Government has the responsibility to ensure we all are being treated equally. All telephone companies should be required to pay .05 cents [sic]⁶² each bill to provide equal access without using lack of funding as an excuse.”

The Canadian Association of the Deaf proposed the following cost consideration:

“Yes, they should pay, but in the form of a standard service contract just like the contracts for regular (voice) phone or Internet service – e.g., \$35/month basic service fee, with extra charges for special services and excess usage and so on. But because VRS is being delivered via the Internet, they should get 50% discounts on their billings to compensate for their higher usage of broadband. As for equipment, it should be costed just the same way ordinary phones are costed.”

Some organizations reported that the U.S. model should be adopted and that telecom companies can all pay into one fund that is managed by an independent company. The independent company would then distribute the money to qualified VRS providers, thus allowing those without a telecom license the ability to become providers.

⁶² Five cents.

5.1.6. Other Considerations

Education and Outreach

All organizations stressed the importance of public education and community outreach in reference to VRS. Many groups mentioned the importance of educating hearing people on how VRS works, in order to increase awareness and likeliness to receive interpreted calls. This is of special significance in regard to third party limitations on calls. For example, Revenue Canada would not accept an interpreted VRS call from a Deaf citizen due to restrictions related to releasing information to a third party (i.e. the interpreter). Some VRS companies provide power of attorney documents to their consumers to circumvent this issue.

Education will benefit potential users who may be less technologically capable and all education for the community must be provided in their preferred language to facilitate full understanding and access to the service.

Responses varied on how public education should be funded and who should provide it. Answers included:

- VRS provider should be responsible for education and outreach
- CRTC as a neutral party should take responsibility
- Telephone companies in partnership with VRS providers
- VRS providers in partnership with Consumer organizations
- Consumer advocacy organizations with or without funding
- Provincial governments

Many groups emphasized that public education for the Deaf community should be conducted by Deaf people. Some groups expressed willingness to conduct public education through their own resources (e.g. websites, vlogs, events, etc.).

“It will be necessary, especially if Canadian VRS is different from American VRS in any way (because consumers will want to know why it is different). It is not only the Deaf community that needs education; the non-deaf community also needs to be educated so that they understand a little better that VRS allows Deaf people to use the phone just as easily as non-deaf people do. Also, if the CRTC creates a surcharge-funded TRS fund as the CAD recommends, consumers (both Deaf and non-Deaf) will need to be informed why there is a new surcharge on their phone bills to pay for VRS. Outreach to the deaf community must be done by Deaf people themselves; outreach to the non-deaf community should be done jointly by Deaf and non-Deaf people, if only to illustrate how VRS bridges the communication gap between them.”

Consumer Advisory Committee

Another consideration of importance to those surveyed was the creation of an advisory or monitoring committee representing consumers in order to monitor VRS. This group would be responsible for monitoring the service to make sure quality is maintained and consumer concerns are represented. Comments about the role of a committee are as follows:

“There should be a monitoring committee composed entirely of users, perhaps on a regional representative basis. The Canadian Government defines six geographical regions in Canada and that would be a good model for a monitoring committee. I use the term “monitoring committee” instead of “advisory council” because the latter have a bad reputation for uselessness and being ignored by the telecom providers that set them up; a monitoring committee would have more power and specific responsibilities (monitoring the service, interpreter quality, impact on the community, etc.) and they would be PAID for their time.”

“There needs to be an advisory role and that needs to be a structure whereas there are minimal expectations (minimum standards) and that guidelines are established and enforced to ensure that quality VRS services are provided. The VRS providers need to be involved in the community and demonstrate commitment to improving the services.”

Competition

All responses indicated preference for a competitive model of VRS in Canada with answers ranging between only a few providers to several providers.

Reasons listed were:

- Provide consumers with choice
- Competition encourages overall better quality of service
- Uncomfortable with monopoly model, specifically Sorenson
- More opportunities and choices for interpreters
- More jobs for Deaf people

Many representatives reported concerns about the presence of Sorenson call centers, particularly those serving the U.S. According to them Sorenson has a tarnished reputation in the Canadian Deaf community and therefore many users do not want to see Sorenson as the sole VRS provider. For instance, the CAD made the following comment regarding monopolies:

“...Sorenson’s behaviour has shown us the terrors of allowing them to have a monopoly, and if there is a monopoly in Canada it will be Sorenson who gets it; so now we favour

open competition. We might favour a monopoly if three conditions are met: (1) It is not Sorenson; (2) It is at least 80% Canadian-owned (public or private ownership); (3) At least 60% of its employees, including executives, are Deaf Canadians.”⁶³

Registration

In consideration of potential applications (such as providing location information to 9-1-1 centers, control of program costs, etc.) groups were asked whether VRS users should be required to register before being able to use VRS and if proof of hearing loss should be mandatory. In addition, they were asked if hearing people (e.g. relatives of Deaf, or schools for the deaf) could also be registered VRS users, perhaps allowing them to utilize the enhanced technology for point-to-point calls. Responses varied and most reported that registration should be required for 9-1-1 purposes, but some indicated that 9-1-1 would not work with mobile VRS because the registered address may not be the location of the originating call. Many responses illustrated unfamiliarity with the purpose of a registration process; however some comments regarding these questions are as follows:

“VRS should be open to anyone who needs it, hearing people calling deaf and deaf calling hearing.”

“No, the 911 office should be connected with the VRS companies to connect the users’ IP number or GPS location. Hearing people should have access, as some Deaf adults go home to visit parents, and can’t bring VP with them. Also VP set up at hearing parents will allow option of video-to-video conversations and VRS service use.”

“The same requirements for registering for the current 50% discount for basic phone service should apply to VRS registration.”

5.1.7. Concerns and Overall Comments

The majority of concerns reported by those surveyed related to their perception of a shortage of interpreters currently existing in Canada. They stress the importance of VRS providers working with interpreter agencies and consumer groups to establish procedures to prevent community shortages. Some organizations stated that it may be necessary in the beginning stages of VRS to have limited hours to allow the pool of interpreters to grow resulting in added VRS availability. Suggested strategies to deal with interpreter availability included:

- Limited hours of availability (e.g. cut midnight to 6:00am shift)
- VRS model that balances community interpreting with VRS
- Tiered system for interpreters in VRS (e.g. basic or routine calls not requiring a high skill of ASL could be routed to a compatible interpreter)⁶⁴

⁶³ Emphasis is in the original.

- Investment by VRS providers or telephone companies in training programs (e.g. scholarships, funding for expansion and teachers)
- ASL and LSQ communication modes first with others added when resources can support them

Another area of concern was related to affordability. Several organizations reported that Deaf people typically do not have large incomes and most are unemployed or under employed. This is an important factor as VRS requires broadband access to the Internet and may require purchased equipment. Several groups reported that accommodations should be provided so that those with less income can also access VRS. Deaf consumers using VRS will use a significantly larger amount of broadband and should not be penalized for that. Organizations stated that VRS is supposed to give Deaf and hard of hearing people equal access to the telephone and as such the cost of broadband should be affordable, comparable to unlimited telephone calling. The lack of availability of broadband Internet access in rural areas may not accommodate VRS, but organizations hope that adjustments and improvements will be made to allow access to those users, perhaps by setting up VRS stations in community centers or libraries.

Advocacy organizations all emphasized the importance of involving the Deaf community in and throughout all stages of VRS implementation. They report that consultation with the Deaf community should not be limited to an advisory capacity, but should have meaningful functions for consumers throughout the process. Furthermore, several stakeholders strongly suggested that Deaf people be employed by the CRTC in order to assist the CRTC in understanding, appreciating, and being appropriately responsive to disability access issues related to the Deaf community.

“It is absolutely essential for the CRTC to mandate the full and complete engagement of all stakeholders – deaf, deafened, and hard of hearing community members, representatives of the interpreting community, existing community interpreting service providers (like The Canadian Hearing Society) – in the development and delivery of VRS in Canada to assure that resource capacity will not be entirely draining from community service needs.”⁶⁵

As reported earlier, consumers groups indicated that they do not want to be limited to one Internet or telephone company as is the case with current IP Relay. They state that requiring customers to have a telephone line in order to use IP Relay is prohibitive, since many Deaf people no longer possess landlines. This protocol would not be acceptable for VRS.

British Columbia and Alberta organizations’ largest concern was the lack of a permanent solution. They do not see how such a valuable service could be given to the community and then taken away when the

⁶⁴ Some reported this would not work since people would tend to choose the higher quality interpreter regardless of their need.

⁶⁵ Canadian Hearing Society response to CRTC Broadcasting Notice of Public Hearing CRTC 2008-8 Telecom Public Notice CRTC 2008-8.

current Telus/Sorenson trial ends. They feel strongly that many Deaf and hard of hearing people have come to rely on the service and hope that a permanent VRS solution will occur prior to the anticipated trial end date.⁶⁶

Consumer stakeholder representatives were asked to provide their thoughts on what the biggest challenges for VRS deployment in Canada might be. Several themes emerged from their answers:

- Interpreter availability in ASL and LSQ
- Cost and funding issues
- Technical issues

“The biggest challenge would be to provide qualified interpreters, but with the right approach, the right strategy, it is achievable.”

Lastly, groups were asked how they would define a successful service in the beginning and their responses are summarized below:

- By simply having it start and be available
- Qualified interpreters with minimal strain on community
- Provision in four languages: ASL, LSQ, English and French

“Strong community education, equal access, various VRS providers, open for any individuals to establish their own VRS business, deaf and community friendly, work closely with community interpreters, and deaf service providers, free usage, high quality of interpreters –members of AVLIC not RID. CRTC must be sure that Sorenson is not the only service provider. There are an increasing number of complaints in USA about Sorenson’s quality of service and monopoly of the market.”

“We will be celebrating as history will be occurring for Deaf Canadians!”

5.2. Francophone User Group Perspectives on Video Relay Services

A response rate of 71% was achieved for francophone advocacy groups, and all completed questionnaires came from Québec and Ontario only.⁶⁷ Representative user organizations’ primary constituents are summarized in the table that follows.

⁶⁶ Telus’ trial was expected to end in June 2011, but was extended to January 15th 2012.

⁶⁷ Questionnaires were received in French and translated into English.

Table 6: Constituents Represented

Constituents	Number
All inclusive (no distinction)	6
Culturally and Linguistically Deaf	3
Deaf-Blind Usher's Syndrome	1
Hard of Hearing (distinct from Deaf)	2

In addition to the questionnaire responses, several groups were interviewed in-person and provided ongoing consultation throughout the research for this phase. Additional meetings of representatives from various advocacy groups were also held in Québec as part of this study's consumer perspectives research. The information was categorized by topic and is summarized in this section.

5.2.1. Personal Experience with VRS and Perspective

Previous experience with VRS was less widespread in Québec due in part to the fact that no VRS offers LSQ-French interpretation. However, several organizations reported experience with VRS, but only in American Sign Language. Many of these individuals are fluent in both LSQ and ASL and therefore had experience with the U.S. ASL-English VRS. Those with experience all stated that the service was truly wonderful and the only drawback was that they had to communicate in ASL rather than LSQ. All expressed strong interest in having LSQ-French VRS available in Québec.

Responses to questions about each organization's goals or views regarding VRS are summarized as:

- Equal access to information and opportunities equivalent to hearing persons
- Establishment of VRS in LSQ and other forms
- Access to telephone communication for Deaf individuals in LSQ
- Facilitate video communication for lip reading
- Better communication for the hard of hearing
- Access to telecommunication adapted to specific needs

The majority of organizations did not have an interest in becoming VRS providers, although two culturally Deaf organizations would be interested. Organizations do state, however that continued involvement from stakeholders throughout Québec, including interpreter organizations, is critical to successful implementation.

5.2.2. VRS Service Considerations and Expectations

Questions regarding the most important considerations and consumer expectations were asked of each group. Answers varied, primarily in relation to who their primary constituents are. For instance, the hard of hearing groups' responses focus only on considerations related to speech-reading. However, some areas of agreement between the groups were as follows:

The most important considerations for VRS:

- Interpreter availability and minimum qualifications
- Stakeholders involved in all stages of VRS (implementation, operation, etc.)
- Cost and funding, how to pay for it
- Recruiting interpreters and preventing drain of community interpreters
- Broadband limitations in rural areas, cost of broadband
- Recognition of LSQ and access to VRS in LSQ

In terms of consumer expectations, common themes were:

- Access to professional and qualified interpreters
- Interoperability of equipment (equipment must work with all potential providers)
- Protocols for handling calls (e.g. announcing the call) similar to current relay
- Universal and free equipment and service
- Access to 9-1-1
- Complaint and resolution procedures
- Deaf and hard of hearing community involved in VRS in all stages
- Equipment should allow point-to-point calling

One organization had the following comment regarding common expectation for VRS:

“Independence. A feeling of freedom and equality. Reduction of comprehension errors in communication. No longer depending on anyone.”

Similar to the Anglophone community, opinions varied regarding which forms of communication are appropriate for use in VRS. The culturally Deaf and Usher's Syndrome groups plus three all inclusive organizations only approve of ASL and LSQ, making up approximately 58% of those surveyed. One hard of hearing group only mentioned oral French as appropriate and the other group stated only oral French and LSQ should be included. The remaining organizations reported that all forms of communication should be included. As is the case throughout Canada, the inclusion of various forms of communication continues to be a controversial topic amongst stakeholders. The reasons cited for only including ASL and LSQ were identical to those of Anglophone groups that had the same preference. Groups fear that

too many different communication forms will further tax the availability of qualified interpreters. They are also concerned that the CRTC will conclude VRS too difficult to accommodate. Some also indicated that other forms can come later, but that in the beginning VRS should focus only on LSQ/ASL. Others stated that access should be available to all who can benefit from the service and therefore VRS should not discriminate based on language preference. Varied comments regarding forms of communication are as follows:

“There are more than one would think! There is the Québécois Sign language, American sign language, signed French, Pidgin, Cued speech (LPC), etc. It will therefore be necessary to see a very efficient sorting of calls based on working language.”

“Only the Québécois sign language, like other countries. The VRS should never use different communication because the francophone deaf community only recognizes the Québécois sign language.”

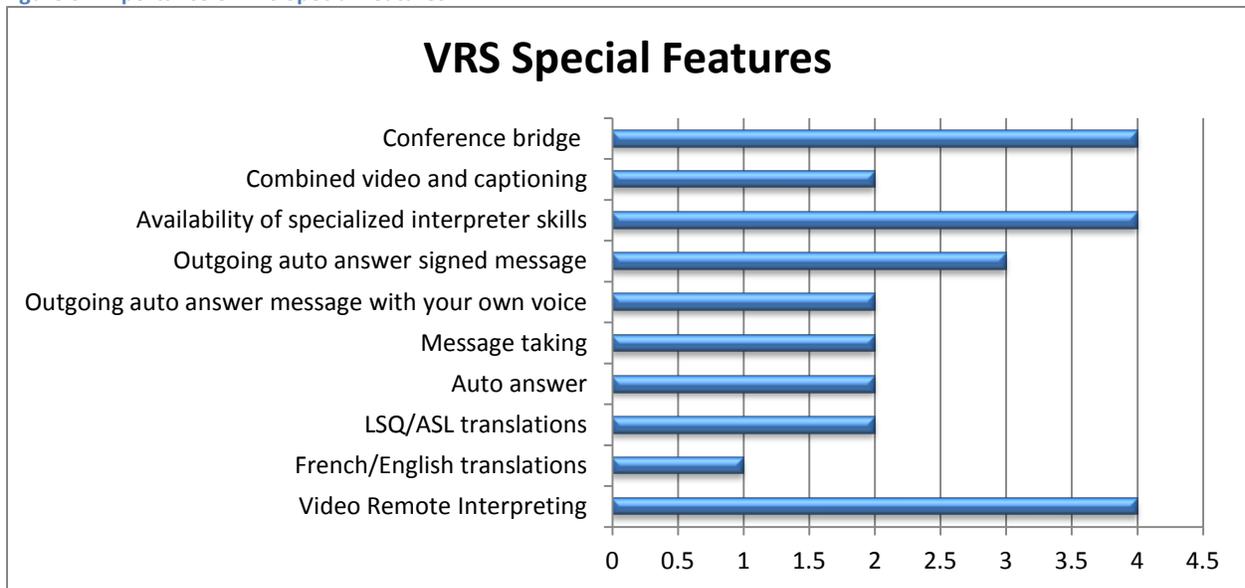
“At the beginning we set it up for those that have had a great desire for this service for a long time: the LSQ and ASL users. For the others, the hard of hearing do not feel a need for this service so the VCO and HCO functions and other forms can wait. There are almost no users of signed English or signed French in Québec.”

“LSQ and ASL, the true languages of the Deaf. Cued speech must be removed; signed French and signed English are false languages.”

“Access to all modes and codes.”

Consumer groups were asked to prioritize selections from a list of potential VRS features by relevance and importance. The most popular responses for each feature are summarized in the following figure.

Figure 3: Importance of VRS Special Features



Opinions are mixed regarding whether these features should be free or paid for. Some report that any features that are included in a standard cellular or phone contract should be included and additional features can be purchased by the consumer according to interest. VRI is of interest to those in Québec mostly due to the shortage of interpreters. Some consumer groups reported that VRI would help alleviate the shortage by allowing consumers to use an interpreter's services more efficiently through VRI instead of having to book an interpreter for a minimum of two hours for an appointment that may take substantially less time.

Groups indicated that potential users are interested in these features, but they believe initial service is most important. Similar to concerns over the inclusion of too many communication forms, many consumer groups report trying to include and accommodate all various features may cause the CRTC to delay implementation. It is also worthwhile to mention that due in part to the limited VRS exposure of the francophone population, several responses indicated a lack of awareness regarding special features.

Questions about other features (e.g. VCO, HCO) and user profiles to indicate communication preference also drew mixed answers depending on constituent base. The groups representing the culturally Deaf do not want any additional barriers or delays to having VRS; therefore they state other features and communication forms can come after the initial set up. Other groups report that VRS should not discriminate against anyone who may prefer other forms of communication. Some state that the inclusion of additional services will most likely depend in part on the availability of resources to support those features.

5.2.3. VRS Interpreter Considerations

Questions pertaining to interpreter considerations for VRS were asked in order to gather perceptions and information about interpreter availability, certifications and minimum standards, and other factors related to VRS from the perspective of advocacy organizations.

LSQ-French interpreter availability in Québec and Ontario is limited and advocacy groups report a severe lack of qualified LSQ-French interpreters. However, regardless of a shortage of interpreters all groups report that VRS should only hire qualified interpreters. LSQ-French interpreters do not have a standardized certification procedure as of yet, but many service agencies do have internal evaluation procedures. Consumer groups report that in order to obtain qualified interpreters, VRS providers should require proof of a service agency evaluation and/or graduation from the interpreter training program at UQAM. Similar to the responses of interpreter organizations in Québec, consumer groups also emphasize the need for a balance between community and VRS interpreting. Many suggest that VRS providers work in partnership with the local agencies to prevent a strain on the current availability of interpreters.

“There is a lack of interpreters almost everywhere in Québec. However, if agreements were made with the organizations that offer services in Québec, many interpreters in the private field would work for these organizations since there would be more full-time positions. For the users there must be a guarantee of quality and professionalism. The VRS could subcontract to organizations that offer interpreting services in Québec, in

order to assure themselves that the interpreters of the VRS have been evaluated, that they are qualified, and that they receive continuing education.”

The lack of standardized certification procedures is of major concern to many stakeholders. Therefore, it is imperative that consultation with interpreter agencies and trainers, plus consumer community involvement occur during the implementation of VRS. Some report that strategies to increase the pool of interpreters and the number of qualified trainers be addressed during the process. Possible strategies include funding to encourage more students to complete the training (e.g. scholarships) and implementation of LSQ instructor training programs. Particularly in Québec, where interpreter resources are strained, it is reported that collaboration with all stakeholders is critical for successful VRS implementation. The lack of standardized evaluation of interpreters is another concern for stakeholders. In Québec many interpreters work for themselves as freelance interpreters and many have not completed appropriate training, and therefore there can be no assurance of quality.

Responses were split regarding whether interpreters should be permitted to work from home for VRS. Those in favour stated less travel time for the interpreters would increase their availability and also benefit those in rural areas where access to interpreters is limited. Those against interpreters working at home cited confidentiality, monitoring of employees, respect for the client, and technical considerations as potential issues.

Using U.S. interpreters for VRS is not a feasible option for the Canadian francophone population, as LSQ does not exist outside of Canada. Most organizations recommend the call centre for LSQ-French users be located in Québec with significant input from the consumer groups and interpreter organizations. Again, consultation with consumers and interpreters regarding the placement of call centres is seen as imperative to prevent critical shortages of community interpreters. Oral deaf users also stated a preference for call centres to be placed in Québec due to the fact that speech reading will be better facilitated by oral transliterators familiar with the specificities of Québécois French.

In response to the question whether quality or availability is more important when VRS first begins providing service, consumer groups provided the following comments.

*“No concession is possible. There must be availability **AND** quality”*

“Availability while including training to improve quality”

“The two values are inseparable, but it is quality that takes preference over availability.”

A summary of all responses is provided in the following chart.

Figure 4: Importance of Quality vs. Availability



5.2.4. Equipment and Technology

Consumer groups were unanimous in reporting that VRS equipment must be interoperable (i.e. required to work with any other VRS service) even if the equipment is distributed for free by the VRS provider. They also state that the equipment should allow for video calls to others (i.e. point-to-point) in addition to relay calls. Several organizations reported preferences for mobile VRS and the ability to download software to computers instead of being tied to a videophone. Another important consideration raised was the need for image quality (i.e. frames per second) showing the fluidity of hand movements in order to ensure comprehension.

5.2.5. Costs and Funding Considerations

The overall consensus of all groups surveyed was that VRS should be free and funded in the same manner as other relay services (i.e. a surcharge on telephone bills). Costs to the user should be equivalent to those a hearing person incurs with concessions made for the fact that a VRS call takes longer than a spoken call. Varied comments regarding costs and funding include:

“In Canada, the current relay services are financed by all the citizens. It is a collective, social, and inclusive service. Making the users pay is a measure that would favour the richest to the detriment of the poorest and that is unacceptable. In Québec the

equipment is free and paid for by the RAMQ.^[68] The equipment should therefore be submitted to the RAMQ so that the government of Québec will pay for this equipment.”

“The users can pay roughly the same price per month as hearing people. For example, Bell offers a home telephone service and the user pays the monthly price and chooses a plan. So, for users, they could make the same choice above with the VRS to choose plans.”

5.2.6. Other Considerations

Education and Outreach

Québec organizations also stress the importance of public education and community outreach in regard to VRS. It is important to educate the non-deaf population on VRS to increase awareness and improve their communications with Deaf people. Consumer groups stated that all potential user groups and current relay users will need to be educated on VRS and ideally the education should be in the communication form of their choice. Several organizations underline the importance of hiring Deaf individuals to conduct outreach and education.

Responses varied on how public education should be funded and who should provide it. Answers included:

- VRS provider should be responsible for education and outreach
- Telephone companies
- Government
- Advocacy organizations with or without funding

Many organizations illustrated willingness to provide “word of hand” efforts to educate the public through their networks, although they would most likely require some funding to do so.

Consumer Advisory Committee

The concept of an advisory committee to monitor VRS and ensure quality for the customer was of great importance to those surveyed. Groups stated that it is crucial to have involvement from the users and stakeholders for the provision of VRS and to guarantee the service meets the needs of the user population. This is of special significance for those in Québec due to the lack of standardized interpreter qualification procedures and therefore, user groups report the importance of having a committee to monitor and evaluate interpreter qualifications.

⁶⁸ RAMQ: Régie de l'assurance maladie du Québec; Québec's health care agency at <http://www.ramq.gouv.qc.ca>.

“The users should have an advisory group representing them to critique the service and give advice on the changes, orientation, and development of the service.”

Competition

The majority of responses indicated preference for a non-competitive VRS model with a strong caveat that the service work with any equipment, telephone or Internet provider.

Reasons listed include:

- Conserve interpreter resources
- Allow for better control and universal quality of services
- Less cost and confusion over multiple providers

Those who indicated a preference for a competitive model believe competition will create better service and lower costs.

User group comments concerning competition:

“If there is one sole supplier of VRS it must be able to collaborate with all telecommunication businesses without regard to competition. If this is impossible, it would be necessary to have several suppliers depending on the competition of telecommunications suppliers in Canada. For example, Videotron blocks all communication with the supplier of Bell Relay Service, forcing users to use Telus Relay Service because of the agreement linking them even though Telus and Bell work together at the HSPA cellular level.”

Registration

In consideration of potential applications (such as providing location information to 9-1-1 centers, control of program costs, etc.) groups were asked whether VRS users should be required to register before being able to use VRS and if proof of hearing loss should be mandatory. In addition they were asked if hearing people (e.g. relatives of Deaf, or schools for the deaf) could also be registered VRS users, perhaps allowing them to utilize the enhanced technology for point-to point calls. Responses varied, but the majority reported if registration would help facilitate 9-1-1 calls then it may be necessary. However, issues of mobility and perhaps calling 9-1-1 from a location other than the registered location were discussed. Most groups reported that registration should not be limited to those who can prove hearing loss.

“The Deaf communicate also with hearing individuals and vice versa and anyone across Canada can use VRS if he or she knows LSQ.”

5.2.7. Concerns and Overall Comments

Areas of concern for francophone stakeholders are summarized below:

- Interpreter availability and qualifications
- Lack of standardized interpreter qualification
- Inclusion or exclusion of various communication forms
- Cost and funding issues
- Equal service for LSQ compared to ASL

Consumer advocacy groups report that interpreter availability is the biggest challenge to a successful deployment of VRS in Canada. Therefore organizations in Québec place great importance on VRS providers working with interpreter agencies and consumer groups within Québec to develop strategies to balance community needs with VRS needs, and increase interpreter resources. Of special significance and concern for Québec is the need for minimum standards for interpreter qualifications. According to many advocacy groups it is absolutely imperative that VRS providers set minimum standards for hiring interpreters and that they work with the existing interpreter service agencies and LSQ training program to do so. As reported in this study's phase 6, *Interpreter Considerations*, the lack of standardized evaluation has resulted in many interpreters working as freelancers without proper training or experience. This is an important consideration for LSQ-French VRS deployment.

Concerns over affordability of broadband and equipment related to VRS are similar across Canada. Issues of unemployment and underemployment of Deaf and hard of hearing individuals are comparable in Québec to that of other provinces. Of special concern to francophone stakeholders is to make certain that equal access to VRS occurs in LSQ and French.

6. Online Individual Consumer Survey

In order to obtain additional information directly from potential VRS consumers, an online survey was developed and administered by a third party IPSOS, under contract and direction from Bell Canada.⁶⁹ The goal of the survey was to identify interest in VRS for Canada across different constituent bases. The survey was initially sent to a Bell Canada panel of about 3,000 people with communication disabilities who offer to participate in Bell research. This resulted in about 400 responses, of which only a handful used sign language. The survey was then sent to all advocacy groups contacted for this research phase

⁶⁹ Mission Consulting developed the questions, IPSOS developed the online format. IPSOS provided the data files, a cross tabs report and a summary report. In addition to the IPSOS output, Mission Consulting hired a survey research firm, JD Franz Research Inc., to develop data runs and outputs of interest under Mission's direction. The analysis in this section 6 is a compilation and assessment of data by Mission from outputs by IPSOS and JD Franz.

with instructions to send the survey link to their members. Combined, the total number of Canadians who participated in the study was 1,299.

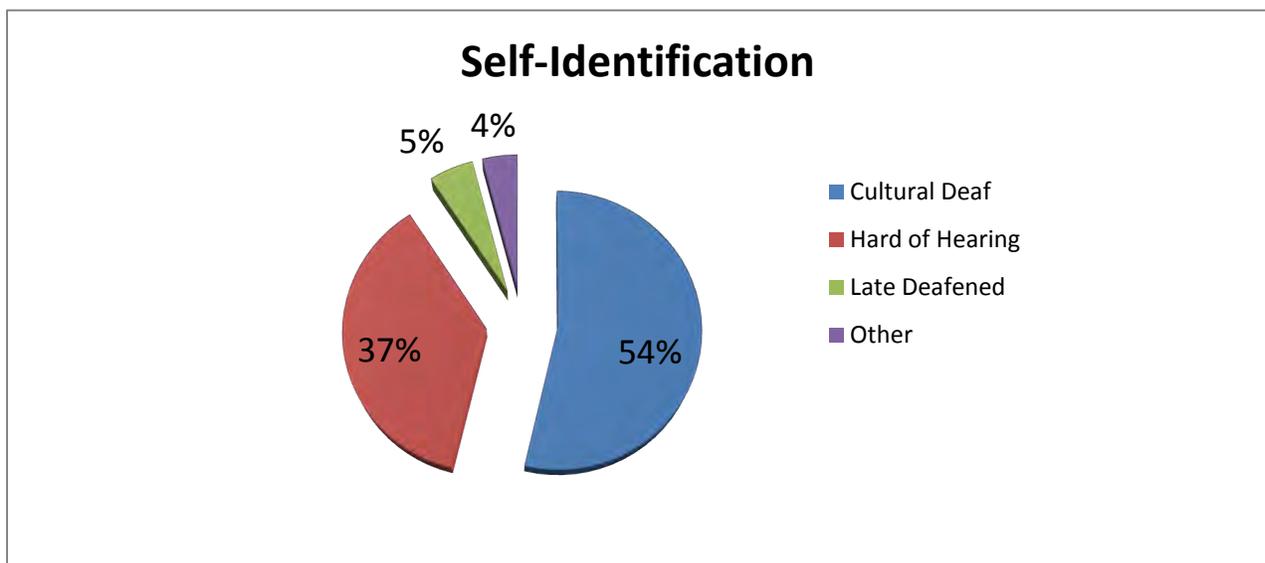
Because of time constraints related to the creation and posting of the online survey, it was not practical to provide the survey in ASL and LSQ. The survey was administered in written English or French, which therefore excluded many Deaf individuals who may not understand non-sign language communication. Many consumers reported difficulty understanding the survey, and therefore their answers may not be completely accurate representations of their intended responses. Additionally the survey was distributed online, which may not accurately represent the opinions of those who do not have Internet access.

Given these limitations, the information is presented as a general overview of possible potential users and their expressed interest in VRS and other forms of communication. It should not be taken as a full representation of all Deaf, deaf, deafened, and hard of hearing communities. Nevertheless the survey results are particularly informative of various user group interests, concerns and perspectives.

6.1. Population Demographics

In order to qualify respondents had to identify themselves, or another member of their household upon whose behalf they would be completing the survey, as living with a hearing impairment or complete deafness. Responses were well distributed across Canada with the majority of responses coming from Deaf and hard of hearing individuals.

Figure 5: Self Identification of Sample



In order to illustrate meaningful comparisons, individuals who did not self identify as culturally Deaf, hard of hearing or deafened were categorized as "Other". The individual identification types within the "Other" category are shown below.

Table 7: Analysis of Other Self Identification Category

Individual Identifications Classified as Other	Number
Deaf (unspecified)	23
Speech and Language impaired	9
Single sided deafness	5
Degenerative hearing loss	4
Deaf-Blind	3
No disability	5
Unable to hear certain frequencies	2
Other	2

The following two charts show respondents' age and region.

Figure 6: Age Group by Self Identification

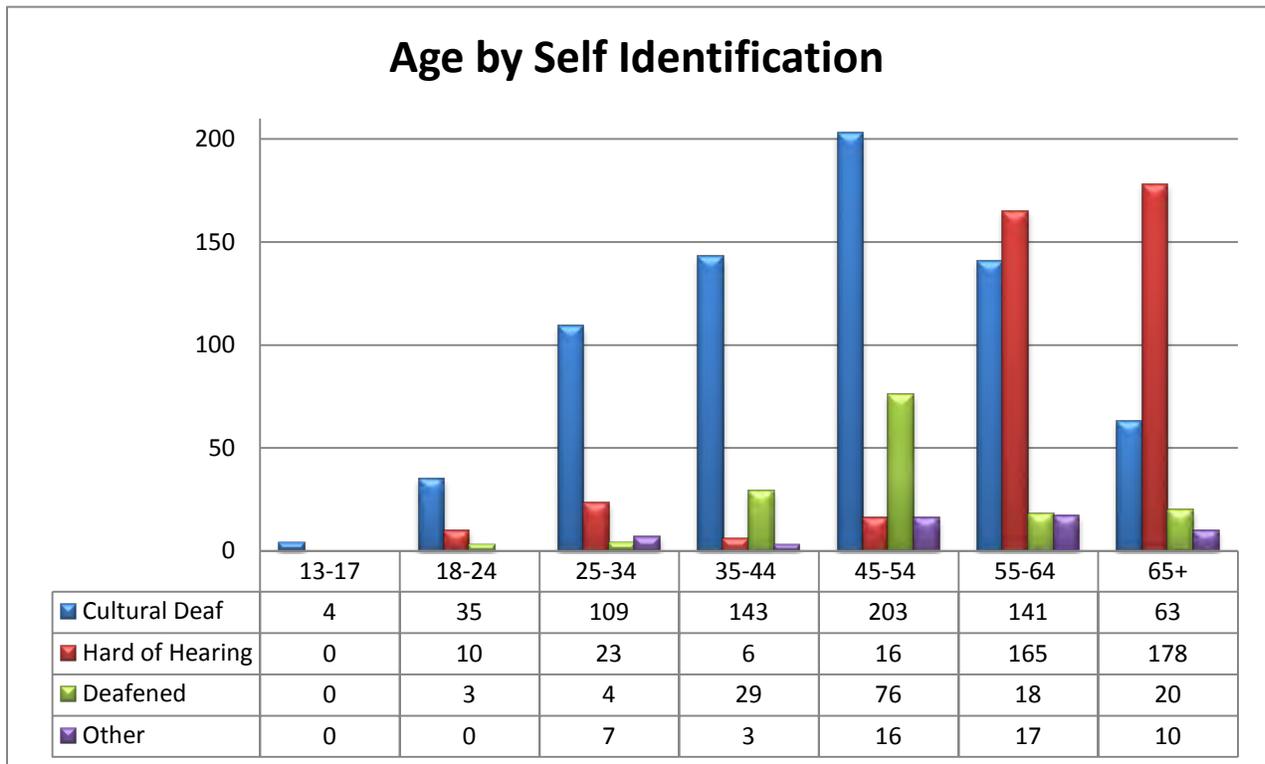
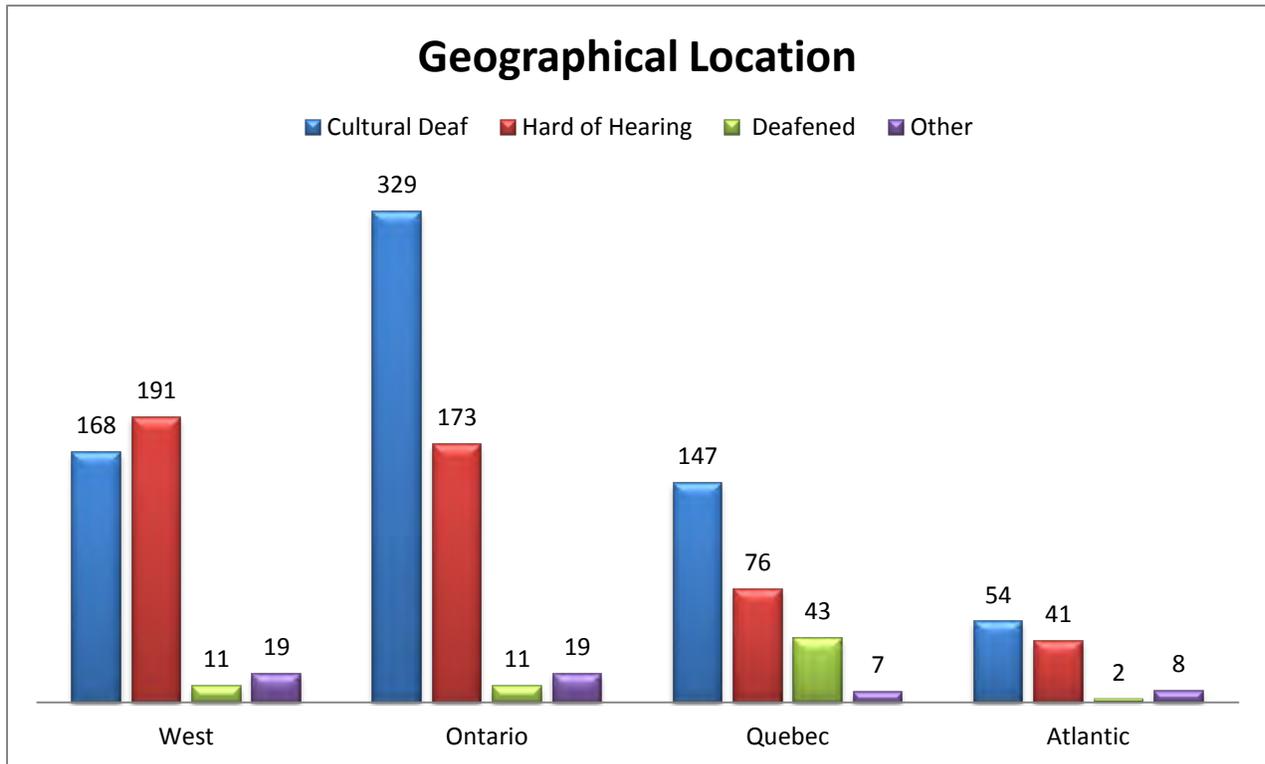


Figure 7: Geographical Location by Self Identification



The Francophone population accounted for approximately 18% of those surveyed indicating a dominance of Anglophones in the sample. The total Francophone population identified included all forms of language preference that made reference to either French or LSQ.

In order to create more meaningful comparisons for the purposes of VRS, the data on language preference was grouped into visual or non-visual forms of communication, which resulted in the following four categories:

- ASL: includes all combinations of ASL with written and/or spoken English, and speech reading
- LSQ: includes all combinations of LSQ with written and/or spoken French, and speech reading
- Spoken and/or written French or English
- Speech reading in either French or English without mention of visual support

Further details of language preference are shown in the following table:

Table 8: Language Preference Frequency by Self Identification

Language Preference	Frequency	Percent
ASL	633	48.7%
LSQ	161	12.4%
Spoken/Written English or French	427	32.9%
Speech Reading	37	2.8%
Other language preference	41	3.2%
Total	1,299	100.0%

The responses classified above as “Other language preference” were unspecified and as such are not included in this analysis. The total for these “other” responses only account for approximately 3% of those surveyed and do not alter the statistical significance of any of the findings. Therefore the sample size for language preference will be slightly lower than the self identification classification, 1,258 versus 1,299.

The table above confirms that the survey reached the intended audience. For instance, combining all forms of visual communication (e.g. ASL, LSQ, signed English/French, ASL/LSQ with speech-reading) regardless of type, accounts for 61% of those surveyed. The preference for spoken or written language (e.g. English, French, speech-reading) makes up 33% of those surveyed. Only 3% of those surveyed indicated that they preferred speech reading without any visual language support. No responses indicated the use of cued speech in either English or French.

Of those who prefer spoken or written language approximately 89% identify as hard of hearing. The percentage becomes 93% if deafened individuals are combined with the hard of hearing; confirming spoken and written language as the preferred method for these groups. Of those who prefer speech-reading 87% are either hard of hearing or deafened.

Further breakdown of language preferences is provided in the following charts.

Figure 8: Self Identification by Language Preference (n=1258)

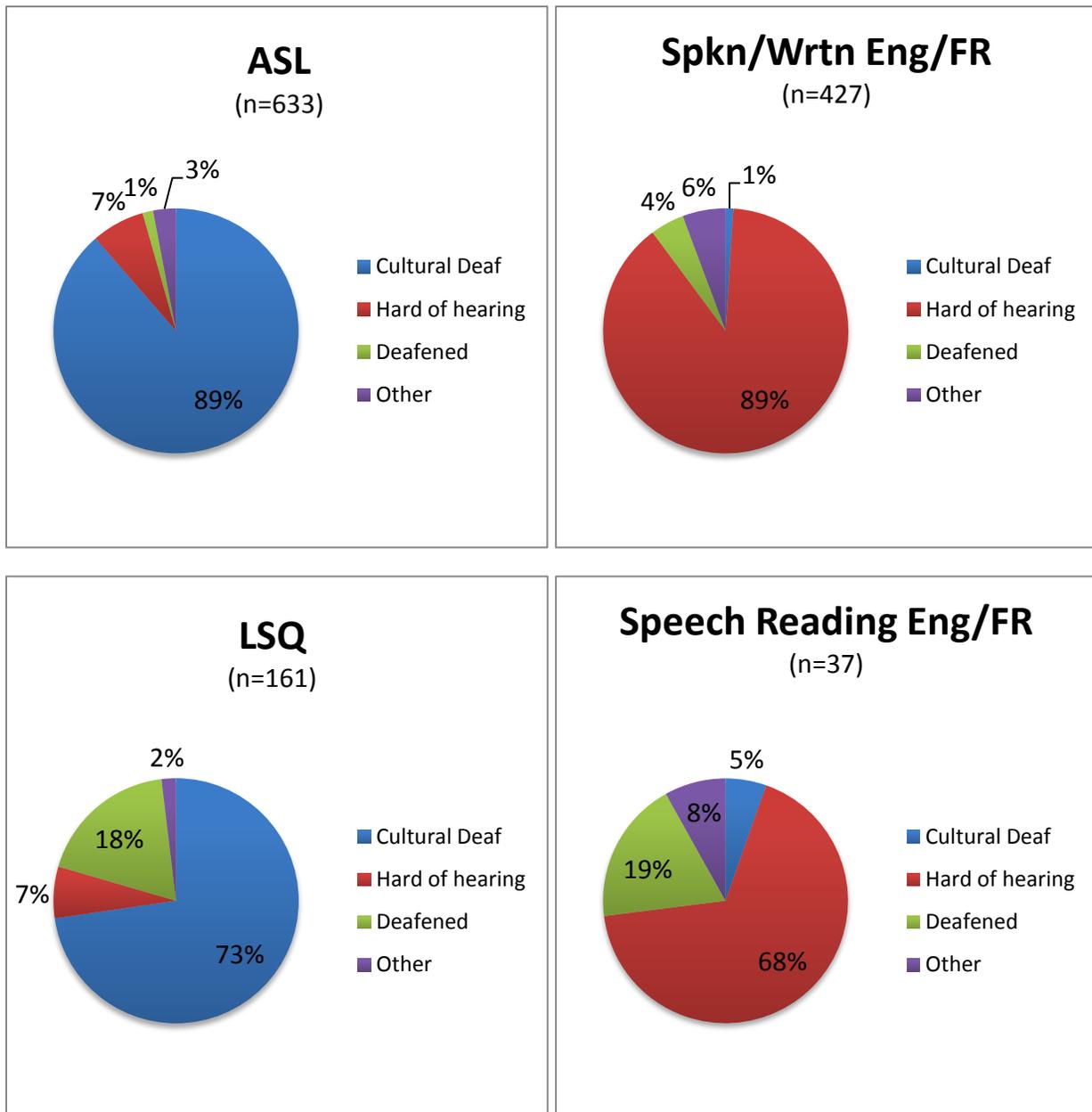
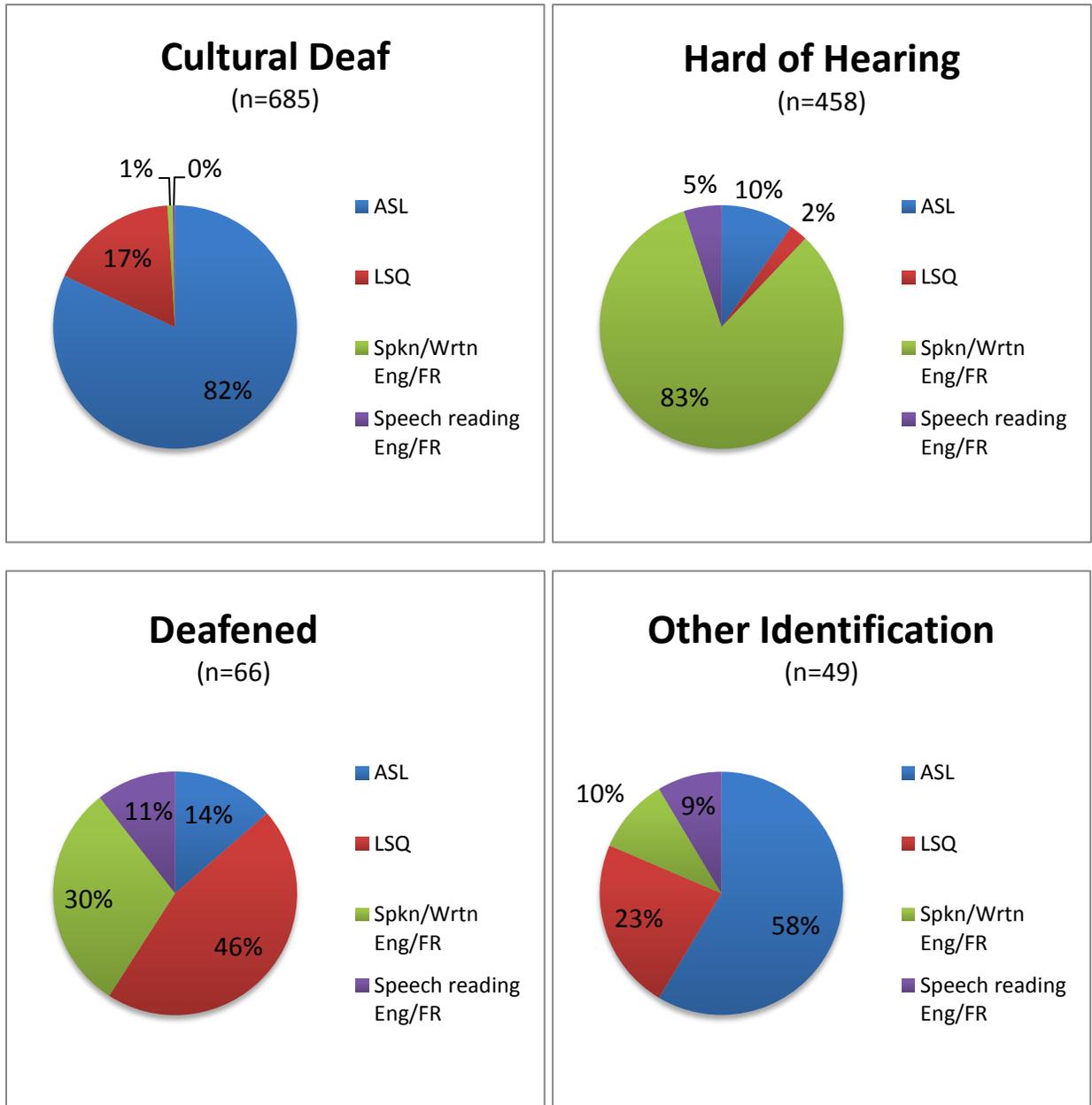


Figure 9: Language Preference by Self Identification (n=1258)



Additional demographic information including employment, education level, and income are summarized in the tables below.

Table 9: Percentage of Employment Status per Group (n=1299)

Employment Status	Culturally Deaf (=697)	Hard of Hearing (n=478)	Deafened (n=67)	Other (n=57)
Full time or 35 hours or more	48%	27%	30%	23%
Part-Time less than 35 hours	10%	9%	12%	9%
Unemployed	11%	4%	6%	4%
Unable to work	4%	3%	4%	9%
Student	7%	2%	1%	6%
At home full time	3%	2%	1%	17%
Retired	15%	53%	45%	30%

Of significance from the employment data is the high percentages of retired hard of hearing and deafened individuals. Additionally, the data substantiates the higher percentage of unemployment for culturally Deaf individuals, as mentioned earlier in this research.

Table 10: Percentage of Household Income per Group (n=1299)

Income Level	Culturally Deaf (=697)	Hard of Hearing (n=478)	Deafened (n=67)	Other (n=57)
Less than \$20,000	17%	8%	13%	17%
\$20,000 to less than \$29,999	13%	8%	16%	15%
\$30,000 to less than \$39,999	15%	11%	19%	9%
\$40,000 to less than \$49,999	8%	10%	13%	8%
\$50,000 to less than \$59,999	6%	12%	7%	6%
\$60,000 to less than \$79,999	9%	12%	7%	15%
\$80,000 to less than \$99,000	6%	9%	3%	6%
\$100,000 or more	4%	13%	6%	4%

The data on income levels again substantiates the lower earning potential for Deaf, oral deaf, deafened, and hard of hearing individuals. The median income in Canada for 2009 was \$68,410;⁷⁰ the data shows that approximately 68% of deafened, 59% of Deaf, 55% of other identification, and 49% of hard of hearing individuals make less than the median income.

Table 11: Percentage of Education Level per Group (n=1299)

Education Level	Culturally Deaf (n=697)	Hard of Hearing (n=478)	Deafened (n=67)	Other (n=57)
Elementary School	3%	3%	0%	11%
Some High School	9%	10%	13%	13%
Completed High School	27%	20%	36%	19%
Some college/technical school	8%	11%	6%	8%
Completed college/technical school	14%	22%	15%	13%
Some University	9%	11%	12%	9%
Completed University	25%	23%	15%	17%
Refuse	5%	0.4%	3%	9%

Education levels were consistent across self identification groups. However of significance is the high percentage for only elementary school completion. For example 3% of those who identify as culturally Deaf and 3% of hard of hearing and 11% of the other category all report only completing elementary school, even though only 4 people indicated being under the age of 18. This may be indicative of the challenges faced by some individuals with hearing loss in the school environment.

6.2. Current Communication Types and Relay Usage

Data were collected on the types of communication currently used by respondents and their preferences for current forms of relay.

High speed Internet was the predominant form of communication used at home, followed by cell phones, videophones and TTY services.

⁷⁰ <http://www40.statcan.ca/l01/cst01/famil108a-eng.htm>

Figure 10: Home Usage

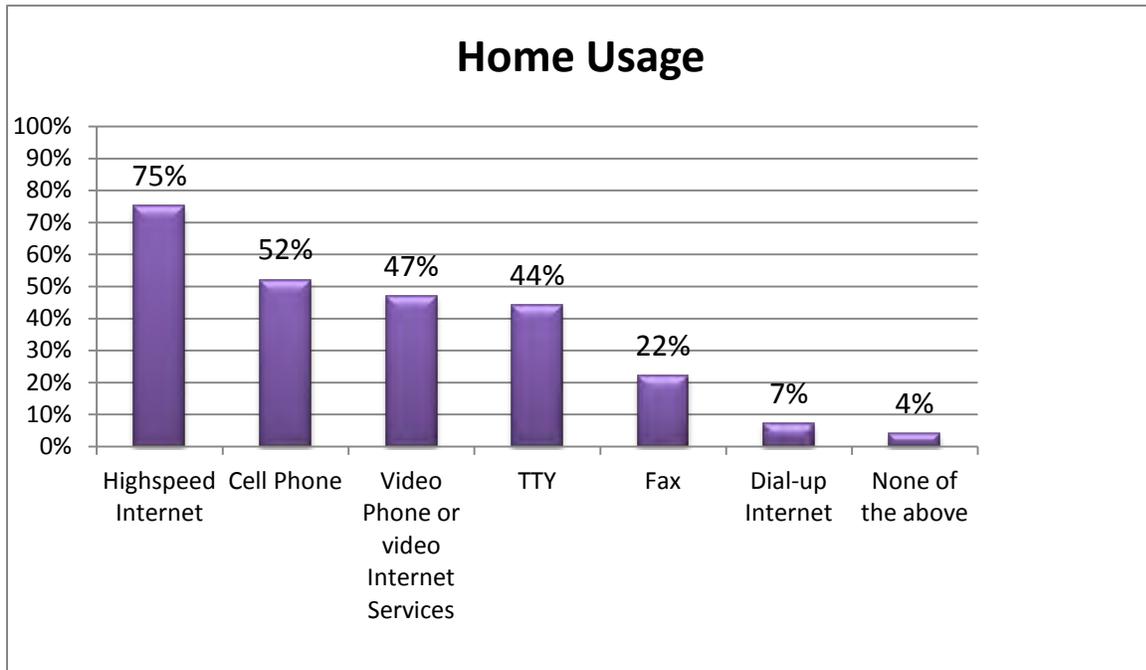
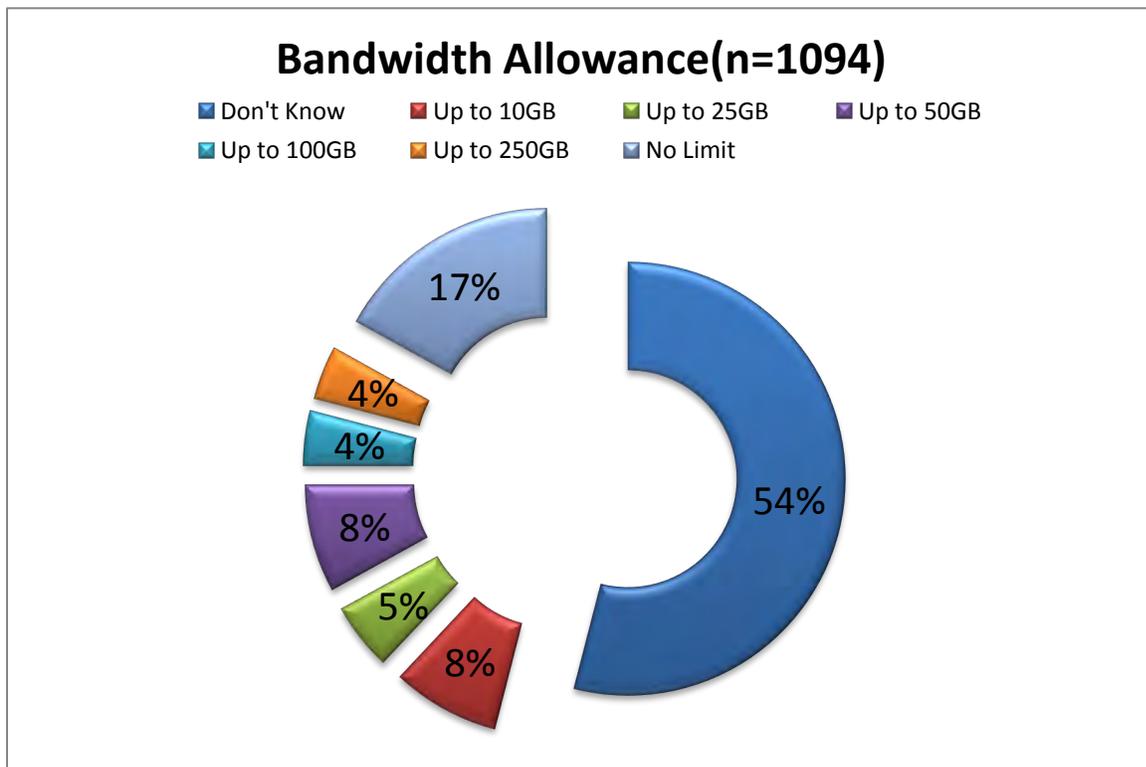
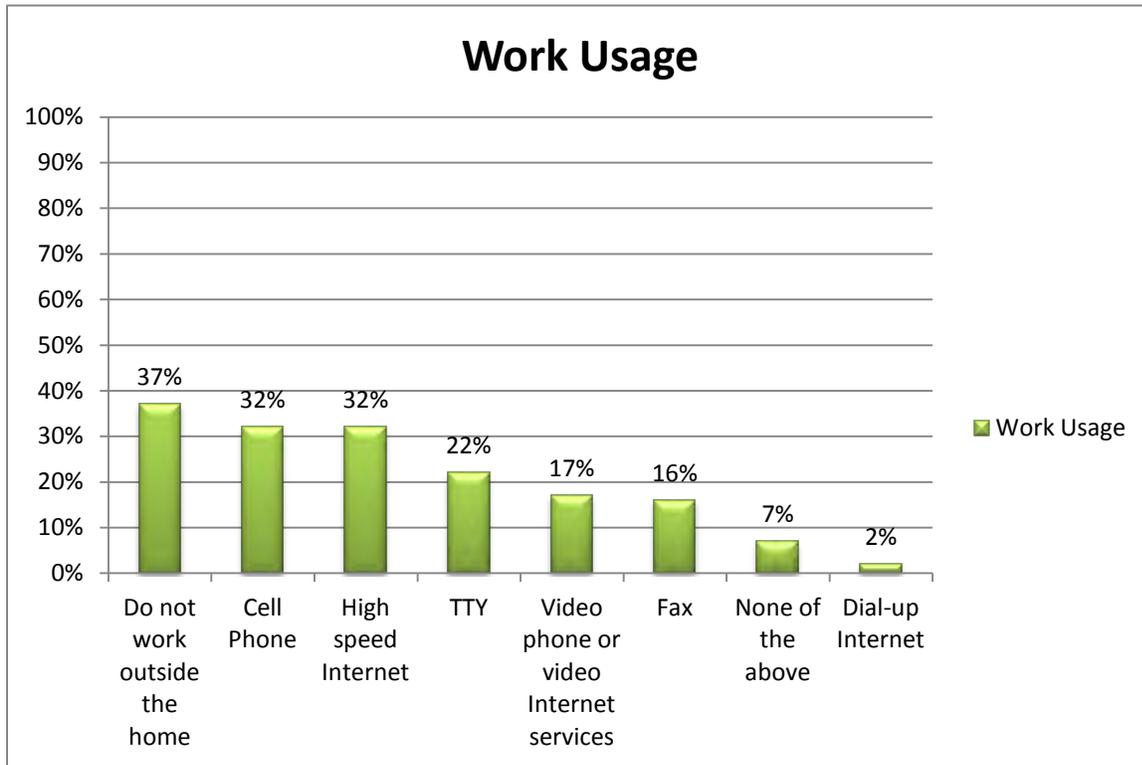


Figure 11: Bandwidth Allowance



Cell phones and high speed Internet were the most used forms of communication for those who worked outside the home, followed by TTY and videophones, as depicted in Figure 12 below.

Figure 12: Work Usage

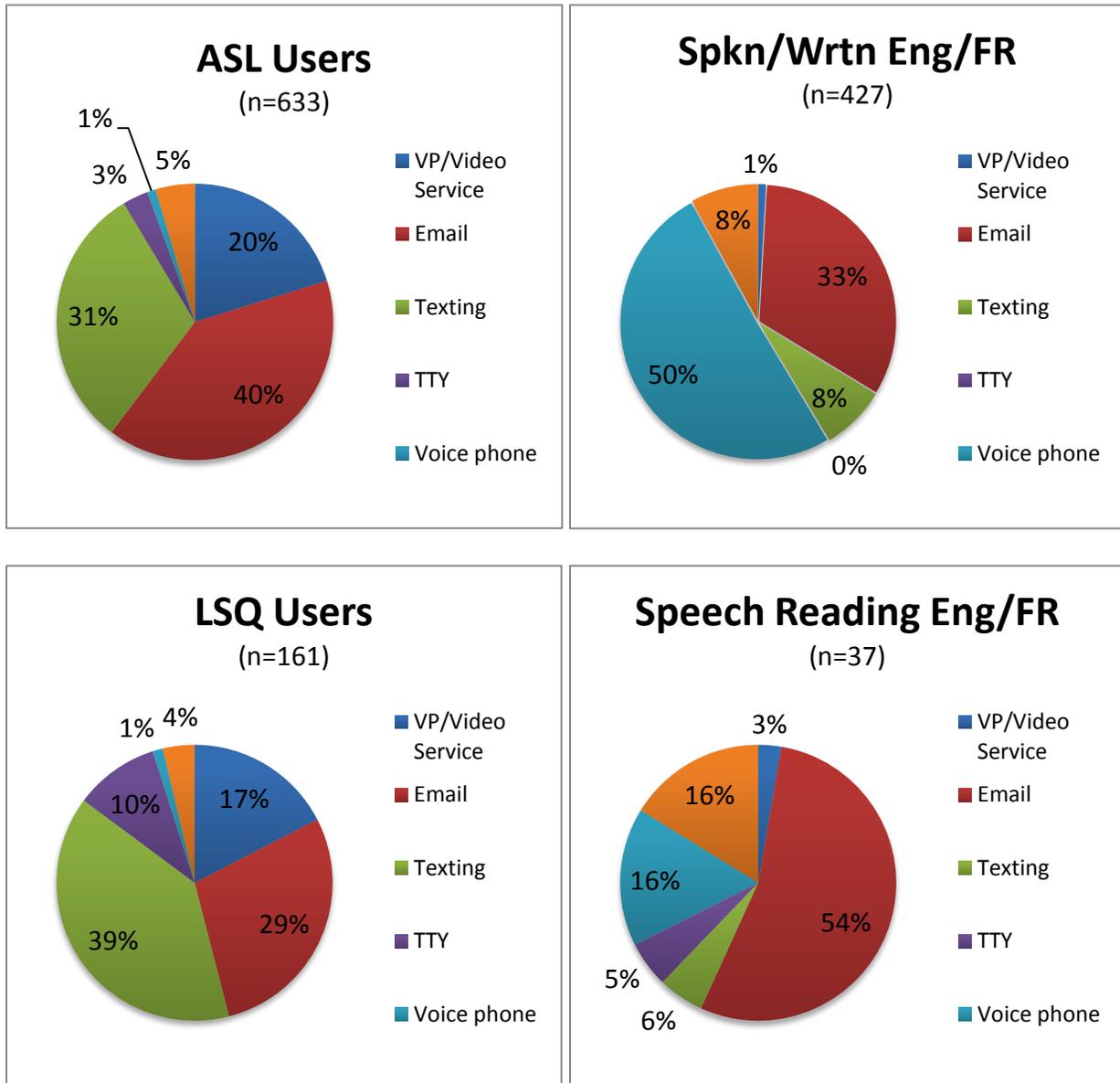


Further analysis identified the following key points regarding communication technologies in the home.

- Video phone and video Internet services were most popular with culturally Deaf individuals
- 33% of those with knowledge of bandwidth allotment have high bandwidth up to 50GB and above
- 13% are low bandwidth users and 54% do not know their allotment
- Culturally Deaf users show greater technological proficiency than hard of hearing users
- Those who identify as hard of hearing are more likely to use communications means that require auditory stimuli

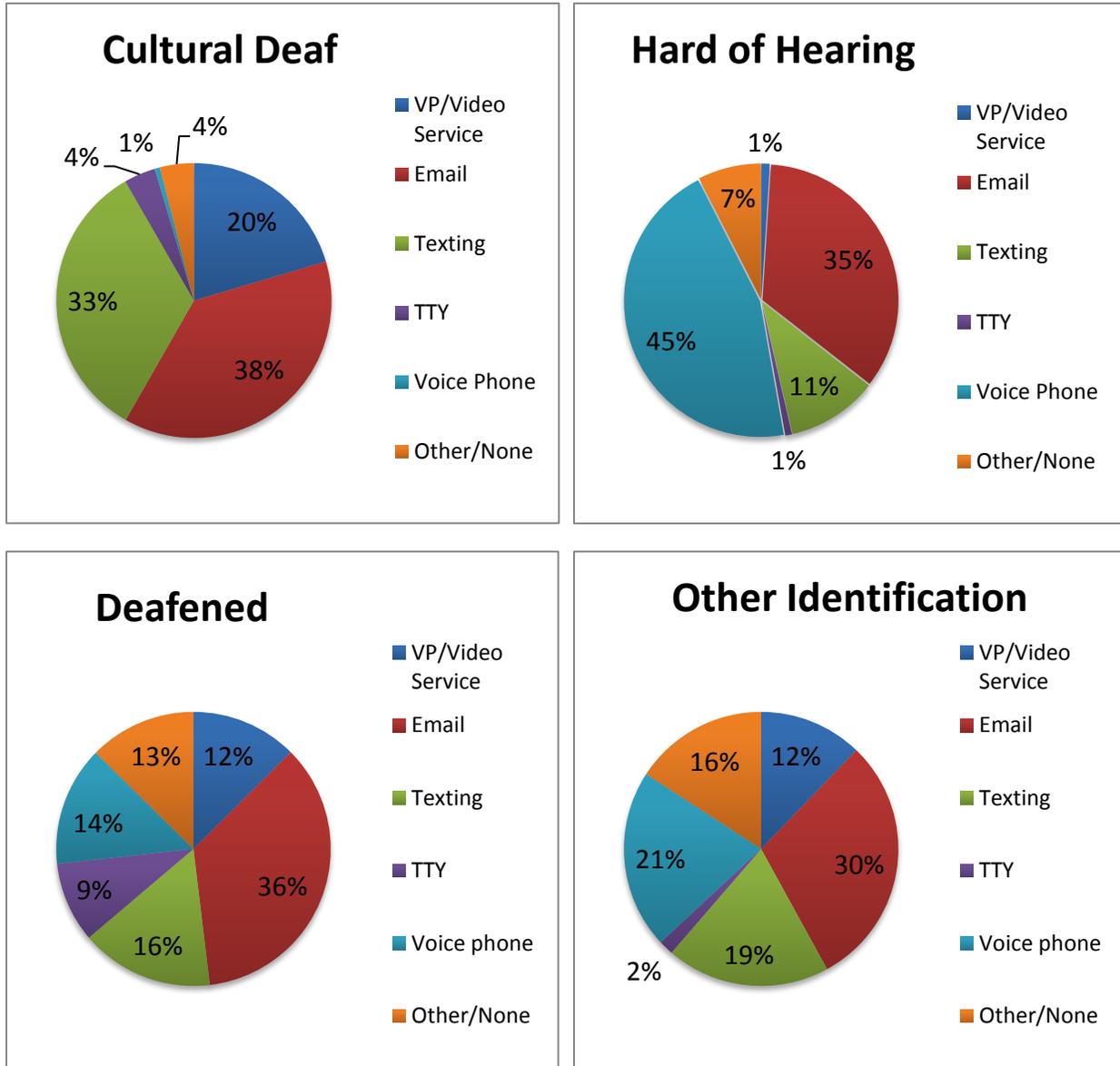
The most used form of communication responses were analyzed by the preferred language data with the following results:

Figure 13: Most Common Used Forms of Communication by Language Preference (n=1258)



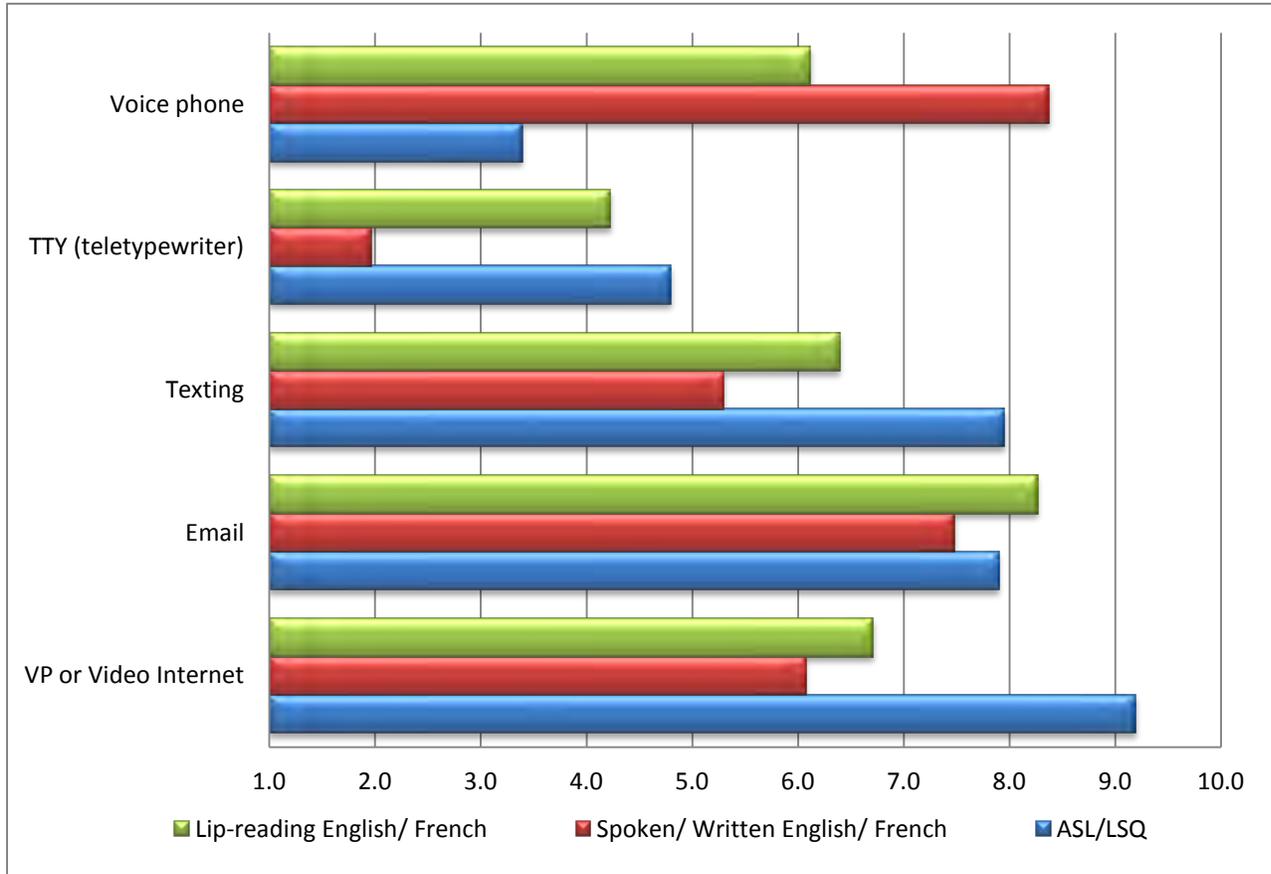
ASL and LSQ users had very similar usage patterns with email, texting and videophones. Those who preferred spoken language showed high usage of voice telephones. The same responses were then analyzed by self identification and are shown in the graphs below.

Figure 14: Most Common Used Forms of Communication by Self Identification (n=1299)



The average appreciation ratings (rated from 1 to 10) for various communication modes shown by language preference are displayed in the following graph. Although usage of TTY communication is listed among the most common used forms, the appreciation rating for it is very low across all groups.

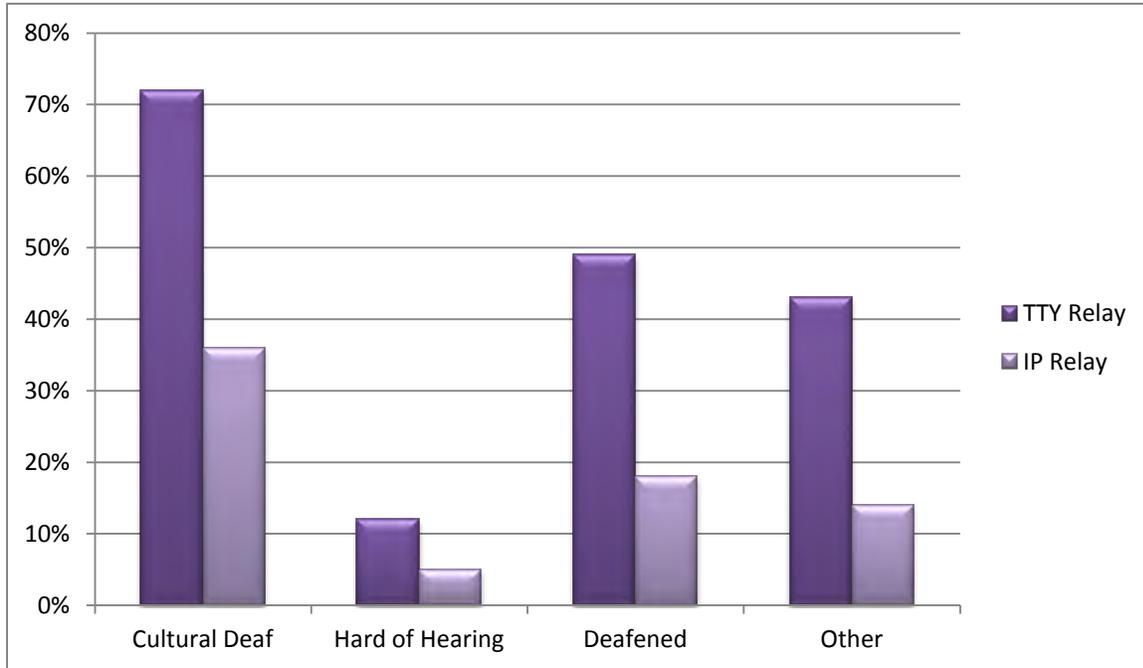
Figure 15 Average Communication Ratings by Language Preference 1 to 10 Scale (n=1258)



Those who prefer spoken and written language show a strong preference for voice telephones, while those who prefer visual language have strong preferences for videophones. All preferences have low appreciation for TTY communications. The highest average rating was awarded to videophone and video Internet services by those who primarily use ASL/LSQ.

Further data was obtained in regard to current usage of relay services with TTY relay having the highest usage. Relay service is used most amongst the culturally Deaf. Current relay usage by self identification is displayed in the graph below.

Figure 16: Current Relay Usage by Self Identification



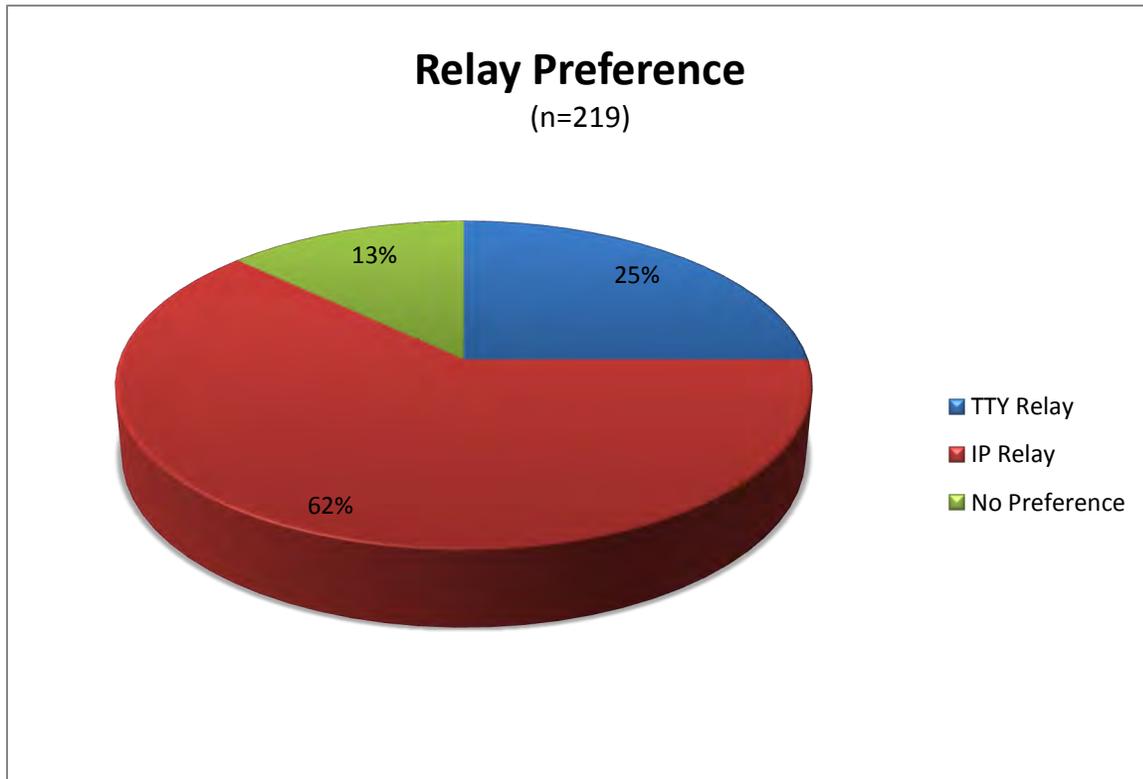
Of those who use both TTY relay and IP relay services, respondents show a clear preference for IP relay and a slightly higher usage frequency for it, as shown below.

Table 12: Frequency of Relay Usage

Frequency of Use of Relay Service ⁷¹	Often	Regularly	Rarely
IP Relay (n=294)	19%	65%	16%
TTY Relay (n=615)	12%	65%	23%

⁷¹ Often = 20 times per month; regularly = 1-20 Times per month; rarely = a few times a year.

Figure 17: Relay Preference of Current Users



In summary, the data for current relay usage showed high TTY usage, but low appreciation for this form of communication. In addition, current relay users indicated an inclination to use their preferred method of relay (i.e. TTY or IP) in the event they might need to access 9-1-1. This may imply that relay users will also be inclined to use VRS for 9-1-1 calls.

6.3. Community Interpreters and Availability

Approximately 60% of those surveyed use community sign language interpreters, primarily for meetings and other appointments, followed by doctor's appointments. The use of sign language interpreters was highest amongst the culturally Deaf, followed by deafened individuals. Of significance was the low utilization of sign language interpreters by the hard of hearing. Respondents whose language preference is either ASL or LSQ account for approximately 99% of those who utilize sign language interpreters.

Figure 18: Use of Community Sign Language Interpreters by Self Identification

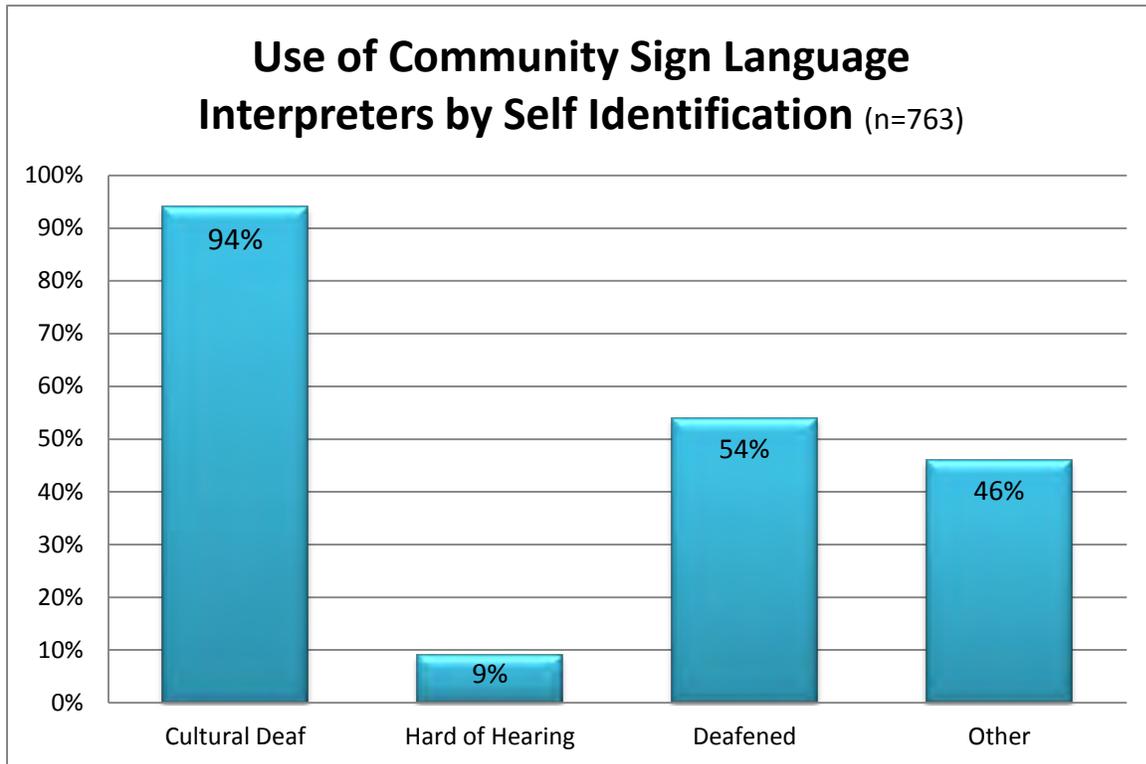
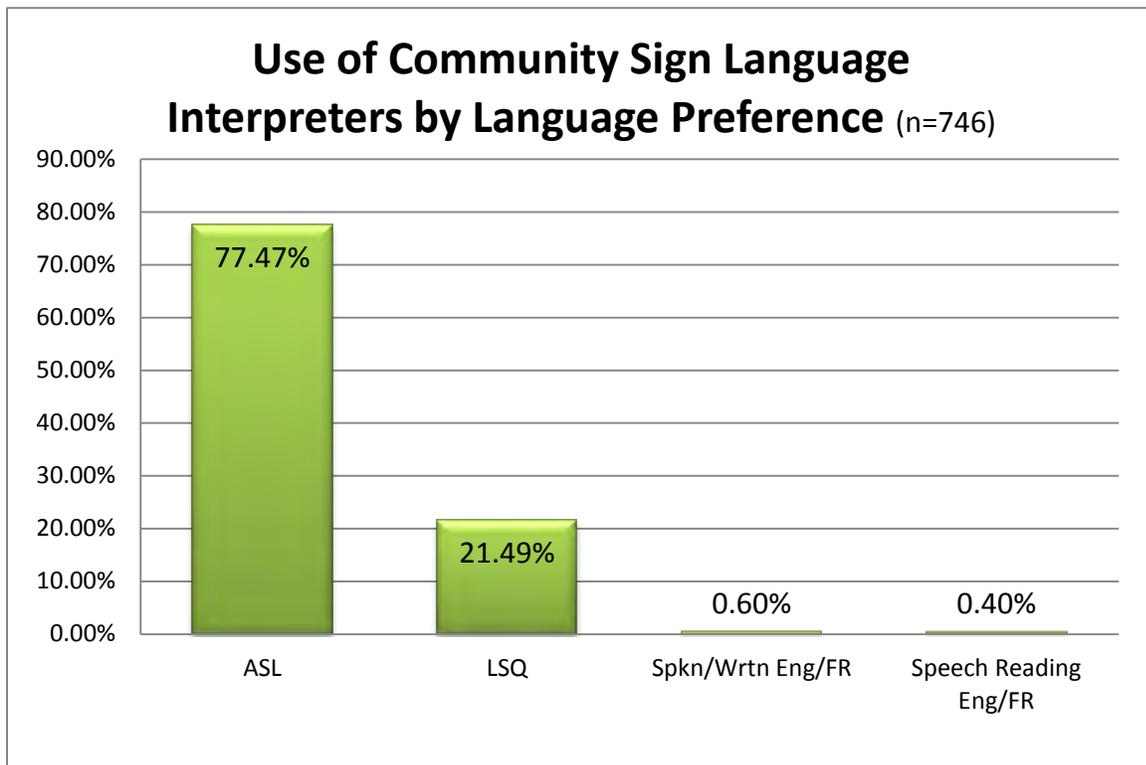
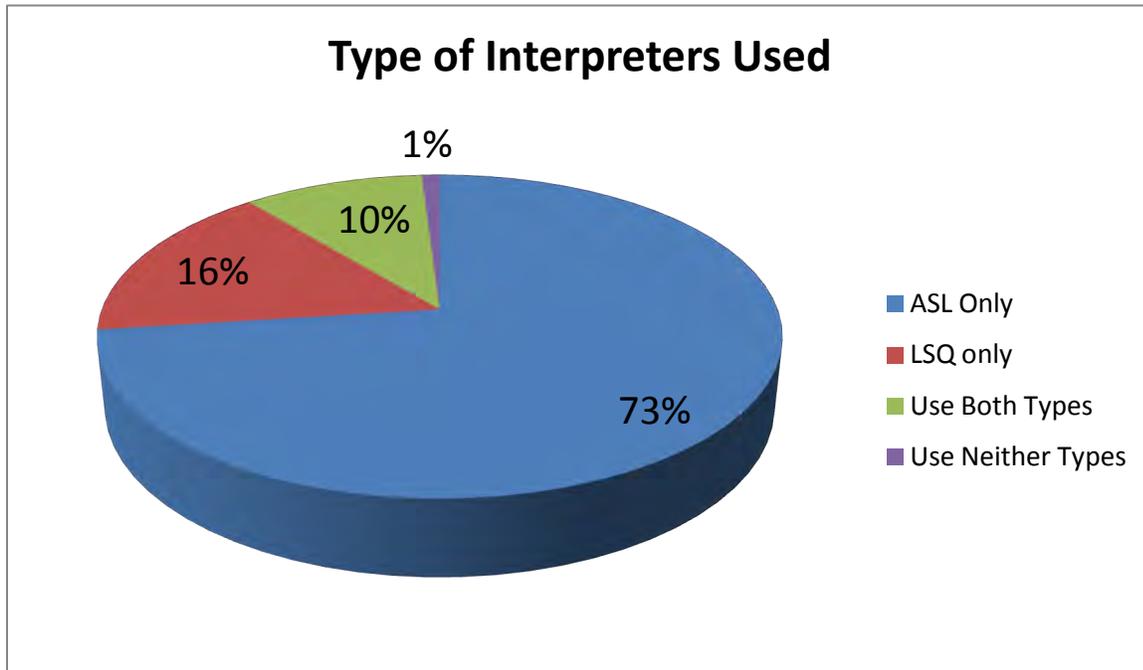


Figure 19: Use of Community Sign Language Interpreters by Language Preference



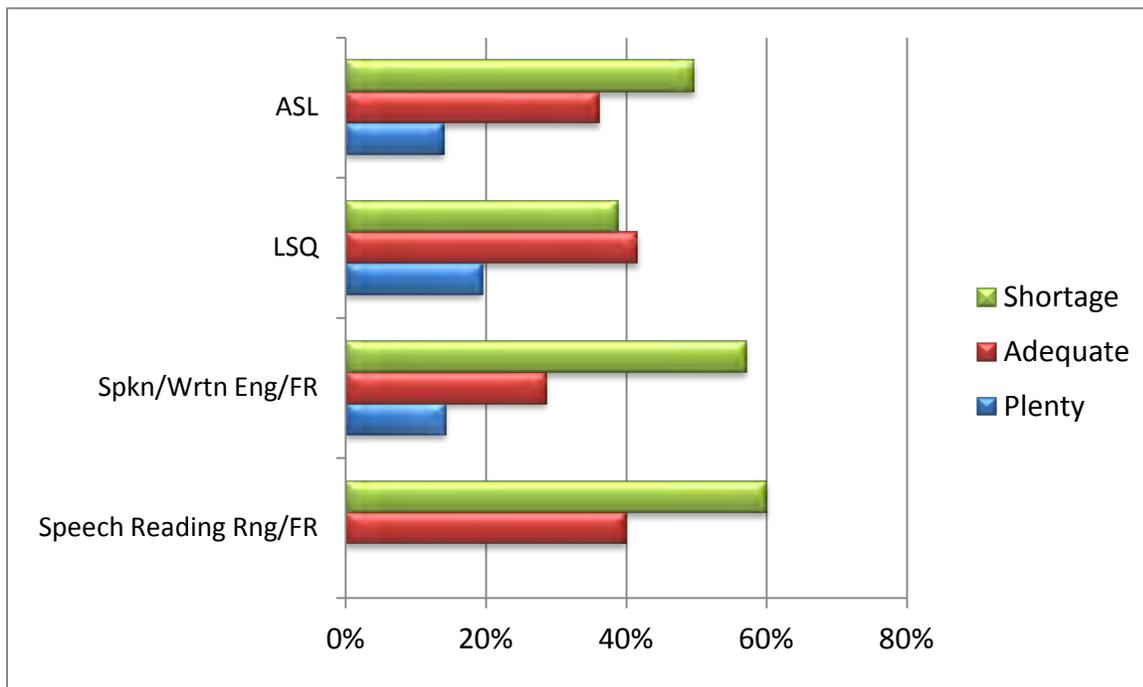
ASL interpreters were the majority, but within Quebec LSQ interpreters were the preferred choice. The type of sign language interpreter used by those who utilize them is illustrated in the graph below.

Figure 20: Type of Interpreters Used



Those who use sign language interpreters were asked to describe the current availability of community interpreters.

Figure 21: Perception of Availability of Interpreters Classified by Language Preference



All language preferences reported a shortage of interpreters with a slight exception for LSQ users, who reported an adequate supply. This may be due to the lack of standardized evaluation of LSQ interpreters and that many individuals are working as interpreters without proper qualification resulting in a seemingly adequate supply of community interpreters.

6.4. VRS Perspectives

VRS is generally deemed an important component for communication needs with 75% of all respondents reporting the importance of having it available. The following data analysis attempts to show which constituents and language preferences will be most likely to utilize VRS through importance ratings, estimated usage, and willingness to pay for VRS.

6.4.1. VRS Importance and Usage

Ninety-seven percent (97%) of ASL or LSQ users rated VRS as important, confirming the value of the service for those constituents. Those who prefer speech reading also consider VRS as an important service with approximately 70% of responses indicating importance. However, the degree of importance varies between these groups with the majority of ASL and LSQ users reporting VRS as “absolutely necessary”, while the majority of those who prefer speech reading reporting lower degrees of importance.

Importance ratings by self identification reveal similar patterns to language preference, particularly between the culturally Deaf and ASL/LSQ usage and the hard of hearing with spoken/written language preference.

The specific data related to importance are displayed in the following series of charts.

Figure 22: Importance of VRS by Language Preference (n=1258)

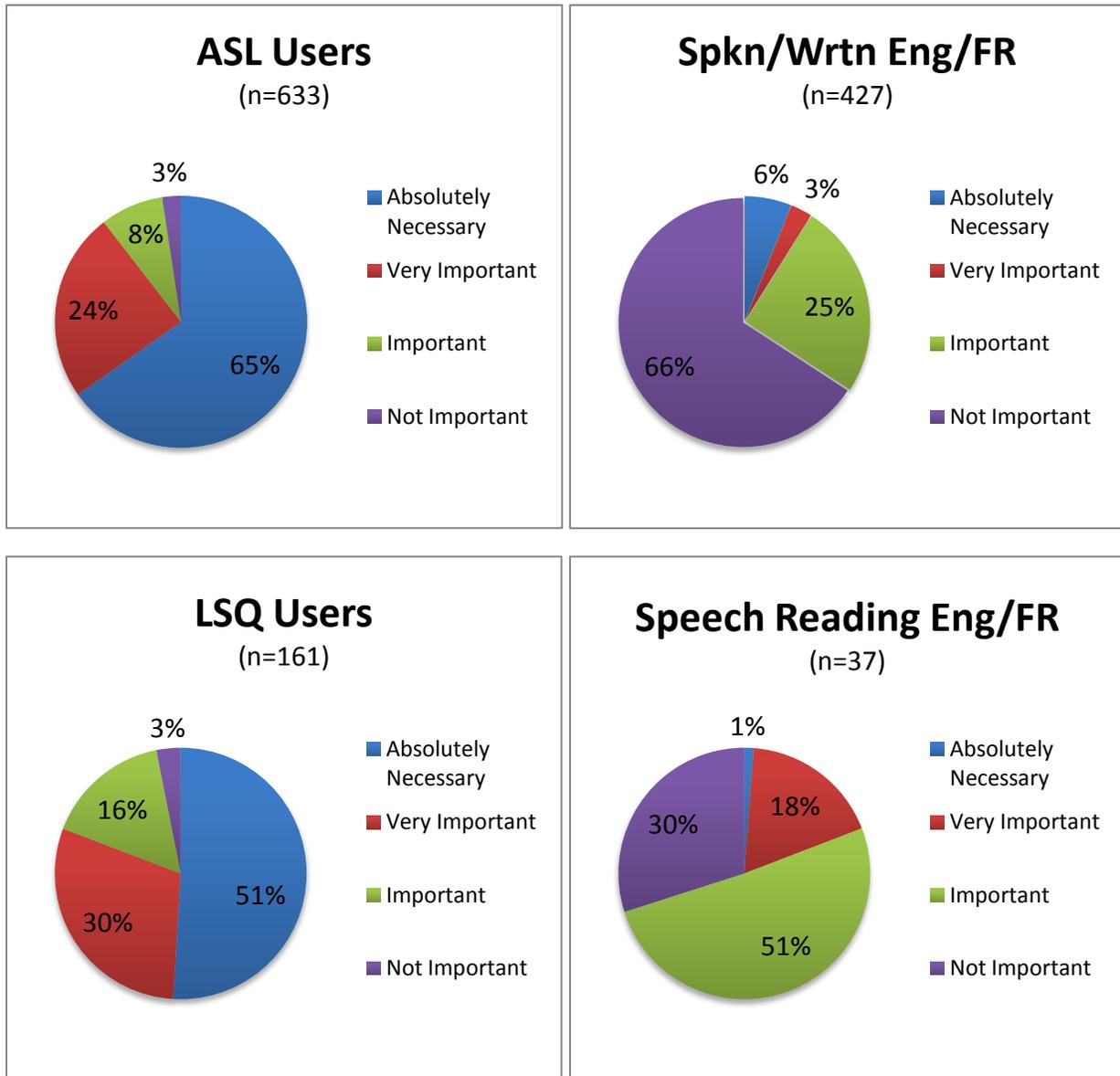
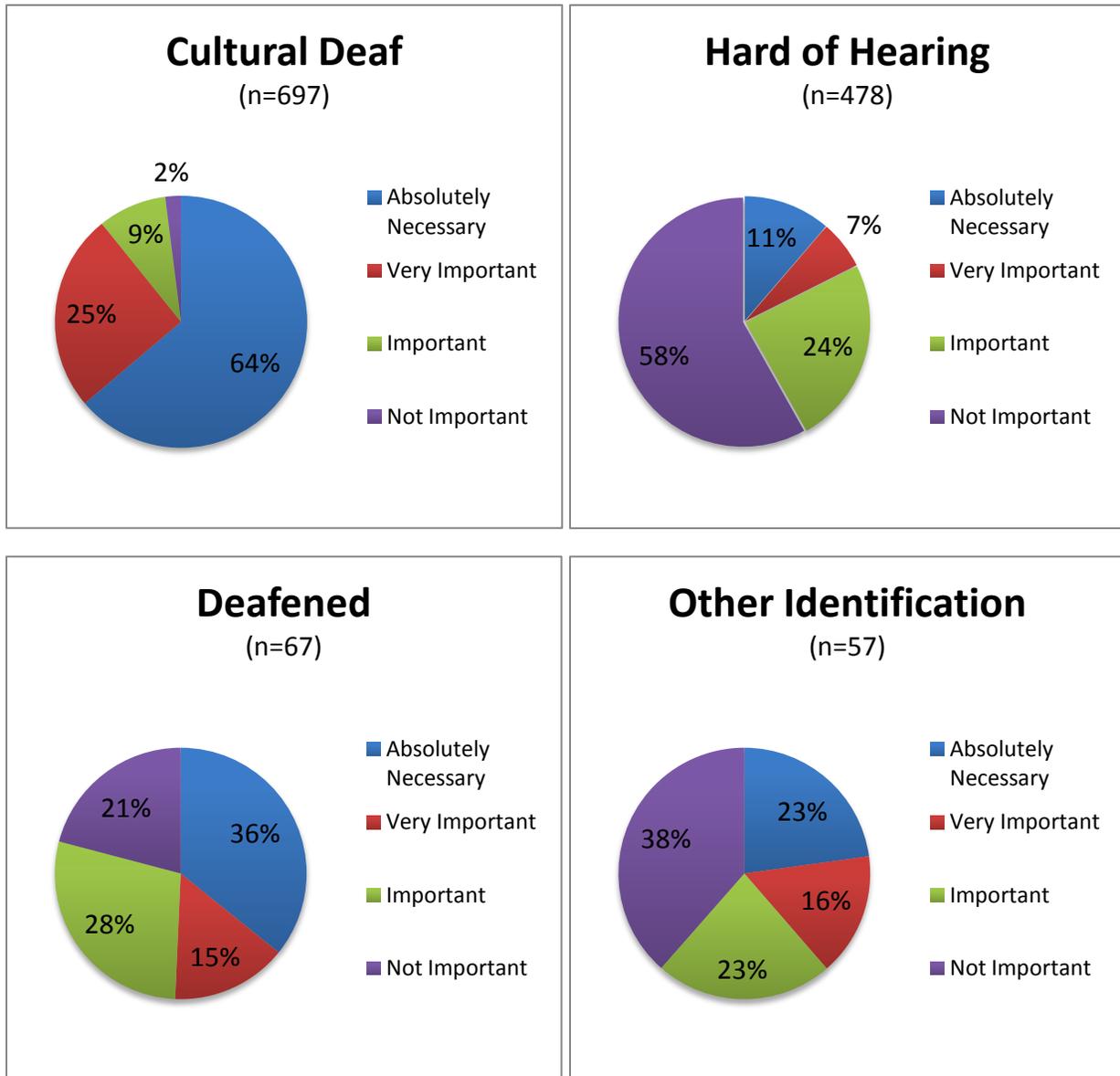


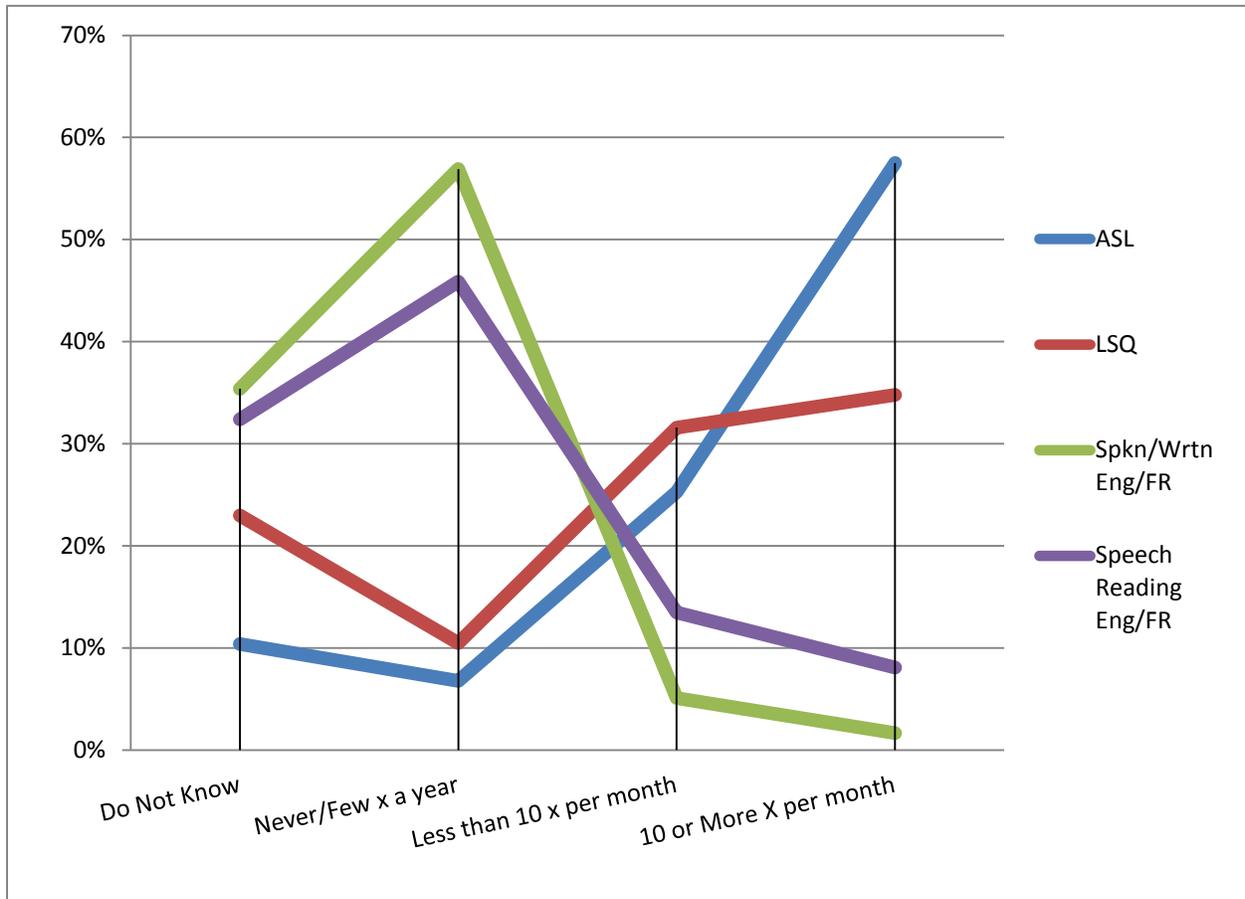
Figure 23: Importance of VRS by Self Identification (n=1299)



6.4.2. Estimated Usage of VRS for Relay Calls by Language Preference

ASL and LSQ users are most likely to use VRS as determined by the survey respondents' estimates of usage. Despite a 70% importance rating, those who prefer speech-reading did not indicate high estimates of usage if the service was available. Those who prefer spoken and written language also indicate low estimated usage of VRS, which is in agreement with how they responded to the importance of VRS. The specific data related to estimated usages of VRS are displayed in the chart below.

Figure 24: Estimated Usage of VRS by Language Preference

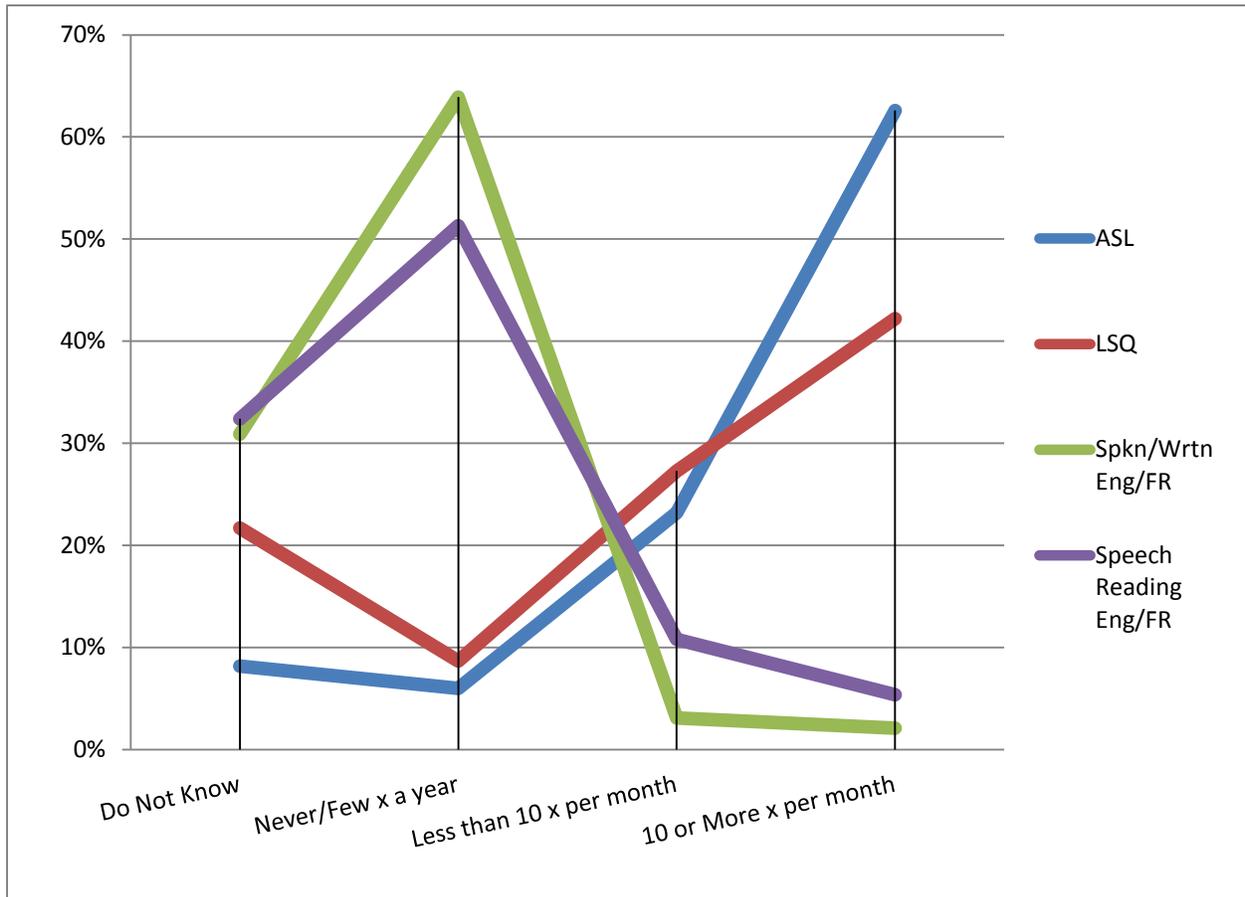


The analysis confirms that ASL and LSQ users are the primary users of VRS and that those who prefer other forms of communication have less interest and estimated usage of VRS.

6.4.3. Estimated Usage of VRS for video-to-video calls by Language Preference

Additionally the estimated usage for video-to video calling (i.e. calls without an interpreter – not relay) was slightly higher than estimated relay usage, demonstrating the desire of potential VRS users to connect with other users via the VRS interface without using the interpreting function.

Figure 25: Estimated Usage of VRS for Video-to-Video calls (not VRS) by Language Preference



6.4.4. Willingness to Pay for VRS

Estimated usage or feelings of VRS importance do not necessarily translate into a willingness to pay for the services. In general, Canadian respondents did not indicate a willingness to pay for VRS. Of those who indicated VRS was important to them approximately 47% would not be willing to pay anything more than they currently pay for their phone or Internet service.

6.5. General Calling Experiences

As part of a Bell formatted survey, respondents were asked to provide comment on the one thing that could be done to improve their calling experiences. The answers summarized below do not necessarily relate to VRS.

- Need VRS in all provinces as soon as possible 29%
- Nothing/VRS is not needed 17%
- VRS is a good/useful service to communicate 13%
- Phones with louder speakers/amplifiers..... 6%
- VRS is better than TTY (outdated)/Do not like TTY 5%
- Faster service/Less waiting for reply 4%
- Need qualified interpreters 4%
- Cheaper price/Free services 3%
- More accessible services 3%
- Meet the needs of the deaf better..... 3%
- More information about products 2%
- Do not know 10%

7. Conclusion

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.

As indicated by the group questionnaires and online survey responses, the inclusion or exclusion of various modes of communication in addition to ASL and LSQ will continue to be a controversial topic. 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 survey results suggest that most types of usage can be accommodated by qualified sign language interpreters (ASL and LSQ).

VRS is a service that is primarily provided to the Deaf community, which means that their involvement is crucial for successful deployment. Again, the advocacy groups all agreed on the importance of involving the users in the Canadian VRS implementation and operations.

The information in this research summary is meant to express the opinions of the Deaf and hard of hearing and their advocacy groups, as gathered from interviews, questionnaires, discussions and surveys.

CONSUMER PERSPECTIVES

APPENDIX A: LIST OF ORGANIZATIONS

Consumer Advocacy groups, and other individuals consulted for this study's Phase 3 research are provided as Appendix A to this report, as follows:

- 1. Ontario Association of the Deaf**
Toronto, Ontario
Dean Walker, Executive Director
John Mans, Vice President
Jeff Beatty, OAD Guest

- 2. Canadian Hearing Society**
Toronto, Ontario
Gary Malkowski, Special Advisor to the President, Public Affairs
Chris Kenopic, President and CEO
Jim Hardman, Director Information Technology
Len Mitchell, Chair, Board of Directors

- 3. Canadian Cultural Society of the Deaf**
Toronto, Ontario
Joanne Cripps, Co-Director

- 4. Canadian Association of the Deaf**
Jim Roots, Executive Director
Doug Momotiuk, President
Frank Folino, Vice President
Henry Vlug, Attorney

- 5. Saskatchewan Deaf and Hard of Hearing Services**
Saskatoon and Regina, Saskatchewan
Roger Carver, Executive Director

- 6. Manitoba Deaf Association**
Winnipeg, Manitoba
Aaron Montney, President
Doug Momotiuk, Secretary
Gunars Butkans, Treasurer

- 7. British Columbia – VRS Committee**
Vancouver, British Columbia
Lisa Anderson-Kellett, Communications Officer
Nigel Howard, CRTC Liaison
Sarah Hrycenko, Alberta-BC groups Liaison

8. Alberta Association of the Deaf

Edmonton and Calgary, Alberta

Linda Cundy, Secretary / Chair of VRS Task Force

Angela Straity, Member of VRS Task Force

Jan McCarthy, Member of VRS Task Force

Judy Nadon-Yuen, Member of VRS Task Force

Brent Novodvorski, Member of VRS Task Force

9. Deafness Advocacy Association Nova Scotia (DAANS)

Halifax, Nova Scotia

Justin DeBaie, Member VRS Committee

Jennifer Gibson, President Maritime Association of Professional Sign Language Interpreters

Tammy Martin, Member VRS Committee

Darrell Feit, Chair, Let Abilities Work, Deaf and Hard of Hearing Committee

Richard Martell, President, Halifax Association of the Deaf

Betty MacDonald, Chair, Deaf Literacy Network

Marie Josee Crawford, Member VRS Committee

Melba Bunden, Community Development Coordinator, DAANS

Elliot Richman, President, DAANS

Linda Quigley, Executive Director, DAANS

10. Communicaid for Hearing Impaired Persons (CHIP)

Montreal, Quebec

Alvin Goldman, Executive Director

Carroll Salomon, Editor

Ken Tatebe, Technical Director

11. Association du syndrome d’Usher du Québec (ASUQ)

Montréal, Québec

Daniel Deschênes, General Director

Yann Lacroix, Member Representative

12. Centre de communication adaptée (CCA)

Montréal, Québec

Marie-Andrée Gilbert, Assistant Director

13. Centre québécois de la déficience auditive (CQDA)

Montréal, Québec

Monique Therrien, Executive Director

Daniel Peloquin, Board Member

14. Association des devenus sourds et des malentendants du Québec (ADSMQ)

Montréal, Québec

Michel Nadeau, President

15. Centre Communautaire des Sourds de l'Est du Québec

Montréal, Québec

Jacques Boudreault, President

16. Association des malentendants Québécois Inc.

Québec

Rachel Picard, Treasurer

Gilles Nollet, President

Francine Chalut, Administrator

Lisa Pelletier, Vice President

Nicole Belanger, Executive Director

17. Centre des loisirs des Sourds de Montréal

Montréal, Québec

Gilles Boucher, Vice-President

Real Routhier

Donna Bell

Guy Fredette

Claudette Belanger

18. Société culturelle québécoise des Sourds

Montréal, Québec

Michel Lelièvre

France Beaudoin

Dominique Lemay

19. L'Atelier d'Alpha des Sourds de Québec

Québec

Jean-Yves Dion, Secretary

20. Fondation des Sourds du Québec

Québec

Daniel Forgues, President

21. Association des Sourds de Quebec

Stephane Renaud

22. Centre de la communauté sourde du Montréal Métropolitain (CCSMM)

Gilles Read, Executive Director

Yann Lacroix

Andre Lauzon

Daniel Deschenes

Manon Bergeron

23. Bernard Belley, LSQ Professor

24. Jean Davia, Sourdologue Representative

25. Association Ontarienne des Sourd-e-s Francophones (AOSF)

Montréal, Québec

Chris G. Séquin, President
Michael McGuire, Vice President
Ryan McGuire
Marie-Josée Blier
Stéphanie Rousseau
Chantal Deguire
Yannick Gareau
Richard R. Hudon

26. Regroupement des parents et amis des enfants sourds et malentendants franco-ontariens

Ottawa, Ontario

Régine Petit

27. Association de l’Ouïe de l’Outaouais

Gatineau, Québec

Michael McGuire
René Leroux
Julie Goulet
Gloria Dungan
(additional 23 members consulted)

28. Patrick Boudreault, VRS Advisory Committee Representative

29. Greater Vancouver Association of the Deaf

Robie Scholefield
Janice Lyons

Phase 4:

VRS Models in Other Countries

VRS Feasibility Study

Mission Consulting

February 24, 2012

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VRS IN OTHER COUNTRIES

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the fourth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This phase 4 research summary, *VRS in Other Countries*, is intended to provide an understanding of the challenges and success other countries encountered in their efforts to test and deploy VRS. Mission Consulting conducted research on VRS in nine countries:

- Australia
- Finland
- France
- Germany
- New Zealand
- Sweden
- Switzerland
- United Kingdom
- United States

Although phase 4 is not intended to provide detailed research on Canada, some Canadian references are included such as comparative demographic data. Additionally, research on international standards and multi-national policy agreements, related to the rights of people with disabilities and the use of enabling technologies, were reviewed and referenced where appropriate.

The phase 4 research summary, *VRS Models in Other Countries*, provides a country-by-country synopsis of the legal, regulatory, social and operational environment related to message relay services, and specifically Video Relay Services. By country, each summary includes:

- An overview of the population and potential VRS user demographics;
- Regulatory issues related to oversight of MRS/VRS;
- How the rights of people with disabilities are established and the relationship these rights have to the provision of relay services;
- Funding models and sources supporting MRS/VRS;

- ☑ Types of relay services provided and any user limitations;
- ☑ Technology issues related to VRS;
- ☑ Restrictions on relay services, such as limited access to VRS;
- ☑ Service related issues encountered such as abuse of the relay service or fraudulent billing by providers;
- ☑ Interpreter resources and initiatives to address increased demand;
- ☑ Access to emergency services; and
- ☑ VRS education and outreach programs.

2. Methodology

Prior to beginning the research on other countries, Bell representatives were engaged in finalizing the scope and methodology for this Phase. Organizations, individuals, providers and regulators in the subject countries were approached to participate in this research, with the understanding that the purpose of the research was to gather information related to VRS on behalf of Bell and for possible inclusion in a report to the CRTC.

For each country, a list of potential resources to be interviewed was developed, working from international rosters of MRS and VRS stakeholder organizations, governmental regulatory directories, known MRS and VRS providers, manufacturers of VRS equipment, and recommendations by others who are informed on the rights and services for individuals with disabilities.

Before any direct contact with stakeholders, extensive online research was conducted to determine a base level understanding of the services in each country and to refine the topics of discussion when direct contact was achieved. Unfortunately, in some instances direct contact was not possible and the online research, as well as the data provided by others knowledgeable on that country's VRS, was used to best understand the issues in that particular environment. The contact list was modified as the research continued. In fact twelve countries were included in the initial research effort. However the participants from the Czech Republic, Italy and Spain were nonresponsive, or offered very little information, and it was agreed that their VRS market data was not significant to the purpose of the study.

To facilitate data gathering and prepare those that were interviewed by telephone, unique questionnaires were developed and distributed to the following categories of stakeholders: Consumer Groups, VRS Providers, and Regulatory Organizations. Additionally, when an identified party was unresponsive, multiple efforts were made to email the questionnaire a second or third time, to call them, and also to find an alternative country representative in that category of stakeholder.

Additionally, some research obtained for other phases of the study, such as Phase 5 - *Technologies and their Forecasts* and Phase 6 - *Interpreter Considerations*, was also used as applicable in completing the summary report on *VRS Models in Other Countries*.

There was reluctance for individuals to contribute to the report as 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, this is a highly competitive market, where some providers have had legal problems related to relay practices, and providers and regulators were very guarded in what they would discuss. In personal conversations with many of the VRS stakeholders it became apparent that sharing the type of information we were pursuing, such as VRS call volumes, challenges in test programs, user data, and actual costs, was not going to be forthcoming. Responses from 27 representatives are incorporated in this summary report. Some subjects agreed to be interviewed, to provide as much help as they could, but only if their comments and experiences were considered from a confidential source.

As stated earlier, additional VRS information on other countries' VRS programs continues to be provided, and relevant information may be incorporated into the final feasibility study.

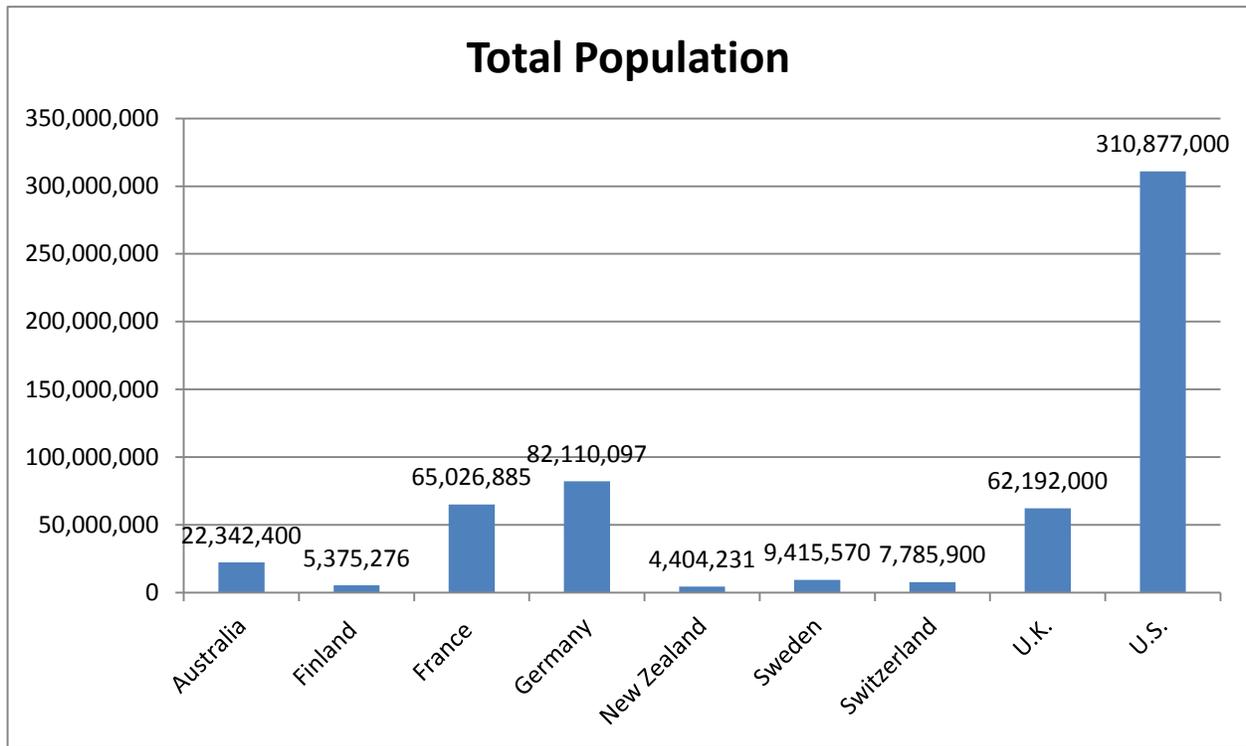
3. Summary Findings

There is a substantial amount of data in each country's summary report. There are several reoccurring themes related to VRS deployment in many of the countries reviewed, such as concerns about the limited availability of qualified interpreters. However, there are also unique instances where an issue, such as outreach and education in with the introduction of VRS, is identified as having been thoughtfully addressed. The following summary findings are meant to provide an overview of particularly interesting VRS issues that may have significance to the potential application of VRS in Canada, or help inform stakeholders on issues of consequence; but it is not intended to replace the need to read each individual country summary.

Deaf and hard of hearing population

Each country report begins with population estimates. However, one of the challenges in gathering data on individuals with disabilities is that affected individuals often are not included accurately in census data, and they may not wish be identified as having a limitation. This challenge, of individuals not correctly reporting or self-identifying a disability, is particularly true for the late deafened and hard of hearing population. The cultural standards for each country may discourage certain self reporting, while in others there may be a reduced stigma or social isolation for those with disabilities. Also, in some cases there were different statistics available, such as when the government offers one set of numbers and stakeholder organizations publish a significantly different projection. Therefore, the numbers and percentages of individuals reported with disabilities may not be as reliable as desired. Nevertheless, estimates of the total populations for each country as well as the Deaf or hard of hearing population, and users of sign language, are represented on the following charts.

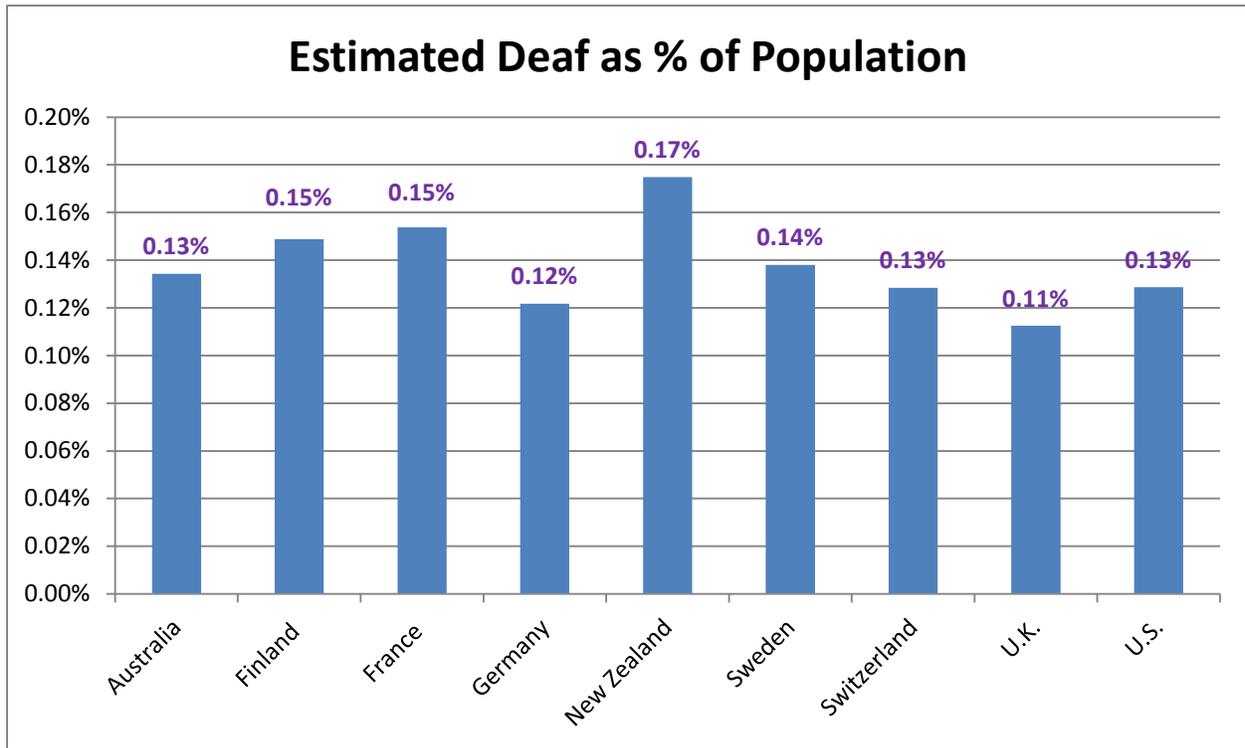
Figure 1: Total Populations by Country



In collecting the data for the total populations of Deaf and hard of hearing individuals reported from each country, it became apparent that there is a great disparity in the ratios (from country to country) of this focus population to the total population. It is believed that the accuracy of the estimated populations for hard of hearing individuals reported by some countries caused of the wide discrepancy.

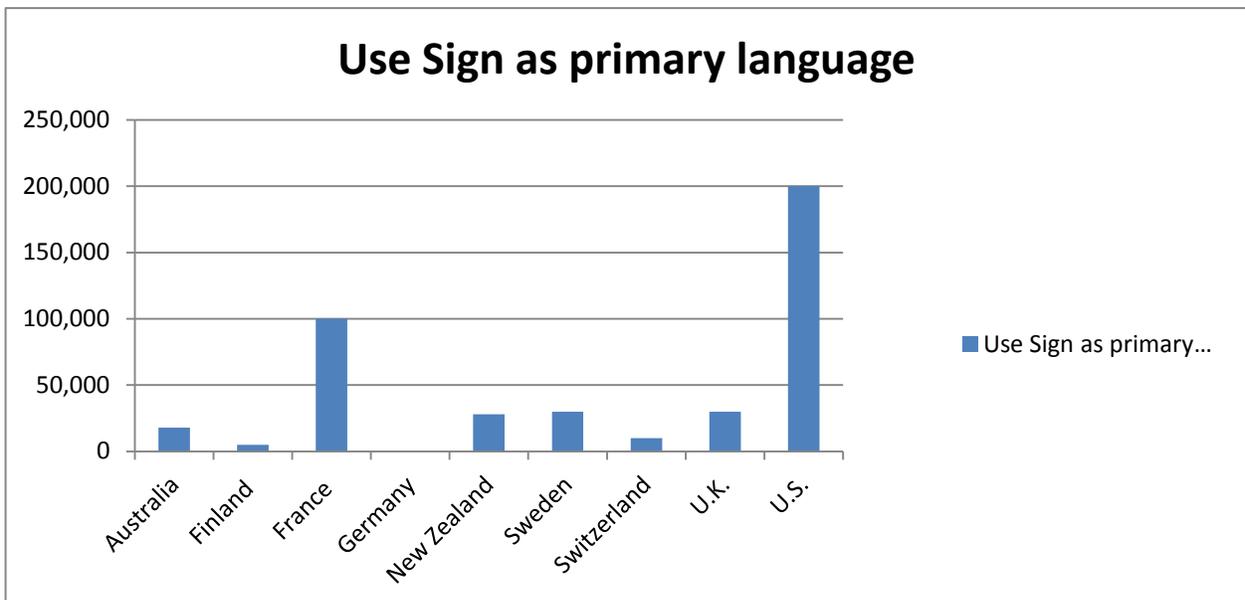
However, if the ratios reported Deaf populations alone are measured and considered as a partial indicator of potential VRS consumers, there is a fairly consistent ratio from country to country.

Figure 2: Estimated Deaf Population as Percentage of Population



Also of interest is the number of individuals who are reported using sign as their *primary* language. While video relay may well be used to enhance other forms of communications, the population of sign users is of consequence as it may most directly relate to the number of potential users of VRS.

Figure 3: Estimated Population that Use Sign Language as Their Primary Language



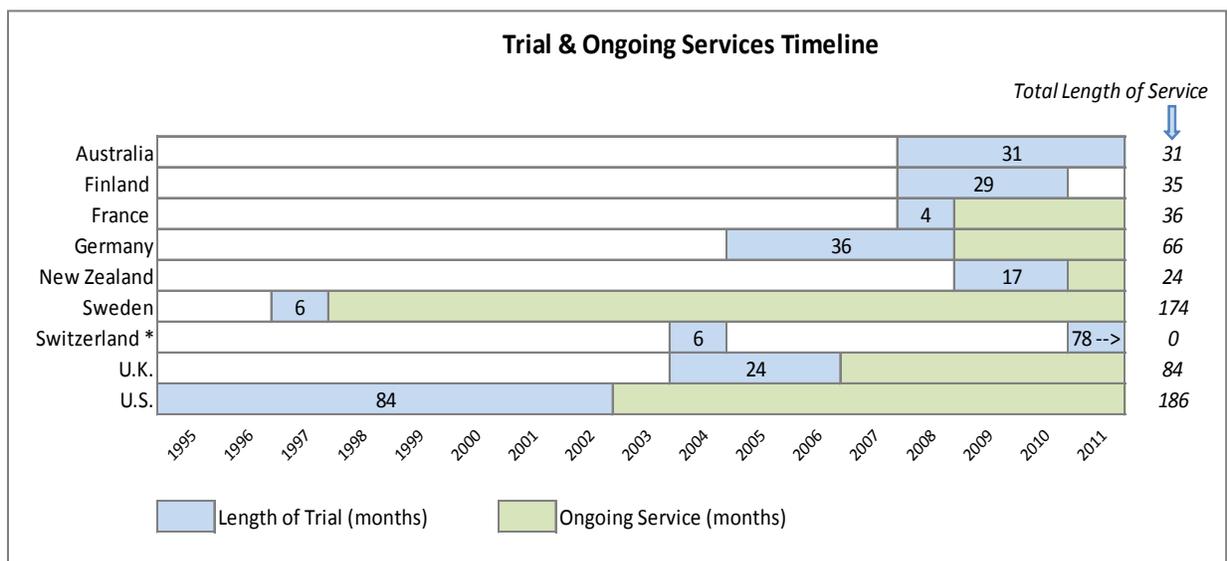
Status of VRS Development

Each of the nine countries surveyed had some form of VRS trial period and three continue to provide VRS as a trial. Seven countries reported having ongoing VRS services. The following charts represent the length of each country's trial, as well as a timeline of VRS trial periods and ongoing services.

Table 1: VRS Trial Dates and Length of Service by Country

Country	Length of Trial (months)	Trial Dates	Total Length of Service (months)
Australia	31	11/2008 - present	31
Finland	29	7/2008 - 12/2010	35
France	4	4/2008 - 7/2008	36
Germany	36	2005 - 2008	66
New Zealand	17	6/2/2009 - 11/2/2010	24
Sweden	6	1/1997 - 6/1997	174
Switzerland	78	6/2011 - 6/2017 (+ 6 months 2004)	None
U.K.	24	2004 - 2006	84
U.S.	84	1995 - 2002	186

Figure 4: Timeline of VRS Trial Dates and Ongoing Service by Country



Each country has a unique regulatory structure to oversee and manage its VRS. To varying degrees the consumer access to and actual speed of their broadband service may impact the quality and growth of VRS. But these issues are not of great concern.

The individual country reports provide the legal and social foundations that support the rights of individuals with disabilities and the available funding to support these services. These issues are important to understanding a government’s interest in deploying VRS, as well as their current and often very limited service environment.

Recent developments of commercially available VRS platforms, as well as trends towards interoperability of systems and service, will provide the greatest consumer and regulatory flexibility. The development of the EU Total Conversation Standard requiring simultaneous voice, text, TTY and video will further ensure international consistency of service options.

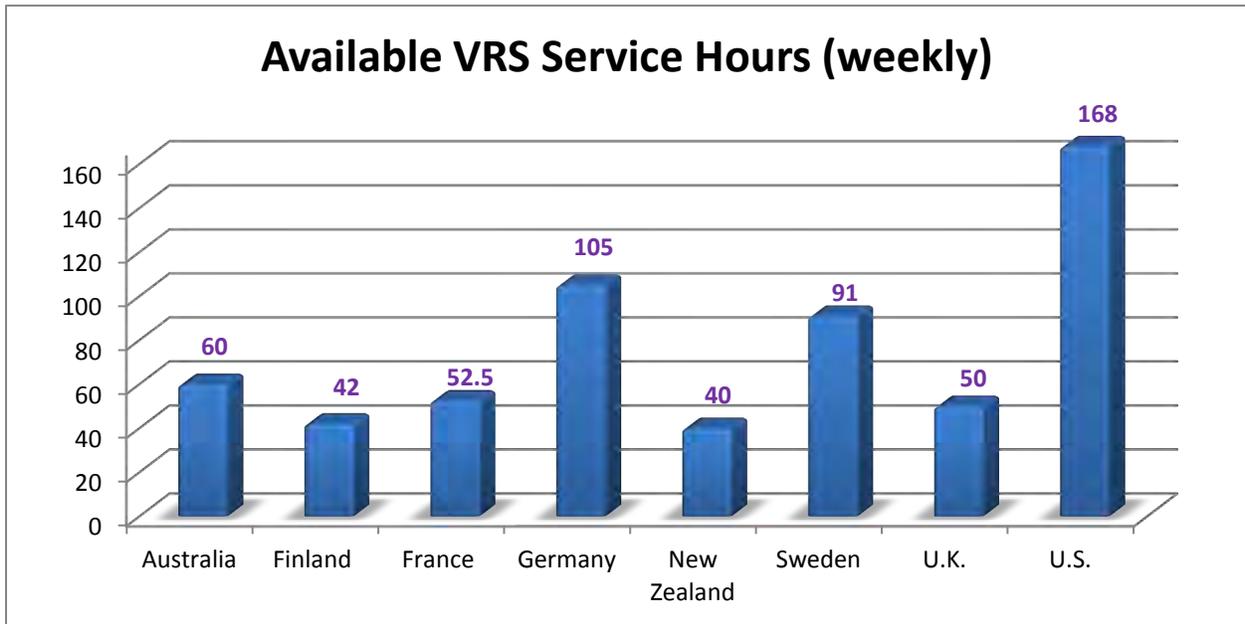
Availability of VRS

With the exception of the U.S. program, no other country with ongoing (non-trial) VRS services currently provides continuous services, 24 hours a day, 365 days a year.

Figure 5: Availability of VRS by Country

Country	VRS Schedule	Hours available per week
Australia	7AM - 7PM weekdays	60
Finland	8AM - 4PM M,T,TH, F & 8AM - 6PM W	42
France	8:30AM - 7PM weekdays	52.5
Germany	8AM - 11PM 7 days a week	105
New Zealand	9AM - 5PM weekdays	40
Sweden	7AM-10PM weekdays / 9AM - 5PM SA, SU	91
U.K.	8AM - 6PM weekdays	50
U.S.	24/7/365	168

Figure 6: Hours of Availability of VRS by Week, by Country



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

- Australia’s trial VRS program has a maximum of 2 VRS VI workstations at any time which results in blockage and delays. 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 governmental social insurance program. Services are regionally distributed with many small facilities. It is in the process of transitioning from a limited trial to an ongoing service. But those services are not yet established, and VRS appears not to be operational at this time.
- France’s disability laws and regulations are focused on business communications. A consortium of businesses (Tadeo) was created to provide the access services they were required to provide. Use of VRS is primarily for business use. For private use, a credit system has been established for the consumer to pay for any desired use.
- Germany’s VRS is a two-tiered system. Business calls paid by employer with the government reimbursing commercial enterprises for the first €1,023 per month. Private use is available at a lower charge and 95% paid by government
- New Zealand’s VRS schedule (like Finland’s) is irregular, during weekdays only, and is only available 20 hours a month.

- U.K. provides VRS for business use and calls to government only. Private use allowed, but at a charge. Not an “official trial or pilot” nor is it a permanent component of Universal Services (which covers TRS).

Unique Characteristics of the U.S. VRS Program

Relay services that support individuals with disabilities are established in law based upon the Americans with Disabilities Act of 1990 (ADA). The ADA and the FCC established the standard of “functionally equivalent” relay services or equal to a hearing person’s access to a telephone

The Federal Communication Commission (FCC) and the individual states share in the costs of providing traditional relay services (e.g. MRS, Speech-to-Speech) based on interstate vs. intrastate use. IP based services 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.

Because each state is required to provide traditional TRS, there are many TRS providers contracted to the individual states. The FCC initially authorized any relay contractor doing business with a state relay program to provide VRS and eventually certified a few others.

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

- Its own rules qualifying providers for reimbursement from the Intestate TRS Fund
- 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:

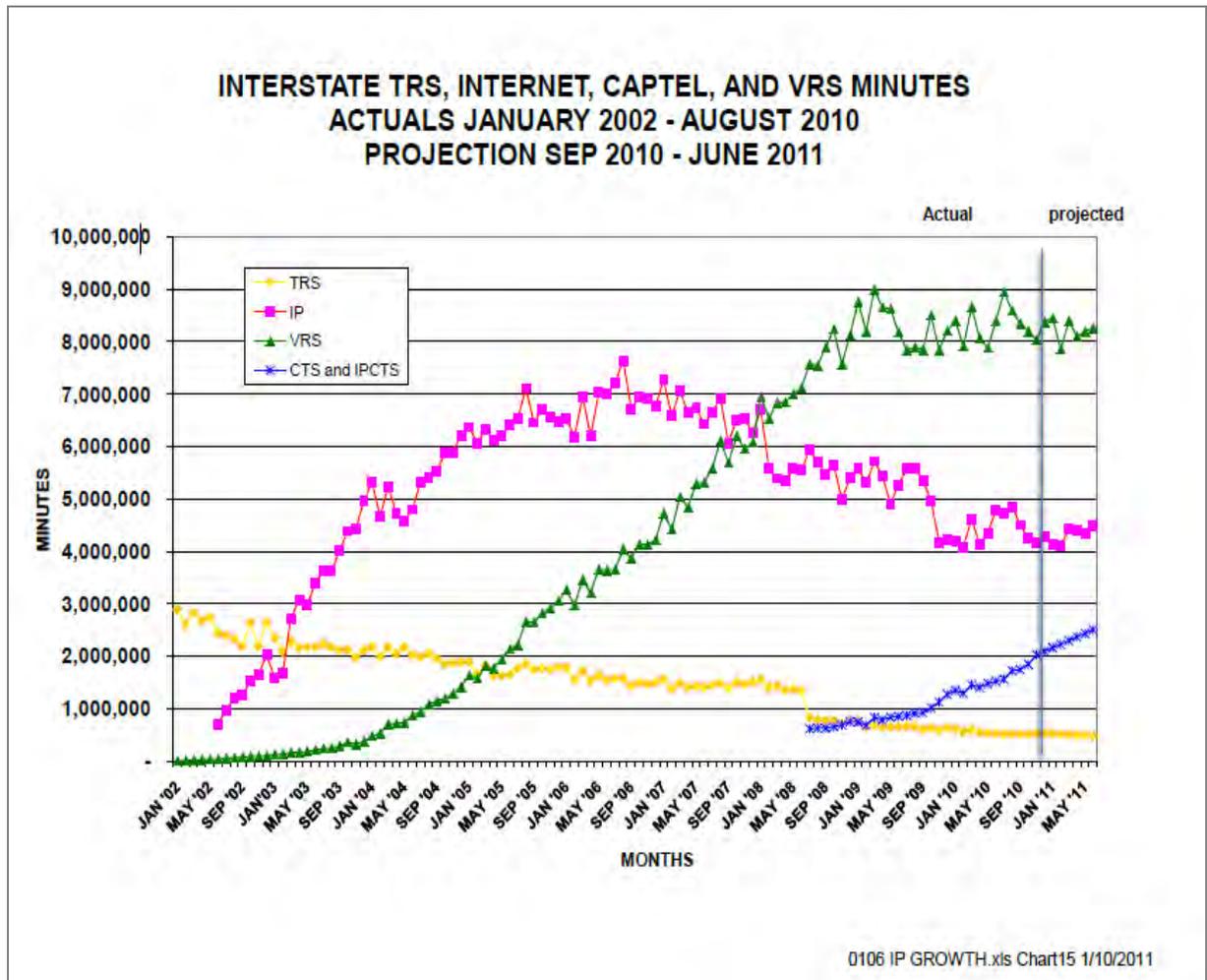
- An open market where competing providers aggressively promoted their service to consumers
- Certified providers, successful in their advertising and outreach campaigns, then subcontracting VRS traffic to others
- Entrepreneurs, eager to enter the profitable VRS market, opening relay centers
- opportunities for fraudulent billing and abuse of the service

From the consumers’ perspective, this environment also

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

The FCC is establishing additional regulatory restrictions on VRS providers to ensure quality of service and control fraud as well as restrictions on the use of uncertified subcontractors.

Figure 7: Interstate Relay Service Traffic History in the United States, by Modality



Traffic patterns reflect that growth of new relay services, specifically VRS and IP-Relay, greatly exceeds the reduced use of traditional relay. Once new services stop their initial growth, usage volumes become predictable

Availability of Interpreters

The following charts reflect the number of qualified interpreters reported. As the U.S. has significantly more interpreters than any other country, the second chart provides perspective without the U.S. data.

Figure 8: Reported Number of Interpreters by Country

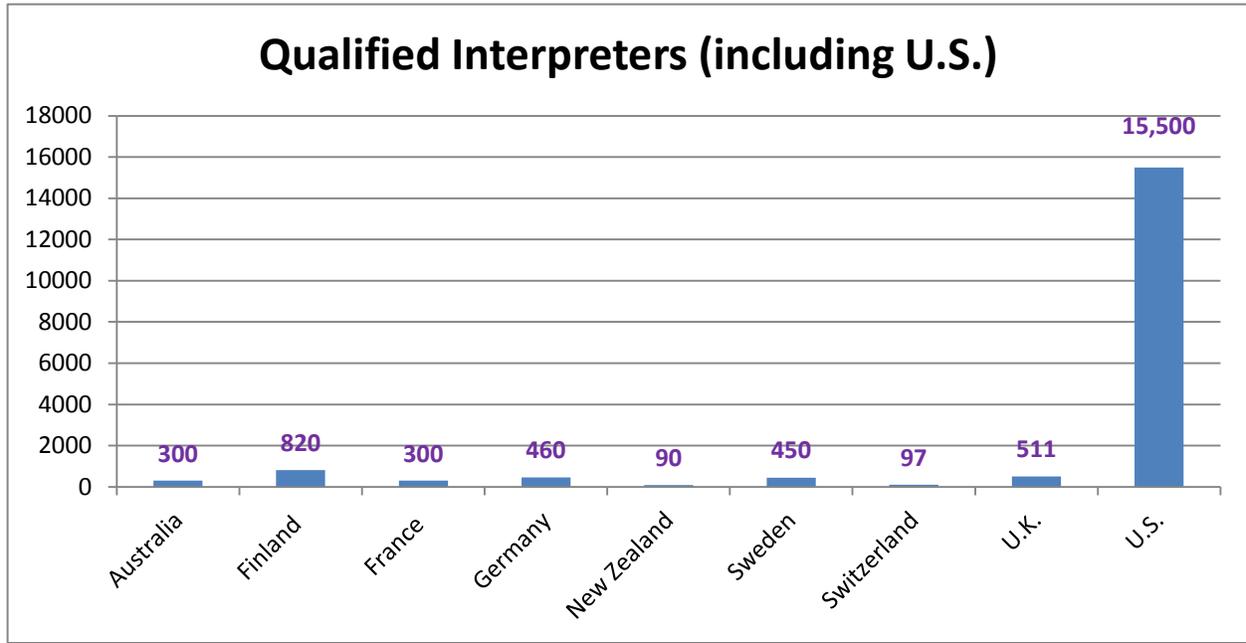


Figure 9: Reported Number of Interpreters by Country Without U.S.

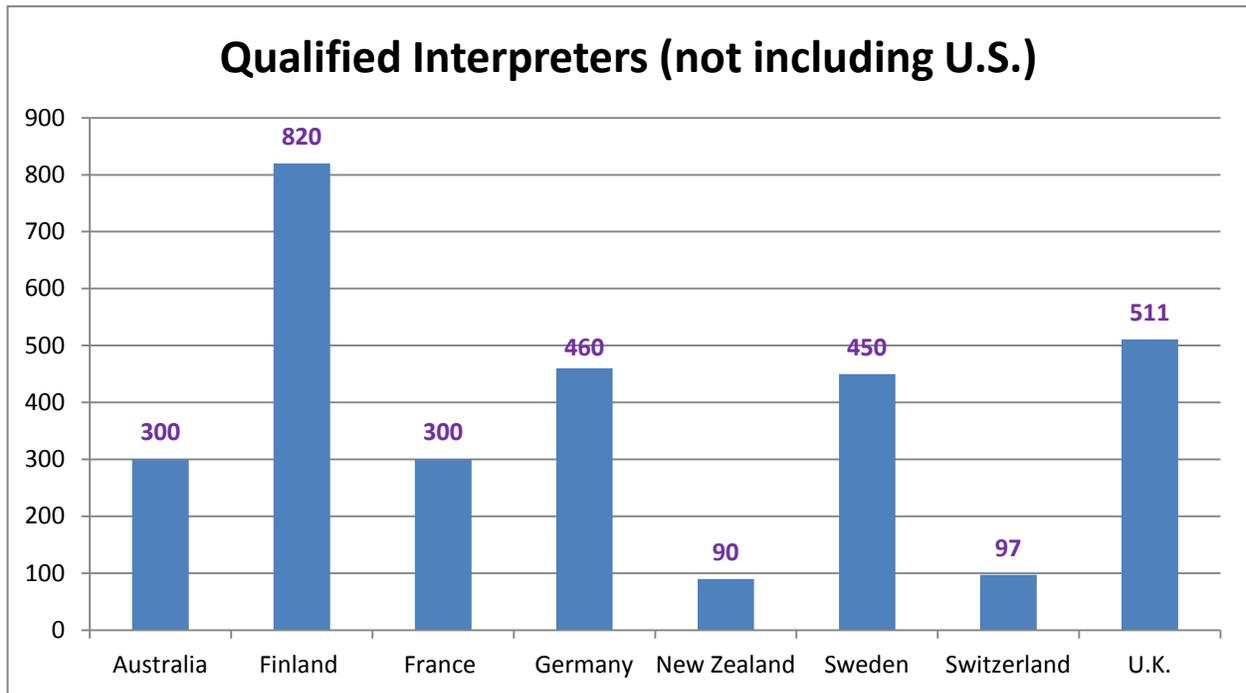


Figure 10: Reported Number of Interpreters as a Percentage of Deaf Population by Country with U.S.

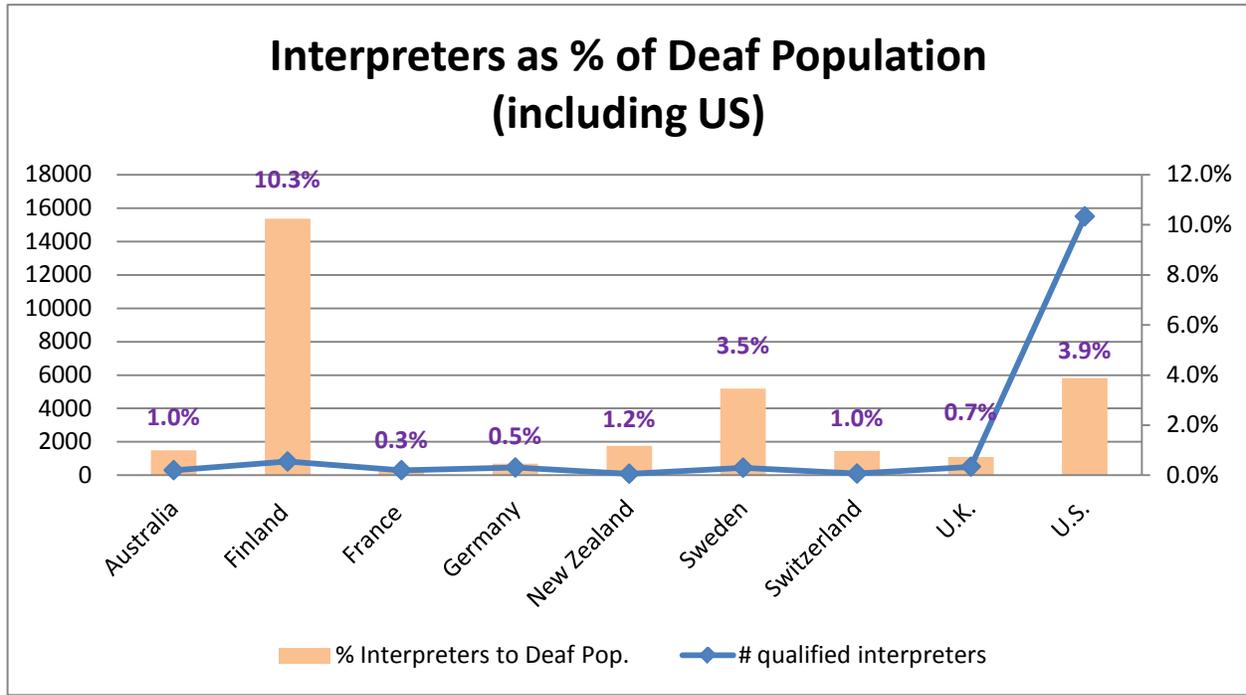
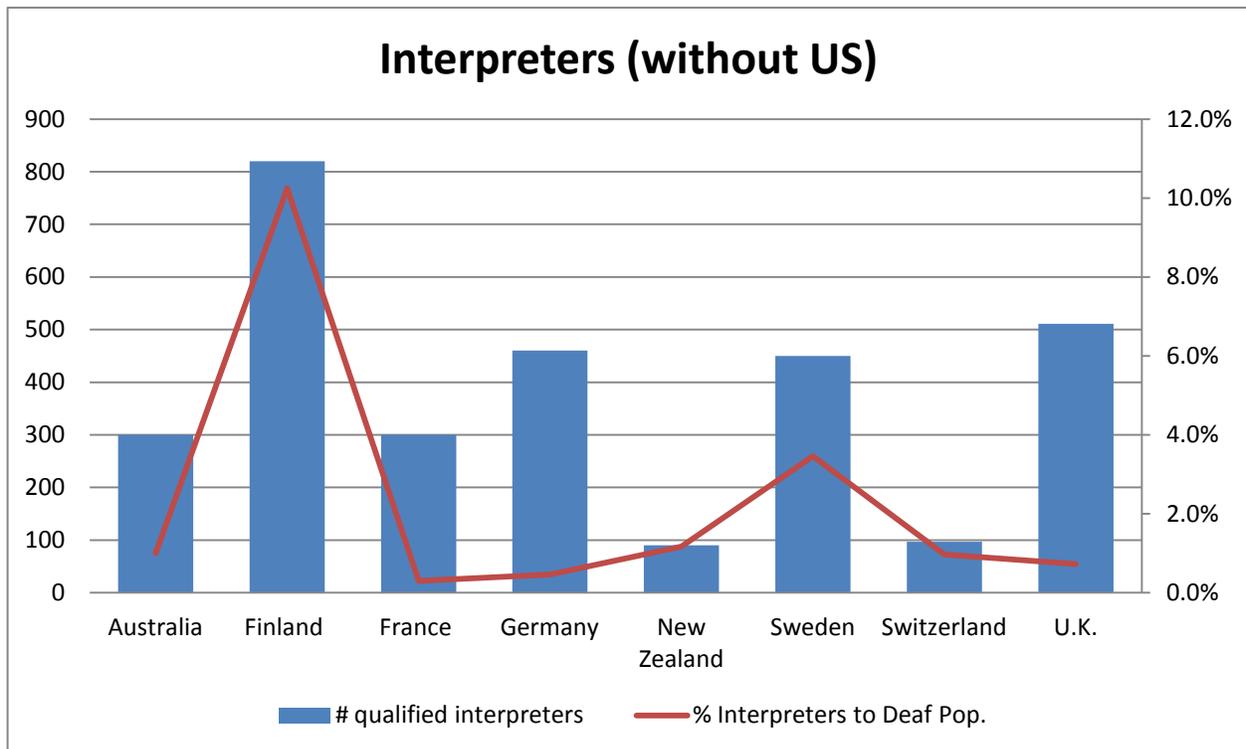


Figure 11: Reported Number of Interpreters as a Percentage of Deaf Population by Country without U.S.



Finland has achieved both a large number of interpreters and a high percentage in comparison the reported Deaf population. Australia, France, Germany, New Zealand, Switzerland and the U.K. all report under a 1% ratio of interpreters to the reported Deaf population.

It is believed that the social and legal status of individuals with disabilities has a great influence of the number and ratio of interpreters.

The number of interpreters reported for the U.S. has grown significantly as a result of the rapid unrestrained growth of VRS as, discussed above. For other countries, that do not have this additional commercial opportunity and its financial incentives for both providers and potential interpreters, training for additional “qualified” interpreters lags well behind need. This disparity would be even more noticeable with the additional demand on resources as a result of expanded VRS services. Although certain countries such as Finland have made concerted and successful efforts to encourage the development of sign language programs and schools, a shortage of qualified interpreters was still reported as universal to all countries.

4. Conclusion

Of the nine countries surveyed, six claim to have ongoing VRS. Only the U.S. offers VRS coverage 24-hour a day, 365 days a year. All other countries have severe limitations on VRS availability by restricting the hours of operation, the parties that may be contacted with VRS (such as for business use or for government contact only), the number of VRS CA positions enabled, or limited funding.

The two primary limiting factors appear to be availability of interpreters and funding.

Although access to high-speed broadband is one key factor in the successful deployment of VRS, most countries have significantly high availability of broadband to almost all of their populations.

Recent developments and international initiatives have created standardized requirements for relay service platforms, particularly as a result of the EU Total Conversation initiative and standards.

The U.S. model is established in law (the ADA). Aggressive providers each promoted their own VRS, frequently with the use of subcontractors to satisfy user demand, with services offered free to the consumers. While providing wide availability, unregulated growth of VRS has proven to be very expensive.

AUSTRALIA VRS

SUMMARY

1. Overview

Total Population:	22,342,400
Deaf Population:	20,000-40,000
Hard of Hearing Population:	200,000-3,550,000
Use Sign as Primary Language:	18,000
No. of Qualified Interpreters:	300
Official Language:	English
Name of Sign Language:	Auslan
VRS Service Schedule:	2008 Trial, Continuing 2011
VRS Vendor:	ACE (Australian Communication Exchange)
MRS/VRS Funding Model:	MRS is funded by a tax levied on current telecommunications carriers with annual revenues greater than \$10 million AUD.

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – Australia*, provides a synopsis of the VRS environment in Australia.

Key points:

- Australia has a high ratio of hard of hearing to hearing people compared to other countries.
- Australia has an average ratio of Deaf to hearing people compared to other countries.
- Australia has a unique native (Aboriginal) population, which could affect the complexity of interpreter requirements.
- The 1992 Disability Discrimination Act and the 1999 Telecommunications Act (Consumer Protection and Services Standards) provide access to relay services for the Deaf.
- Non-VRS MRS services are funded by a levy on telecommunications carriers.
- Pilot funding for VRS is funded by the government at approximately \$1 million AUD.

- The MRS levy is collected and distributed by a separate, independent government body, similar to MRS models in other countries.
- TTY Relay is available 24 hours a day, 365 days a year.
- VRS is available for 12 hours per day, Monday through Friday.
- Video Relay volume is, currently, approximately 2,500 minutes per month in 2011.
- Interpreter education and outreach programs are a required component of MRS and are provided by an entity separate from the MRS vendor.

AUSTRALIA VRS

RESEARCH

1. Demographics

The Australian Bureau of Statistics estimates the Australia population at 22,342,400.¹

Australia has a relatively large Deaf and hard of hearing community. While the ratio of Deaf individuals to hearing individuals is about the same as in other countries, it is estimated that Australia has a large number of hard of hearing individuals.

- 20,000-40,000 Deaf individuals / 22,342,400 total population
- Over 3 million hard of hearing individuals, 13% of the population²
- 100,000-200,000 Deaf or hard of hearing users likely to use text and video relay services³

The Aboriginal population:⁴

- comprises 558,560 individuals;
- accounts for 2.5% of the total population;
- uses over 200 different languages and dialects.

Regarding the use of sign language among the Aboriginal deaf communities, there is conflicting information. It is thought that many deaf Aboriginals are isolated and communicate with immediate family via a system of home sign and would not be able to communicate with VRS officers via the Australian sign language, Auslan. It is also widely recognized that many Aboriginal people have transformed into the mainstream culture, and deaf members of those Aboriginals may or may not have learned Auslan. Use of an Aboriginal dialect of Auslan has developed in Far North Queensland. Currently, the NRS/VRS provider, ACE, makes no references to this Aboriginal dialect of Auslan and provides no information regarding the Deaf and hard of hearing Aboriginal population.

¹ The Australian Bureau of Statistics (ABS) is a government department in charge of the national census, which is administered every five years. The next census is scheduled to take place in August 2011. Therefore the current population is estimated from the 2006 census figures. <http://www.abs.gov.au/>

² NRS/VRS provider Australian Communication Exchange (ACE), at <http://www.aceinfo.net.au/>.

³ NRS/VRS provider Australian Communication Exchange (ACE) at, <http://www.aceinfo.net.au/>.

⁴ Estimates of the Aboriginal population are based on the ABS 2006 census, at <http://www.abs.gov.au/>.

2. Legal Background

2.1. Rights of People with Disabilities

The Disability Services Act 1986 provides support services, funded and procured by the Commonwealth (i.e., federal) government for people with disabilities. Under this Act, the Commonwealth is responsible for employment services, and the states and territories are responsible for accommodation and other support services.

The 1992 Disability Discrimination Act upholds the equality of people with disabilities and protects Australians from direct and indirect discrimination in a majority of public situations, including employment, education, and access to premises.⁵

The Disability Discrimination Act 1992 and the Telecommunications (Consumer Protection and Services Standards) Act 1999 ensure that people with disability have access to the standard telephone service. Through these regulations, the National Relay Service (NRS) is made available to all Australians to allow the Deaf or those with a hearing or speech impairment to access the standard telephone service.

The Telecommunications (Consumer Protection and Services Standards) Act 1999 defines the right to access standard telephone service as being:

- “a telephone service fit for the purpose of voice telephony, or
- If voice telephone is impractical for a person with a disability, a form of communication that is equivalent to voice telephony.”⁶

Section 6 of the Act of 1999 states that voice telephony can include the carriage of data. The Australian Association of the Deaf asserts that, as defined by the telecommunications industry, "data" includes video transmission and therefore VRS is “a form of communication that is equivalent to voice telephony” and should be made accessible as a result of this legislation.⁷

The Disability Discrimination Act 1992 and the Telecommunications (Equipment for the Disabled) Regulations 1998 enable people with disabilities to access appropriate equipment for using the NRS. This applies primarily to TTY equipment and special telephones. The only available equipment solutions for accessing VRS are user's personal computers or mobile phones. This is not just because VRS is a trial

⁵ Australian Human Rights Commission; About Disability Rights in Australia, at http://www.hreoc.gov.au/disability_rights/

⁶ The Telecommunications (Consumer Protection and Services Standards) Act of 1999; Section 6.1.b, at http://www.austlii.edu.au/au/legis/cth/consol_act/tpassa1999620/s6.html.

⁷ Australian Association of the Deaf Inc.; Deaf Telecommunication Access and Networking Project page 5

service. IP Relay is an established service, and no IP Relay or VRS equipment is offered free of charge to users. Users must purchase their own computer or mobile phone as well as any connectivity required.⁸

2.2. Telecommunications Service Obligations

The National Relay Service (NRS) is the government sponsored relay and communication service for the Deaf and hard of hearing. The NRS is a legislated consumer protection under Part 3 of the Telecommunications Act 1999. As such, the Act “provides persons who are deaf, or who have a hearing and/or speech impairment, with access to a standard telephone service on terms, and in circumstances, that are comparable to the access to which other Australians have in regards to standard telephone service.”⁹

The NRS has two focuses and, correspondingly, contracts with two companies:

- Relay Services
 - Australian Communication Exchange Ltd. (ACE) is contracted to deliver relay services. Relay Officers work in the Call Center where they relay calls between the Deaf, individuals with hearing or speech impairments, and hearing individuals.
 - Call relay services are provided 24 hours a day, 365 days a year, in English.¹⁰
- Outreach Service
 - Westwood Spice Pty Ltd. (WWS) is contracted to deliver outreach services, providing activities that support awareness, training, and use of the NRS.

ACE is an Australian not-for-profit company that focuses on the Deaf population of Australia. It has a Call Center located in Brisbane and has been under contract to provide NRS in Australia since 1995.

WWS is a consulting group that specializes in community and public sector work. Their current contracts with the Australian Government began on July 1, 2006 and expire on June 30, 2011.

2.3. Regulatory Funding of MRS/VRS

Australia’s NRS is funded through a levy on eligible telecommunications carriers, paid quarterly to the Australian Communications and Media Authority (ACMA). The ACMA has statutory authority for the federal regulation of broadcasting, Internet, radio communications, and telecommunications.¹¹

⁸ www.relayservice.com.au; NRS Relay Equipment page

⁹ Australian Telecommunications (Consumer Protection and Service Standards) Act 1999; Part 3 – The National Relay Service, p. 90.

¹⁰ National Relay Service Plan 2009-10 – An Australian Government Initiative pp. 3-4.

As of July 1, 2006, the ACMA has had contract management responsibilities for NRS relay services and NRS outreach contracts. The ACMA's related legislated duties include:

- monitor contractor performance;
- maintain contract compliance;
- provide necessary, contractually required, approvals;
- provide approval of government branding on all NRS materials;
- provide the Minister annual written reports on the performance of the NRS contractors and service;¹²
- determine, through annual assessment of revenues, which carriers are required to pay;
- collect the NRS levy on behalf of the Australian Government.

As of 2005 the levy requirement applies to telecommunications carriers that have an annual gross revenue of \$10 million or more and that are already included in the previous year's ACMA revenue assessment.¹³ The actual proportions of the levy costs paid by each carrier are calculated based on its share of that year's total revenue of all carriers.¹⁴

The ACMA takes a forward estimate of the provision of NRS call services and outreach for the current quarter and adjusts it by the actual costs of providing these services in the previous quarter. Total costs in Australian dollars of providing NRS have been:¹⁵

- \$13.1 million for relay and \$3 million for outreach, FY 2007-2008
- \$13.4 million for relay and \$3 million for outreach, FY 2008-2009
- \$1 million annually, VRS pilot

The ACMA payments to the NRS contractors are based on actual service call minutes delivered (3.25 million call minutes in 2008-2009). There is a contracted per-minute rate specified in the NRS VRS pilot

¹¹ The ACMA is equivalent to the CRTC.

¹² Telecommunications (Consumer Protection and Service Standards) Act of 1999; subsection 97 (2)

¹³ The levy is imposed on the NRS contribution amount by the *NRS Levy Imposition Act 1998*. Australian Telecommunications (Consumer Protection and Service Standards) Act 1999; Division 3, The NRS levy; Section 100, Amount of levy, page 92

¹⁴ Australian Communications and Media Authority; National Relay Service; performance Report 2008-2009

¹⁵ Australian Communications and Media Authority; National Relay Service; performance Report 2008-2009

contract. It is assumed that the payments for VRS will be incorporated into the NRS cost and funding mechanisms already in place once VRS is made a permanent NRS component service.¹⁶

3. Relay Services in Australia

3.1. Types of User Services Provided

NRS provides traditional relay service that operates 24 hours a day, 365 days a year. Users can make as many calls as they wish with no limit on the length of calls or the number of follow-on calls to local, long distance, or mobile numbers. However, users are required to create an account through which they can make payments if they wish to make calls to international or premium rate numbers. If equipment such as a TTY is required, or network connection is required, these costs are paid by the user.

The Australian National Relay Service provides the following services:

- Text to Speech
- Speech to Text
- HCO
- VCO
- VCO to VCO
- VCO to TTY
- Speech to Speech
- IP Relay
- VRS (as a pilot)

The NRS call options, include all traditional forms of relay services, including TTY text relay to emergency services. VRS is not listed in the report or on the National Relay website due to its limited trial status.¹⁷ In November of 2008, the first trial of VRS was initiated through the national not-for-profit organization, the Australian Communication Exchange (ACE). The original pilot trial was offered on a very limited schedule. VRS continues to be provided through ACE, and the hours of availability were extended in 2009 to Monday through Friday, 9AM to 5PM. Hours of availability were further extended in 2011 to Monday through Friday, 7AM to 7PM. Services are described at the ACE website.¹⁸

¹⁶ Australian Communications and Media Authority; ITU International Training Program 2009. These payments also include the cost of MRS capital improvements.

¹⁷ National Relay Service Plan 2009-10 – An Australian Government Initiative p. 4

¹⁸ <http://www.aceinfo.net.au/>

3.2. Current VRS Communication Technologies

When the VRS trial was launched, users had to download a proprietary script software program from ACE. This service was referred to as MMR (MultiMedia Response) Service since VRI was also made available for trial on the same platform and with the same funding. One year after the service was introduced, the platform was changed to satisfy the Skype standard¹⁹.

Users with high-speed broadband currently have various options, including videophones or computers with webcams, for connecting to VRS. The NRS and ACE recommend no specific brands or models of equipment on their websites. The ACE website does have links for downloading Skype user software and a lengthy, customized instruction manual.

The ACE website has various YouTube videos in Auslan that describe VRS technical requirements. The videos present the fundamentals and do not recommend specific videophone equipment, but they do state that computer users need Windows XP, Vista, or Windows 7 for compatible connectivity. Users should also have a 1.5 Mbps downstream Internet browser speed (and a URL to allow ACE to confirm status online) and an upstream speed of 512 Mbps or better.²⁰

The Telecommunications Act of 1997 provides for all people in Australia to have “reasonable access to standard telephone service, which includes supplying equipment required by people with a disability.” The right to special equipment was legislated as early as the Telecommunications (Equipment for the Disabled) Regulations 1998, which says: “People who are Deaf, hearing impaired or speech impaired have a right to certain types of disability equipment, including a TTY, computer modem or a Cochlear Implant Telephone Adaptor device.”²¹ However, under NRS there is no provision for equipment such as videophones, computers, or other VRS hardware.

Telstra, a national telecommunications provider, established a “Disability Action Plan” to meet the regulatory requirement and provide disability equipment. However, the equipment currently available under this plan only includes specialized telephones, TTYs, and computer modems for text-relay; it does not include any equipment to access VRS.²² Optus, another national telecommunications provider, has a similar Disability Action Plan that is also limited in the relay equipment available and has no video relay options.²³

In spring 2010, ACE announced a new way to access VRS. As part of a new phase for the VRS trial, ACE kiosks are being introduced to schools with deaf units, to advocacy bodies, and to organizations with Deaf employees. According to ACE, the new kiosk is “a small compact portable touch-screen netbook

¹⁹ Mission Consulting March 2011 interview with Kirk Pascoe, IT Director at ACE

²⁰ www.youtube.com; aurelayinfo

²¹ Telecommunications (Equipment for the Disabled) Regulations of 1998

²² www.telstra.com.au; disability equipment program

²³ www.optus.com.au; disability equipment

with integrated camera. It provides instant access to an ACE Auslan interpreter to make VRS video phone calls through one-touch.”²⁴

3.3. Broadband and Connectivity Infrastructure

The ACMA is currently working with the Government to amend the existing Telecommunications Act to add new broadband "consumer protection standards." These are different from the existing consumer codes, as they would be directly enforceable by the ACMA and violators would be subject to monetary penalties. The ACMA also intends to amend the Act to further extend consumer protections by creating "consumer-related" Service Provider Determinations.²⁵

In April 2011, the Australian Bureau of Statistics released an *Internet Activity Report* that provided the following broadband information as of December 2010:

- Overall Internet subscribers:
 - Internet subscribers numbered 10.4 million;
 - 47% of the total population of 22.3 million were internet subscribers.²⁶
- Mobile Wireless:
 - There was a significant increase in mobile wireless broadband connections. During a six month period there were 777,000 additional users (a growth of 22.5%), and by the end of 2010 there were over 4 million subscribers.²⁷
 - Mobile wireless was the fastest growing Internet access technology; annual numbers for 2010 show an increase from 2.8 million to 4.2 million subscribers.
- DSL:
 - Although the DSL percentage share decreased, DSL continues to be the major technology for broadband connectivity in Australia.

²⁴ ACE, Australian Communication Exchange; Spring 2010 Communiqué

²⁵ Senator Stephen Conroy; Minister for Broadband, Communications and the Digital Economy; Address to CommsDay Summit; April 20, 2010

²⁶ “Active subscribers are defined as subscribers that have an Internet connection with an ISP on the last day of the reference period. These statistics measure the number of ‘subscriber lines’ rather than number of users and therefore, counts of subscribers are not the same as counts of people/organizations with Internet access. This is because some subscribers may have accounts with more than one ISP or multiple accounts with a single ISP. Conversely, there are single ISP subscriber accounts that provide Internet access for multiple people/organizations (e.g. universities). Australian Bureau of Statistics

²⁷ Australian Bureau of Statistics; Commonwealth of Australia; Media Release; “Australia’s Internet subscribers exceed 10 million”; April 1, 2011

- Other technologies:
 - Cable, fibre, satellite, and other technologies did not show much growth and continue to represent approximately 10% of connectivity (See Appendix C).²⁸
 - Dial-up connections are disappearing: “the phasing out of dial-up Internet connections continued with 93% of connections being non dial-up.”

According to the report, “Australians continued to access increasingly faster download speeds, with 81% of access connections offering a download speed of 1.5 Mbps or greater.” The data shows that over 4 million subscribers had speeds between 1.5 Mbps and 8 Mbps. Another 3.5 million subscribers had speeds between 8 Mbps and 24 Mbps.²⁹ A full 9.7 million (93%) of the 10.4 million subscribers satisfied the minimum connectivity speed required for VRS (256 Kbps) in Australia.

The Australian Department of Broadband, Communications and the Digital Economy (DBCDE) is investing in a National Broadband Network, and in 2009 it created the NBN Company. The NBN Company spent its first year developing a nationwide Broadband implementation study on how to provide access to 100 Mbps connectivity for most of Australia. It is currently developing procurement contracts and building new superfast broadband services throughout various regions. Thousands of kilometres of fibre optic cable have already been deployed to improve Australia’s digital infrastructure.

4. VRS Usage Volumes

The trial for VRS began as a limited service in 2008. Initially, approximately 200 Deaf consumers across Australia registered to use the service,³⁰ which was offered only during the week and had limited hours. Although the service hours were extended in 2009 and 2011, no weekend or holiday service is available. VRS continues to be provided as a not-for-profit pilot with no user fees.

VRS is available for 12 hours a day, Monday through Friday, with times varying by territory.³¹ The trial period may soon end, and VRS may become a permanent service. ACE and the NRS are working on securing and implementing a new NRS contract.³²

The NRS Performance Report for 2008-2009 indicates very steady year-over-year traffic volumes (variations within 5%) for the previous six years. Usage figures are as follows:

²⁸ Australian Bureau of Statistics; Commonwealth of Australia; Internet Activity Report, Australia (cat. No. 8153.0); March 31, 2011

²⁹ Ibid

³⁰ Australian Communication Exchange CEO Sandy Gilliland

³¹ Times are 5:00 AM – 5:00 PM, 6:30 AM – 6:30 PM, or 7:00 AM – 7:00 PM. See http://www.aceinfo.net.au/index.php?option=com_content&view=article&id=5&Itemid=16.

³² Australian Communication Exchange; The ACE Plan for 2011; Delivery Components

- An estimated 8,000 Australians used the NRS each month for calls to and from the Deaf and hard of hearing
- 88% of the calls were from the Deaf and hard of hearing population to voice telephone users
- Approximately 3.5 million total call minutes were relayed per year
- Approximately 2,200 – 2,500 calls are made per day in 2011
- 2011 VRS traffic is approximately 2,500 minutes per month³³

Due to recent confidentiality concerns, ACE was not able to divulge if the service was working at or below capacity. Since the current MRS/VRS contract is undergoing the final stages of a new bidding and procurement cycle, ACE declined to share more recent details and updates regarding usage volumes and trends.

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses. However, during the 2008-2009 year the relay service provider informed the ACMA that its traffic reports were not accurate that year “due to an abnormally high volume of calls made by people inappropriately dialling the NRS contact numbers listed on contact information for government agencies.”³⁴ The NRS provider recognized that these users were not part of the legitimate use for the service and did not allow them to make outbound relay calls. Apparently, due to congestion on standard telephone lines for certain government agencies during that year, people tried to call these agencies through their NRS numbers.

6. Interpreter Resources and Programs

Australia has a shortage of qualified Sign Language Interpreters for the Deaf. Due to the large distances involved, this is especially true for the rural Deaf populations. A report related to interpreting services in the State of Victoria confirmed that the interpreter pool is very limited and that the need is even greater in regional areas where fewer interpreters live and work. Furthermore, the report stated: “There is a very large cost associated with getting Interpreters from the city to travel and work in the country. If the distance traveled is greater than 40 kilometres, then the client must pay travel costs in addition to

³³ Mission Consulting March 2011 interview with Kirk Pascoe, IT Director at ACE

³⁴ National Relay Service Performance Report; 2008-2009; Snapshot of the NRS; Call Minutes

the two hour minimum booking cost.” This high expense leads the rural Deaf to cope by relying on family members and using pen and paper.³⁵

Most Interpreter services are not free to consumers in Australia; this includes the use of interpreters for school and other educational needs. However, the government does provide free Sign Language Interpreters for private medical appointments through the National Auslan Interpreter Booking Service (NABS). NABS provides qualified sign language interpreters to Deaf users free of charge for this limited purpose Monday through Friday from 8:00 AM to 8:00 PM, and 8:00 AM to 1:00 PM on Saturdays (excluding national holidays). The following is a list of NAB interpreter suppliers by territory served:³⁶

All States

- Australian Communication Exchange
- Sign Language Communications

Australian Capital Territory

- Deaf Society of NSW

New South Wales

- Deaf Society of NSW

Northern Territory

- National Auslan Interpreter Booking and Payment Service
- Royal South Australian Deaf Society

Queensland

- Deaf Services Queensland
- See.You.Say Sign Language Services and Consultancy
- Signing Hands
-

South Australia

- Royal South Australian Deaf Society

³⁵ Worcester Polytechnic Institute; “Video Relay Interpreting Services in Victoria”; An Insight into the human experience surrounding video relay interpreting services and an outline of the current awareness and expectations of Victorian stakeholders; April 2008

³⁶ Official Australian Government web portal; <http://jobaccess.gov.au>; Product or solution; Auslan Interpreters

Tasmania

- Tasmanian Deaf Society

Victoria

- Auslan Services
- Gippsland Auslan Interpreter Service at Latrobe Community Health Service
- The Auslan Company
- Victorian Deaf Society

The Australian Sign Language Interpreters' Association (ASLIA) is the national leading organization representing Auslan community and relay Interpreters in Australia. Although ASLIA does not publish its total membership or the number of current sign language interpreters in Australia, ACE states that there are currently approximately 300 sign language interpreters in Australia.³⁷

ASLIA is working to provide an adequate supply of qualified sign language interpreters across Australia. ASLIA also supports industry expansion and provides policy advice to the government and service providers on subjects such as: “training, professional development, recruitment, working conditions, remuneration, and the provision of services.”³⁸

According to data provided in the State of Victoria Report, national statistics for sign language interpreters showed that there were only 46 Interpreters per 1,000 Deaf users in Australian metropolitan areas. In rural areas, the Report estimated that there were only 73 Auslan Interpreters for 1,244 Deaf users (59 per 1,000), although the Australian Government reported “only 6 Auslan Interpreters for 595 Deaf Auslan users living in remote areas (27 per 1,000).”³⁹

7. Access to Emergency Services

Australian Relay has limited ability to connect and communicate with local emergency services authorities. The NRS operates a dedicated ‘106’ text-based emergency service for people who are deaf or have a hearing or speech impairment. The Telecommunications (Emergency Call Persons) Determination of 1999 specified the NRS as the national operator of emergency call services for text calls to the emergency service number 106.⁴⁰

³⁷ Mission Consulting March 2011 interview with Kirk Pascoe, IT Director at ACE

³⁸ ASLIA (Australian Sign Language Interpreters’ Association; Official web portal; www.aslia.com.au; about ASLIA

³⁹ Worcester Polytechnic Institute; “Video Relay Interpreting Services in Victoria”; An Insight into the human experience surrounding video relay interpreting services and an outline of the current awareness and expectations of Victorian stakeholders; April 2008

⁴⁰ National Relay Service Plan 2009-10 – An Australian Government Initiative p. 6

According to the Australian NRS, the 106 service is the world’s first national text-based emergency service. The NRS provider receives the text call (from a TTY or a computer with dial up modem), connects the caller to the requested emergency agency (police, fire, or medical), and relays the call during the emergency. 106 calls are treated as a priority over other NRS calls. The 106 service is limited to text only; it will not accept voice calls or SMS messages, and it cannot be called using a regular telephone, Internet Relay, or mobile phone.⁴¹ According to the ACMA, there were 359 genuine emergency calls routed through the dedicated 106 number in the 2008-2009 annual period.⁴²

In April 2010 the Minister for Broadband, Communications and the Digital Economy announced the intention to establish an SMS emergency service for people with disabilities. The Ministry has also acknowledged that there are a range of technical and legislative issues that would need to be addressed for this service to become a reality.⁴³

Callers using Internet Relay can also make emergency calls by dialling the general NRS access numbers, and then requesting that the relay officer connect them to Triple Zero (000) – the national voice emergency number. These calls cannot be identified as an emergency and cannot be given any priority until the connection to the relay officer has been made. Additionally, the caller’s true location cannot be automatically determined, so the caller must be able to identify his or her location.⁴⁴

8. VRS Education and Outreach Programs

The Outreach Service is an integral part of the NRS contract and will expand to cover VRS as it becomes a permanent service. This service is designed to increase awareness and acceptance of Relay Services. As stated by the ACMA, the goal of the Outreach Service is: “For all users and potential users of the relay service component of the NRS to be aware of it, know how it works, and be able to use it effectively.”⁴⁵ The Outreach Service has consistently been operating under a capped budget of \$3 million a year, as set forth by the NRS contract and the ACMA funding.⁴⁶

The current Outreach Services, contracted to Westwood Spice (WWS) have been subcontracted to the Australian Federation of Deaf Societies and to specialist social marketing consultants. To support the

⁴¹ www.relayservice.com.au; making a call; emergency calls

⁴² Australian Communications and Media Authority; ITU International Training Program 2009

⁴³ www.Minister.scbde.gov.au; Sen. Stephen Conroy, Minister for Broadband, Communications and the Digital Economy; Media Speech, April 2010

⁴⁴ www.relayservice.com.au; making a call; emergency calls

⁴⁵ Australian Communications and Media Authority; National Relay Service; Outreach Service Provider performance Report 2008-2009

⁴⁶ Australian Communications and Media Authority; National Relay Service; performance Report 2008-2009

NRS, WWS has established a national network of seven information and education officers as well as three customer service officers.

The NRS Plan for Education and Outreach initiatives provided by WWS is to:

- “Develop and deliver a national Outreach Service;”
- “Promote and raise awareness of the NRS to its users and potential users;”
- “Offer information, support and training to users and potential users;”
- “Handle NRS/VRS questions and complaints.”⁴⁷

Deaf Australia Inc., a national organization for the Deaf in Australia, represents the views of Deaf Auslan users. According to their Mission Statement, “Deaf Australia is the only leading national peak body for deaf people managed for and by deaf people. We represent, promote and preserve the Australian Deaf community and its language and culture. We provide an advocacy and information service for and about deaf people. We work with the deaf community and stakeholders in the best interest of deaf people.”⁴⁸

Deaf Australia has been actively promoting VRS to the Deaf community and providing “VRS Community Consultation” meetings, presented in Auslan, that describe the benefits of VRS to potential consumers. A goal of its “Next Generation NRS Campaign” is to promote the inclusion of VRS as a permanent element of NRS contracted services. (See Appendices A and B).

⁴⁷ Telecommunications (Consumer Protection and Service Standards) Act 1999; Under Section 95, the NRS Providers are required to develop NRS Plans for the Relay Service and Outreach Service

⁴⁸ www.deafau.org.au

APPENDIX A



I support the Video Relay Service and my vote counts for you!

I am a [Deaf/hard of hearing/hearing] person and I support for the need to have an enhanced National Relay Service (NRS) based on the emerging National Broadband Network (NBN) which will provide accessible, affordable and available new telecommunications services for the deaf and hard of hearing community in Australia.

The existing NRS is an Australia-wide telephone access service provided for people who are Deaf or have a hearing or speech impairment. To use NRS, a deaf person can use a teletypewriter (TTY) or an IP based text relay service (www.iprelay.com.au) to call anyone. Since the NRS was setup in Australia in 1995, it has provided fairly accessible telecommunication services to many people (including myself) and enables us to use the 106 Text based emergency services for the last 15 years.

Australia ratified the United Nations Convention on the Rights of Persons with Disabilities in 2008 which means the Australian government must guarantee availability, affordability and accessibility of telecommunications for deaf and hard of hearing people in Australia. Deaf Australia is very pleased that the government is planning to implement an essential SMS emergency service for deaf people.

Responses to Deaf Australia's 2005 telephony discussion paper indicated that Deaf people would happily change over from TTY to video telephony were a staggering 85% Yes compared to a 15% No. Also when asked to rate different telecommunications equipment currently available in terms of what Deaf people consider to be a Deaf equivalent to a voice phone. Video telephony rated the highest at 64% whilst SMS (not a real time communications tool) rated 38% and the TTY lowest at 22%.

The enhanced NRS with Video Relay Services will greatly improve the lives of Deaf and hard of hearing people, promote participation and create a more inclusive society.

For more information, please visit Deaf Australia's website » www.deafau.org.au

Email this document to:

ALP Senator the Hon Stephen Conroy minister@dbcde.gov.au

ALP The Hon Bill Shorten bill.shorten.mp@aph.gov.au

Liberal The Hon Malcolm Turnbull Malcolm.Turnbull.mp@aph.gov

Liberal The Hon Tony Smith Tony.Smith.mp@aph.gov.au

Greens Senator Bob Brown senator.bob.brown@aph.gov.au

Greens Senator Scott Ludlam senator.ludlam@aph.gov.au



CC David Parker. Email david.parker@deafau.org.au. Fax 02 9871 8218 Mail PO Box 4681 North Rocks NSW 2151

APPENDIX B



VRS Community Consultation

David Parker, a Deaf person, from Deaf Australia will give a presentation in Auslan about the Video Relay Service (VRS) and the Next Generation NRS campaign.



When:
Friday 30th April

Time:
7pm for one hour.

Where?
Braddon Club
Corner of Cooyang St
and Donaldson St
Braddon Canberra

Free!

- What is a Video Relay Service?
- What is happening about a Video Relay Service in Australia?
- Next Generation NRS Campaign
- Questions

For more information about the VRS campaign, go to:
<http://sites.google.com/site/nrscampaign/how-does-it-work>

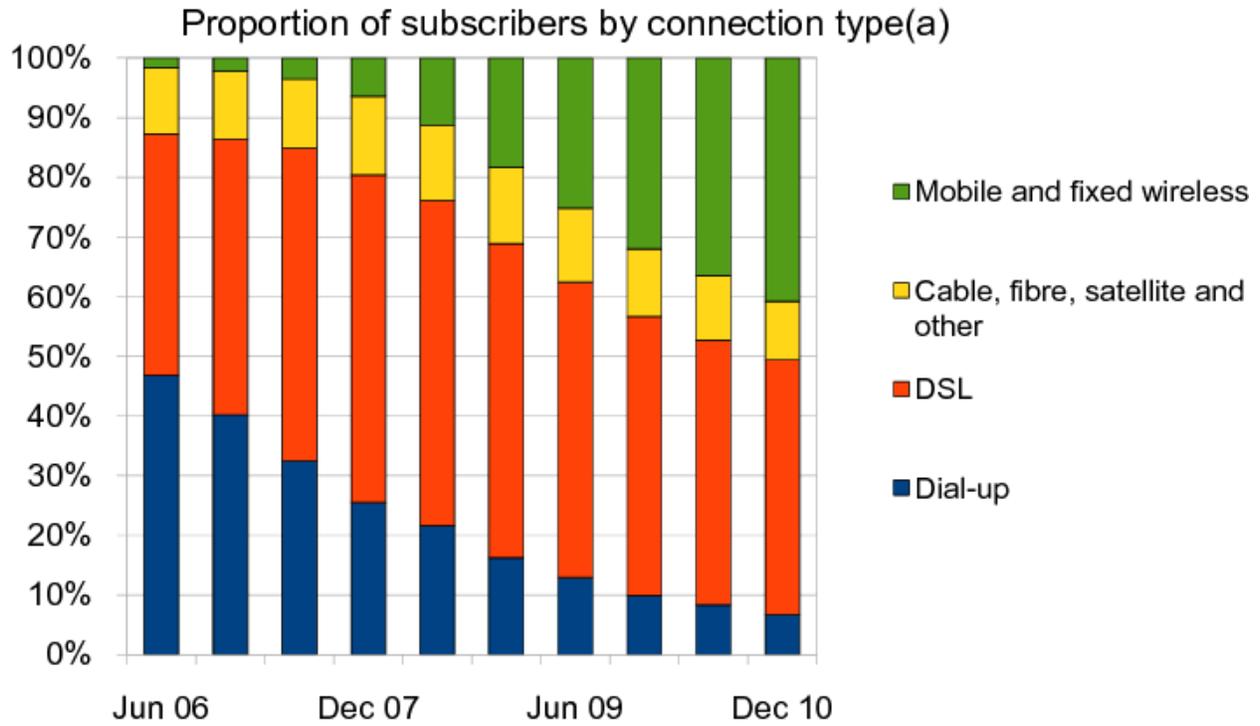
Questions? Contact:

David Parker at Deaf Australia

Email: david.parker@deafau.org.au

WWW: www.deafau.org.au

APPENDIX C



FINLAND VRS

SUMMARY

1. Overview

Total Population:	5,375,276
Deaf Population:	8,000
Hard of Hearing Population:	Not Available
Use Sign as Primary Language:	Less than 5,000
No. of Qualified Interpreters:	820
Official Languages:	Finnish, Swedish, and indigenous Sami & Roma, and the Finnish sign language
Name of Sign Language:	Suomalaisen Viittomakielen
VRS Service Schedule:	VRS Trial 2008- 2010
VRS Vendors:	Etätulkki/ Evantia Oy/ TeliaSonera
TRS/VRS Funding Model:	Interpreting services (including VRS trial) are funded primarily by the Social Insurance Institution of Finland (KELA) and a contribution from the regional and local municipalities (new law Sep. 2010). The funds come from general taxation of the population.

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – Finland*, provides a synopsis of the VRS environment in Finland for telecommunications, relay services and VRS.

Key points:

- Finland has a relatively low percentage of sign language users
- Finland has a relatively low demand for VRS and interpreter services
- Finland has a higher ratio of interpreters to sign language users than many other nations
- Finland, despite the above points, does not have a sufficient number of interpreters

- Regulatory obligations to provide interpreting services were transferred to the Social Insurance Institution of Finland in September 2010 (a regional to national change)
- The VRS trial was co-funded by the Ministry of Social Affairs and Health, the municipalities, and the joint municipal authorities
- The trial budget was €1.3 million.⁴⁹
- Permanent VRS after 2011 will be funded entirely by the government (not by telecommunications providers or as a direct cost to users)
- The MMX Call Center platform was adopted during the VRS trial (as used in Sweden, Germany, and other EU relay centers)
- Education and outreach programs were very well developed throughout the trial
- There are 4-year sign language interpreter degrees offered by two institutes
- All interpreters must be accepted into the Finnish National Register of Interpreters prior to professional work
- The trial ended in December 2010.
- New service is currently in the bidding process. Between the trial period and the start of services under a new contract, VRS has not been available.

⁴⁹ One Euro (€) is equivalent to approximately 1.39 Canadian dollars. All funds shown herein are in Euros.

FINLAND VRS

RESEARCH

1. Demographics

The total population of Finland is estimated at approximately 5,375,276. The national census was recently conducted in Finland, and the census results are yet to be published. Census day was 31 December 2010, and results will be published between 2011 and 2012.⁵⁰ Demographics reported by various other entities include:

- There are approximately 8,000 Deaf people in Finland
 - 0.001% of the total population
- Less than 5,000 are identified as using sign language as primary method of communication.⁵¹
- Finland has one of the lowest ratios in the EU of sign language users and potential VRS users
- Finland has over 800 sign language interpreters
 - The highest ratio of interpreters to Deaf people in Europe⁵²

2. Legal Background

2.1. Rights of People using Different Languages

Finland passed a new Constitution in 1999, enacted in 2000, that guaranteed rights to one's own language.⁵³ This made both Finnish and Swedish national languages, as well as the native languages of the indigenous people, the Sami and Roma, and Suomalaisen Viittomakielen, the Finnish sign

⁵⁰ Tilastokeskus; Statistics Finland; Census Population

⁵¹ Kuurojen Liitto; Finnish Association of the Deaf; Facts in Finland

⁵² Suomen Viittomakielen Tulkit ry; Finnish Association of Sign Language Interpreters;

⁵³ The Constitution of Finland; 1999; Section 17 (731/1999); Fundamental Rights;

language.⁵⁴ Previously the constitutional recognition of sign language rights was adopted in 1995; this made Finland the second country in the world to acknowledge sign language at the Constitutional level.⁵⁵

The new Constitution of Finland guarantees Minority Rights. It requires society to support the linguistic and cultural development of minorities and their languages. These rights oblige public authorities to take active measures to ensure that sign language users have the opportunity to use their own language and to develop their own culture.

2.2. Rights of People with Disabilities

The Constitution of Finland declares that, “the State and the Municipality have to guarantee preconditions for a life with human dignity in situations in which one’s own resources do not suffice.”⁵⁶

Finland’s Non-Discrimination Act of 2004 included a section dedicated to “improving the access to employment and training of persons with disabilities” and a blanket prohibition of discrimination on the basis of: age, ethnic or national origin, nationality, language, religion, belief, opinion, health, disability, sexual orientation, or other personal characteristics.⁵⁷

Finland also participates in many international conventions and treaties regarding the rights of people with disabilities.

The regulatory department responsible for disability services in Finland is the Ministry of Social Affairs and Health.

2.3. Telecommunications Service Obligations

The obligation to provide MRS and VRS are not associated with telecommunications laws or regulations.

2.4. Regulatory Funding of MRS/VRS

Municipalities in Finland were, traditionally, responsible for the funding of all interpreter services including traditional relay services. The VRS trial, Etätulkki, was co-funded by the Ministry of Social Affairs and Health, the municipalities, and the joint municipal authorities. According to available information for the Etätulkki trial, which ended in 2010:

⁵⁴ Nousiainen, Jaakko; “The Finnish System of Government: From a Mixed Constitution to Parliamentarism; Political and Historical Background” Note that at one time the linguistic divide between Finnish-speakers and Swedish-speakers threatened to divide the governance of the country

⁵⁵ Kansanvalta; Finland Democracy Data Bank;

⁵⁶ The Constitution of Finland; 1999; Section 17 (731/1999); Fundamental Rights

⁵⁷ Finland Ministry of Employment and the Economy; January 2010; Non-Discrimination Act of 2004

- The total budget was €1.3 million
 - The State provided €993,000; 76.4% of the budget

In September 2010, a “Law for Interpreting Services – Tulkkauspalvelulaki”⁵⁸ was passed and will affect regulatory funding for and administration of all interpreting services, including VRS. This law requires the Social Insurance Institution of Finland (KELA) to fund and manage all interpreting services.⁵⁹ The new law allocates 180 hours of community (in-person) interpreting services per person per year. These hours can be increased on request. Deaf-Blind users have up to 360 hours per person per year.⁶⁰

The new law does not specify any limit for usage of traditional or video relay. It does state that KELA will pay for video relay interpreting services, as well as any equipment needed, including broadband connectivity (computer, webcam, ADSL, etc.)⁶¹

KELA is financed both by statutorily required contributions from insured persons and by contributions from the public. Therefore, it is expected that the new VRS will be entirely funded by the State when the permanent service is launched later this year.⁶²

3. Relay Services in Finland

3.1. Types of User Services Provided

A VRS trial, Etätulkki, began in July 2008 as a nationwide project to establish remote interpreting services in Finland for the Deaf and people with speech impairments. Etätulkki also provided a remote interpreting service for government authorities that work with immigrants, refugees, and other minority language groups (such as Sami language users).⁶³

The Finnish Government launched the trial service to improve availability and accessibility of interpreting services. It expected interpreter service providers to operate more efficiently by using remote call centers since this would free up resources for targeted, on-site interpreting needs (Community Interpreting). By distributing call centers regionally, the demand for resources was divided

⁵⁸ Sosiaali-ja Terveysministeriö; Ministry of Social Affairs and Health

⁵⁹ Providing interpreting services and VRS is a subcomponent of KELA’s overall disability benefits services. See Appendices A and B.

⁶⁰ www.kela.fi; Social Insurance Institution of Finland; Vammaister Tulkkauspalvelukeskus; Legislation

⁶¹ Kuurojen Litto; Tulkkisihteeri; Finnish Association of the Deaf, Interpreting Officer; Virpi Thurén; Mission Consulting correspondence March 2011

⁶² Kela; Social Insurance Institution of Finland; About the FPA; Financing

⁶³ Evantia Account Manager Belinda Troger; Mission Consulting correspondence March 2011

between different regional providers. The trial included the latest broadband and mobile solutions in an effort to expand the geographical reach of interpreter services into remote areas.⁶⁴

The VRS trial ended in December of 2010 and was considered a success. This was a small trial with only 60 registered users. The pilot users gave very positive feedback and reported that, “being able to call someone with the help of an interpreter without being forced to leave the home or office was experienced as an equalizing factor compared to hearing people.”⁶⁵ As of April 2011, the government had yet to decide whether to permanently deploy VRS in Finland.

3.2. Current VRS Communication Technologies

The VRS trial was available via the Etätulkki web site, www.etatulkki.fi. The Etätulkki homepage stated that, “Etätulkki.fi is a website intended for those interested in remote interpreting. In the future, the site will also provide access to a nationwide interpreting service.”⁶⁶ The website is no longer available since the trial has ended and permanent service has not yet started.

During the trial, VRS was available via PCs with webcams and broadband connections. The service was also available via mobile 3G devices as well as off-the-shelf videoconferencing equipment. Due to the confidential nature of the current bidding process, further details on technical requirements are unavailable. However, it was confirmed that the pilot trial used the same call center platform (MMX) currently deployed in Sweden, Norway, Denmark, and other countries.

The MMX call center application was developed by nWise AB, a Swedish company. In addition to providing call center functionality in a multi-media environment (voice, video, text, land lines, broadband, mobile, etc.) it also provides a graphic interface that gives remote users call queuing position information.⁶⁷

VRS stakeholders are currently awaiting the conclusion of the government’s bidding process for new services. As of November of 2011, the new service was announced to be awarded to Telecom operator TeliaSonera. TeliaSonera is the result of a 2002 merger between the Swedish and Finnish telecommunications companies, Telia and Sonera. Telia Sonera will host the service for Kela using the nWise MMX platform. It will provide the hardware, MMX software application and internet connection to users. It will coordinate with the two interpreter agencies that were awarded the contract for booking and interpreter services. The immediate goal is to roll out the service during 2011-2012 for approximately 2,000 end users.

⁶⁴ www.etatulkki.fi; Etätulkki Project

⁶⁵ Evantia Account Manager Belinda Troger; Mission Consulting correspondence March 2011

⁶⁶ www.etatulkki.fi; Etätulkki Home Page Announcement

⁶⁷ Evantia Account Manager Belinda Troger; Mission Consulting correspondence March 2011

3.3. Broadband and Connectivity Infrastructure

Finland is one of the highest ranking countries in the EU for Internet use. An October 2010 report by Statistics Finland stated that: “Every second Finn uses the Internet several times a day.”

- 93% - 100% of people 16-54 had used the Internet in the 3 months prior to the study
- This percentage was 100% for people 25-34
- 65-74 year olds had the lowest usage at 43%
 - This brought the total average down to 86%⁶⁸
- Most users access the Internet via high-speed broadband connections

According to the European Commission on Digital Competitiveness, Finland is also one of the leading countries in providing broadband. In its 2008 National Broadband Strategy, Finland set goals for nationwide internet access:

- By 2010 all households, businesses, and government offices were to have access to the Internet and eServices
 - Download speeds were to meet or exceed 1Mbps
- By the end of 2015, at least 99% of these same entities are to have speeds of 100 Mbps
- According to an update by the Commission, “DSL coverage in Finland stands above the EU average, but a small part of the population is still not covered.”⁶⁹

The Finnish Communications Regulatory Authority recently released highlights of the 2010 Annual Report. According to the report, development toward faster data transmission increased in 2010:⁷⁰

- Over 50% of all fixed broadband subscriptions had a download speed of 4 Mbps or more
- Almost 60% of mobile broadband subscriptions had a nominal speed of 2 Mbps or more
- Data transmission in mobile networks grew
 - Mobile broadband accounted for over 50% of all broadband subscriptions
 - There were over 1.6 million mobile broadband subscriptions
 - An increase of 720,000 from the year before

⁶⁸ Statistics Finland; Prevalence of Internet Usage; 10/26/2010

⁶⁹ European Commission; Europe’s Digital Competitiveness Report; Volume 2; Brussels, May 2010; Finland; page 152

⁷⁰ Finnish Communications Regulatory Authority; Press Release; March 31, 2011; Annual Communications market review 2010; Mobile broadband

Although the following charts were published as part of the Finnish Communications Regulatory Authority mid-year report, the trends for broadband subscriptions and technologies in Finland are evident:

Table 2: Development of broadband connections 2007-2010⁷¹

Year	2007		2008		2009		2010
Date	31.12.	30.6.	31.12.	30.6.	31.12.	30.6.	30.6.
DSL	1 270 500	1 270 100	1 231 300	1 216 300	1 185 900	1 162 600	
Real estate and housing company subscription	114 000	104 600	134 900	104 700	106 600	117 500	
Cable modem	209 600	212 900	214 800	215 500	222 700	229 600	
Mobile broadband	143 100	307 100	479 700	664 300	908 000	1 152 200	
Wireless broadband	15 300	19 600	26 100	31 600	31 800	30 100	
FTTH					12 600	14 500	
Other*	7 700	9 000	9 800	11 500	6 000	800	
Total	1 760 200	1 923 300	2 096 600	2 243 900	2 473 600	2 707 300	

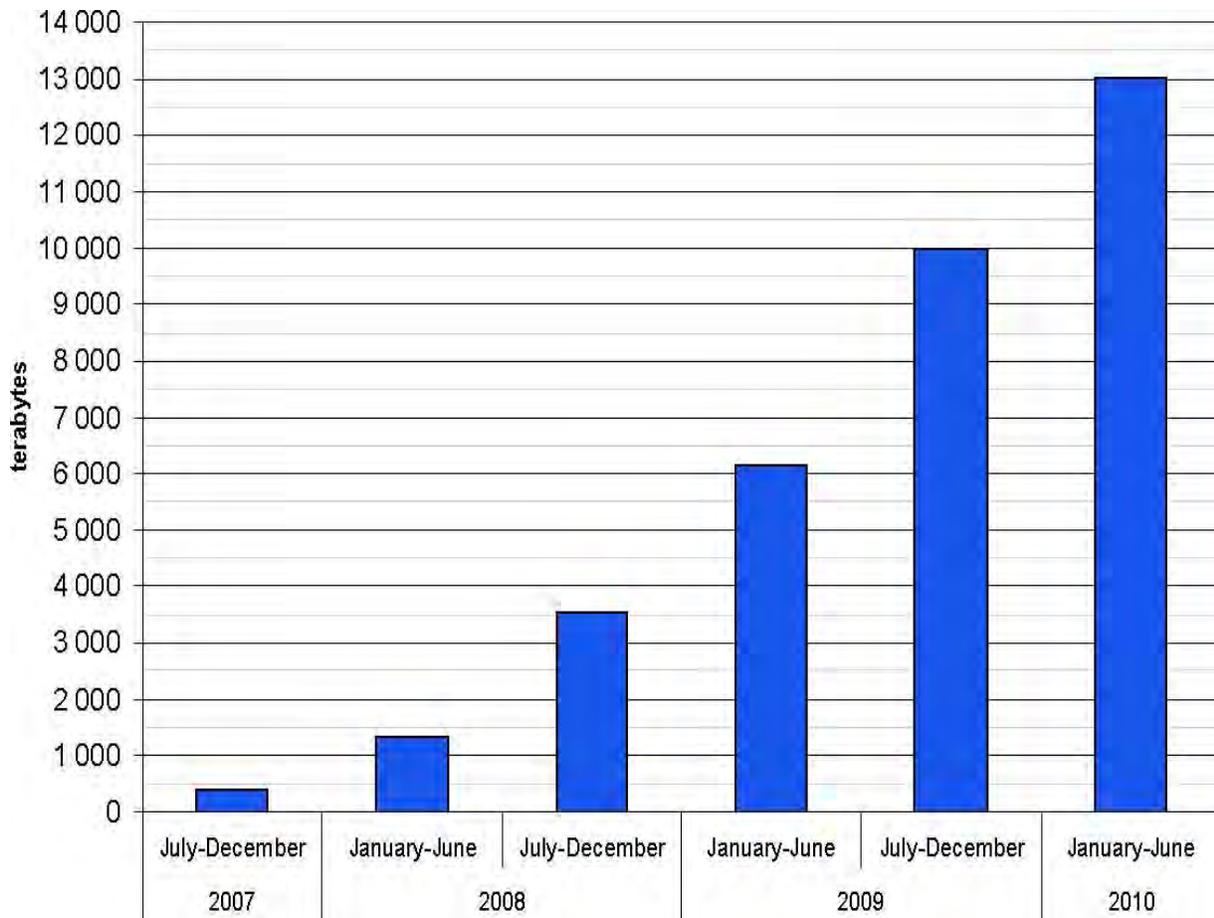
*The "Other" group includes subscriptions that cannot be included in the above-mentioned technology categories. The changes may partly be due to the specification of the reporting, which allows a better itemization of technologies.

Table 3: Development of fixed broadband connection speeds 2007-2010

Year	2007		2008		2009		2010
Date	31.12.	30.6.	31.12.	30.6.	31.12.	30.6.	30.6.
Less than 2Mbit/s	70%	54%	40%	43%	39%	30%	
2Mbit/s – less than 4Mbit/s	26%	40%	50%	47%	26%	22%	
4Mbit/s – less than 10Mbit/s					19%	25%	
10Mbit/s or more, but less than 25Mbit/s	4%	6%	9%	9%	14%	19%	
25Mbit/s – less than 100Mbit/s			< 1%	1%			
100Mbit/s or more			1%	1%	2%	3%	

⁷¹ Finnish Communications Regulatory Authority (FICORA); FICORA Market Review 2010 Bi-annual review; 2.1 Broadband services, Broadband subscriptions and technologies

Table 4: Data volume transferred over mobile networks 2007-2010⁷²



4. VRS Usage Volumes

Current usage volumes for VRS in Finland are not available due to confidentiality concerns during the government’s tender process for the first official national VRS contract. Earlier usage was sporadic and limited to 60 trial participants during limited operational schedules. The provider’s trial manager suggested that Sweden’s usage volumes are good predictors of anticipated usage in Finland.

⁷² ⁷² Finnish Communications Regulatory Authority (FICORA); FICORA Market Review 2010 Bi-annual review; 2.2 Mobile services

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

According to the Finnish Sign Language Interpreter Register, Finland has approximately 820 interpreters. This is confirmed by numbers published by the Finnish Association of Sign Language Interpreters (Suomen Viittomakielen Tulkit ry).⁷³

Beginning in 1979, local and regional municipalities supplied and financed community interpreting services, which they provided to the population without charge. Interpreting services are available for work, studies, social participation, recreation, and other corresponding communication needs. Interpreters are expected to provide interpreting services in both Finnish and Finnish-Swedish sign languages.

The first training courses for Finnish Sign Language interpreters began over 30 years ago; graduate level programs began in 2009. Currently there are 4-year, full-time, sign language interpreting programs offered by two institutes:

- Humanities Polytechnic
 - Helsinki campus
 - Kuopio campus
- Diaconia Polytechnic
 - Turku campus⁷⁴

The Finnish National Register of Interpreters is maintained by many stakeholders. These include:

- The Finnish Association of the Deaf
- The Finnish Association of the Hard of Hearing
- The Finnish Deafblind Association
- The Finnish Association of Sign Language Interpreters

Once potential interpreters have completed training to become professionals, they may apply to be accepted by the members of the cooperation, and to be listed in the directory and register. Interpreters

⁷³ Finnish Association of Sign Language Interpreters (Suomen Viittomakielen Tulkit ry); The Register and Directory of Interpreters; as quoted in an interview with the European Union of the Deaf; Last Updated December 22, 2010

⁷⁴ Suomen Viittomakielen Tulkit ry; Finnish Association of Sign Language Interpreters; Education and Training

will only be accepted if they intend to take assignments or to become full time interpreters. Registration is not granted to someone who does not intend to enter the field of professional interpreting in Finland. The register also contains the names of the interpreter service providers (agencies) that these interpreters may be working through if they do not take up freelance work. The purpose of the register is to serve Deaf and hard of hearing users, to ensure quality, and to track the supply of interpreters in the field.⁷⁵

The services of interpreters, including for VRS, are booked by the Social Insurance Institution of Finland, KELA, through independent agencies. None of the agencies are owned by the national government. It is currently estimated that there are over 30 agencies. These agencies are typically owned by a group of interpreters, a single interpreter, the Finnish Association of the Deaf, a cooperative, a foundation, a municipality, or other organizations. It is important to note that in this system interpreters need to be employed by an agency.⁷⁶

7. Access to Emergency Services

Finland has adapted to new technologies to connect and communicate with local emergency services and has developed legislation to ensure equal access. The Communications Market Act in Finland includes a requirement that, “people with a disability must have access to emergency services equivalent to that enjoyed by other users.”

The Finnish strategy has incorporated access to the Emergency Number ‘1-1-2’ through an SMS-based service since 2005.⁷⁷ The system was intended for individuals with disabilities, such as those with a hearing impairment, but it may be used by anyone in an emergency situation. The system routes all 1-1-2 emergency text messages to one centralized answering service. The centralized emergency service provider then sends an acknowledgement message to the user and pinpoints the location of the mobile device by means of an emergency call positioning system. The centralized answering service then uses the location data to deliver the 1-1-2 emergency message and corresponding information to the closest emergency response center.⁷⁸

Although SMS emergency access has been in place for years, technical integration with video technology and mobile phones has not yet been implemented. In addition, the operational limitations during the VRS trial raised concerns about emergency situations among the pilot users. Not only would they be

⁷⁵ Suomen Vottomakielen Tulkit ry; Finnish Association of Sign Language Interpreters; Facts About Services

⁷⁶ Kuurojen Litto; Tulkkiyhdistys; Finnish Association of the Deaf, Interpreting Officer; Virpi Thurén; Mission Consulting correspondence March 2011

⁷⁷ Finnish Communications Regulatory Authority (FICORA); FICORA Working Group Report for Emergency Communications

⁷⁸ Finnish Communications Regulatory Authority (FICORA); FICORA Working Group Report for Emergency Communications

unable to make emergency calls during the day when all agents were busy with other calls, but the service was not available during nights or weekends because of its limited schedule. Users provided feedback to the trial project team, requesting that at least one video interpreter be made available 24 hours a day so that users could access emergency services by using Finnish Sign Language through VRS.⁷⁹

8. VRS Education and Outreach Programs

The Finnish Ministry of Social Affairs and Health funded the VRS trial project, Etätulkki. It also partnered with a national interpreter brokerage firm, Evantia Oy, which provided the overall project management of the trial. Because of the trial nature of the project, as well as current bidding for permanent services, contract details and requirements for VRS education and outreach are minimal. However, public information regarding the project indicates that much effort was made to introduce and integrate VRS into the communities and municipalities.

The project steering committee compiled a comprehensive list of participating municipalities, joint municipal boards, and consumer organizations; it worked closely with all stakeholders to ensure success. The Ministry of Social Affairs assigned an interpreter services manager to the project in order to gain experienced insight. The project team also contacted various Universities to hold seminars on VRS and to test the VRS trial. In November 2007, the team held a seminar at the University of Art in Helsinki to announce the trial objectives and to introduce the various consumer groups involved in influencing the service development. The team also discussed how VRS would affect the availability of local interpreters as they transitioned to supporting a nationwide state service. The Executive Director of the Finnish Deaf Association opened the seminar, and the well-known actor, Markku Toikka, hosted the Panel discussion; this enhanced the public profile of the project.⁸⁰

Later that year, the Etätulkki project launched a mobile tour to market the new service and recruit interpreters for VRS. Tour events were organized in cooperation with the Applied Sciences, Turku campus of Diaconia University. All events were presented in sign language, were free, and were open to all people. The project team was accompanied by sign language interpreters from the Finland Association of Interpreters.

The Etätulkki project also organized informational gatherings in various cities to target sign language customer groups. In addition to explaining the system features and benefits, they enabled participants to experiment with VRS after the presentation. These meetings took place before access to the call centers was established, but by working with an interpreter available in a test studio in Helsinki consumer tests were made possible.

⁷⁹ Evantia Account Manager Belinda Troger; Mission Consulting correspondence March 2011

⁸⁰ www.Etatulkki.fi; archives; seminar

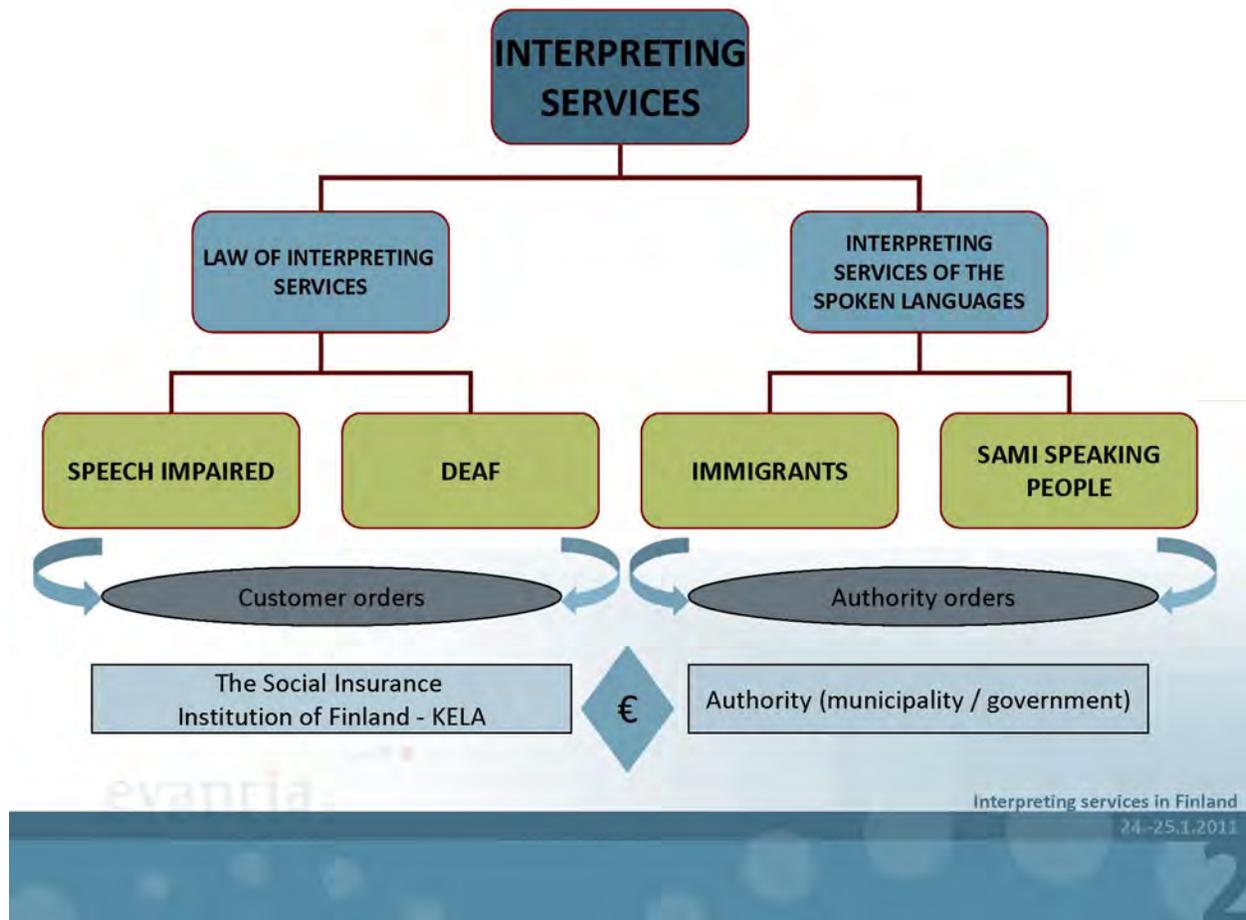
In the second year of the trial, the project team again partnered with Diaconia University to test 3G VRS functionality. During the test the service was available six hours a day, four days a week. Test calls were made outside of normal service hours to enable testing for 3G gateway functionality to three different call centers.

Another technical test took place with system supplier nWise for adaptation to the new MMX call center platform software. This test was initiated with a group of 20 testers and was later expanded. The test users were selected through Deaf Associations, via television advertisements, and from active work groups. In addition to testing for technical issues in the new application, the project team used these tests to learn about Finnish Sign Language communication.⁸¹

The Etätulkki effort is recognized as an example of a creative and comprehensive VRS education and outreach program.

⁸¹ www.Etatulkki.fi; archives; Network types; regional Spokespeople

APPENDIX A

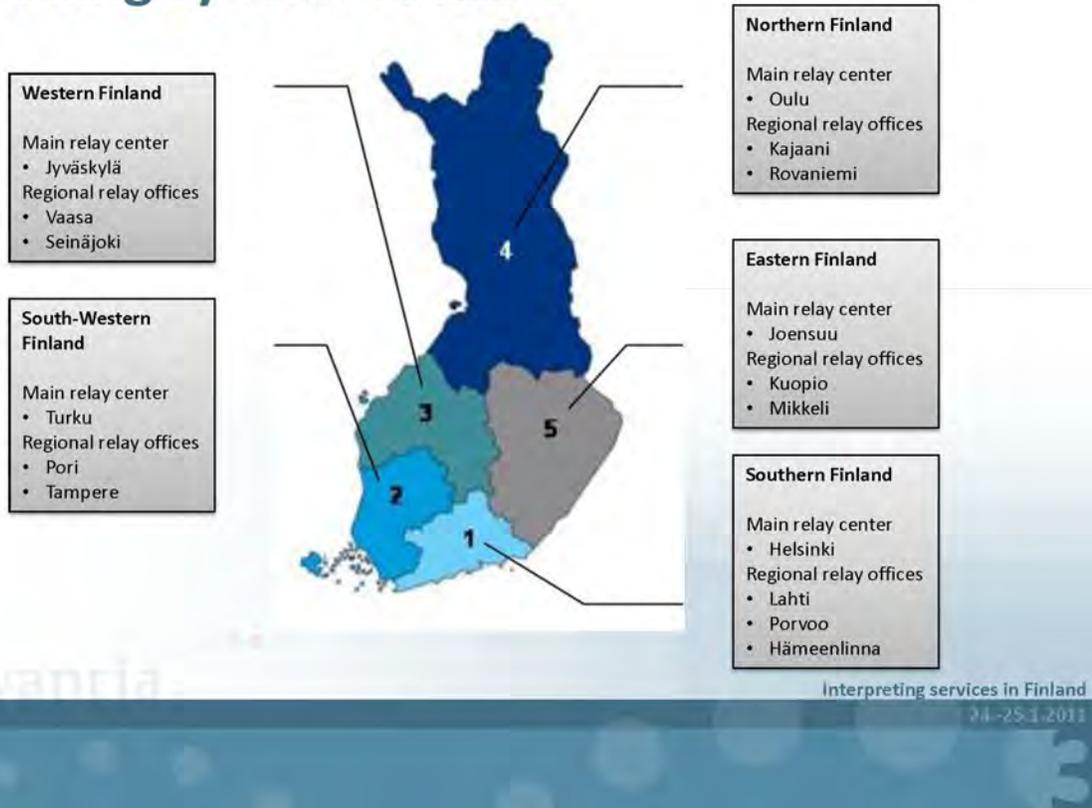


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⁸² Regulatory and Funding Model for Interpreting Services (including VRS trial) in Finland; Belinda Troger; Etätulkki Project; "Interpreting Services in Finland"; January 2011

APPENDIX B

Booking system of KELA



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⁸³ Regional Model for Interpreting Services (including VRS trial) in Finland; Belinda Troger; Etätulkki Project; "Interpreting Services in Finland"; January 2011

FRANCE VRS

SUMMARY

1. Overview

Total Population:	65,026,885
Deaf Population:	100,000
Hard of Hearing Population:	3,000,000
Use Sign as Primary Language:	Nearly 100,000
No. of Qualified Interpreters:	300
Official Language:	French
Name of Sign Language:	Langue de Signes Français (LSF)
VRS Service Schedule:	2008
VRS Vendors:	Tadeo, WebSourd, Viable France
MRS/VRS Funding Model:	Relay Services are mandated as employment rights. They are provided for employees and are paid for by employers. The general public can use relay services free of charge to contact government offices; they must pay for all other uses.

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – France*, provides a synopsis of VRS environment in France.

Key Points:

- France has a high demand for VRS and interpreter services
- France has a high percentage of LSF users in the general population
- Regulatory obligations to provide MRS require that Text Relay and Video Relay be made available:
 - At the workplace
 - For communications with Government offices and public services

- MRS services are currently funded by:
 - The Government for limited uses
 - Employers for their Deaf employees
- Some VRS providers will relay calls for private use from individuals willing to pay for the service
- The 2010 stated funding for one of three VRS providers was €5 million
- Video relay and text relay were made available at the same time using Total Conversation standards technology
- VRS did not have the typical adoption pattern of high text relay volume which would later decline in favour of video
- France is incorporating many leading technological solutions within the VRS environment including:
 - Total Conversation access to 1-1-2 emergency services
 - Sign language avatar interpreters
- Interpreter education and outreach programs exist in France
 - These programs are reported to be insufficient to satisfy demand
- Four universities in France offer 2 and 3 year LSF Interpreting training programs

RESEARCH

1. Demographics

France has:

- An estimated population of 65,026,885⁸⁴
- An estimated population of over 3,000,000 Deaf and hard of hearing individuals
 - Approximately 4.75% of the total population
 - Approximately two times the ratio of any other country in this study
- Nearly 100,000 individuals who use LSF (*Langue des Signes Française*—French Sign Language) as their primary language⁸⁵
- Approximately 300 LSF interpreters⁸⁶
 - A very low ratio of interpreters to LSF users

2. Legal Background

2.1. Rights of People with Disabilities

France is a signatory of the United Nations Convention of 2006 on the Rights of Persons with Disabilities; and has adopted the principles of the EU Disability Action Plan. This Plan outlines an overarching set of strategies that began in 2003; it is updated every two years. The Plan is intended to integrate the needs of people with disabilities into the framework of general policies, both new and existing.⁸⁷

⁸⁴ L’Insee et la statistique publique; French Institute of Public Statistics

⁸⁵ Federation Nationale des Sourds de France (France National Deaf Federation)

⁸⁶ (see Interpreter Resources and Programs section of this report)

⁸⁷ European Commission; Employment, Social Affairs and Inclusion; The EU Disability Action Plan at <http://ec.europa.eu/social/main.jsp?catId=430&langId=en>

The EU has also passed new laws and directives in order to further the principles of equal treatment and anti-discrimination. The European Union Council Directive 2000/78/EC establishes disability rights in employment. The directive states that: “all employers must provide ‘reasonable accommodation’ for people with disabilities;” the workplace must be adapted to accommodate employees with disabilities in the fulfillment of their jobs.⁸⁸ Member states such as France were given three years (from December 2000) to enact their own legislation in support of this disability directive.

The “*Loi du 11 février 2005*” (Law of 11 February 2005) was passed in order to provide new rights for people living with disability in France. It legally defines disabilities and social rights and grants official recognition of LSF (French Sign Language) as a language by the French Republic. This legislation also requires companies to hire a minimum number of employees with disabilities based on the size of company. Companies must make the workplace accessible to these employees. VRS (and to a lesser extent text relay and transcription services) have been made available to employees with disabilities in compliance with this mandate.⁸⁹

The *Loi du 11 février 2005* is the strongest legislation in France requiring relay services for the Deaf. Mr. Hillyard, Project Developer of *Viable France* stated, “Our new laws are not as strong as the ADA. It is a system of regulations for the disabled that work ...(and)... there are no relay center specifics.”⁹⁰

Legislation is being worked on in France to adopt the European requirements from 2009 regarding Amendments to Universal Service Directives. As soon as they become ratified, they will become public once registered in the Official Journal (“le journal officiel”: <http://www.journal-officiel.gouv.fr/>). Indications are that it will expand the video relay service for all consumers in France and will receive funding as a Universal Service.

2.2. Telecommunications Service Obligations

Relay services in France are not regulated; they are not provided by telecommunications carriers, and they do not have the government or telecommunications industry funding. Consequently they are not offered as a free or discounted service for the general population.

2.3. Funding of MRS/VRS

Prior to the *Loi du 11 février 2005* (Law of 11 February 2005) France passed legislation in 1987 promoting the employment of people with disabilities. This earlier law required that for public and private employers with at least 20 employees, at least 6% of their workforce must be individuals with

⁸⁸ European Commission; Employment, Social Affairs and Inclusion; The EU Legislation; European Union Council Directive 2000/78/EC; L303 02.12.2000 pages 16-22

⁸⁹ www.Legifrance.gouv.fr; Le Service Public de la Diffusion du Droit; Act No. 2005-102 of 11 February 2005 ‘for Equal Rights and Opportunities, Participation and Citizenship of Persons with Disabilities; NOR SANX0300217L

⁹⁰ Mission Consulting interview with Mr. Tom Hillyard of *Viable France*, March 22 2011

disabilities. Private-sector employers that failed to comply with this requirement were to be fined with a levy. This triggered the creation of *L'Association de Gestion du Fonds pour l'Insertion des Personnes Handicapées* (The Association of Fund Management for the Professional Integration of People with Disabilities—AGEFIPH).

AGEFIPH collects and manages the levy fund and uses this money for integration programs to help individuals with disabilities to find employment. AGEFIPH also promotes local professional integration and defines and implements local policies for the employment of people with disabilities.

In the absence of permanent government funding mechanisms, most VRS providers are funded by the companies that provide relay services to employees in compliance with the Law of 11 February 2005.

VRS was begun in 2008 (see section 3 below) and was funded by commercial entities. These entities sometimes cooperated with government-funded organizations such as in the case of the collaboration between WebSourd and AGEFIPH. WebSourd is funded by an endowment budget of €5 million per year sponsored by the consortium of government and commercial partners.⁹¹

3. Relay Services in France

3.1. Types of User Services Provided

There are three main providers of VRS in France:

- Tadeo
- WebSourd
- Viable France SARL

Tadeo

Tadeo is unique; it is a consortium of 16 large commercial companies in France:

⁹¹ Francis Goudenov; Director at WebSourd at announcement of 2012 Plan for Deaf and Hard of Hearing by Ministers Xavier Darcos and Nadine Morano; Toulouse, February 11, 2010

- Air France
- Alcatel
- Lucent
- Areva
- BNP Paribas
- Cap Gemini
- Crédit Agricole
- Delta Process
- GE Healthcare
- GMF
- Lyonnaise des Eaux
- Pôle Emploi
- Siemens
- Société Générale
- Sopra Group
- Thalès

This group supports Tadeo through joint financing and governs the company through an Executive Board with representatives from each of the 16 companies. These companies also support and enhance the development and delivery of Tadeo’s services by contributing their combined expertise and know-how in research and development, engineering, human resources, finance, and law.⁹²

- December 2006
 - Tadeo began researching the possibility of a VRS solution
- October 2007
 - Tadeo began experiments with different technologies and platforms
 - Tadeo began working with Deaf user focus groups
- July 2008
 - Tadeo created its first VRS and Remote Interpreting platform
 - This platform transitioned from developmental to operational
 - During the trial phase Tadeo progressively increased the load of traffic on the platform
- November 2008
 - The Tadeo VRS became fully operational⁹³

⁹² www.Thalesgroup.com; Press Releases; Group 2010; Thales and Tadeo win 2010 Innovation Prize for Sustainable Development

⁹³ www.Tadeo.fr; Company; History

Tadeo emphasizes:

- *Who can use Tadeo?* “This service has been created by companies for companies only,”
- *How can I get Tadeo?* “Your company has to become a partner of Tadeo,”
- *How much does the Tadeo Box cost?* “Tadeo is provided by the employer. The employee does not pay anything,”
- *What if the company refuses to pay? Can I pay for it?* “That is not the purpose of Tadeo. Tadeo is meant for companies.”⁹⁴

WebSourd

WebSourd was first established in 2002 by the National Federation of the Deaf and the France Regional Union of Cooperatives—Midi-Pyrenees. WebSourd began the first official VRS in France as a trial in February 2008 and began offering Text Relay at the same time. Additional partners joined to support the deployment of VRS including: France Telecom R&D, SFR, Caisse d’Epargne, Macif, and the Groupement des Industriels de Santé en Midi-Pyrenees. The WebSourd Video Relay Center services were built in partnership with IVès as the prime contractor. IVès provides the call center infrastructure and service, Visio08; this service was rebranded in April 2011 and is now called Elision.

WebSourd offers both VRS and VRI and is compatible with the Total Conversation standard. It simultaneously provides access to users via any combination of video, text, or voice. The WebSourd IVès services supply VRS to public organizations and private companies and are the only Video Relay link available on the AGEFIPH website.

Viable France, SARL

Viable France, SARL was established in 2008 by Viable Inc., a VRS provider from the United States. Viable France participated in the VRS trial sponsored by AGEFIPH and opened its relay call center in May 2008. To access Viable, PC users download a proprietary software application called Viable Vision. Users can also access Viable through a specialized videophone, the VPAD, or any broadband videophone.

All three VRS providers offer, or are developing and will soon offer, services made possible by cutting-edge technologies:

- All three VRS providers:
 - Offer platforms that satisfy the Total Conversation technology requirements
 - Include Text and IP relay as simultaneous user services
- Tadeo:

⁹⁴ www.Tadeo.fr; TadeoFAQ; Tadeo France website; Frequently Asked Questions tab

- Has developed “RepeaWriting”
 - A relay service linking lip-reading to speech recognition software
 - An aid for people with speech impairments
 - A service that can be used with or without sign language
 - A service available in English and French
- Employs Speech Recognition and Speech-to-Text technology in real-time speech transcription services⁹⁵
- Viable:
 - Has been developing speech recognition technology to enhance its real-time transcription service
 - Is available from a web browser
 - Can display text on mobile devices
 - Markets its real-time remote captioning service as ideal for:
 - Meetings
 - Training sessions
 - Education
 - Provides subtitles in foreign languages in real-time
 - A list of languages is available on request⁹⁶
- WebSourd:
 - Has been pioneering the development of LSF avatar technology
 - Is a partner in the SignCom project⁹⁷

These three companies are dedicated to providing VRS for employees and government services in compliance with the 11 February 2005 law.

Few Deaf or hard of hearing users are willing to pay for VRS; most have access to these services through an employer.

⁹⁵ www.Tadeo.fr, Plateforme de Communication; TadelInnovations; Le RepeaWriting; Le Nouveau Service de Tadeo

⁹⁶ www.Viable.fr; Viable France SARL; L’espace pour les particuliers; Centre de Transcription à Distance

⁹⁷ Both LSF avatar technology and the SignCom project are explained in further detail in the following section of this report, as well as in this VRS study’s phase 5, Technologies and Their Forecasts.

3.2. Current VRS Communication Technologies

Each of the three French VRS providers offers unique technical capabilities:

WebSourd

It is common to connect to VRS in France through a videophone. WebSourd provides information on Oplink, a videophone device it sponsors. (See Appendix A) Additional features for this videophone include mobile WiFi portability and 3D video resolution. WebSourd describes it as: “The latest generation terminal primarily aimed at the Deaf and Hard of Hearing, allowing them to communicate in sign language.”⁹⁸

Most of WebSourd relay traffic is accounted for by commercial companies, and WebSourd has a dedicated service offer for this clientele. This service, Elision Pro, is described on the WebSourd website: “Elision Pro is a suite of communications services for business customers. Elision Pro is available via the Internet from a Broadband video phone, computer or other compatible terminal.”⁹⁹ This is a new generation service that employs the Total Conversation standard, allowing simultaneous or concurrent communication in multiple modalities. According to WebSourd: “The interface allows contacting written, visual and audible operator relays and contacts, according to the selected communication modes (LSF, French written or oral, LPC). Elision Pro also offers many functions to manage calls, voice mail, contacts, organization and planning of meetings, etc.”¹⁰⁰

Tadeo

Tadeo developed its proprietary Video Relay Center platform in cooperation with Delta Process. Tadeo also provides an end-user terminal, the Tadeo Box, which includes a pre-packaged laptop (pre-loaded with the video relay application software), two 3D resolution webcams, and a microphone. An additional feature is high level software encryption to guarantee the confidentiality of communications. (See Appendix B)¹⁰¹

Viable

Viable has recently introduced its own proprietary tablet videophone, the VPAD, which was designed by Deaf engineers and is produced by Viable. The VPAD performs in the Total Conversation environment using video, voice, and text. It has a touch screen with a video resolution of 30 frames per second (broadcast quality full motion video) and has both WiFi and Bluetooth capability. The VPAD includes a

⁹⁸ www.Websourd.com; Web Site services remote communication; Oplink

⁹⁹ www.elision-services.com; Products and Services; Communication Services to Remote; Elision Pro

¹⁰⁰ Ibid

¹⁰¹ www.Tadeo.fr; Tadeo Company website; The TadeoBox

stand to provide proper viewing and projection angles when used as a stand-alone device. It can also be connected to a computer or television. (See Appendix C)¹⁰²

France is also experimenting with Virtual Sign Language technologies. A consortium of academic, industrial, and research partners, including WebSourd, is working on the SignCom Project. This project is funded by the *Agence Nationale de la Recherche* (ANR—French National Research Agency), and its goal is to: “improve the quality of real-time interaction between humans and virtual agents.” By using motion capture data and building a comprehensive database of multiple repetitions of the same sign in many different contexts, the team can animate a virtual French Sign Language (LSF) signing avatar.¹⁰³ (See Appendix D)

The project team divided tasks into two goals:

- Sign Language Analysis
- Sign Language Animation

The data collection for analysis included motion capture (mocap), video, and annotations. The team initially developed the avatar vocabulary in a laboratory. Twelve cameras were placed around a Sign Language interpreter to capture the motions of body markers placed on the interpreter. The markers included:

- 41 facial markers
- 43 body markers
 - 12 hand markers
 - 6 per hand¹⁰⁴

Once the vocabulary database was built, it could be used to animate the avatar for various applications.

While recognizing that the research: “will be valuable for the creation of multiple ‘intelligent and expressive’ interfaces for people who use signed languages,” the SignCom project identified two main applications for the avatar:

- Interactive Kiosk: “making public announcements accessible for Deaf and Hard-of-Hearing people is recognized as a national priority. With the interactive kiosk, users’ gestures are

¹⁰² www.Viable.fr; Viable France SARL; Company website; Particuliers; The VPAD

¹⁰³ Corpus Design for Signing Avatars; by Kyle Duarte and Sylvie Gibet; Université de Bretagne-Sud, Laboratoire VALORIA, Vannes France; Author manuscript, published in “Workshop on Representation and Processing of Sign Languages: Corpora and Sign Language Technologies, Valetta: Malta (2010)

¹⁰⁴ Language Resources and Evaluation Conference (LREC); Valletta, Malta; May 22-May 23 2010; Kyle Duarte and Sylvie Gibet; Université de Bretagne-Sud, Laboratoire VALORIA, Vannes France; Heterogeneous Data Sources for Signed Language Analysis and Synthesis: The SignCom Project

captured by cameras and recognized by the system; then, responses are provided through a virtual expressive character, giving information and advice. In this case, the dialogue is guided by restrictive scenarios.”

- Virtual Reality: “LSF signs, previously recorded with motion capture (mocap), are used to drive a virtual character’s animation. Interaction is guided by the progressive construction of a 3D virtual space shared by the human user and the humanoid character.”¹⁰⁵

There are no indications of when these applications will be commercially available. However, in a July 2010 update to the Corpus Abstract report, researchers concluded: “Having collected our data, we believe that we have an excellent base with which we can create convincing animations of French Sign Language, due in large part to the intentional way we built the SignCom corpus.”¹⁰⁶ The project team shared its experience and results at the LREC conference in Malta in May 2010 and at many other venues including:

- Proceedings of the Colloque A3DM 2010 in Poitiers, France, 17-18 June 2010
- Proceedings of the Workshop *Traitement Automatique des Langues des Signes (TALS 2010)*, Montréal, Quebec, Canada, 23 July 2010
- The First International Workshop on Sign Language Translation and Avatar Technology in Berlin, Germany, 10-11 January 2011¹⁰⁷

3.3. Broadband and Connectivity Infrastructure

In recent years, France has created new directives placing emphasis on Information Communication Technologies (ICT); it has created a new Directorate-General post (a CIO) to oversee the deployment of broadband infrastructure and to modernize public administration of eGovernment.¹⁰⁸

In France, the number of Internet and eGovernment users has been rising:

- France has more Internet and eGovernment users than the EU average
- However, France ranks 12th in EU broadband penetration into households

¹⁰⁵ www.valoria.univ-ubs.fr/signcom; Valoria University website; The SignCom Project: Sign-Based Communication Between Real and Virtual Agents; Overview; Applications

¹⁰⁶ Corpus Design for Signing Avatars; by Kyle Duarte and Sylvie Gibet; Université de Bretagne-Sud, Laboratoire VALORIA, Vannes France; Author manuscript, published in “Workshop on Representation and Processing of Sign Languages: Corpora and Sign Language Technologies, Valetta: Malta (2010); hal-00505182, version 1 – July 22, 2010

¹⁰⁷ www.valoria.univ-ubs.fr/signcom; Valoria University website; The SignCom Project: Sign-Based Communication Between Real and Virtual Agents; Dissemination; Publications and Events

¹⁰⁸ European Commission; Europe’s Digital Competitiveness Report; Volume 2 SEC (2010) 627; Information Communication Technologies Country Profiles; page 154

- 56% of French households have subscribed to broadband service

Part of the State reform was the implementation of the national plan, *France numérique 2012*.

Highlights include:

“Broadband for all: the number of high-speed connections increased, bringing closer one of the main goals of the national plan, which is to provide broadband access to 100% of the population at a reasonable price, by exploiting the wide coverage provided by satellite solutions.”

“Deployment of optical fiber: the Government launched several actions to enable the extensive deployment of optical fiber in France with the aim of connecting 4 million households by 2012. The objective is for 70% of the population to be connected to high-speed Broadband by 2020 and 100% by 2025.”

“Mobile Broadband: the granting of licenses for the available frequencies. This will lead to the availability of commercial mobile Broadband services by 2012.”¹⁰⁹

The effort to rapidly deploy widespread availability of broadband services has resulted, to some degree, in uneven growth; some technologies establish themselves more quickly than others. For example:

- France surpasses many countries in DSL technology
 - France reports 100% coverage availability
- As reported in 2010, wireless technologies have not made similar progress¹¹⁰
 - Only 2% of the population was accessing the Internet on 3G mobile devices
 - France was below the EU average for use of wireless Internet on laptops

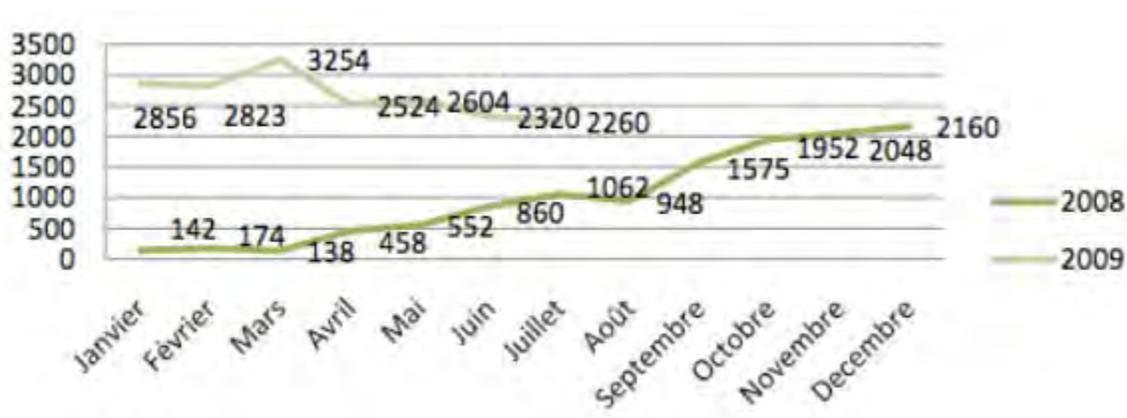
4. VRS Usage Volumes

WebSourd is the only VRS vendor that made information on consumer traffic available. The WebSourd VRS trial began in February 2008. This is also when WebSourd began offering Text Relay. WebSourd reported handling 30,710 Video Relay calls (through December 2009 as shown below) and only 826 calls for Text Relay.

¹⁰⁹ European Commission; Europe’s Digital Competitiveness Report; Volume 2 SEC (2010) 627; Information Communication Technologies Country Profiles; page 154

¹¹⁰ Ibid

Figure 12: WebSourd Video Relay calls January 2008 through July 2009¹¹¹



This difference may be due in part to the hours of service. Text Relay is available Monday afternoon 2:00 to 4:00 PM and Tuesday morning 10:00 AM to 12:00 noon. In comparison, VRS is available Monday through Friday 8:30 AM to 7:00 PM. WebSourd reports that most people who use Text Relay also use VRS.¹¹²

Tadeo does not report precise numbers, but states they serve thousands of clients in over 140 organizations.

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

According to Guilane Paris of AFILS (*Association Française des Interprètes en Langue des Signes*), there are approximately 300 LSF interpreters in France. The demand on sign language interpreter resources is a significant challenge in France. The lack of sufficient LSF resources is particularly interesting given that France has had some form of sign language since the 16th century and had the "first sign language in the world to gain recognition as a language in 1830."¹¹³

¹¹¹ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support Programme (PSP); Current Status and Availability of Total Conversation Systems, Version 1.0; page 83

¹¹² www.WebSourd.com; horaire; WebSourd website schedule of services

¹¹³ Lewis, M. Paul, 2009; *Ethnologue: Languages of the World*, Sixteenth edition; ISO 639-3: FSL

WebSourd collaborates with a number professional organizations in order to engage LSF interpreters for its VRS call center. Most of the interpreters come from the Interpretis agency in Toulouse.

WebSourd and Interpretis are working together to develop additional, formal university training programs for Sign Language Interpreters. The current course in Sign Language Interpreting at the University of Toulouse includes teaching interpreters about working in a relay center. Interpretis also offers similar in-house training for interpreters who have not taken university classes.

There are four Universities in France that offer LSF Interpreting training:

- The University of Toulouse – Le Mirail
 - 3-year interpreter training program
- The University of Paris
 - 2-year program
- The University of Lille
 - 2-year program
- ESIT (l'École Supérieure d'Interprètes et de Traducteurs)
 - A specialized school of Interpreters sponsored by l'Université Sorbonne Nouvelle – Paris
 - 2-year program

Many interpreters in France, as in many other nations, do not work in the relay centers full time. This may be due to many factors. One stakeholder commented, “We don’t know who’s working full-time; no data, no statistics about it.”¹¹⁴ Interpreters may work part time in VRS because they:

- Also work in the community
- Are new to interpreting in a relay center environment
- Are working toward full certification and qualification experience.

Although WebSourd estimates that there are 280 interpreters in France, this number may be increasing due to training and exposure to employment opportunities like VRI.¹¹⁵ According to an executive for Viable, there may be approximately 300 LSF interpreters; approximately 20 new LSF interpreters graduate every year, but this is far from satisfying the need. The same Viable executive says: “This

¹¹⁴ Mrs. Guylaine Paris; President; Association Française des Interprètes en Langue des Signes (AFILS); 2010 Interview and French Country Report for the European Forum of Sign Language Interpreters (efsli)

¹¹⁵ Francis Goudenov; Director at WebSourd at announcement of 2012 Plan for Deaf and Hard of Hearing by Ministers Xavier Darcos and Nadine Morano; Toulouse, February 11, 2010

makes it very difficult to think of being able to offer the services around the clock if the funding was provided for more than just people that work.”¹¹⁶

Tadeo agrees that there are only a few hundred LSF interpreters available and that this is not enough to satisfy the demand, especially in light of the 2015 deadline in the Law of 11 February 2005. Tadeo calculates that the demand for the Deaf population (3 million hours), would require 20,000 full-time interpreters).¹¹⁷ These Tadeo projections presume that 600,000 Deaf and hard of hearing individuals are able to use LSF to communicate. However, the Federation Nationale des Sourds de France (France National Deaf Federation) estimates the number of Deaf and hard of hearing that use LSF is approximately 100,000. Adjusting the Tadeo number to support 100,000 people would result in a need for 3,333 full-time interpreters. Even this number may be high. According to the opening statement of the 2011/2012 Licensing of Applied Languages Specialty (French/English/LSF) within the University of Toulouse Le Mirail, France currently has 280 Sign Language Interpreters for a requirement estimated at 2,500 in 10 years.¹¹⁸

7. Access to Emergency Services

Access to emergency services has always been a challenge and a concern when it comes to the Deaf and hard of hearing populations in France. According to an EU Information and Communication Technologies (ICT) program report: “There is currently no national availability of either text or video relay through which to be able to communicate with emergency services – although contact by FAX is possible in some locations.”¹¹⁹

Historically, emergency calls in France were answered by local emergency services. Users dialed many different numbers in addition to the 1-1-2 EU standard. For example, Emergency voice calls can be made directly to:

- Emergency medical services —15
- The police and gendarmerie—17
- The fire department—18
- SAMU or the fire department—112

¹¹⁶ Mission Consulting interview with Mr. Hillyard of Viable France, March 22 2011

¹¹⁷ This number is based on taking the 18 billion minutes per month of telephone usage by the general population and dividing it by the general population of 63 million people. Then they apply a 1% formula to come up with 600,000 Deaf and/or Hard of Hearing people. www.Tadeo

¹¹⁸ University of Toulouse le Mirail; CETIM (Centre for Translation, Interpreting and Linguistic Mediation); Academic Year 2011-2012; Licensing of Applied Languages; Elise Leroy; Head of Training

¹¹⁹ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support Programme (PSP); Current Status and Availability of Total Conversation Systems, Version 1.0; page 46

The fire department responds to 80% of all 1-1-2 calls in France

The organization of these call handling systems is managed separately and the interoperability of communication and information systems can be very different across the various parts of France. For example, SAMU services (15) in Grenoble are interconnected with the fire brigade (18/112) which has voice and data capability, but they are not interconnected with the police or gendarmerie services (17). Calls can be transferred to each other, but the medical and fire systems cannot share emergency call and caller data.¹²⁰

France and the EU ICT Policy Support Programme (PSP) are working together to make the adaptations necessary to implement the Reach 1-1-2 Project on a national level. They will be using the Total Conversation technology (simultaneous real-time transmission of video, voice, and text) already available in France to accomplish this. According to the project report: “Deaf people, speech impaired people and other citizens currently unable to access emergency services, will be able to call 112 at the national level and be answered by a Deaf 112 agent in sign language and text communication, or in text and voice communication by a hearing 112 agent. Each agent will then pass the information to the local emergency services, with the help of an onsite interpreter.”¹²¹

The French pilot will recruit both Deaf and hearing operators as well as interpreters for voice communication. According to the report, “In order to be able to handle many simultaneous calls, an unfeasibly large number of Deaf operators could potentially be needed at the National Emergency Platform.” The report recommends using external relay service in the event that no Deaf operator is available.¹²² However, VRS in France is not accessible to most Deaf people except through their work.

8. VRS Education and Outreach Programs

Outreach programs in France are limited. Some form of VRS has been available for years; and most of the Deaf population are already aware of its existence. The National Federation of the Deaf and other organizations such as AGEFIPH continue to mount public relations campaigns. For example, they celebrate the anniversary of the Law of 11 February 2005. WebSourd and other VRS providers also participate in public relations campaigns for the Deaf. They also continue to update their service and technology marketing strategies with web presences including Facebook and Twitter.

Press and event coverage for new technologies also develop outreach and awareness. Viable France participated in the 3D European eAccessibility Forum at which Tom Hillyard gave the presentation:

¹²⁰ www.samu-de-france.fr/fr/rapport; SAMU France website; Rapport: “Ressources nécessaires au bon fonctionnement d’ une structure d’ urgence”

¹²¹ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support Programme (PSP); Current Status and Availability of Total Conversation Systems, Version 1.0; page 71

¹²² Reach 112 Project; Information and Communication Technologies (ICT) Policy Support Programme (PSP); Current Status and Availability of Total Conversation Systems, Version 1.0; Quoted from text in the report; page 77

“Mobile communications; helping people with disabilities at work.” WebSourd, and the team sponsored by the ANR (French National Research Agency—*Agence Nationale de la Recherche*), garnered press coverage promoting their work in Sign Language Avatars. The applicability of all education and outreach is limited by the restriction to VRS through work, except by some providers for a fee.

AGEFIPH and ARCEP also collaborated on a report regarding video relay services in France. The report covered similar topics related to the existence of video relay services around the globe. It also researched the operational details of providing VRS, such as interpreter training and availability, staffing, ancillary services, costs, etc. The report determined that finding enough qualified interpreters is the biggest challenge to implementing and expanding video relay services in France.¹²³

¹²³ ARCEP, AGEFIPH, FIPHP, Advent Report; “Evaluation des besoins des personnes sourdes ou malentendantes en matière d’accessibilité des services téléphoniques”; “Assessment of the accessibility needs of Deaf and hearing impaired of phone services”; March 1, 2010. Editorial note: Although the report was broad in scope and overall very useful, portions of the data included incongruities, was dated or incomplete.

APPENDIX A

Figure 13: WebSourd Oplink



Figure 14: WebSourd Oplink Videophone Tablet



APPENDIX B

Figure 15: TadeoBox Package Solution



APPENDIX C



Le VPAD+

En vente !



[Fonctions et caractéristiques techniques](#) | [Prix d'un VPAD+](#) | [Acheter un VPAD+](#)

Qu'est ce que le VPAD+ ?



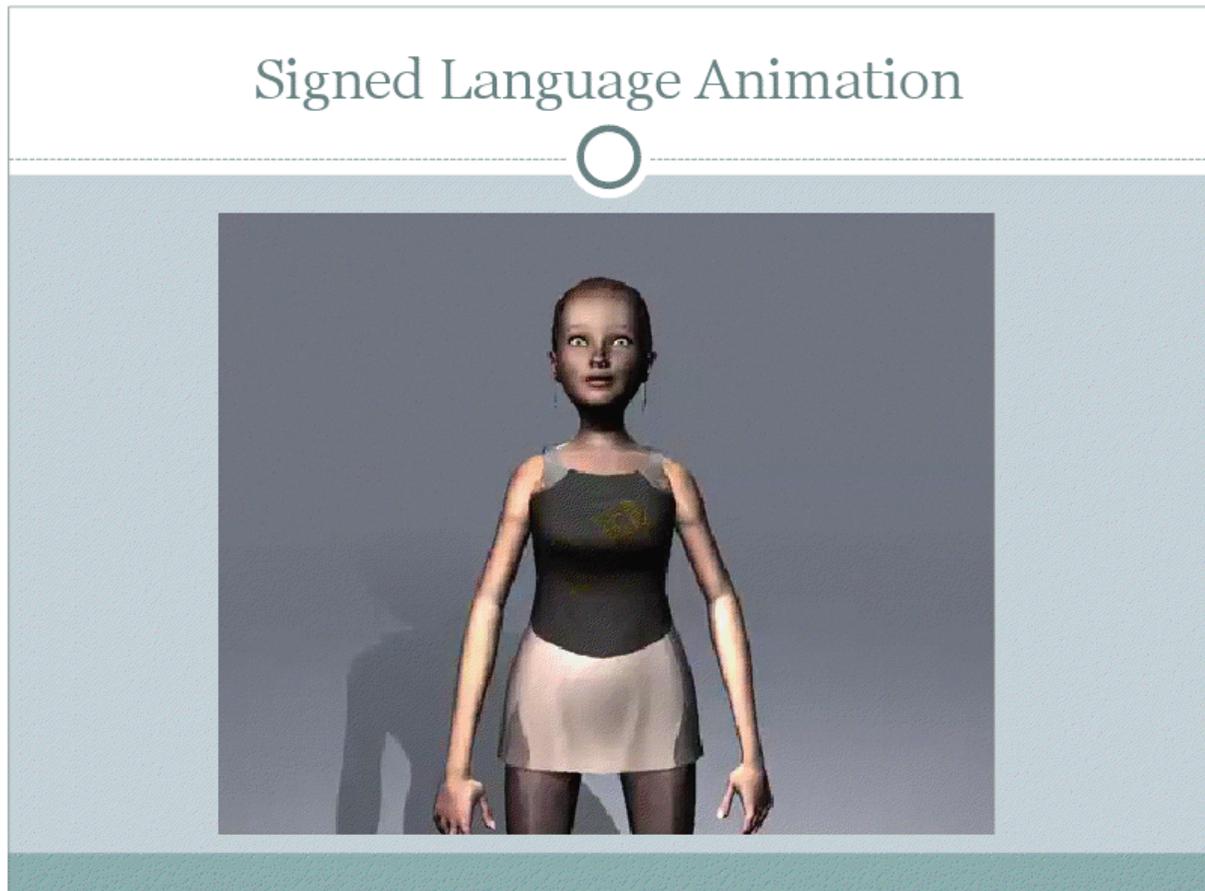
C'est un vidéophone révolutionnaire qui permet aux personnes sourdes et malentendantes de communiquer, directement, sans intermédiaire et en temps réel, avec leurs amis, leurs familles, leurs collègues, depuis n'importe quel lieu.

Le VPAD+ est spécifiquement adapté aux différents modes de communication des personnes sourdes et malentendantes : Langue des signes française (LSF), langage parlé complété (LPC) et écrit.



APPENDIX D

Figure 16: SignCom LSF Virtual Interpreter Avatar



GERMANY VRS

SUMMARY

1. Overview

Total Population:	82,110,097
Deaf Population:	100,000
Hard of Hearing Population:	260,000
Use Sign as Primary Language:	Not Available
No. of Qualified Interpreters:	460
Official Language:	German
Name of Sign Language:	DGS (<i>Deutsche Gebärdensprache</i>)
VRS Service Schedule:	2005-2008 Trial
VRS Vendors:	TeleSign, TeSS
MRS/VRS Funding Model:	A fund paid into by all telecom service providers pays 95% of the VRS costs for one national relay provider for public consumer use. 5% is paid for by consumers. A different government fund reimburses users for VRS costs paid for by business users.

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – Germany*, provides a synopsis of the VRS environment in Germany.

Key Points:

- Germany has an average demand for VRS and interpreter services
- Germany has an average ratio of sign language users to general population
- As a founding member of the EU, Germany's BGG, Behindertengleichstellungsgesetz (Federal Act on Equal Opportunities of Disabled People) and the SGB IX, Sozialgesetzbuch IX (Social Security Code IX) are based on EU Initiatives.
- One provider, TeSS, is required to provide MRS for public use

- Separate funding provides for business use of the VRS
- Germany's national relay provider service costs are currently covered by a telecom fund and minimal user fees
- 95% of the total costs for personal consumer use of TeSS Video Relay are divided among the telecom service providers
- The remaining 5% is paid by the consumers
 - Basic Fee = €220 per month, plus Call Cost = €1 per minute
- VRS business calls are paid for by the business consumer
- Consumers can apply for reimbursements up to €1,023 per month
- Business video relay calls from TeSS or TeleSign can be made Monday through Friday, 8:00 AM to 5:00 PM.
- TeSS relay services are available for personal use 7 days a week, from 8:00 AM to 11:00 PM (TeleSign only processes business calls.)
- TeleSign provides pairs of interpreters for translations in English from 8:30 AM to 12:30 PM on Wednesdays, and from 9:00 AM to 4:00 PM on Fridays.
- Interpreter Education and Outreach programs are in place
 - Germany has more technical information and documentation for users than any other country
- Three universities offer full time interpreter training programs
- Four organizations offer part time interpreter training programs

GERMANY VRS

RESEARCH

1. Demographics

Germany has a total population of 82,110,097. It is the most populous EU member state and has the largest economy in the European Union.¹²⁴

According to the German Deaf Association (*Deutscher Gehörlosen-Bund e.V.*):¹²⁵

- There are 100,000 Deaf in Germany
- There are 260,000 hard of hearing people in Germany
- The number of Deaf people who use German Sign Language (*Deutsche Gebärdensprache* or 'DGS') is unknown
- The need for interpreters cannot be calculated

According to the European Union of the Deaf: "There are no statistics in Germany about the number of Deaf people using sign language as their primary sign language."¹²⁶

2. Legal Background

2.1. Rights of People with Disabilities

Germany developed formal policies regarding people with disabilities as it adopted the UN Convention Ninth Book of the Social Codes (19 June 2001) and the Act on Equal Opportunities for Disabled Persons (27 April 2002). Since then, Germany has often set the standard in the EU, and was the EU's main

¹²⁴ Statistisches Bundesamt Deutschland; German Federal Statistics Office. The reported number is based on statistical extrapolation from the last complete census that was held in 1987. According to the statistics office, this number may be "about 1.3 million too high" as much has happened through European integration since then. The next census is currently being conducted (May 2011) and the real-time results are not available as of the writing of this report.

¹²⁵ As a ratio of deaf to general population, the German environment ranks 5th, in the middle of the pack of our 10 country reports. The actual ratio is .12% deaf and .32% Hard of Hearing.

¹²⁶ www.eud.eu; European Union of the Deaf; Germany; Deutscher Gehörlosen-Bund e.V;

negotiator for key draft articles of the 2006 United Nations Convention on the Rights of Persons with Disabilities. Germany is a prime signatory of this Convention.¹²⁷

Germany adopted the principles of the EU Disability Action Plan. This Plan outlines an overarching set of strategies that began in 2003; it is updated every two years. The Plan is intended to integrate the needs of people with disabilities into the framework of general policies, both new and existing.¹²⁸

The EU has also passed new laws and directives in order to further the principles of equal treatment and anti-discrimination. The European Union Council Directive 2000/78/EC established disability rights and protections against discrimination in employment. The directive states that, “all employers must provide ‘reasonable accommodation’ for people with disabilities;” the workplace must be adapted to accommodate employees with disabilities in the fulfillment of their jobs.¹²⁹

The German *General Equal Treatment Act* (*Allgemeines Gleichbehandlungsgesetz* or ‘AGG’) resulted from the EU Directives. This legislation was passed to protect against discrimination based on: “disability as well as discrimination based on race, gender, religion or belief, age or sexual identity, especially in civil and labour law.”¹³⁰

The German *Federal Act on Equal Opportunities of Disabled People* (*Behindertengleichstellungsgesetz*— or BBG) and the *Social Security Code IX* (*Sozialgesetzbuch IX* or ‘SGB IX’) are also important to the implementation of VRS.

The BGG is a German national State law enacted to improve accessibility for people with disabilities in public and government offices and to German authorities. The SGB is a Social Security Code that works against discrimination based on disability and fosters self-determination and equal participation in the workplace. This is one of the regulations that justify federal funding of VRS for employees.¹³¹ VRS providers in Germany reference Section 102, paragraph 4, regarding the importance of VRS to business users. Paragraph 4 states: “Within the framework of the Integration Office’s scope of responsibility for accompanying aid in vocational life, from the available countervailing charges fund, severely

¹²⁷ Auswärtiges Amt; German Federal Foreign Office; The International Convention on the Rights of Persons with Disabilities; Germany’s Role

¹²⁸ European Commission; Employment, Social Affairs and Inclusion; The EU Disability Action Plan

¹²⁹ European Commission; Employment, Social Affairs and Inclusion; The EU Legislation; European Union Council Directive 2000/78/EC; L303 02.12.2000 pages 16-22

¹³⁰ Deutsches Institut für Menschenrechte (German Institute for Human Rights); Aktiv gegen Diskriminierung (Rights and Opportunities for Participation); Allgemeines Gleichbehandlungsgesetz, AGG; Procedure according to the General Equal Treatment Act **The AGG was passed for implementation of three other EU Equal Treatment Acts in addition to the Council Directive 2000/78/EC; it also included Council Directives 2000/43/EC, 2002/73/EC and 2004/113/EC.

¹³¹ Deutsches Institut für Menschenrechte (German Institute for Human Rights); Aktiv gegen Diskriminierung (Rights and Opportunities for Participation); Sozialgesetzbuch, SGB IX (Social Security Code IX)

handicapped employees are entitled to reimbursement of costs for a work assistant.”¹³² VRS in a business environment is considered a 'work assistant' and therefore qualifies for reimbursement under a separate funding mechanism than from the national fund of the telecommunications service providers.

2.2. Telecommunications Service Obligations

Germany has a national relay contract supported by legislation in the German Disability Act. Through this contract, relay services are awarded to one vendor, TeSS Relay Dienste GmbH (TeSS). This is similar to the Universal Service Obligation that exists in North America, Australia, New Zealand, and other EU countries.

The Telecom Regulator—*Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen* (Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway) awarded the contract for a trial of Text and Video Relay Services to TeSS on 1 January 2005. The trial lasted for four years and ended on 31 December 2008. The service then became permanent. TeSS has been the national relay service provider since 1 January 2009.¹³³

The trial and permanent relay services were organized through a cooperation between the *Deutsche Gesellschaft der Hörgeschädigten – Selbsthilfe und Fachverbände e.V.* (German Society of hearing impaired people, self-help and professional associations) and Deutsche Telecom AG.¹³⁴

2.3. Regulatory Funding of MRS/VRS

VRS funding is provided differently for the two VRS providers: TeSS and TeleSign. However, both providers receive grant funds awarded by the Integration Office for Deaf employees.

The regulatory funding for the use of VRS by the general public¹³⁵ is provided to TeSS through the telecom regulator, from a national fund with contributions from all Telecommunication Service Providers (TSPs). The German regulator (*Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen*) manages the contributions to and distribution of the fund.

- 95% of the total costs for private, personal, consumer use of TeSS VRS is from the TSP fund
- 5% of VRS costs for private use are paid for by the consumers

¹³² Auswärtiges Amt; German Federal Foreign Office; Sozialgesetzbuch, SGB IX (Social Security Code IX); Chapter 6 Implementation of the Special Regulations for Integrating Severely Handicapped Persons; Section 102 Integration Office Duties

¹³³ Mission Consulting Questionnaire response from Tess-Relay-Dienste GmbH, April 5, 2011

¹³⁴ Ibid

¹³⁵ calls made by individuals for personal or private use as opposed to working persons making calls as an employee

According to an executive at TeSS, current funding is based on actual costs: “for the given extent and degree of care (opening times and number of working interpreter’s stations). An expansion of times and the interpreter’s stations would mean a rise in cost. This would have to be regulated by the Bundesnetzagentur.”¹³⁶

The costs for business calls are not paid for by the telecom fund, but are paid for by consumers regardless of VRS provider. Business consumers can apply for reimbursement of costs at their Integration Offices (*Integrationsamt*). The Integration Office decides how much money is allotted to each user based on need as described in the user’s application. This decision is usually limited by a standard budget allotment of up to €1,023 per month. This amount may be increased; however the employer must also support the employee's claim to confirm that the need is real.¹³⁷

TeSS

TeSS recently made a change in its pricing structure to reflect the fact that the rates charged to business users are higher than the rates publicized for private use. Business use is not subsidized and actual costs of providing the service are passed on to businesses that use the service. For business calls, TeSS employs specialized interpreters called “Professional TeSign Interpreters” who have more training and experience and whose services cost more.

TeSS rates for business use are: ¹³⁸

TeSign (VRS):	Basic Fee = €220 per month Call Cost = €1 per minute
TeScript (IP/Text Relay):	Basic Fee = €110 per month Call Cost = €0.50 per minute
Both TeSign and TeScript:	Basic Fee = €330 per month TeSign Call Cost = €1 per minute TeScript Call Cost = €0.50 per minute

Individual users must also directly pay some of the costs of TeSS relay services. TeSS rates for private use are: ¹³⁹

¹³⁶ Mission Consulting Questionnaire response from Tess-Relay-Dienste GmbH, April 5, 2011

¹³⁷ Deutsches Institut für Menschenrechte (German Institute for Human Rights); Aktiv gegen Diskriminierung (Rights and Opportunities for Participation); Sozialgesetzbuch, SGB IX (Social Security Code IX)

¹³⁸ TeSS business rates as advertised in May of 2011 and do not include 19% VAT

¹³⁹ TeSS private rates as advertised in May of 2011 and include 19% VAT

In March 2011, TeSS separated the more experienced and higher skilled interpreters into a dedicated service to support business callers. In order to have the business callers reach appropriate interpreters, business and personal customers are routed separately through the call center platform based either on the user's registration number or on the number dialled (in the case of hearing callers).

All business users must register as "professional services" customers and must select whether they want to pay for TeSign (VRS), TeScript (IP relay), or both. Each user is charged for services according to the published business rates. Users who wish to place both business and personal calls must register in separate accounts for each purpose. The government and the VRS provider control inappropriate use by instructing interpreters to refuse business calls made from a private account and vice-versa.¹⁴²

The TeSS Relay hours of operation differ depending on the nature of the call:

- The business service is available Monday – Friday, 8:00 AM – 5:00 PM
- The private service is available seven days a week, 8:00 AM – 11:00 PM¹⁴³

TeleSign

TeleSign provides services only to business users and therefore relies heavily on reimbursement/grant funding provided by the Integration Office. TeleSign only provides VRS; it does not provide any form of text relay. TeleSign provides VRS Monday – Friday, 8:00 AM – 5:00 PM. Interpreters work with both German Sign Language and a form of oral transliteration described as the use of sound-speech related gestures. TeleSign also provides paired interpreter and translator teams for communications in English – Wednesday, 8:30 AM – 12:30 PM and Friday 9:00 AM to 4:00 PM.¹⁴⁴

Additional information about these services was provided by the German Deaf Association (*Deutscher Gehörlosen-Bund e.V.*):¹⁴⁵

- Users wish they had 24-hour service
- Users can currently make multiple calls without having to hang up and reconnect
- Users have a 30 minute time limit after which they must reconnect
- The downloadable software application (MMX) for the relay service is free
- End-user devices for private use can cost €200 – €1000
 - The Integration Office (*Integrationsamt*) can reimburse this expense for business users

¹⁴² Letter to TeSS customers from TeSS Managing Director Sabine Broweleit, March 2011

¹⁴³ Mission Consulting Questionnaire response from Tess-Relay-Dienste GmbH, April 5, 2011

¹⁴⁴ www.Telesign.de; TeleSign website portal; Leistungen (Services) section

¹⁴⁵ Mission Consulting Questionnaire response by Cornelia von Pappenheim and Kathleen Schulze; Deutscher Gehörlosen-Bund e.V.; March 28, 2011

3.2. Current VRS Communication Technologies

Users can connect to VRS in Germany in various ways.

TeSS:

- With a computer with a webcam:
 - The user downloads a free PC MMX software application
 - The user's PC must:
 - Have a webcam
 - Use a Windows operating system¹⁴⁶
 - Have high-speed Internet access of at least 256Kbps upstream
- With a videophone:
 - A standard off-the-shelf SIP-based videophone is compatible
 - Only the ISDN View 100 model is supported for ISDN users¹⁴⁷
- With mobile phone:
 - The service is compatible with UMTS-enabled mobile phones

The TeSS website has a lengthy technical requirements section that explains the technology and provides more information in a detailed FAQ (Frequently Asked Questions) section. Visitors can access this information at the TeSS website: www.tess-relay-dienste.de/. The website contains information regarding accessibility technology, including:

- *Erreichbarkeit* (Accessibility)
- *Technik/Anforderungen* (Technology and Requirements)
 - Five subcategories
 - The first subcategory is *Technik/Handbuch*, a 44 page Technology Manual
- *TeSS-Kundeninfos* (TeSS Customer Information)

¹⁴⁶ The TeSign Video Relay Service using MMX software is NOT compatible with Apple's MAC operating system. An Apple user would need to download additional SIP softphone software such as X-Lite 4 or Bria 3 as referenced in the technical requirements of the TeSS website.

¹⁴⁷ Due to concerns over video quality, TeSS states, "older technology of the ISDN videophone and low bandwidth of an ISDN line. Therefore, TeSS cannot guarantee a successful communication." www.tess-relay-dienste.de; Technik/Anforderungen; TeSS relay website portal; Technology and Requirements section.

- FAQ
- *Forum für Nutzer* (Forum for Users)
 - Includes many technical discussions

The description of firewall requirements is an example of the extent to which this VRS provider educates users regarding technology requirements. For secure networking environments, TeSS provides warnings that firewall settings will need to be configured for access to the service. It also provides detailed specifications regarding these adjustments. (See Appendix A)

TeSS also provides compatibility and access instructions for its TeSign (Text/IP relay) customers:

- A PC with MMX software (provided by TeSS)
- Textphone technology
- A PC with the Apple MAC OS X operating system
 - There may be pressure from the user community to use Apple technology
 - TeSS has gone to great effort to communicate when and how Apple systems can be used with TeSS services

TeleSign

To access TeleSign VRS, users must have one of the following:

- An ISDN-based videophone with DSL connection
- An SIP-based videophone with DSL connection¹⁴⁸
 - Including the VPAD SIP videophone, which can use wireless LAN connectivity
- The minimum required DSL speed is 512 Kbps
- TeleSign VRS cannot be accessed with a PC and an Internet connection

¹⁴⁸ The website Frequently Asked Questions section makes reference to the availability of videophones. This is because Deutsche Telecom AG has stopped production of the T-view videophone and there are currently no more Deutsche Telecom videophones on the market. The answer from TeleSign indicates that foreign-built videophones such as the VPAD and The Theseus will work as well.

Figure 17: SIP-based rexfon 5 as recommended by TeleSign



Figure 18: VPAD as recommended by TeleSign



3.3. Broadband and Connectivity Infrastructure

- In Germany the largest broadband market provider is Deutsche Telecom
 - This company has upgraded its DSL network with ADSL2+ and VDSL in many urban areas
- DSL coverage in Germany is nearly 100% nationwide and up to 90% in rural areas¹⁴⁹
- Cable companies are gaining share with their faster 120Mb/s services. These companies include:
 - Kabel Deutschland
 - United Internet

The availability of high-speed broadband has created additional demand for new bundled services, and the competitive environment has caused pricing to drop dramatically. Demand is evident in increasing broadband penetration numbers:¹⁵⁰

- Broadband penetration in Germany is 30.4%; which is higher than the EU average of 24.8%
- Only 19% of the German population has never used the Internet compared to the EU average of 30%.

Mobile telephony and wireless Internet technologies also continue to gain popularity:

- The number of mobile users in Germany tripled between 2005 and 2007
- 2G/3G technology is now the main voice access technology in Germany
- By the end of 2009, mobile subscriptions reached 108.26 million
 - Mobile penetration was at 132.2%¹⁵¹

According to the European Commission's Digital Competitiveness Report, Germany: "has a very comprehensive eGovernment program, including putting the Internet at the core of public service delivery."¹⁵² In addition, the German government is pursuing an IT Investment Program and in the 2009/2010 Fiscal year set aside a 500 million euro budget to modernize government administration and stimulate investment in the IT Sector. German government initiatives also include national broadband strategies. Goals include the deployment of broadband infrastructure to provide:

¹⁴⁹ European Commission; Europe's Digital Competitiveness Report; Volume 2 SEC (2010) 627; Information Communication Technologies Country Profiles; page 156

¹⁵⁰ Ibid;

¹⁵¹ www.point-topic.com/content; Germany Broadband Overview; Point Topic is an independent company out of the UK. It specializes in worldwide DSL statistics and Broadband industries

¹⁵² European Commission; Europe's Digital Competitiveness Report; Volume 2 SEC (2010) 627; Information Communication Technologies Country Profiles; page 156

- Nationwide availability of 1Mbps
- 75% availability of 50 Mbps by 2014¹⁵³

4. VRS Usage Volumes

TeSS did not provide any statistical information regarding the volume of calls or minutes of use. Similarly, there is no public information readily available from the German regulatory agency.

TeSS did indicate that it had 44 German Sign Language interpreters; and that each interpreter worked an average of 5 hours per work day for VRS usage.

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

As in all countries, VRS in Germany is dependent on the quality and availability of sign language interpreters. According to the German Deaf Association (*Deutscher Gehörlosen-Bund e.V.*), German Sign Language interpreters do not have to be members of the Association of Sign Language Interpreters; “Therefore, it is hard to tell how many qualified sign language interpreters there are in Germany. We have estimated approximately 360.”¹⁵⁴ The Federal Association of German Sign Language Interpreters (*Bundesverband der GebardensprachdolmetscherInnen Deutschlands e.V.*) agrees that it is difficult to obtain exact figures on interpreters: “Interpreters are working some part-time, some full-time; we don’t have exact data about the percentages yet.” However, the association states that:

- It believes its 400 interpreter members represents 75% of German sign language interpreters.
- Therefore their estimated total number of German sign language interpreters is approximately 460.¹⁵⁵

¹⁵³ The German Regulator (Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen); Eckpunkte über die regulatorischen Rahmenbedingungen für die Weiterentwicklung moderner Telekommunikationsnetze und die Schaffung einer leistungsfähigen Breitbandinfrastruktur März 2010; Regulatory report titled “Vertices on the Regulatory Framework for the Development of Modern Telecommunication Networks and Developing an Effective Broadband Infrastructure; March 2010

¹⁵⁴ www.eud.eu; European Union of the Deaf; Germany; Deutscher Gehörlosen-Bund e.V.;

¹⁵⁵ Bundesverband der GebardensprachdolmetscherInnen Deutschlands e.V.; Federal Association of German Sign Language Interpreters; Annual Country Report 2008/2009

TeSS employs:

- 44 German Sign Language Interpreters for VRS
- 7 Text Interpreters

All TeSS interpreters:

- Are hired “based on permanent contracts” (not freelance or part-time contracts)
- Have Master’s Certificates
- Sign an Oath of Confidentiality¹⁵⁶

TeleSign interpreters:

- TeleSign does not cite specific degree or certification requirements
- Interpreters are not interns or trainees
- All interpreters are bound by an Oath of Confidentiality¹⁵⁷

There are three full-time training programs in Germany at the following Universities:

- University of Applied Sciences in Magdenburg-Stendal; (Diploma in Sign Language Interpreting)
- University of Applied Sciences in Zwickau ; (Diploma in Sign Language Interpreting)
- University of Hamburg; (BA and MA in Sign Language Interpreting)

University BA programs run for three and a half years, and MA degrees add two more years. Part-time programs for interpreters who already have knowledge and experience with German Sign Language are offered by the following organizations:

- The Institute of Sign Language in North Rhine-Westphalia
- The Institute of the Deaf in Bavaria
- The Institute of Sign Language in Baden-Wuerttemberg
- The University of Applied Sciences in Frankfurt

These part-time training programs take 2 to 3 years to complete and require participants to pass a prerequisite course in Sign Language Competency. Many of the sign language interpreters who take the part-time courses are preparing for the State Interpreter Examination (*Staatliche Prüfung*). The State

¹⁵⁶ Mission Consulting Questionnaire response from Tess-Relay-Dienste GmbH, April 5, 2011

¹⁵⁷ www.Telesign.de; TeleSign website portal; Leistungen (Services) section; FAQ

Examination can be taken in Darmstadt or Nuremberg and, any interpreter who passes receives a “State Approved” Sign Language Interpreter Certification.¹⁵⁸

7. Access to Emergency Services

Germany has adopted the EU 1-1-2 emergency number standard. However, it has not agreed to the ICT Reach 1-1-2 Project; this project is intended to modernize EU emergency calling networks and procedures and incorporate the Total Conversation standard (the ability to communicate simultaneously via voice, text, or video).¹⁵⁹

In Germany, the traditional emergency number for the police was 1-1-0. This number is still listed as the primary emergency number, and both 1-1-0 and 1-1-2 can be used to reach the police. Germans trying to reach emergency medical assistance or fire brigades now usually call 1-1-2.

Accessibility to these services is still quite limited for the Deaf population. The Deaf can connect to an emergency number via FAX (direct TTY access is not listed on Relay provider sites or telecom provider sites such as Deutsche Telecom).¹⁶⁰ Mobile 1-1-2 is available via the GSM network for SMS messages, but will not work if the phone does not have a SIM card.¹⁶¹

Emergency calls are not required in the contract TeSS has with the German regulatory authority (*Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen*) and are therefore not an official relayed service offered to the public. However, TeSS will relay emergency calls during business hours: “thanks to a cooperation between TeSS and the Federal emergency call center in Frankfurt am Main.”¹⁶² As confirmed by the German Deaf Association (*Deutscher Gehörlosen-Bund e.V.*): “It is possible to make emergency calls using the relay services during the offered schedule. Deaf people with other working hours are not able to use the service.”¹⁶³

¹⁵⁸ Bundesverband der GebärdensprachdolmetscherInnen Deutschlands e.V.); Federal Association of German Sign Language Interpreters; Annual Country Report 2008/2009

¹⁵⁹ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support Programme (PSP); Current Status and Availability of Total Conversation Systems, Version 1.0

¹⁶⁰ www.eena.org; EENA website; European Emergency Number Association; Germany

¹⁶¹ A SIM card is a specially programmed microchip that inserts into a compatible Global System for Mobile Communications (GSM) mobile device. The SIM card encrypts transmissions and identifies the user to the mobile network.

¹⁶² Mission Consulting Questionnaire response by Nadine Brohm, Tess-Relay-Dienste GmbH, April 5, 2011

¹⁶³ Mission Consulting Questionnaire response by Cornelia von Pappenheim and Kathleen Schulze; Deutscher Gehörlosen-Bund e.V.; March 28, 2011

8. VRS Education and Outreach Programs

German government offices and the regulatory agency publish information about VRS. Much of this information is intended to educate the public about how to access their services. The government also publishes information on funding business calls through the *Integrationsamt* (Integration) Office. The *Deutsches Institut für Menschenrechte* (German Institute for Human Rights) provides a significant amount of VRS information via a government web portal.

Both VRS providers make information available on their websites. They make it easy for the user to understand the Integration Office program, and they have downloadable sample applications on their sites. TeSS has effective marketing and outreach materials, which it has used in public relations efforts including community presentations about VRS and traditional mainstream advertising channels. (See Appendix B)

The amount of technical education and information available to users on the VRS provider websites is voluminous. The TeSS site in particular is very comprehensive. In one section, users can review or download a seven-page “Terms and Conditions” document that outlines the relationship agreement between the VRS provider and the user. It also offers the availability of experimental services that may become available, but that the provider is under no obligation to make permanent. Software update information and user responsibilities for hardware maintenance are also listed at the TeSS website.¹⁶⁴

TeSS also provides a downloadable Power of Attorney document. This is helpful for users that need to use relay for banking, medical, or other communications in which the retail associate is instructed not to help if contacted by a third party (this problem often arises when a relay interpreter announces he or she is relaying the call for the actual customer).¹⁶⁵

There is a very active Deaf community in Germany that uses websites and social media for connecting, marketing, and keeping current. *Taubenschlag-Das Portal für Gehörlose und Schwerhörige* (the portal for the Deaf and hard of hearing) is a good example. This portal has many sponsors including:

- VRS providers (TeSS)
- The German Deaf Association (*Deutscher Gehörlosen-Bund e.V*)
- Training schools (Vibelle)

¹⁶⁴ www.tess-relay-dienste.de; Tess-Kundeninfos; TeSS relay website portal; Customer Information section

¹⁶⁵ Ibid

APPENDIX A



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Which router do I need?

Most routers are suitable for Tess. If the router will block the video communication, then the function "SPI and Anti-DoS firewall protection" turned off.

Known problems and solutions:

- T-Sinus 154 DSL Basic
 - Switch off in the advanced settings to select "Turn on SPI and Anti-DoS Firewall"
- Arcor and Vodafone Router
 - In the Advanced Settings / Firewall in "SPI and Anti-DoS firewall protection" Remove marker

For Tess is not suitable:

- Speedport W 303V, Type A (Arcadyan)
- Speedport W 502V, Type A (Arcadyan)
- Speedport W 503V, Type C (Arcadyan)
- Speedport W 504V, Type A (Arcadyan)
- Speedport W 700V (Siemens / Arcadyan)
- Speedport W 720V (Arcadyan)
- Speedport W 722V, Type B (Arcadyan)

Firewall settings

NEW as valid 10.11.2009

! Only for business!

Use the following table, it should be possible to use a corporate firewall to
To configure that use of Tess relay services both through the web client as the
also on the MMX client is possible.

Web Client (Tess is available on site):

SrcIP	SrcPort	Protocol	DestIP	DestPort
own	any	TCP	79.171.92.199	443
own	any	TCP	79.171.92.199	20000

MMX Client Video:

SrcIP	SrcPort	Protocol	DestIP	DestPort
own	any	TCP	79.171.92.199	80
own	any	TCP	79.171.92. 202	80
own	any	TCP	79.171.92.199	8093
own	any	TCP	79.171.92.199	1098
own	any	TCP	79.171.92.199	1099
own	any	TCP	79.171.92.199	4444
own	any	UDP	any	25000-25007 RTP-out
any	any	UDP	own	25000-25007 RTP in

MMX-client text:

SrcIP	SrcPort	Protocol	DestIP	DestPort
own	any	TCP	79.171.92.199	80
own	any	TCP	79.171.92. 202	80
own	any	TCP	79.171.92.199	8093
own	any	TCP	79.171.92.199	1098
own	any	TCP	79.171.92.199	1099
own	any	TCP	79.171.92.199	4444

For questions, please send an email to support@tess-relay-dienste.de.

Stand: 20.10.2009

APPENDIX B

Ohne Kommunikationsbarrieren telefonieren!

www.tess-relay-dienste.de

Dein hörgeschädigte Mensch ...

... erreichen über die
Tess - Relay-Dienste ...

... in
Gebärdensprache ...

... oder Schriftsprache

... für viele Menschen
am Telefon oder Handy.

Tess - Sign & Script -
RELAY-DIENSTE FÜR HÖRSCHÄDIGTE MENSCHEN GMBH

Höfenerstraße 18 • 34719 Bielefeld
Tel.: +49 (0) 43 31 38 97 - 23 • Fax: +49 (0) 43 31 38 97 - 26
info@tess-relay-dienste.de • www.tess-relay-dienste.de



Tess
Relay-Dienste

NEW ZEALAND VRS

SUMMARY

1. Overview

Total Population:	4,404,231
Deaf Population:	7,700
Hard of Hearing Population:	200,000
Use Sign as Primary Language:	28,000
No. of Qualified Interpreters:	90
Official Languages:	English, Maori, New Zealand Sign Language
Name of Sign Language:	New Zealand Sign Language (NZSL)
VRS Service Schedule:	2009 Trial, Nov. 2010 Permanent
VRS Vendor:	Sprint New Zealand
MRS/VRS Funding Model:	MRS funded by combination of federal subsidy, levy on telecommunications carriers, and limited user fees. (VRS trial funded solely by federal subsidy.)

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – New Zealand*, provides a synopsis of the VRS environment in New Zealand.

Key Points:

- New Zealand has a high demand for VRS and interpreter services
- New Zealand has a high ratio of sign language users to general population
- New Zealand has an indigenous native population (Maori)
 - There are almost no trilingual interpreters
 - Most Maori speak English
- Regulatory obligations to provide MRS services are called Kiwi Share Obligations
 - Kiwi Share Obligations are similar to Universal Service Obligations

- MRS services currently receive funding from three sources:¹⁶⁶
 - Government subsidy
 - Levy on current telecommunications carriers
 - Limited user fees
 - Surplus MRS funds are used to pay for VRS
- Current MRS average cost is \$2 million–\$2.5 million NZD per year¹⁶⁷
- The Ministry of Economic Development projects \$5 million per year to extend VRS as a permanent service
- MRS funding includes \$100,000 grant for 20 annual interpreter scholarships
- MRS TTY relay services are offered 24 hours a day, 365 days a year, with limited availability for Speech-to-Speech and VRS.
 - VRS:
 - Monday through Friday: 9:00 AM – 5:00 PM
 - Weekends and public holidays: No service
- VRS availability is further restricted by a maximum of only two video interpreters operating at the same time.
- VRS education and outreach programs are in place
 - Consumer representatives desire improvement in these programs

¹⁶⁶ In New Zealand the relay services are termed Telecommunications Relay Services or TRS. They are referred to herein as MRS except when referring to named laws or in quotes.

¹⁶⁷ One New Zealand Dollar (NZD) equals approximately 0.79 Canadian Dollars. All dollars shown herein are NZD.

NEW ZEALAND VRS

RESEARCH

1. Demographics

1.1. General Population

New Zealand has an estimated population of 4,404,231.¹⁶⁸ Statistics New Zealand (*Tatauranga Aotearoa*) is a government department and New Zealand's national statistical office. It administers the [Statistics Act 1975](#) and is the Government's primary source of official statistics. In the wake of the 22 February Christchurch earthquake, the 8 March [2011 National Census](#) was cancelled, and the Census will not proceed in 2011.

The next [Disability Survey](#) was scheduled to take place soon after the 2011 Census,¹⁶⁹ therefore there are no current statistics on the number of Deaf people in New Zealand. Statistics New Zealand did a 2006 limited survey of people with disabilities resulting in the following extrapolations for the country:

- 7,700 partially or completely deaf adults living in households were using NZSL to communicate
- This is only a fraction of the 200,000 people in New Zealand with hearing impairments
- 6,057 people can communicate in all three of New Zealand's official languages:
 - English
 - Te Reo Maori
 - New Zealand Sign Language

According to Deaf Aotearoa:¹⁷⁰

- Nearly 28,000 New Zealanders use New Zealand Sign Language
 - 0.64% of the population (This is a very high ratio)

¹⁶⁸ www.stats.govt.nz

¹⁶⁹ www.stats.govt.nz

¹⁷⁰ www.deaf.org.nz; Deaf Aotearoa, "About New Zealand Sign Language"

1.2. Maori Deaf Population

Based on the 2006 census, the Maori population in New Zealand is estimated to be 663,900.¹⁷¹ The Maori have their own language, Te Reo Maori, one of the three official languages of New Zealand.

According to the New Zealand Office for Disability Issues, Maori Deaf people constitute a large proportion of the Deaf community in New Zealand; some estimates place this number at approximately 110,000 individuals.

The Maori Deaf are also potentially trilingual and tricultural, requiring access to environments where English, Maori, and NZSL are used. When English is the main language spoken, Maori Deaf people can usually communicate effectively using a New Zealand Sign Language/English interpreter. When Maori is the principal language, a trilingual interpreter who can communicate in English, Maori, and NZSL is needed. There are currently few trilingual interpreters; trilingual interpreters are in demand and must be booked four weeks in advance.¹⁷²

2. Legal Background

2.1. Rights of People with Disabilities

New Zealand passed the Human Rights Act of New Zealand in 1993 making it illegal to discriminate against people on the basis of disability. The Government then passed the Public Health and Disability Act of 2000. This Act was significant because it required the development of a New Zealand Disability Strategy, which was adopted in 2001. This Strategy was: “founded on the social model and aims to create a non-disabling society by progressively removing the barriers to participation which confront impaired people.”¹⁷³

During the same period, the United Nations Convention on the Rights of Persons with Disabilities was gaining momentum. By the time New Zealand became a principal signatory of the UN Convention, no new legislation was required for New Zealand to implement the Convention domestically. Implementing the Convention meant that New Zealand would continue to ensure people with disabilities human rights and fundamental freedoms on an equal basis with others and without discrimination on the basis of impairment.

In April 2006, New Zealand became the first country to declare a sign language (NZSL) an official language.

¹⁷¹ www.stats.govt.nz

¹⁷² Office for Disability Issues; Administered by the New Zealand Ministry of Social Development; “A Guide to working with New Zealand Sign Language Interpreters; Maori Deaf People”

¹⁷³ New Zealand Disability Strategy

2.2. Telecommunications Service Obligations

The original New Zealand telecommunications network was created through decades of public funding; the industry was privatized in 1990. In order for New Zealanders to retain some control over future service availability, the Kiwi Share Obligations (KSOs) agreements were made between the private telecommunications company and the Government. These obligations required the only national telecommunications provider to ensure the availability and affordability of basic services to citizens.

The KSO requirements have continued to evolve over time:

- In 1990 - basic service meant residential telephone voice service
- By 2001 - basic service was expanded to include dial-up Internet calls
- By 2007 - basic service included broadband access¹⁷⁴

The original KSOs became part of the *Local Service Telecommunications Service Obligations Deed* (TSO or TSO Deed), which further enforced these principles of basic service access throughout New Zealand.

The TSO framework has two main components that:

- "enables the supply of certain telecommunications services which would otherwise not be made available commercially; and
- enables levying the telecommunications industry to recover the subsidization cost for supply of TSO services"¹⁷⁵ (including MRS).

The Telecommunications Relay Service (TRS or MRS) was created to meet the telecommunications needs of the Deaf and Deafblind as well as people with hearing and speech impairments. It was established in 2004 as a Telecommunications Service Obligation (TSO) under the Telecommunications Act 2001 to be: "the regulatory mechanism which enables services to be made available to supplement the range of services that are commercially available."¹⁷⁶

Since the TRS TRO Deed was signed in 2004, addendums have been added to update the program. These include:

- Addendum One (May 2005): "incorporated the New Zealand Internet Relay Service as a permanent part of the TRS and formally recognized the role of the TRS in the delivery of emergency text calls."

¹⁷⁴ New Zealand Ministry of Economic Development; Telecommunications Service Obligations

¹⁷⁵ New Zealand Ministry of Economic Development; Telecommunications Service Obligations

¹⁷⁶ Ministry of Economic Development

- Addendum Two (September 2006): “added ‘Speech to Speech’ as a permanent core relay service and required the TRS provider to have chargeable minutes for relay calls independently audited.”
- Addendum Three (October 2007): “extended the duration of the TRS Deed for an additional term of two years and adjusted the per minute charge rates for relay calls made during the additional term.”
- Addendum Four (February 2009): “set out an agreement under which Sprint will conduct a five-month VRS trial for Deaf persons who wish to communicate over the Internet.”¹⁷⁷

2.3. Regulatory Funding of MRS/VRS

The current MRS in New Zealand is provided by Sprint through the New Zealand Relay brand, and the government retains the intellectual property rights. Counties Power, an electrical power company, has been subcontracted by Sprint to provide the relay services from its relay call center in Pukekohe.¹⁷⁸

MRS is available at no charge to users nationwide when calling to landline phones within New Zealand. International calls and calls to cell phones are charged using a pre-pay system, which avoids billing and collection costs. Payments for textphone equipment rentals are made by direct debit for the same reason, and users may be eligible for a fully subsidized textphone if their income is below a certain level.¹⁷⁹

User charges were temporarily suspended due to the Christchurch earthquake. According to the NZ Relay website: “We have temporarily removed chargeable call and registration requirements to offer you immediate access so that you can make calls to check on the wellbeing of family and friends. RAs will complete calls without requesting registration and/or pre-paid card information from callers.”¹⁸⁰

According to the New Zealand Ministry of Economic Development: “the rationale for direct government funding is that disability services are part of wider social services provided by taxpayers for social justice reasons.” However, due to a limited funding budget, these services are also paid for by other contributions. Relay services are funded by a combination of contributions from the government, user charges, and the levy of the telecommunications industry. Industry funding for relay services comes from a Universal Service Obligation levy. According to the Ministry: “The clear advantage of relay services funded via this mechanism is that many countries, including New Zealand in the form of the TSO, already have such a mechanism in place to fund basic telecommunications services that governments see as socially important.” The Ministry states that some degree of user funding is likely to

¹⁷⁷ New Zealand Telecommunications Relay Service: Regulatory

¹⁷⁸ www.countiespower.com

¹⁷⁹ Ministry of Economic Development; Funding the TRS and associated services, 11/09 update

¹⁸⁰ www.nzrelay.co.nz

continue to be a part of the funding for MRS/VRS in New Zealand in order to offset the high cost of new technology, the difference in the benefits to users, and the variable nature of individual call costs.¹⁸¹

The government contributes approximately \$1.5 million annually to fund MRS, including:

- Contract administration – \$50,000
- The textphone pool – \$600,000 (for equipment and related services)
- Grants for sign language scholarships – \$100,000¹⁸²

The MRS costs covered by the yearly TSO charge levied on liable telecommunications service providers are paid to the TSO MRS provider (currently Sprint). Yearly payments to the MRS provider are as follows:

15 Nov 2004 to 30 June 2005	=	\$1,825,117
1 July 2005 to 30 June 2006	=	\$2,735,745
1 July 2006 to 30 June 2007	=	\$2,516,323
1 July 2007 to 30 June 2008	=	\$2,057,086
1 July 2008 to 30 June 2009	=	\$2,175,986
1 July 2009 to 30 June 2010	=	\$2,295,074 ¹⁸³

The formula used to determine the total TSO charge paid to the provider is calculated as the sum of an annual fixed charge and an annual variable charge.¹⁸⁴ The TRS TRO Deed also prescribes a schedule used by the Commission to calculate the annual variable rate charge based on actual call volumes.

VRS cost funding is similar to the funding for all other MRS costs. VRS is currently provided as a permanent service, but at the same limited level of access as when it was a limited trial. The costs of providing a permanent VRS service at a level appropriate to a universal service function would result in higher annual VRS costs and would require additional funding. However, the increased cost of permanent VRS should be partially offset by a decline in usage and costs of traditional MRS. Sprint's 2009 agreement to provide a 5 month service trial of the VRS service cost a little over \$600,000. The Ministry of Economic Development projected increases in TSO charges for MRS services to \$5 million per year if VRS were provided at a universal service level.¹⁸⁵

¹⁸¹ Ministry of Economic Development; Funding the TRS and associated services, 11/09 update

¹⁸² *ibid*

¹⁸³ New Zealand Commerce Commission; Final Cost Calculation Determination for TSO Instrument for Telecommunications Relay Services

¹⁸⁴ Schedule 2 of the Deed

¹⁸⁵ Ministry of Economic Development; Funding the TRS and associated services, 11/09 update

The original launch of the trial began on 2 June 2009 and ran for five months ending on 2 November 2009. The trial was considered a reasonable success and the Government extended trial funding for an additional year, to November 2010. On 9 August 2010, the Cabinet decreed that VRS would become a permanent service offered by the MRS TSO. Since funding for VRS under the TSO decree has not yet been established, a levy has not yet been imposed on telecommunications carriers (the traditional MRS funding method), the Government is supplying the entire annual contribution for VRS; however, funding of VRS is limited to the surplus in current funding for all MRS.¹⁸⁶

3. Relay Services in New Zealand

3.1. Types of User Services Provided

The NRS provides a relay service for TTY and IP Relay users 24 hours a day, 365 days a year:

- Users can make as many calls as they wish
- There is no limit on the length of calls
- There is no limit on the number of follow-on calls

Only VRS and Speech to Speech are *not* offered 24 hours a day.

- Speech to Speech hours:
 - Weekdays: 7:30 AM – 9:00 PM
 - Saturday: 9:00 AM – 5:00 PM
 - Sunday: No service
- VRS hours:
 - Monday through Friday: 9:00 AM – 5:00 PM
 - No service weekends or national public holidays¹⁸⁷

Although VRS became a permanent MRS service offering in November 2010, the hours are still restricted to weekday use only.

New Zealand Relay provides the following services:

- Text to Speech

¹⁸⁶ New Zealand Relay; www.reachnzrelay.co.nz

¹⁸⁷ www.nzrelay.co.nz

- Speech to Text
- HCO
- VCO
- VCO to VCO
- VCO to TTY
- Speech to Speech
- IP Relay (currently used by half of New Zealand MRS users)
- VRS
- VRS Sign Carry Over (enables a VRS user to participate in three-party conference calling via a conference bridge)

The New Zealand Telecommunications Relay Service (TRS) conducted a stakeholder review in 2006 of approximately 1,000 Deaf users. The review showed that the relay service in New Zealand compared well to equivalent services in other countries for service adequacy and quality; the relay service had an 85% satisfaction rating.¹⁸⁸ In addition to showing strong support for the continuation of traditional MRS services, the review recommended that VRS development should be made a priority.¹⁸⁹

3.2. Current VRS Communication Technologies

Users have various options for connecting to VRS:

- Access VRS via computer
 - Requirements:
 - Computer software application from New Zealand Relay
 - 1GB RAM – Minimum memory requirement
 - 64 MB video RAM – Minimum memory requirement
 - 2.4 GHz P4 – Minimum processing speed
 - Webcam with 800 X 600 display resolution
 - DSL, Fiber-optics, or wireless Internet
- Access via video phone

¹⁸⁸ Ministry of Economic Development; Telecommunications Relay Service Stakeholder Review

¹⁸⁹ *ibid*

- D-Link DVC-1000
- Polycomm
- Grandstream
- Other brands are listed at the website¹⁹⁰

The call center platform within the Counties Power facility is a proprietary, custom software platform that uses commercially-available HP Proliant servers for the communications gatekeeper and reporting functions. The user software (supplied by New Zealand Relay) allows two-way calling between users that are both on-line and registered in the closed user group.¹⁹¹

The user community primarily employs videophones or computers to access the service. The option of cell phone access increases mobility, but only recently became available. A Canadian company, CounterPath, offers software (X-Lite) for softphone applications. This software enables users to make point to point calls, but the interoperability of different equipment is still an issue that requires “goodwill and intent of the involved partners.” When asked if they would have wanted anything done differently, a New Zealand consumer group had some negative comments about the NZ Relay software application, stating that it was not “user friendly” and that they would have preferred to “use computer programmes that are readily available and readily accessible. In particular, look at what programmes Deaf people are already using, i.e. Skype.”¹⁹² Note however that New Zealand Relay VRS is now able to provide access to users via a Skype application.¹⁹³

Although calls *to* cellular users via VRS are available for an additional fee using a calling card, there was no VRS availability *from* a cellular phone. NZ Relay has announced that they are in the process of building a platform that will support most H.323 and SIP standards. Demand for such a service is likely to be high, since, as of 2008, the usage of cellular telephones had already reached a saturation point of 106 percent.¹⁹⁴ Counties Power has recently stated that calls are currently available *from* cellular telephones. The ability to offer this service has been expected from all providers bidding on the TSO MRS contract for continuation of VRS services.

3.3. Broadband and Connectivity Infrastructure

According to the Organization for Economic Development and Cooperation (OECD), New Zealand has been steadily increasing its number of broadband subscribers. In the OECD 2008 Annual Report:

¹⁹⁰ www.nzrelay.co.nz; NZ VRS Trial Participants Application Form

¹⁹¹ New Zealand Ministry of Economic Development; Telecommunications Service Obligations; Addendum Four of the TSO Deed For Telecommunications Relay Services, Technology, page 862554 - 9

¹⁹² Mission Consulting New Zealand VRS Consumer Group Questionnaire March 2011 from Deaf Aotearoa.

¹⁹³ Updated information as of 11/15/2011.

¹⁹⁴ Telecommunications Act 2001: Schedule 3 Investigation Into Regulation of Mobile termination, page 14

- New Zealand ranked 19th out of 30 with 20.4% broadband penetration
 - Canada ranked 10th with 27.9% broadband penetration
 - The U.S. ranked 15th with 25% penetration.¹⁹⁵
- In 2009 New Zealand ranked 18th with 23.2% penetration
- In 2010 New Zealand ranked 17th with 24.5% penetration¹⁹⁶

OECD also measures and ranks countries based on restrictions placed on consumer data plans. New Zealand was rated poorly, since: “All New Zealand ISP's put limits on the amount of data that can be downloaded on a monthly plan, with punitive charges or a slow-down to dial-up speed applying to those who bust their cap.” According to the OECD, the three other member countries that have data caps or limits are: Australia, Belgium, and Canada.¹⁹⁷

New Zealand's data market is dominated by DSL service. The New Zealand government has acknowledged that it would like to make fibre-optic available to households, provide higher usage with faster download speeds, and have fewer data caps and limits on plans. In 2009, the Government issued a directive to provide fibre broadband to 75% of inhabitants in 10 years' time. Agreements were made with Ultra-fast Broadband Limited, Northpower Limited, Telecom New Zealand, and Enable Networks for the government's Ultra-Fast Broadband (UFB) Initiative with the goal of speeds of 100 Mbps. The UFB is complemented by the Rural Broadband Initiative (RBI), which is deploying faster Broadband to rural areas.

A total of almost \$250 million investment capital is being dedicated to ultrafast broadband infrastructure in FY 2010/2011. Last year's budget also included an extra \$48 Million for "Broadband Investment-Rural Supply." The government is also anticipating reduced end-user costs as a result of the broadband initiatives and predicts that: “Wholesale household prices will start at \$40 or less per month for an entry level product and \$60 per month for the 100 Megabit product.”¹⁹⁸

4. VRS Usage Volumes

The New Zealand TRS (Telecommunications Relay Service) conducted a review in 2006 that included a survey of usage trends. In this report, Deaf representatives of the New Zealand Advisory Group

¹⁹⁵ www.nbr.co.nz; OECD data published in the New Zealand National Business Review; “NZ leaps up the OECD table”; 10/30/2008

¹⁹⁶ www.computerworld.co.nz/news; OECD data published in Computerworld New Zealand; NZ beats Australia in OECD broadband rankings; May 28, 2011

¹⁹⁷ www.nbr.co.nz; OECD data published in the New Zealand National Business Review; “NZ leaps up the OECD table”; 10/30/2008

¹⁹⁸ www.beehive.govt.nz; The official website of the New Zealand Government; Steven Joyce; “Ultra Fast Broadband deal puts NZ ahead of the pack; May 24th 2011

indicated that only 10% of Deaf people use traditional MRS because many Deaf people are too uncomfortable with their English literacy to use text-based relay services. This was further confirmed by 2008 data indicating that only 1,000 Deaf individuals actively use the relay services; approximately 50% use a TTY and 50% use IP Relay.¹⁹⁹ VRS usage is expected to be adopted at a significantly higher rate since it is based on Sign Language and not written English.

The VRS trial was open to all Deaf individuals. There were approximately 60 users in the first month and 100 in the second month.²⁰⁰ New Zealand Relay indicated that this was a low number compared to the number of potential users, and NZ Relay proposed various explanations for the low number:

- Relatively high degree of computer literacy is required for VRS
- Lack of knowledge about the trial among potential users
- Computer-literate users probably already use services such as: e-mail, Skype, and texting
- Not all potential users own computers and cameras
 - Those without the equipment needed might not want to purchase it for a temporary, trial program that may never be made permanent
- Potential users may not be aware of or willing to use VRS at a Deaf Association Center or local library

Due to the fact that the current MRS/VRS contract is currently undergoing the final stages of a new bidding and procurement cycle, NZ Relay was prohibited from sharing more recent details and updates regarding usage volumes and trends. The VRS volumes that were made public in the December 2009 edition of New Zealand Relay's E-newsletter cannot have exceeded the current call center capacity. NZ Relay has two active VRS stations that operate 4 hours daily; the actual VRS traffic volume at that time was averaging approximately 150 calls/month and 3,500 minutes of use.

NZ Relay was able to share some key points from the VRS trial that have an ongoing implication for the permanent service:

"There is a real demand for the Video Relay Service; some users have told us it is life changing."

"Many members of the Deaf community cannot readily afford the quality of Broadband connection required for the Video Relay Service; of course New Zealand government's fiber optic rollout plans may assist here."

¹⁹⁹ New Zealand Relay; number was derived from known rentals of textphones and the proportion of textphone to Internet relay minutes of use.

²⁰⁰ New Zealand Relay; refers to numbers of registered VRS users and does not take into account multiple-user households.

“The present very small call center doesn’t allow for smoothing of call patterns, meaning waiting times are unduly long.”

“The present restricted hours (3 mornings and 2 afternoons a week) can be frustrating for users.”²⁰¹

The current TSO TRS renewal contract has been delayed due to the Christchurch earthquake in February. Tenders have been delayed and information regarding the award had not yet been announced at the time this research summary was delivered.

The existing VRS Provider, Counties Power, is continuing to provide services under an additional extension of Addendum 4 of the TSO TRS until 30 June 2011. On this date, the new service contract is presently scheduled to take effect. The new contract will increase the hours of availability for VRS to "up to 40 hours a week." Some budgets will be rewritten as a result of the earthquake, and this may constrain the availability of the funds for VRS, regardless of demand. However, the current TSO verbiage requests that, “Proponents shall offer variable charges that are based on the number of Vis on duty up to the point that busy hour traffic can be determined and Vis rostered accordingly to provide the most cost effective service. This model may be used to the point that 5 Vis and 1 Supervisor are required.”²⁰²

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

VRS in New Zealand is affected by a shortage of NZSL interpreters able work as a video relay operators or video interpreters (VI). For the VRS trial, the Ministry of Economic Development only required limited staffing levels that were not adjusted during the 18 months of the trial. This service has now been made permanent, but no adjustments were made to the staffing levels: “Two workstations will be permanently manned during the hours of availability (4 hours daily during weekdays only). One lead VI (Video Interpreter) will be available for support. The TRS Provider will recruit VIs using a contestable process that must first be agreed with the Crown.”²⁰³

²⁰¹ New Zealand VRS subcontractor and provider of relay services for Sprint in New Zealand; Counties Power 2011

²⁰² Ministry of Economic Development; Request for Proposal for Telecommunications Relay Services, 1054314 W01/5022 12 RevG Section 9.2 “Video Relay Service (Committed Service), 9.2.2. Annual Variable Charge, p. 47

²⁰³ New Zealand Ministry of Economic Development; Telecommunications Service Obligations; Addendum Four of the TSO Deed For Telecommunications Relay Services, Staffing, page 862554 - 9

The limitation of available VRS staffing is confirmed by the MRS provider's staffing data for all of MRS. For 24 hour service, the total MRS staff (including VRS) for all of New Zealand is 24 relay assistants.²⁰⁴ Furthermore, the national interpreter association for New Zealand lists only 90 interpreters available for NZSL. This shortage is a challenge to the long term provision of VRS in New Zealand.²⁰⁵

As a partial solution to this issue, the Ministry of Economic Development has added scholarships to the TSO spending budgets to fund interpreter training. The scholarships are specific to NZSL interpreter education and are intended to attract candidates to the Relay Interpreting industry. This budget allocation is intended to increase the number of qualified VRS interpreters while preventing any corresponding decrease in the number of NZSL interpreters available for community interpreting services.

According to the Ministry of Economic Development (MED): "The government approved the establishment of twenty scholarships per year (of \$5,000 each and a pool of \$100,000) to grow the pool of interpreters. Scholarships are awarded to qualifying students studying towards the Diploma in Sign Language Interpreting at the Auckland University of Technology (AUT). A funding agreement is in place between the M.E.D. and the AUT with scholarships available from the 2008 academic year through 2012. The scholarships are funded out of a surplus in the textphone monetary budget."²⁰⁶

The Auckland University of Technology gives some additional details and updates in its current Spring 2011 Semester Catalogue:

- The actual amount awarded is \$5,625 (including GST)
 - \$3,750 of this will be paid when the scholarship is awarded
 - The remainder will be paid upon successful completion of the Diploma in Sign Language Interpreting
- The scholarship can only be awarded once to any individual
- The Diploma requires two years of study
- Applicants must demonstrate an appropriate level of NZSL competency
- Recipients must indicate willingness to make reasonable efforts to be employed at the VRS Center for a reasonable period of time following graduation from the SLI Diploma or the BA Major program

²⁰⁴ Counties Power Interview with Mission Consulting March, 2011

²⁰⁵ www.SLIANZ.org.nz

²⁰⁶ Ministry of Economic Development; Funding the TRS and associated services, 11/09 update

- Recipients will agree to allow AUT to deliver progress reports to the Ministry Of Economic Development²⁰⁷

Even with this grant, staffing for efficient VRS service remains inadequate. The user community often cited the limited service availability schedule, caused by a lack of interpreters, as the biggest problem with VRS in New Zealand. Questionnaire responses from Deaf Aotearoa executives included: “The interpreters are good, but it is difficult to access the service due to the limited hours.... Having good skilled interpreters is really important and works well. The limited time slots are restrictive.” Although consumer representatives understand the restriction, they are not willing to give up quality. “Both are critical, however quality has the edge over availability as the interpreter needs to be able to work with a wide range of community members from all over New Zealand.”²⁰⁸

6.1. Trilingual Interpreters

The native Maori population creates an additional consideration when it comes to staffing current and future Relay Services. The large number of Te Reo speakers suggests that the need for trilingual interpreters might be significant. However, most Te Reo speakers in New Zealand can also speak English.

Tania Simon, a movie director in New Zealand, created a documentary about the experiences of the Maori Deaf, *He Maori He Turi: Maori and Deaf – A Journey of Rediscovery*. She describes herself as one of only two trilingual sign language interpreters in New Zealand.²⁰⁹ This statistic was verified in a March 2011 interview with the current VRS provider, Counties Power.

Due to the insufficient number of trilingual interpreters and the fact that most Maori can also speak English, there was no VRS for the Maori Deaf under the current MRS TSO. The 2006 TRS Stakeholder Review concluded that, “Consequently the demand for a relay service in Maori language is expected to be low. Overall, relay in Maori and other languages does not appear to be justified at this time compared with other potential service enhancements. However, further work is required to assess the desirability for introducing such a service in the future.”²¹⁰

7. Access to Emergency Services

New Zealand Relay has limitations on the ability to connect and communicate with local emergency services. MRS has only been available in New Zealand since 2004, and the Deaf rely on FAX and TTY

²⁰⁷ Auckland University of Technology; Applied Humanities; Undergraduate Catalog March 2011; NZSL Scholarship

²⁰⁸ Mission Consulting New Zealand VRS Consumer Group Questionnaire March 2011 received from Deaf Aotearoa.

²⁰⁹ www.throng.co.nz; TVdocumentary; Maori television June 17, 2009

²¹⁰ Ministry of Economic Development 2006 Telecommunications Relay Service Stakeholder Review, Section 3 Relay in Maori Language

Deaf Emergency numbers for emergency access. Although there are Important Alert messages on the main New Zealand Relay websites regarding Emergency Services limitations and instructions, they are difficult to find via the VRS portal. The limitations and instructions are the same for VRS and MRS.

In November 2010, the New Zealand Police, in cooperation with Deaf Aotearoa, the New Zealand Fire Service, St. John, and Wellington Free Ambulance announced a new emergency 1-1-1 text service for the Deaf and hard of hearing in New Zealand. Registration through Deaf Aotearoa is required to use the service. The new service should make it easier for the Deaf to contact emergency police, fire, and medical services. The aim is for a 2-minute response time to texts.²¹¹

8. VRS Education and Outreach Programs

As part of the MRS TSO contract, Sprint agreed to implement the TRS Account Management style of outreach that it has used in the United States. As part of this approach, Sprint hired a member of the local New Zealand Deaf or hard of hearing community to provide outreach and education. This New Zealand Account Manager will locate and hire New Zealanders from each of New Zealand's regions to work directly with people from each local community.

The TSO contract also requires Sprint to provide an annual budget for new service education. Under the terms of the contract, the MRS Provider will arrange for its outreach team to host community meetings across New Zealand in order to educate users and potential users about the trial and will transition to one-on-one support as required to help with video equipment, service issues, and questions. The contract also declares that the MRS Provider's outreach team will also educate users and potential users on:

- "What to expect when using VRS"
- "How to access the service"
- "Technical instructions"
- "Appropriate etiquette for VRS"²¹²

The MRS Provider is also required to host events and create and distribute materials for VRS Trial users. These materials will include:

- "Introduction to VRS"
- "Etiquette"

²¹¹ Ministry of Economic Development; Deaf Community Gets 111 Text Service; www.med.govt.nz

And Deaf Aotearoa; 111 TXT Service Pre-Registration; www.deaf.org.nz

²¹² New Zealand Ministry of Economic Development; Telecommunications Service Obligations; Addendum Four of the TSO Deed For Telecommunications Relay Services, Outreach and Education, page 862554 - 10

- “How to use VRS”
- “Products required”
- “VRS technical support”²¹³

Currently, New Zealand Relay promotes awareness through various outreach activities. Many of these activities are run by New Zealand Relay Service itself. These promotions include:

- Updates on the NZ Relay website pages: www.nzrelay.co.nz
- A VRS E-Newsletter
- News and information published through other associations
 - Such as the December 2010 announcement on the Auckland Deaf Society webpage that: "NZ Relay’s VRS is Now Permanent"²¹⁴
- VRS Demo Days
 - These were hosted last year in various cities throughout New Zealand (See Appendix B)

There is a close and symbiotic relationship between New Zealand VRS and Deaf Aotearoa. Deaf Aotearoa is a Deaf-led, non-profit organization that promotes awareness of, access to, and advancement of NZSL. Deaf Aotearoa Chief Executive Rachel Noble spoke positively of the benefits of VRS for breaking down communication barriers for Deaf New Zealanders. She promotes technological advancement as part of her work and is grateful that the government made this service possible.²¹⁵ “Deaf Aotearoa also works with government agencies and other organizations to provide information and resources on life for Deaf New Zealanders, the Deaf community and NZSL.”²¹⁶ One of Deaf Aotearoa's events is the organization and production of New Zealand’s annual Sign Language Week. This year’s event was held in May 2011 and included promotion of VRS.

The questionnaire response from Deaf Aotearoa indicates a strong desire to improve upon current outreach and educational activities. It stated that, “It is important to have an effective programme in place to model the use of VRS to prospective users, as many are shy and lack confidence around the use of technology. In addition, there have been challenges when people want ‘proof’ that the caller is present (banks, government departments), not wanting to accept the call through an interpreter.”²¹⁷

²¹³ Ibid, page 862554-11

²¹⁴ www.auckland-deaf.org.nz

²¹⁵ Deaf Aotearoa, Rachel Noble, 2011

²¹⁶ www.deaf.org.nz

²¹⁷ Mission Consulting New Zealand VRS Consumer Group Questionnaire March 2011 received from Deaf Aotearoa.

SWEDEN VRS

SUMMARY

1. Overview

Total Population:	9,415,570
Deaf Population:	13,000
Hard of Hearing Population:	530,000
Use Sign as Primary Language:	30,000
No. of Qualified Interpreters:	450
Official Languages:	Swedish
Name of Sign Language:	SSL (Svenskt Teckenspråk)
VRS Service Schedule:	1997
VRS Vendor:	Bildtelefoni
MRS/VRS Funding Model:	MRS and VRS are fully funded by the federal government through general taxation revenue

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – Sweden*, provides a synopsis of the VRS environment in Sweden.

Key Points:

- ❑ Sweden established the world's first publicly regulated VRS
- ❑ Sweden has a high demand for VRS and interpreter services
- ❑ Sweden has a high ratio of sign language users to general population
- ❑ Although Sweden has a relatively high ratio of interpreters to the number of sign language users, it still has constraints on service availability due to a limited interpreter pool
- ❑ Sweden has been at the forefront of VRS development and deployment in terms of technology and deployment history
- ❑ Regulatory obligations to provide MRS services are based on "a right to services", rather than on avoiding discrimination as in some countries.
- ❑ MRS and VRS services are currently fully funded by the government from general tax revenue.

- In Sweden, the County Councils, labour authorities, and social insurance system procure video telephones and provide them free of charge for people who need them.
- The National Post and Telecom Agency allocates funds for services based on tiered annual usage:
 - A basic allocation of €934,566 EUR for the first 60,000 relayed calls.²¹⁸
 - €11.84 – 13.97 per call for 60,001 – 100,000 relayed calls
 - €10.49 per call over 100,000 calls
- In 2007, annual traffic volume was approximately 100,000 calls
- Preliminary figures for 2011 indicate 100,000 calls placed between January and June
- VRS is available weekdays, 7:00 AM –10:00 PM and weekends and holidays, 9:00 AM –5:00 PM
- Education and outreach programs are in place
 - These programs are insufficient to satisfy demand
- The Sweden interpreter training program currently takes approximately four years to complete
- Sign language is taught in some Universities, including Malmö and Stockholm
- Sign language is also taught at adult education centers (also known as Folk schools) around the country

²¹⁸ One Euro equals approximately 1.4 Canadian dollars.

SWEDEN VRS

RESEARCH

1. Demographics

- Total population: approximately 9,415,570²¹⁹
- 13,000 Deaf
- 530,000 hard of hearing people²²⁰
- Nearly 30,000 people use Swedish Sign Language (SSL—*Svenskt Teckenspråk*) as their primary language for communication²²¹
- There is a high ratio (0.32%) of sign language users compared to the general population
 - A five-fold increase over estimates for the U.S. ratio of 0.06%

2. Legal Background

2.1. Rights of People with Disabilities

The Act concerning Support and Service for Persons with Certain Functional Impairments (LSS), was introduced by the *Riksdag* (Swedish Parliament) in the 1990s. An important feature of this wide-ranging reform program was that it gave people with disabilities the right to personal assistance free of charge. The amount of assistance received depends on the extent of the disability.²²²

One of the goals of Swedish disability policy has been to ensure that people with disabilities have power and influence over their everyday lives. In pursuit of this goal, the focus has shifted from social issues and welfare matters to democracy and human rights.

Unlike in the US, where sign language interpreter services are an obligation stemming from a ban against discrimination, in Sweden each Deaf person has an individual right to sign language interpreter

²¹⁹ Statistics Sweden; www.scb.se

²²⁰ Swedish National Association for the Deaf (Sveriges Dövas Riksförbund)

²²¹ European Union of the Deaf 2011

²²² www.sweden.se

services. The right to request interpreter services, and the obligation to provide such services is included in several regulations:

“Deaf, deaf-blind and hearing impaired people are entitled to request an interpreter from the regional authorities for ‘everyday’ tasks (private situations that do not involve any public authorities, for example family events or encounters with private businesses), pursuant to the Health and Medical Service Act. However, public entities are obliged to provide interpreters when they encounter Deaf, deaf-blind or hearing impaired clients or customers. However, it is not always clear which authority is responsible to pay for the interpreters, and the government has requested a clarification of the sign language interpreting services.”²²³

2.2. Regulatory Framework to Provide Relay Service (including VRS)

The National Post and Telecom Agency (*Post – och Telestyrelsen* or PTS) is the authority that monitors and administers the electronic communications and postal sectors in Sweden. In accordance with governmental regulations, it is the responsibility of PTS to ensure, through procurement, that the special needs of people with disabilities are satisfied. The Government grants an annual allowance for this purpose to PTS. The Swedish model continues to be to procure services with funding from general taxation revenue rather than to put obligations on the telecommunications service providers.

According to the 2003 Electronic Communications Act:

“The National Post and Telecom Agency should have official responsibility under the Electronic Communications Act and be the sectoral authority for the electronic communications area. The National Post and telecom Agency should therefore be responsible for defining the relevant markets, analyzing the competition on these markets, identifying players with SMP (Significant Market Power) on a market and deciding on specific obligations for such players. The National Post and Telecom Agency shall cooperate with and ask the Swedish Competition Authority for its comments regarding competition-related issues. The Swedish Consumer Agency should be responsible for consumer issues within the field of electronic communications, to the extent that such issues are not regulated in the Electronic Communications Act.”²²⁴

These regulations encourage access to new and efficient communications services for all, and through the administration of the Electronics Communications Acts, the Swedish National Post and Telecom Agency made relay service for video telephony available in Sweden in 1997, years before any other European country. Sweden established its video interpreting service a few months before a similar

²²³ Swedish Institute of Assistive Technology; “Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing”, p. 16

²²⁴ Swedish Ministry of Industry, Employment and Communications; Electronic Communications Act of 2003 pp. 23-24

service was established in Texas, USA; Sweden had the world's first publicly regulated VI service.²²⁵ During the first years of the program, the service was only offered to sign language users via the ISDN Network. Since the ISDN Network was not widespread, the number of users was limited.

There are regional differences in the provision of services. In some regions, there is only one interpreter service agency, while in others there may be many providers allowing for competition. As in other countries, there is a shortage of sign language interpreters. Regardless of regional differences and regulatory rights, users frequently find that there are no sign language interpreters available.

The *Post-och telestyrelsen* (National Post and Telecom Agency) allocates contributions as follows:²²⁶

- Basic contribution of SEK 8,650,200 (€934,566) every year for the first 60,000 relayed calls
- If the number of calls exceeds 60,000 a tier system applies
 - SEK 109.65 – 129.38 (€11.84 – 13.97) / call for 60,001 – 100,000 relayed calls
 - SEK 97.10 (€10.49) / call if more than 100,000 calls are relayed annually

3. Relay Services in Sweden

3.1. Types of User Services Provided

There are three relay services available in Sweden: text, sign and speech-to-speech.

- The text relay service provides traditional text relay (V.21 with VCO and HCO), web based text relay, fax relay, and a limited SMS relay. A number of operators offer V.21 gateways, which allow IP based and mobile packet based terminals to connect to text telephones and to the text relay service.²²⁷
- A sign relay service for video telephony (VRS) is provided by Bildtelesoni under contract to the Örebro County Council. The service provides video relay for SIP videophones, web clients, H.323 videophones, ISDN/H.320, and 3G video calls. A message based text communication is available during the relay calls.

²²⁵ Swedish Institute of Assistive Technology; "Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing", p. 9

²²⁶ Swedish Institute of Assistive Technology ; "Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing", p. 35

²²⁷ ETSI TR 102974 V1.1.1.1 Sec. 5.29

- A speech-to-speech relay service, Teletal, is provided by Verbaldigitalius. The service provides speech-to-speech relay for people with speech impairments and general support during the conversation for people with cognitive impairments. Summaries of conversations are available for people that cannot take notes because of their disabilities.²²⁸

3.2. End User equipment

In Sweden, the County Councils, labour authorities, and social insurance system procure video telephones and provide them free of charge for people that need them. The Government requires that relay services be interoperable with all of the products and services offered by these authorities; and relay services may also be interoperable with other types of terminals.²²⁹

Deaf users contact County Councils' centers for assistive technology or local employment offices to receive equipment based on location of use (employment/work related or at home/private). When the most suitable model or videophone solution is assigned, users are also entitled to installation and support from these agencies. In 2010, about 5,000 videophones were distributed to end-users.²³⁰

All videophones recommended by the Swedish Institute of Assistive Technology follow the 'Total Conversation' standard, which allows use of video, speech, and text at the same time. "This principle entails that it is the user of the videophone that decides which modality of communication method(s) to use, and should not be dictated by limitations in the videophone. The videophones eligible for provision through the public authorities must be compatible with other models, to secure interoperability of the different models and brands that are distributed in Sweden. Most of the applicants are granted a locked computer with videophone software (MMX or Allan eC), dedicated videophones like VT8882 or TM-9000 models from Visiontech, or the eCPad from Omnitor."²³¹

²²⁸ ETSI TR 102974 V1.1.1 Sec. 5.29

²²⁹ ETSI TR 102 974 V1.1.1 (2009) p. 17

²³⁰ Mission Consulting meeting with nWISE executives, November 2011

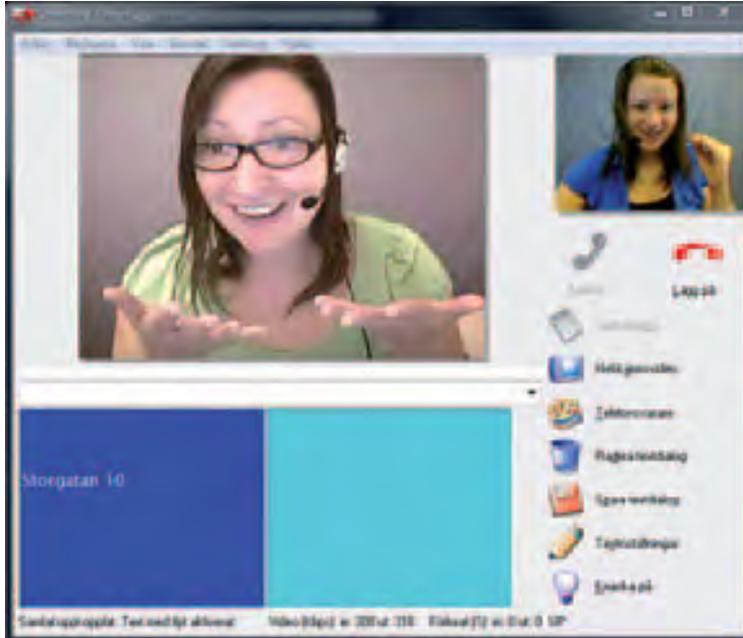
²³¹ Swedish Institute of Assistive Technology; "Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing", p. 37.

Figure 19: Computer screen displaying MyMMX software



nWise develops and provides a VI platform (MMX) for service providers that is used in several countries (the platform can support text, video, and voice). nWise also develops videophone software for end users (MyMMX).²³²

Figure 20: Computer screen displaying AllaneC videophone software developed by Omnitor AB



²³² www.nwise.se

Omnitor AB also produces and distributes the AllaneCpad videophone and is involved in international standardization work through the International Telecommunication Union (ITU), the European Technology Standardization Institute (ETSI), and EU projects.²³³

Figure 21: VT-8882 Videophone²³⁴



Figure 22: TM-9000 Videophone



²³³ www.omnitor.se

²³⁴ www.tm9000.se

Both the VT-8882 and the TM-9000 videophones are developed and distributed by Visiontech. The development of dedicated videophones is Visiontech's primary focus.

3.3. Current VRS Communication Technologies

VRS has been available in Sweden as a national service since 1997, when it was offered to sign language users via ISDN. In 2004, an Internet portal to the service was introduced. This allowed users to access the service from any computer with Internet access. Originally, incoming calls to the service were handled in different studios within the interpreter center depending on the videophone used to place the call. If a user called from an ISDN video telephone the interpreter would go to the ISDN studio, and if a user called from an IP based video telephone the interpreter would go to the IP studio. This was not an ideal situation and was not scalable.

In February 2006, a new IP platform was deployed, which allowed all video calls to be handled on the same platform and with the same quality measures. Another goal was to make the service accessible through a web client. A user with a computer, webcam, and broadband connection could download software for video telephony. This made users less dependent on any specific videophone.

In 2004, the National Post and Telecom Agency initiated the “pocket interpreter” project for the Deaf. This trial tested distance interpreting and relay of mobile video calls. According to the Swedish National Association of the Deaf (*Sveriges Dövas Riksförbund*) an estimated 4,000 to 6,000 Deaf people use a 3G cell phone, representing approximately half of people born Deaf in Sweden.²³⁵ The conclusion of this trial project was that there was great demand for the service and that there were many potential users that could benefit from the service.

In order to meet this demand, the National Post and Telecom Agency started development in 2005 to merge the 3G mobile video calls onto the new IP platform so that mobile video calls could be treated in the same manner as any other call.

Users can now call the VRS using their 3G cell phones, IP based video phones, web clients, or older ISDN video phones. The service and the users are now less dependent on specific video phones; and the service can continue to become more flexible and efficient in connections to interpreters and end users.

3.4. Broadband and Connectivity Infrastructure

A 2009 survey conducted by the Post and Telecom Agency indicated that nationwide broadband coverage is "excellent." However, the actual speed experienced by end users was inconsistent in different parts of the country and the infrastructure was unable to keep pace with the forecasted increase in demand. Speed and capacity issues were most noticeable for commercial and residential users in the rural areas of Sweden.

²³⁵ Swedish National Association for the Deaf (Sveriges Dövas Riksförbund)

Following the 2009 survey, the "Broadband Strategy for Sweden" was published. The overall objective of this strategy is to have "world-class broadband." "By 2020, 90% of households and businesses are targeted to have access to broadband at a rate of at least 100 Mbps, and ample opportunities to use electronic public services and other services via broadband."²³⁶

Broadband indicators from the 2009 survey include:²³⁷

- Households with Internet access: 86%
- Households with broadband connection: 79%
- Individuals regularly using the Internet: 86%

Sweden has the highest ranking in the EU Broadband Performance Index. This index compares broadband development among EU nations by analyzing speed, price, coverage in remote and rural areas, innovations, and other socio-economic factors.²³⁸

Sweden continues to be one of the leading countries in broadband statistics. In 2010 the European Commission published *Europe's Digital Competitiveness Report*, which stated that Sweden had "almost full" DSL coverage. The report also stated that Sweden "is also a frontrunner in wireless internet technologies, with 14% penetration among individuals for 3G internet use on mobile phones and 29% for wireless internet on laptops outside the home or office."²³⁹ In 2009 there was a large scale rollout of mobile broadband services, which placed Sweden ahead of most European countries in terms of broadband and internet services.

The technological development and rapid growth of fixed and mobile broadband networks has created new possibilities for people with disabilities. The Post and Telecom Agency has recognized two significant trends:

1. More and more services are based on the IP protocol
2. There is increasing demand for mobile services

A recent survey showed that nearly everyone in Sweden has a mobile telephone; senior citizens are the only group where accessibility to mobile phones is less than 90%.²⁴⁰

²³⁶ Swedish Post and Telecom Agency (Post – och Telestyrelsen, PTS); Broadband Strategy for Sweden (Bredbandsstrategi för Sverige)

²³⁷ Swedish Post and Telecom Agency (Post – och Telestyrelsen, PTS); 2009 Survey

²³⁸ Commission of the European Communities; Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "Indexing Broadband Performance", page 9

²³⁹ European Commission; Europe's Digital Competitiveness Report; May 17, 2010 page 188

²⁴⁰ Bystedt, Patrik; Swedish Post and Telecom Agency (Post – och Telestyrelsen, PTS); New Remote Services p. 60

Since 2003, Sweden’s National Post and Telecom Agency has initiated two different development projects regarding VRS: the IP access project and the Pocket Interpreter.

- The IP access project will enable Automatic Call Distribution to interpreting resources in various call centers based on a new IP platform that handles calls from IP-based video phones.
- The Pocket Interpreter project will develop methodology and technology for distance interpreting and mediation of mobile video calls (3G) to the IP Platform.

4. VRS Usage Volumes

Under the current Act the Swedish National Post and Telecom Agency has procured three relay services:

- Text Relay Service
- Video Relay Service
- Multiple Media Relay Service (combinations of speech, text, and video)

Under the agreement with PTS, the Örebro County Council runs the national Video Interpreting Service at the Interpreter Centre. Bildtelefoni.net is a subsidiary of the Interpreter Centre, and has six interpreter studios located in Örebro.²⁴¹ Bildtelefoni.net also contracts with subvendors (local sign language interpreter provision agencies) that run five studios in other locations in Sweden. Users only need to call one number to access the service and are automatically distributed among the different studios to the first available interpreter. Interpreters shift between working for Bildtelefoni.net and working on community interpreting assignments.

Although network distributed ACD technology increases the efficiency of VI applications, there are still not enough interpreters to meet demands. “Lately, a number of regional interpreter agencies have considered establishing their own VI studios, mainly to increase the access to interpreter services in cases where VRI may be more efficient than community interpreters. It is not expected that any of these will provide VRS services, however, which still is only provided by Bildtelefoni.net.”²⁴²

VRS Timeline

- 1997
 - VRS trial schedule began
 - 3 VRS stations

²⁴¹ A studio is a VRS workstation or small group of VRS workstations.

²⁴² Swedish Institute of Assistive Technology ; “Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing”, p. 34.

- VRS offered weekdays, 8 AM – 8 PM
- ≈ 400 calls a month
- 2006
 - Bildtelefoni relayed a few hundred calls every month
- 2006 – 2008
 - The number of unique users grew from 1,318 to 3,046
- 2007
 - Annual traffic of approximately 100,000 calls (See Appendix A)²⁴³
- 2006–2010
 - Number of calls grew monthly
- May 2010
 - More than 12,000 VRS calls were relayed (Tolkcentralen 2010)
- 2011
 - Preliminary figures indicate 100,000 calls were placed between January and June²⁴⁴
 - Average usage is 43 minutes per month per user
 - Until 2010, growth of calls/minutes was 30% per month, in 2011 the increase was less than 10%

VRS traffic is expected to continue to grow since only 30% to 40% of potential users (sign language users) have videophones installed at home or in the workplace, and this figure is growing steadily.²⁴⁵ In addition, there are 3G and other equipment alternatives not necessarily provided by the government councils.

As of 6 September 2010 the operating hours of Bildtelefoni.net have been extended by two hours daily. The hours of operation are now:

- Weekdays: 7:00 AM – 10:00 PM
- Weekends and Holidays: 9:00 AM – 5:00 PM²⁴⁶

²⁴³ Johnny Kristensen, Örebro County Council, Swedish Video Relay Service p. 7.

²⁴⁴ Mission Consulting meeting with nWISE executives, November 2011

²⁴⁵ Swedish Institute of Assistive Technology ; “Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing”, p. 35

²⁴⁶ www.Bildtelefoni.net

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

The number of Swedish sign language interpreters is difficult to establish. Different organizations report very different estimates:

- 150 interpreters
 - The Swedish National Association of the Deaf (*Sveriges Dövas Riksförbund*) in a recent update for the European Union of the Deaf²⁴⁷
- 450 interpreters
 - The Swedish Sign Language Interpreters Association (STTF - *Sveriges Teckenspråkstolkars Förening*)
- 600 or more interpreters
 - European Forum of Sign Language Interpreters (EFSLI)
 - “We really don’t know. There is unfortunately no exact number, as Sweden is lacking a register of any kind stating this number.”²⁴⁸

The Swedish Sign Language Interpreters Association was founded in 1969 by Interpreters that attended the very first interpreter training program in Sweden. In order to broaden recruitment for interpreter training, the Swedish government then started actively promoting instruction of sign language for people who had not learned sign language as a child.²⁴⁹

Since 1986, the *Tolk-och Översättarinstitutet* (Institute for Interpretation and Translation Studies — TÖI) of Stockholm University has been responsible for formal interpreter training in Sweden. Although the Institute regularly organizes academic interpreter training, it is also responsible for distributing government grants and supervising and evaluating interpreter training on the national level. The Swedish interpreter training program currently takes approximately four years to complete. Two years of Sign Language courses are a pre-requisite to enrolling in interpreter training in Sweden.

²⁴⁷ www.eud.eu/Sweden-i-203; Swedish National Association of the Deaf (*Sveriges Dövas Riksförbund*); Country Report; Sweden; Last Updated: 15 March 2011

²⁴⁸ www.efsl.org/efsl/nasli/sweden; European Forum of Sign Language Interpreters; Member Forum; Sweden

²⁴⁹ STTF; Sveriges Teckenspråkstolkars Förening; Swedish Sign Language Interpreters Association; Tolktryckets historia

Sign Language is taught in some universities, including Malmö and Stockholm. It is also taught at seven adult education centers (also known as Folk schools) around the country.²⁵⁰

- Fellingsbro folkhögskola
- Härnösands folkhögskola
- Nordiska folkhögskola
- Strömbäcks folkhögskola
- Södertörns folkhögskola
- Västanviks folkhögskola
- Önnestads folkhögskola

According to Stockholm University, about 200 students study Sign Language every year and an average of 85 students graduate. About 20% of the graduates then enrol in the two-year interpreter training program. The interpreter training focuses on the skills needed to become a professional sign language interpreter and includes 8-16 weeks of practice as an interpreter at an interpreting service agency. This training also includes course studies in civics, social psychology, and Deaf culture.²⁵¹

Another important feature of Interpreter training in Sweden is the focus on the development of the trainers of sign language interpreters. “Training the trainers of Interpreters is necessary both in view of promoting professionalism in the field and for establishing Interpreting as an academic discipline.”²⁵²

According to the Stockholm University Institute for Interpretation, many of the Institute Interpreter trainers have substantial teaching experience and are often better prepared, both in linguistic matters and in methodology, than community interpreter trainers. The university recognizes that there is a shortage of these specialized trainers and estimates that there are only 20 qualified trainers in Sweden. As a result, it has launched a special course for Sign Language Interpreter Trainers.

In the Swedish interpreting environment a balance has been achieved on behalf of Sign Language Interpreters; interpreters can easily switch between community interpreting and working for VRS. The Swedish Institute of Assistive Technology reports that: “The Swedish Video Relay Service is organized to secure accessible telecommunication services, and have done so by extending the already well established public interpreter service.”

The County Council manages both VRS and community interpreter needs. “By organizing the Video Relay Service within an established sign language interpreter agency, there are few signs of ‘splitting’ the

²⁵⁰ TÖI, Tolk-och Översättarinstitutet (Institute for Interpretation and Translation Studies); Stockholm University; Interpreter Education; Sign Language and Deaf Blind Interpreter Studies

²⁵¹ Ibid

²⁵² Ibid

Interpreter resources, as is the case in the United States. Providers of Sign Language Interpreter services have larger possibilities to balance the demands for community interpreting and Video Relay Services, and locate resources where they are needed.”²⁵³

The national government has already requested that new legislation that will solidify these relationships between interpreter agencies and video relay services. The potential is to move away from procurement of technology towards a more permanent national infrastructure, both regarding interpreter agencies and technical infrastructure, more in line with the Finland model. Sweden may create a National Interpretation Agency and the Agency will own the infrastructure.

7. Access to Emergency Services

The ‘Total Conversation’ model provides consumers simultaneous voice, video, and text options and is the basis for the *Total Conversation and 112 for all* program.²⁵⁴ It has been the relay communications standard for EU countries and was established in Sweden in the late 1990s. The Swedish Deaf Association partnered with Omnitor and Kalejdo to develop the first Total Conversation compatible consumer devices and standards. This led the Swedish Post and Telecom Agency (PTS) to support the concept and use Total Conversation as a basis for the procurement of relay communication devices.

During 2006–2008, the PTS financed projects with Omnitor to introduce relay call routing based on destination number; this service was mandated by the FCC in the United States in 2009. In both countries, this system allows relay systems to give priority to emergency service calls.²⁵⁵

SOS Alarm (SOS) manages the 1-1-2 emergency number services in Sweden under a contract with the Swedish Ministry of Defence. SOS has shared ownership with 50% interest held by the Swedish Government and 50% by the County Councils. In Sweden, 1-1-2 can be called through any of the relay services. SOS Alarm can also receive emergency calls from:

- “PSTN Textphones;”
- “Fixed line phones where the phone is registered to a calling address;”
- “Mobile phones, available even if the pre-paid phone has run out of call minutes or if the handset is not provisioned with a SIM-card;”
- “SMS, an on-going project to allow Deaf, speech impaired and Hard of Hearing people to access emergency services by text message;”

²⁵³ Hilde Hualand; Hjälpmedelsinstitutet; (Swedish Institute of Assistive Technology) and Fafo Institute for Labour and Social Research; “Provision of Videophones and Video Interpreting for the Deaf and Hard of Hearing”; 2010

²⁵⁴ 1-1-2 is the Swedish equivalent to 9-1-1.

²⁵⁵ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support Programme (PSP); Current Status and Availability of Total Conversation Systems, Version 1.0

- “Satellite phones, which requires dialing a special number to access 112.”²⁵⁶

As one of the leaders in ‘Total Conversation’ and the 1-1-2 Project in the EU, Sweden is currently at the forefront of access to emergency services for the Deaf and hard of hearing.

8. VRS Education and Outreach Programs

Sweden has the oldest national VRS service. However there is little evidence of extensive education and outreach programs on the main internet portals that represent the regulatory agency, the consumer association, or the provider. If there is comprehensive outreach, it may be visible only at the local level. The consumer association indicates that this may need to be established.

The national Post and Telecom Agency provides some information about VRS. However, this information is brief since this agency also regulates telephony in general, the postal services, the internet, and national radio.²⁵⁷

Bildtelefoni.net is currently the only provider of VI services in Sweden. Its marketing and presentation emphasizes information and advice on best practices for getting the most out of their service (e.g.: make sure you have adequate lighting, avoid wearing patterned clothing, etc.). The information is presented in both Swedish Sign language and written Swedish.²⁵⁸

The Örebro County Council (*Örebro läns landsting*) website is more robust in content than the Bildtelefoni site. However, this content is geared mostly toward healthcare and dental care provisions. The site also provides demographic and geographic information about the region including economics, politics, and cultural entertainment. There is little if any mention of the interpreting services provided or VRS.²⁵⁹

Likewise, the website for the Swedish National Association of the Deaf (SDR—*Sveriges Dövas Riksförbund*) has little mention of current VRS services or initiatives. It mentions the importance of interpreting services and the need to achieve sufficient number of sign language interpreters. In the Technical Aids section, VRS is not specifically mentioned. It discusses the work of the County Councils in providing technical aids as directed by the rules and regulations in the Public Health Law, however there is no mention of the Örebro County Council or VRS. In a section titled “IT – undreamt of possibilities for sign language on the net,” no mention is made of VRS and the new accessibility from mobile 3G products. The website does include the following, “For the deaf IT means unthought-of possibilities for signed and visual information on the net. The objective is that the deaf through information and

²⁵⁶ Ibid

²⁵⁷ www.pts.se

²⁵⁸ www.Bildtelefoni.net

²⁵⁹ www.orebroll.se

training have such good knowledge of the significance of IT that they are able to fully take advantage of all its possibilities. Since deaf people are a group treated unfairly when information in their own language is concerned, important information has not reached the target group. *This means that deaf people need knowledge about the fact that the possibilities with IT exist as well as how to go about using them. A network of sponsors for individual IT-users and deaf clubs needs to be built and there is also a need for a signed handbook how to use IT. Through projects supported by society, deaf people can get information about what IT could mean.*"²⁶⁰

²⁶⁰ www.sdrf.se

SWITZERLAND VRS

SUMMARY

1. Overview

Total Population:	7,785,900
Deaf Population:	10,000
Hard of Hearing Population:	500,000
Use Sign as Primary Language:	10,000
No. of Qualified Interpreters:	97
Official Languages:	Swiss German, Swiss French, Swiss Italian, Romansch
Name of Sign Languages:	SDGS, SLSF, and SLIS
VRS Service Schedule:	2004 Limited Trial
VRS Vendor:	Procom
MRS/VRS Funding Model:	MRS is fully funded by the government (OFCOM) as a Universal Service. VRS Trial was funded by a special government credit line as an “equality” measure. In 2018, VRS is expected to become a permanent Universal Service funded the same as MRS.

2. Findings

This Phase 4 research summary, *VRS Models in Other Countries – Switzerland*, provides a synopsis of the VRS environment in Switzerland.

Key Points:

- Switzerland has four official languages:
 - Swiss German
 - Swiss French
 - Swiss Italian
 - Romansch

- Switzerland has three Sign Languages:
 - Swiss German Sign Language
 - Swiss French Sign Language
 - Swiss Italian Sign Language
- Switzerland has Deaf and hard of hearing population numbers similar to Sweden,
 - Switzerland is far behind Sweden in the deployment of VRS
- MRS services are currently paid for by the government and are available 24 hours a day
- There was a limited VRS trial in 2004
- A new VRS trial is beginning in 2011 and will last until 2018
- Education and outreach programs are being strategically delayed
- Interpreter training is available at two universities

SWITZERLAND VRS

RESEARCH

1. Demographics

Population:

- Estimated total population of 7,785,900.²⁶¹
- According to the Swiss Federation for the Deaf (*Schweizerische Gehörlosenbund—SGB-FSS*):²⁶²
 - 10,000 Deaf
 - 500,000 hard of hearing

Switzerland has four official languages:

- Swiss German
- Swiss French
- Swiss Italian
- Romansch

Switzerland has three sign languages:

- Swiss German Sign Language (SDGS)
- Swiss French Sign Language (SLSF)
- Swiss Italian Sign Language (SLIS)

There are approximately 10,000 sign language users in Switzerland.

- 8,300 Swiss German Sign Language users
- 1,380 Swiss French Sign Language users
- ≈ 320 Swiss Italian Sign Language users

These numbers are significant because they add to the complexity of finding interpreters for VRS.

²⁶¹ Swiss Federal Statistical Office

²⁶² Swiss Federation for the Deaf/ Schweizerische Gehörlosenbund (SGB-FSS)

2. Legal Background

2.1. Rights of People with Disabilities

According to the Federal Chancellery of Switzerland, “The objective of Swiss equality policy is to achieve equal rights for and the integration of people with disabilities.”²⁶³ There are many Swiss laws and cantonal legislations enacted to attain this objective.

The 1874 Constitution contained a limited number of fundamental rights. Over time, additional “unwritten laws” were added based on Swiss Federal Supreme Court decisions, adopted from case law of the European Court of Human Rights, and applied from fundamental rights guaranteed by the European Convention on Human Rights. The new Swiss Constitution of 1999 updated a comprehensive bill of rights contained in Title 2.

As stated in Title 2 Basic, Civil, and Social Rights; Chapter 1 Basic Rights, Article 8 Equality:

“All humans are equal before the law.”

“Nobody may be discriminated against, namely for his or her origin, race, sex, age, language, social position, way of life, religious, philosophical, or political convictions, or because of a corporal or mental disability.”

“Men and women have equal rights...”

“The law provides for measures to eliminate disadvantages of disabled people.”²⁶⁴

Excerpts from the Constitution of the Canton of Zurich affirm and extend these basic principles, especially in relation to the rights of people with disabilities. Article 10 states that: “The provisions of the Federal Constitution relating to the implementation and restriction of fundamental rights also apply to fundamental rights guaranteed by cantonal law.” Article 11 confirms equality based on the Federal Constitution and adds:

“Persons with disabilities have the right to have access to benefits and the facilities, sites and public buildings. Measures necessary for this purpose shall be reasonably provided from an economical point.”

“Measures to help disadvantaged people can be taken to implement the principle of equality.”²⁶⁵

The Federal Act on the Elimination of Discrimination against People with Disabilities was enacted in 2004 to further implement the laws set forth by the Constitution. That same year, the Federal Bureau for the

²⁶³ Schweizerische Eidgenossenschaft

²⁶⁴ Switzerland Constitution; in Title 2 Basic, Civil, and Social Rights; Chapter 1 Basic Rights, Article 8 Equality

²⁶⁵ Constitution of the canton of Zurich; 131,211; Chapter One: Fundamentals; Article 11; Equality

Equality of People with Disabilities (FBED) was created to provide information and advice as well as to implement and support initiatives designed to enable equal access for the disabled. According to the Federal office of Communications (OFCOM), the national regulatory authority for communications, the FBED: “keeps a closer (more detailed knowledge) and wider (not only in the communications sector) overview on the challenges facing the disabled and the solutions to overcome them. In addition, the FBED has the authority to suggest enhancements to the law and create financing solutions whenever appropriate.”²⁶⁶

Regarding language, the Swiss constitution recognizes:

- Four national languages:
 - German
 - French
 - Italian
 - Romansch
- General language freedom:
 - “The freedom of language is guaranteed”²⁶⁷

Switzerland has 29 cantons (equivalent to provinces or states). The cantons, not the federal government, are responsible for healthcare, welfare, law enforcement, and public education. They also have taxation authority.²⁶⁸

The Canton of Zurich passed a 2005 Constitutional document that confirmed the Federal Constitutional rights of equality and non-discrimination. It also included an Article dedicated to Sign Language: “The freedom of language includes the use of Sign Language.”²⁶⁹

2.2. Telecommunications Service Obligations

The Federal office of Communications (OFCOM) is responsible for national and regulatory oversight of the telecommunications sector (including radio and television broadcasting). OFCOM sets strategy and policy for:

²⁶⁶ Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011

²⁶⁷ Swiss Federal Constitution; Constitutional Provisions and Title 2; Article 18; Freedom of Language

²⁶⁸ www.admin.ch.ch

²⁶⁹ Canton of Zurich Constitution; 131.211; February 27, 2005; Chapter One: Fundamentals; Article 12; Language Signs

- The Swiss government (the Federal Council)
 - Publishes the Ordinance on Telecommunications Services (OTS)
 - The legislation that provides for Universal Services (including relay services and broadband)
 - Delineates obligations of the Universal Service Provider
 - Provides a framework for the payment of Universal Services
- The Swiss Federal Department for the Environment, Transport, Energy, and Communications (DETEC)
- The Swiss Federal Communications Commission (ComCom)

Article 15 of the Federal Council's Ordinance on Telecommunications Services describes the services that are included as part of the Universal Service obligations: “services for the hearing impaired: provision of a transcription service including emergency calls as well as an SMS relay service which are available round the clock.”²⁷⁰

Article 33 of the Ordinance decrees that these services for the hearing impaired shall be provided at no cost to the customer:

“The services for the hearing or visually impaired and persons with limited mobility must be free of charge, regardless of whether they are provided by providers of services of the universal service themselves or via access to third-party services.”

“The connection charges charged to the hearing or visually impaired and persons with limited mobility within the framework of these services shall not be discriminatory in comparison with the standard tariffs.”²⁷¹

According to direct communication with OFCOM, OFCOM is “regularly in contact with organizations representing impaired persons.” OFCOM further declared that: “Procom is at present initialling a new Trial phase with the aim of acquiring experience at the operative level. This creates the possibility that Video Relay Service will be included in some form in the concept of ‘Universal Service’ for the next license period (after 2018).”²⁷²

²⁷⁰ The Swiss Federal Council; Ordinance on Telecommunications Services; Chapter 3 Universal Service; Article 15 Services of the Universal Service; f. Services for Hearing Impaired

²⁷¹ The Swiss Federal Council; Ordinance on Telecommunications Services; Chapter 4 Obligations Deriving from the Provision of Specific Services; Article 33 Services for the Hearing or Visually Impaired or Persons with Limited Mobility

²⁷² Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011; Procom is the Foundation to Aid the Communication for the Deaf (Fondazione di Aiuto alla Comunicazione per Sordi); (Fondation d’Aide á la Communication pour Sourds)

2.3. Regulatory Funding of MRS/VRS

Funding for traditional relay was initially provided by the government as part of the services under the national postal and telecommunications organization (PTT—Post, Telefon, and Telegramm). This changed due to deregulation legislation passed in 1998. Relay Service is still paid for by the government, but is provided by private companies that bid to provide the service as a Universal Service contractor.

OFCOM expects funding for VRS to be provided by the Ordinance on Telecommunications Services as these services become part of the Universal Service contracts during the next licensing period in 2018. The trial funding is being handled separately by special government financing. According to OFCOM: “Before the inclusion of VRS in the Universal Service concept, the trial and implementation of the project intended to build a public VRS will be financed by a special credit line for equality enhancing measures under the control and advice of the Bureau for Equality of people with Disabilities.”²⁷³

3. Relay Services in Switzerland

3.1. Types of User Services Provided

Initially, Deaf relay services were provided by the government through the PTT (Post, Telefon and Telegramm). In 1998, Swiss law de-monopolized telecommunications and opened the market to new companies. At that time, Procom, the largest sign language interpreting company in Switzerland, became the national relay service provider.

According to Procom, relay services are available 24 hours a day for Swiss-German Sign Language, Swiss-French Sign Language, and Swiss-Italian Sign Language. However, since there are only nine Swiss-Italian Interpreters identified in Switzerland who are available for community interpreting assignments, there may be some challenges to the provision of this relay service.²⁷⁴

3.2. Current VRS Communication Technologies

According to contact made by Mission Consulting with the Telecom Services Division of the Swiss Federal Office of Communications (OFCOM), the 2004 trial was very limited in scope in order to gather “initial information regarding the possibility of such a service and the acknowledgement of the systems available at that time” (from a technical perspective).²⁷⁵ Due to the confidential nature surrounding the

²⁷³ Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011

²⁷⁴ www.procom-deaf.ch

²⁷⁵ Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011

impending announcement and launch of the 2011 Swiss VRS trial, there is no publicly available information regarding VRS technologies in Switzerland.

3.3. Broadband and Connectivity Infrastructure

One of the primary aims of the Swiss Telecommunications Act was to guarantee that broadband access be provided as a Universal Service throughout the country. Switzerland now has one of the highest Internet and broadband penetration rates in the EU.

- The percentage of households with Internet access was 77% in 2008
- The percentage of individuals regularly using the Internet in 2010 was 75%²⁷⁶

Article 15 of the Ordinance on Telecommunications Services (OTS) describes the services as part of the Universal Service obligations, including “data transmission service.”²⁷⁷ Minimum connectivity requirements are listed under Article 16, “Connection.” This Article states that for both residential and commercial premises the Universal Service Provider is obligated to provide “a fixed network termination point which includes a voice channel, a telephone number ...and broadband Internet access with a guaranteed transmission speed of 600/100 Kbit/s; if the connection does not permit the provision of such broadband internet access for technical or economic reasons and no alternative offering is available on the market under comparable conditions, the performance of the connection may be reduced in exceptional cases.”²⁷⁸

OFCOM has stated that these minimum bit rate access values would be increased in the near future, and: “It is expected soon to bring these values to 1Mbps/100kbps and it is very likely that in 2018 (date for the next Universal Service license) the minimal bit rates available on access networks easily allow real time video exchanges.”²⁷⁹

The Ordinance regarding Universal Services decrees that all services, including broadband access, for people with hearing impairments be provided free of charge.

²⁷⁶ Swiss Federal Statistical Office

²⁷⁷ The Swiss Federal Council; Ordinance on Telecommunications Services; Chapter 3 Universal Service; Article 15 Services of the Universal Service; d. data transmission service

²⁷⁸ The Swiss Federal Council; Ordinance on Telecommunications Services; Chapter 3 Universal Service; Article 16; Connection; c. Fixed Network termination Point

²⁷⁹ Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011

4. VRS Usage Volumes

There is no information publicly available regarding the volume of usage during the limited VRS trial in 2004. The trial provider is currently competing for a new service contract and declined to provide usage data.

In response to requests for any statistical reports about VRS in Switzerland that would show volumes, performance metrics, historical trends, or comparisons with other forms of relay, OFCOM said: “It is too early to draw conclusions.”²⁸⁰

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

Because Switzerland is a multi-lingual country, there are three different associations for sign language interpreters:

- Swiss-German Sign Language Association (*Berufsvereinigung der GebärdensprachdolmetscherInnen der deutschen Schweiz* — BGD)
- Swiss-French Sign Language Association (*Association Romande des Interprètes en Langue des Signes* —ARLIS)
- Swiss-Italian Sign Language Association (*Interpreti della Lingua dei Segni Svizzera Italiana* — ILISSI)

As in most countries, the total number of sign language interpreters is insufficient to meet the current demands of the Deaf community. This shortage may significantly impact the deployment of VRS. The sign language environment in Switzerland is even more difficult due to the lack of interpreters fluent in all possible language combinations in Swiss communications.

According to the Swiss Federation of the Deaf, there are:

- 97 sign language interpreters in Switzerland
 - 58 Swiss-German Sign Language Interpreters (members of the BGD)

²⁸⁰ Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011

- 30 Swiss-French Sign Language Interpreters
- 9 Swiss-Italian Sign Language Interpreters

The Zurich University of Applied Science (HfH — *Interkantonale Hochschule für Heilpädagogik*) has developed a 4-year Sign Language training course for Swiss-German Sign language. The training is held 2 days a week for 2,000 lesson hours and offers an additional 300 hours of practical training internships during the semester breaks. A Bachelor of Arts degree in Sign Language Interpreting is awarded upon completion of the program.²⁸¹

The University of Geneva – School of Translation and Interpretation (*Université de Genève - Ecole de traduction et d'interprétation*) has a program that teaches Swiss-French Sign language. It has been offered as a Continuation Certificate program taught part-time over a 2 year period. The current school catalogue for this program with the 2011 details has yet to be updated.²⁸²

7. Access to Emergency Services

The Ordinance on Telecommunications Services specifies additional accommodations so that people with disabilities can communicate with emergency services. These accommodations include a transcription service for emergency calls and an SMS relay service that the Universal Service provider is required to make available at all times and without interruption. The Ordinance also states that these emergency services for the hearing impaired must be provided free of charge, regardless of whether they are accessed via the Universal Service provider or via third-party services.²⁸³

Switzerland is not formally a member of the EU, but the EU standardized emergency call number '1-1-2' can be used throughout Switzerland in case of emergency.

8. VRS Education and Outreach Programs

Currently there is little information publicly available regarding the future of VRS in Switzerland. However, OFCOM stated that: “In the trial initial phase, the existence of the service will not be advertised. The promotion of the service will be made when there will be reasonable evidence of the performance and first clear indication of users’ satisfaction.”²⁸⁴

²⁸¹ www.hfh.ch; Interkantonale Hochschule für Heilpädagogik; Gebärdensprachdolmetschen

²⁸² Université de Genève - Ecole de traduction et d'interprétation

²⁸³ Swiss federal Department of the Interior; General Secretariat SG-DFI; Federal Office of equality for persons with disabilities.

²⁸⁴ Swiss Federal Office of Communications (OFCOM); Telecom Services Division; Fixed Network and Universal Services Division; Correspondence with Mission Consulting, April 2011

UNITED KINGDOM VRS

SUMMARY

1. Overview

Total Population:	62,192,000
Deaf Population:	70,000
Hard of Hearing Population:	2,300,000
Use Sign as Primary Language:	30,000
No. of Qualified Interpreters:	511
Official Language:	English
Name of Sign Language:	British Sign Language (BSL)
VRS Service Schedule:	2009 trial; Nov. 2010 permanent
VRS Vendor:	Significan't SignVideo
MRS/VRS Funding Model:	MRS (without VRS) is funded by profits from Universal Service providers. Limited VRS is funded by the federal government until it becomes a Universal Service.

2. Findings

This phase 4 research summary, *VRS Models in Other Countries – United Kingdom*, provides a synopsis of the VRS environment in the United Kingdom (UK).

Key Points:

- Although the UK has had a trial and limited VRS since 2004, the UK has no current national public VRS service
- The UK definition of "Universal Service" is limited to Text Relay only and therefore no VRS funding is available
- Regulatory obligations to provide MRS services are similar to those in many other countries
- VRS is available now during a limited service, only for communication to or from a public government office, or for employment purposes through a special program: Access to Work
- SignVideo estimates there were between 75,000 and 100,000 minutes of video relay conversations in 2010

- VRS education and outreach programs do exist
- There is a public relations campaign by Deaf associations and providers to urge the Government to make VRS part of the Universal Service obligations

UNITED KINGDOM VRS

RESEARCH

1. Demographics

According to the Office for National Statistics (ONS), the United Kingdom has an estimated total population of 62,192,000.²⁸⁵ The ONS is the executive office of the UK Statistics Authority, a non-ministerial department that reports directly to Parliament and is the Government's single largest producer of statistics. The population estimate from ONS is based on updates of the April 2001 census for England and Wales. The next official census for the UK took place in March 2011, but the results are not expected to be available before the close of this report.

Estimates of British Sign Language users are imprecise since they were not included in earlier census data. However, the ONS has included an accessibility initiative as part of the 2011 census called "Making the census accessible." It has published an instructional video in British Sign Language (BSL), and the largest Deaf organization in the UK, the British Deaf Association, is helping to distribute the video via its website. This initiative will attempt to collect statistics on the number of people throughout the United Kingdom who use BSL.²⁸⁶

Estimates of the BSL user population vary:

- The Open University in the UK offered a course on Issues in Deafness from 1991 to 1996. In a research report they stated that: "BSL is probably used by at least 50,000 people as their only or preferred language." This estimate is based on three different published sources:
 - *British Sign Language*, M. Deuchar, (London, Routledge and Kegan Paul, 1984)
 - *Deaf Worlds*, S. Sainsbury, (London, Hutchinson Educational, 1986)
 - British Deaf Association report, "BSL: Britain's Fourth Language"²⁸⁷
- The Social Policy Research Unit at York University used data obtained from the Office of Population Censuses and Surveys during a mid-1980s disability survey in the UK. It specifically

²⁸⁵ United Kingdom Office for National Statistics

²⁸⁶ : Recognizing that this population is often reluctant to participate in surveys or to identify themselves as having a disability, participation by consumers is encouraged with comments such as, "Your answers will be turned into statistics about the community and groups within it. Personal census information is kept confidential for 100 years and is not shared with government departments." www.bda.org.uk/news/story/2011/03/18/bda-briefing-census

²⁸⁷ The Open University; Social Sciences; Issues in Deafness; D.251.1.1; "Deaf People in a Hearing World"

identified those who had said that they were not able to use a voice telephone because of deafness, and who said they used sign language for communication. At that time, it estimated the number of BSL users at 21,000.²⁸⁸

- Currently, the British Deaf Association estimates the number of BSL users in the UK to be approximately 30,000.

The UK has approximately 511 Sign Language Interpreters.²⁸⁹

2. Legal Background

2.1. General Regulatory Background

The Office of Communications (Ofcom) is a branch of the national government with regulatory authority over telecommunications, broadcasting, and mail services. Ofcom was initially established by the Office of Communications Act of Parliament 2002, and obtained expanded authority in the [Communications Act 2003](#). Text Message Relay and Video Relay are services under the regulated authority of Ofcom.

2.2. Rights of People with Disabilities

In 1970, the UK passed the Chronically Sick and Disabled Persons Act, establishing specific laws to improve access and support for people with disabilities. This Act was the basis for future legislation. During the development of the Act it became clear that members of this population often did not participate in surveys or identify themselves as having disabilities. Local government agencies were not offering additional services for constituents with disabilities because they did not know who, where, or how numerous these constituents were.²⁹⁰

In 1995, the Disability Discrimination Act (DDA) was passed in the UK making it illegal to discriminate against people with disabilities at work or in the provision of goods and services. It was, “An Act to make it unlawful to discriminate against disabled persons in connection with employment, the provision of goods, facilities and services or the disposal or management of premises; to make provision about the employment of disabled persons; and to establish a National Disability Council.”²⁹¹

The UK Disability Discrimination Act (DDA) is a civil rights law. It applies to all employers and everyone who provides a service to the public except the Armed Forces. The main purpose of the Act is to end

²⁸⁸ City University, London; OFCOM study 2006; ‘Feasibility of Additional Telephone Relay Services’; page 55

²⁸⁹ National Registers of Communication Professionals working with Deaf and Deafblind People (NRCPD), <http://www.nrcpd.org.uk/>

²⁹⁰ Peter White; BBC News Disability Affairs Correspondent; “What Needs to be Done to End Disability Discrimination”; November 28, 2010

²⁹¹ UK National Archives; Legislation; Disability Discrimination Act 1995 Chapter 50; Introduction

“less favourable treatment for a reason related to a person’s disability; and failure to make a ‘reasonable adjustment’.” As stated in the DDA:

“Duty of Employer to make adjustments.

1) *Where –*

- a) *Any arrangements made by or on behalf of an employer, or*
- b) *Any physical feature of premises occupied by the employer, place the disabled person concerned at a substantial disadvantage in comparison with persons who are not disabled, it is the duty of the employer to take such steps as it is reasonable, in all the circumstances of the case, for him to have to take in order to prevent the arrangements or feature having that effect.”²⁹²*

The “reasonable adjustment” clause in this legislation is key. While the Act cites many exceptions to this provision, it does require employers to proactively remedy the work environment. Other legislation enables a person with a disability to seek redress after he or she has been disadvantaged.

The Disability Rights Commission (a predecessor to the National Disability Council) established Codes of Practice, providing additional clarifications and guidelines to assess whether a certain adjustment is reasonable. Guidelines include asking:

- Whether the proposed adjustment would meet the needs of the disabled person
- Whether the adjustment is affordable
- Whether the adjustment would have a serious effect on other people

The UK Disability Rights Commission acknowledges that in certain cases no reasonable adjustment may be made and that, as a result of these circumstances, the person with a disability may be treated less favourably. The Disability Discrimination Act has a stipulation that permits employers and service providers to justify less favourable treatment of (failure to make reasonable adjustments for) persons with disabilities in certain cases.²⁹³

The Disability Laws evolved as more statutes and regulations were passed. Many of these new laws are clarifications or consolidations of previous laws; none have a significant impact on the provision of services for BSL users. For example:

- The Disability Rights Commission Act of 1999 replaced the National Disability Council with the Disability Rights Commission.

²⁹² UK National Archives; Legislation; Disability Discrimination Act 1995 Chapter 50; Section 6; Duty of Employer

²⁹³ UK National Archives; Legislation; Statutory Instruments; Disability Discrimination Act; Disability Rights Commission Codes of Practice

- The Special Educational Needs and Disability Act of 2001 inserted new provisions in the 1995 Disability Discrimination Act to address the same issues in schools and other educational institutions.
- The DDA Amendment regulations of 2003 updated the 1995 Act to be in line with EU employment directives.
- The Disability Discrimination Act of 2005 extended the DDA of 1995 to cover public transport, and introduced a requirement for public offices to promote equality for people with disabilities.
- The Equality Act of 2010 was created primarily to consolidate all previous Acts and Regulations that had been developed to promote equality and anti-discrimination in the UK into a single document.²⁹⁴

British Sign Language was recognized as an official British language in March 2003. However, the British Deaf Association notes that Deaf Sign Language users still do not have full access to vital information and services including education, health, employment and communication access because BSL still does not have any legal protection under the Constitution.

2.3. Telecommunications Service Obligations

The UK created the Universal Service Obligation (USO) program as a basic safety net that ensures that most of the population will have access to affordable telecommunications services. According to Ofcom, “Universal Service ensures that basic fixed line services are available at an affordable price to all citizen-customers across the UK.”²⁹⁵ The relay services in the UK are authorized under the Universal Service Obligation (USO) programs.

Ofcom explicitly states that the provision of USO is not free and that it has costs that must be considered and funded. The program requires a subsidy from other users of the telephone network to pay for services for those who might not be able to afford them and for those who live in the rural areas that are not served by the natural market elements found in large metropolitan areas.

In the UK, Ofcom has incorporated a periodic review process for Telecommunications and the Universal Service Obligation. It views Universal Service as an evolving concept and not a fixed program. When the telecommunications industry was deregulated in 1984, the fundamental services required by the USO were significantly different from what they are today. However, the USO is described as “not being at the forefront” of technological changes and as only taking effect when the lack of an affordable service represents a serious obstacle to full participation in society.²⁹⁶

²⁹⁴ UK National Archives; Legislation; Disability Discrimination Act 1995; Disability Rights Commission Act of 1999; Special Educational Needs and Disability Act of 2001; Disability Discrimination Act of 2005; Equality Act of 2010

²⁹⁵ OFCOM; Office of Communications; Universal Service Obligation: Review

²⁹⁶ OFCOM; Office of Communications; Universal Service Obligation: Review

Ofcom has announced a review of the Universal Services in order to facilitate the incorporation of technological changes into the 2011–2012 Plan, potentially including VRS.²⁹⁷

2.4. Regulatory Funding of MRS/VRS

The current Relay Service in the UK is provided by British Telecom (BT), the one provider designated by Ofcom as a Licensed Universal Provider of Universal Services for the Disabled. The Universal Service Obligations are primarily funded by BT.

Historically BT²⁹⁸ has been able to fund the net costs of providing Universal Services from profits made on other services. As competition increases, however, the profits that supply these services are threatened and diminishing. Ofcom has been preparing for this possibility and recognizes that providing USO may become an undue burden for BT. It is considering alternative funding models, such as:

- “A direct levy on all consumers of certain communications services (for example, a fixed amount that appears directly on the bill);
- An indirect levy on consumers via a levy on communications providers (such as the models used in the U.S. and France);
- Direct Government funding.”²⁹⁹

Although VRS in the UK has not yet been adopted into the Ofcom Universal Service provision, it likely will be in the future. Therefore VRS funding is anticipated to be similar to the funding solutions for all other MRS costs. VRS is currently being provided as a limited service. The costs of providing a permanent VRS service to the entire Deaf and hard of hearing community for use with any calls (not just calls to government officials or in a work setting) would create a higher annual MS cost and require additional annual funding. However the increased cost of permanent VRS should be partially offset by a corresponding decline in the usage and cost of traditional MRS.

3. Relay Services in the United Kingdom

3.1. Types of User Services Provided

Universal Service for the Deaf is primarily text relay, also known in the UK as TypeTalk. This service is provided by the Text Relay division of British Telecom (BT). The TypeTalk service was started in the

²⁹⁷ OFCOM; Office of Communications; Ofcom Relay Services; April 2011

²⁹⁸ With contributions from Kingston, a small telco.

²⁹⁹ OFCOM; Office of Communications; Universal Service Obligation: Provision and funding of Universal Service Arrangements

1980s by Lady Pauline Ashley of the Royal National Institute for Deaf People (RNID). The first telephone relay service in the UK was staffed by two operators working out of the RNID headquarters.

Users can download a dedicated software application known as TalkByText from the RNID site to access the UK relay provider using an Internet-based service from computers and mobile devices. According to the RNID site: “No other equipment is needed - just install the TalkByText program on your PC. TalkByText never uses your telephone service, but instead makes and receives all text calls over your broadband connection. Your telephone line always remains available during text calls.”³⁰⁰

BT Text Relay provides the following services:

- Text to Speech
- Speech to Text
- HCO
- VCO
- VCO to VCO
- VCO to TTY
- Speech to Speech

Although traditional Relay Service in the UK is severely limited in comparison to other countries, Ofcom has been investigating how to improve upon the service by offering new technologies. Since 2003, it has commissioned five or six studies on improved services including researching the feasibility of VRS. Some of these studies also included other services such as: IP-based technology, SMS, e-mail, voice recognition, and captioned telephony.

The most recent review, “will assess whether the current arrangements for the provision of relay services are adequate in delivering equivalence to voice telephone for hearing- and speech-impaired users.”³⁰¹ Ofcom will be using an independent market research company, Opinion Leader, to conduct research into the current needs of the Deaf and hard of hearing community. Several aspects will include how well the current text-relay service is addressing community needs and what community attitudes toward the provision of VRS are.

Ofcom intended to publish the results of the review by the Spring of 2011 and, although the review has not yet been released, a copy was provided for this study. The research data sampling included 94 individuals with disability in Phase I and 323 individuals with disability in Phase II, with only 25% of these being BSL users. Although this group was highly positive about the inclusion of video relay in future Universal Service offerings, this option was overshadowed by requests for faster text relay and

³⁰⁰ www.RNID.org.uk; RNID; TalkByText; Overview

³⁰¹ OFCOM; Office of Communications; Ofcom Relay Services; April 2011

captioned telephony.³⁰² The final published report that became public July 28, 2011, requests additional comments and consultations by October 20, 2011 in order to better implement a video relay service. Ofcom cited high costs of between £12.6 million and £113million and the scarcity of BSL interpreters as too prohibitive to open up unrestricted VRS in the UK. “In light of those considerations, we consider that a requirement to provide an unrestricted VR service would not be appropriate at this time.”³⁰³

VRS is currently available in the UK only for use in certain instances. SignVideo (from Significan’t) is the primary VRS provider under an agreement with BT, the Universal Service provider. In 2007 there were two other fledging VRS operated by RNID and BDA. However, they have since ceased operations due to a lack of sustained funding.³⁰⁴ Therefore, SignVideo remains the sole provider for VRS in the UK.

While VRS exists in the UK, it is neither an official national “Trial” or “Pilot Phase” offering, nor a permanent component of Universal Service or Traditional Relay Service. VRS is available as a government funded or subsidized service under two circumstances. Outside of these circumstances, users may contact a provider independently and request a quote for the service.

The two main applications for Video Relay as a government service are to contact public officials and/or to use VRS for work purposes through the Access to Work Programme.

As stated on the SignVideo website, VRS is available weekdays 8AM to 6PM if you are:

- “Visiting your local authority building that has a videophone and using the service to interpret a conversation you are having with a hearing member of staff there,”
- “Visiting your local authority office that has a videophone and using the service to make a telephone call to the department you wish to speak to and then interpret the call for you,”
- “By connecting to SignVideo from home via your videophone or webcam to make a call to your local authority”
- “If you are working, you may be able to use the ‘Access to Work Programme’. It is now possible to use video-conferencing and a service level agreement with SignVideo to meet your work interpreting needs.”³⁰⁵

3.2. Current VRS Communication Technologies

Users have various options for connecting to VRS and can make video calls through SignVideo, using:

³⁰² Opinion Leader; Ofcom Relay Services; Consultation Review; Executive Summary; February 2011

³⁰³ Ofcom, Review of Relay Services, Consultation Review, July 28, 2011

³⁰⁴ Mission Consulting interview with SignVideo; April 15, 2011

³⁰⁵ www.SignVideo.co.uk; Services

- A webcam with appropriate videoconferencing software
- ISDN2/ISDN6 Calls with an ISDN6 videophone and an ISDN6 connection
- A Corporate videoconferencing unit
- A broadband videophone with a fast broadband Internet connection
- IP Videophones
- HSDPA enabled (post 3G) mobile videophone with an HSPA (post 3G) mobile network connection³⁰⁶

Some requirements listed by SignVideo are:

- A minimum 384 Kbps upload/download speed
- A computer software application (SV²) provided by SignVideo (for users connecting via a PC with webcam)
 - The SV² software is Live Video Plugin application that is downloaded on Microsoft Windows OS for the Explorer internet browser

3.3. Broadband and Connectivity Infrastructure

The UK has various initiatives to ensure that broadband and other telecommunications services are available for commerce and to the general population. One solution is the Race Online 2012 initiative, which is comprised of partners from across the public, private, and non-profit sectors. This initiative is working to help people connect to the Internet. Race Online 2012 stakeholders are driven by concern over the fact that, as recently as 2010, there were over 9 million people in the UK who were unable to access the Internet. This group has created online centers to help users who are at a social, physical, or financial disadvantage since these individuals are at least three times more likely not to have access to the Internet. To promote their objectives, they have installed thousands of online centers across the UK in libraries, community centers, care homes, social housing estates, and many other locations.³⁰⁷

Ofcom does not provide free Broadband to consumers as a Universal Service. According to the current Universal Service Obligation: "Ofcom believes that the case for extending the Universal Service Obligation to Broadband is not currently strong either on the basis of economic efficiency, or on the basis of equity. It is simply too early in the development of the market for the necessary conditions to

³⁰⁶ www.signvideo.co.uk; SignVideo Services; Technology

³⁰⁷ www.ukonlinecenters.com; Policy Context and legal Framework

be met.”³⁰⁸ Based on current plans for service rollout by BT and other market dynamics, Ofcom believes that a majority of the population will soon have access to broadband services and that the remaining shortfall “may best be addressed through public sector infrastructure schemes.”

Section 1.10 of the Universal Service Obligation states: “BT and Kingston are required to provide a connection upon reasonable request and at uniform prices, irrespective of geographical location.”³⁰⁹ This requirement should have the greatest impact in rural areas that otherwise would not be served.

In a recent response to the Ofcom 2011/12 draft Annual Plan, Consumer Focus, an organization known in the UK as the "Statutory Consumer Champion," disagreed with Ofcom’s perspective on broadband, stating: “Despite continuing investment from super-fast Broadband networks in specific areas and in new built-up areas together with £830 Million committed by the UK government, we have concerns that there will remain a large number of households who will not receive basic broadband speeds where there is not an economic reason to do so. We are also concerned that those citizens living in rural parts of England, Wales and Scotland will be left behind.”³¹⁰

Legislation known as the Digital Economy Bill aims at ensuring:

- A minimum speed of 2Mbps to all homes in the UK by 2012
- The delivery of super-fast Broadband to “most of the country” by 2017

In March 2010 Ofcom published a report stating that this goal had been upgraded to provide:

- Super-fast access to “all homes by 2020”

The Ofcom March 2010 report also stated that:

- Super-fast broadband is available in 46% of UK homes
- The UK is ahead of “most large economies where deployments have been funded commercially”³¹¹

Ofcom provided an update on super-fast broadband deployment in its 2011/12 draft Annual Plan, stating, “BT is on track to deploy super-fast broadband to up to 10 million premises by 2012, and has said that it intends to cover 66% of the UK population by 2015.”³¹²

³⁰⁸ OFCOM; Office of Communications; Review of the Universal Service Obligation; Section 3; Scope of Universal Service Arrangements; Broadband obligations

³⁰⁹ OFCOM; Office of Communications; Universal Service Obligation; Section 1.10

³¹⁰ Consumer Focus; Response to Ofcom’s Draft Annual Plan 2011/12; March 2011; promote effective and sustainable competition; page 4

³¹¹ Ofcom; Super-fast Broadband report; March 2010; Context and summary for ofcom’s consultations on the wholesale local access and wholesale Broadband access markets

4. VRS Usage Volumes

RNID's TypeTalk, the UK's first relay service, began in the 1980s with a six week trial and approximately 100 subscribers. In 1991 the UK launched TypeTalk as a full national public service, and it has continued to grow. The TextRelay information site currently states that: "today's text relay service handles a significant number of calls each week." Discussions with RNID related to this report resulted in the more specific estimate of 8 million minutes of text relay usage annually. However, RNID indicated that this volume was decreasing as users migrated to newer technologies such as SMS, e-mail, and IM.³¹³

Discussions with SignVideo resulted in estimates of current VRS traffic volume, although VRS is only provided in a limited program. SignVideo Timeline:

- 2004 – began offering VRS
- 2006 – VRS volume was up to 10,000 minutes of use per year
- April 2011 – 75,000 to 100,000 estimated annual minutes of video relay
- Changes in the Universal Service provisions would be expected to trigger future changes in VRS usage³¹⁴

5. Fraudulent Call Volumes and Costs

No examples of fraudulent use were indicated in the news media or in the questionnaire responses.

6. Interpreter Resources and Programs

The first register for Sign Language Interpreters was founded in 1982 by 112 members of the Deaf Welfare Examining Board (DWEB) who were joined by 9 other interpreters who were certified by the CACDP (Council for the Advancement of Communication with Deaf People). One of the register's initiatives was to require that all interpreters earn the CACDP's highest level examination credential within 5 years in order to remain a member of the organization. This requirement caused a 50% decline in membership, and by 1987 there were only 62 Interpreters in the register.³¹⁵ According to the National Registers of Communication Professionals working with Deaf and Deafblind People (NRCPD), there are currently 511 British Sign Language Interpreters.

The NRCPD administers professional registers for:

³¹² Ofcom Draft Annual Plan 2011/12; March 2011

³¹³ Mission Consulting interview with RNID; April 26, 2011

³¹⁴ Mission Consulting interview with SignVideo; April 15, 2011

³¹⁵ National Registers of Communication Professionals working with Deaf and Deafblind People (NRCPD)

- Sign Language Interpreters (BSL– English)
- Lipspeakers
- Speech to Text Reporters
- LSPs - Deafblind Manual
- Electronic and Manual Notetakers

The low number of qualified BSL Interpreters limits the VRS. SignVideo currently employs only 24 BSL interpreters dedicated to the service. According to SignVideo, all of their interpreters are registered with NRCPD and:

- “Meet the agreed video interpreting standards for BSL/English interpreters;”
- “Meet the required interpreter training qualifications;”
- “Pass the Criminal Records Bureau (CRB) check;”
- “Adhere to the IRP (Independent registration Panel) Professional Code of Conduct;”
- “Have Professional Indemnity Insurance.”³¹⁶

An Interpreter can register with NRCPD in three different categories:

- Fully Accredited Interpreter: requires meeting the National Occupational Standards in Interpreting (NOSI) and being competent in a variety of settings, including legal and mental health interpreting.
- Trainee Interpreter: requires completion of a recognized Interpreter Training Program and a skills assessment by the Approved Assessment Centre at Level 4 NVQ (National Vocational Qualifications) or equivalent.
- Junior Trainee Interpreter: requires completion of or work towards a recognized Interpreter Training Program, as well as Level 3 NVQ assessment.

There are six NVQ assessment Levels; 6 NVQ is the highest level.

7. Access to Emergency Services

The UK has been using 9-9-9 as the Emergency Access number since 1937 and its national emergency communication system is one of the oldest. The UK is also a participant in the EU 1-1-2 emergency number service. All 1-1-2 calls are automatically routed to the 9-9-9 operators, as both services use the same physical network, and neither type of call is given priority over the other.

³¹⁶ www.SignVideo.co.uk; Services; interpreter Standards

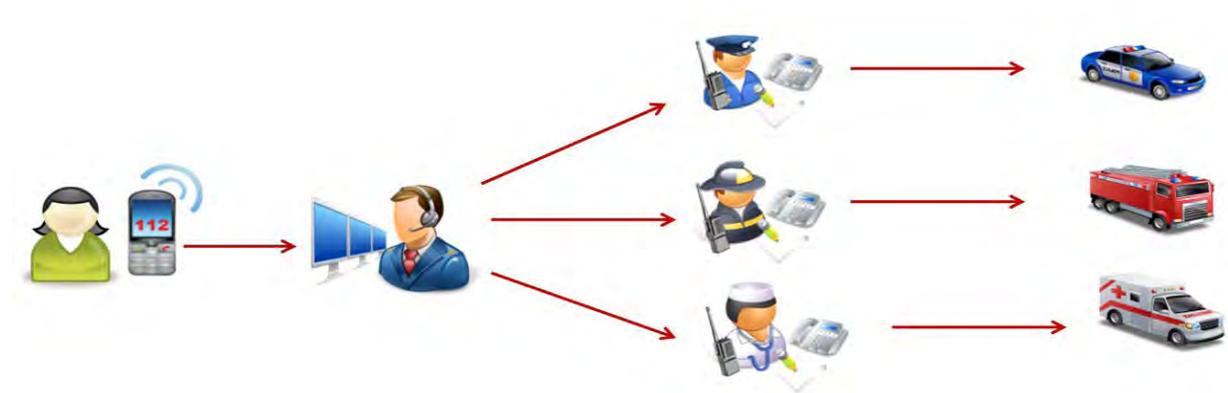
In 1998, British Telecom introduced the EISEC (Enhanced Information Service for Emergency Calls) system. With this system, it was no longer necessary for an operator to state the caller's location and phone number to the emergency call taker since the caller's information was automatically forwarded electronically. In 2003, BT upgraded the system to add EISEC functionality for emergency calls made from mobile phones using "map zone" references.

In 2005, the UK Government formed a 9-9-9/1-1-2 Working Group that included Ofcom, RNID, Deaf representatives, and representatives from the telecom and emergency services sectors. The goal was to establish a national SMS emergency service, and in 2009 the Government began a trial for the Deaf and those with disabilities to contact 999 via SMS messages to a relay center.³¹⁷

Users are required to register their mobile devices to begin using this service. Users can then access Emergency services by sending an SMS text that will be delivered via the Text Relay service TypeTalk, and the relay services operator will relay the SMS conversation.

The flow of the UK SMS calls was outlined in an image provided by the Working Group's report:³¹⁸

Figure 23: SMS Relay Call Procedure in the UK



The UK is also a participant in the EU Total Conversation initiatives. In the UK, Total Conversation will enable the Deaf and those with disabilities to communicate via a variety of fixed and mobile devices. This translates into the increased ability to connect to Emergency services using Relay Operators/Interpreters through Text, SignLanguage, and voice. As part of this initiative, the UK is installing Total Conversation terminals in many UK Emergency Services call centers so that Deaf users

³¹⁷ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support programme (PSP); Total Conversation and 112 For All; SMS access to 999/112 in the UK; page 38; August 24, 2010

³¹⁸ Ibid; page 66; August 24, 2010

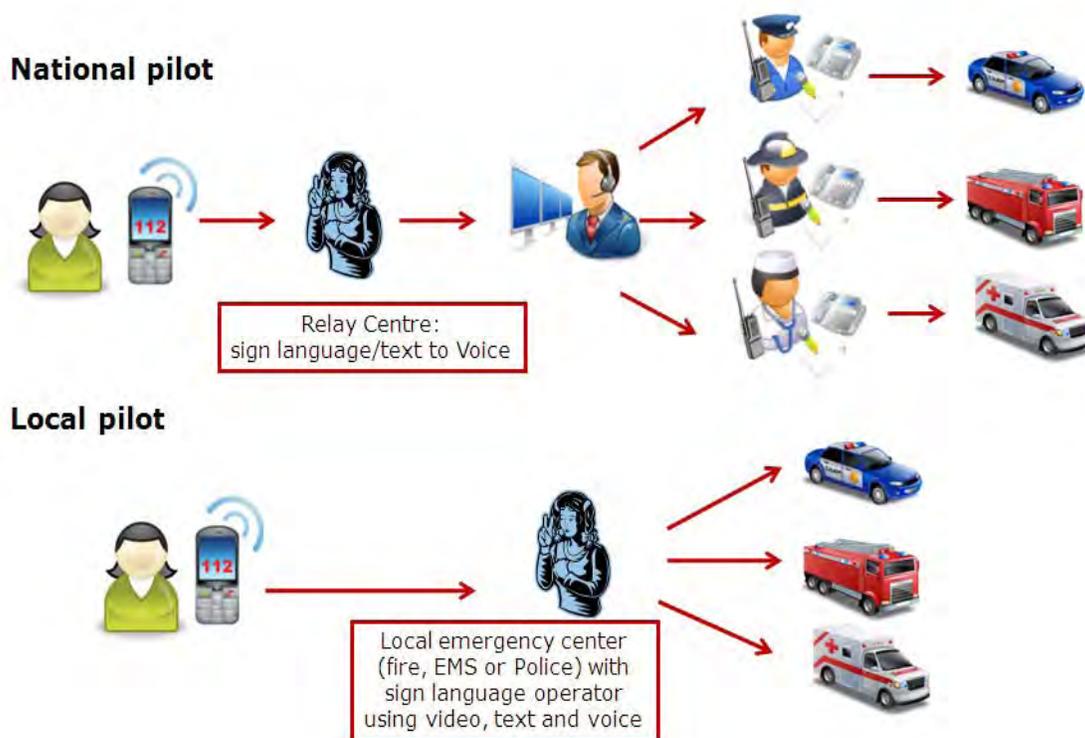
will have direct access to specially trained SignLanguage operators working in these Emergency call centers.³¹⁹

The working group cited two main challenges to these systems in the UK:

- The first is that two regions, AFR (Avon Fire and Rescue) and ASP (Avon and Somerset Police), are not currently connected to a broadband network. The proposed solution for these two emergency services is the installation of a standalone platform that can be connected to the Internet.
- The other primary challenge is the availability of local British Sign Language Interpreters to work at the various Emergency call centers, especially if and when there is a high volume of Total Conversation emergency calls. The solution proposed for this challenge is the use of an external VRS for times when a local center Interpreter is not available (overflow routing).³²⁰

These processes were visually presented by the Working Group, as follows:

Figure 24: Total Conversation Pilot Call Procedure in the UK



³¹⁹ Reach 112 Project; Information and Communication Technologies (ICT) Policy Support programme (PSP); Total Conversation and 112 For All; Emergency Services and Reach 112 in the UK; page 74; August 24, 2010

³²⁰ Ibid; Specific Pilot Challenges and Risk Analysis; UK page 78; August 24, 2010

8. VRS Education and Outreach Programs

One of the unique aspects of VRS education and outreach in the UK is the need to tell users where they can access the service, meaning the physical location of an established VRS facility. This is because the contractual Universal Service subsidized by the Government is limited to communication with government offices or to the employment sector through the "Access to Work" program.

SignVideo, the UK VRS provider, has installed videophone stations in VRS centers for Deaf users who then go to these locations to use the service. On the SignVideo website, a user can find a map of UK counties, informing them where the nearest call center is located. (See Appendix B) The description of the SignVideo web portal "Services" section is dedicated to the process of visiting the local center to use the services.

Another education and outreach issue in the UK is the initiative taken by others to promote VRS (i.e. promotion that is not by Ofcom, the UK Universal Service provider BT, or Significan't SignVideo). In addition to promoting VRS and other services, these independent efforts appear to lobby the government to make VRS a permanent service perhaps with more than one provider, from an equal access perspective, and not limited to the applications associated with employment or contacting government services.

One such group is TAG, a consortium of the major national and regional UK Deaf organizations, including:

- British Deaf Association (BDA)
- Deaf Connections
- Deafness Support Network
- DeafPLUS
- Hearing Concern LINK
- National Association of Deafened People (NADP)
- Royal Association for Deaf People (RAD)
- Royal National Institute for Deaf People (RNID)
- Sense
- Other non-voting organizations

The TAG website includes links to Significan't SignVideo, Scotland's Sign-Now video relay, and Sorenson's VRS Today websites. Sorenson provides the site's explanation of VRS.

The "TAG Relay Campaign" asks the UK Government, Parliament, and Ofcom to ensure that the following be available:

- "Video relay for fixed line, mobile and internet users"
- "Internet access to all relay services"
- "Fair text and video relay tariffs on all mobile networks"
- "Real-time text that is affordable and can be used on mobile IP networks";
- "Captioned relay that costs the same as a normal telephone call"

- “Deaf-aware sales and customer services.”³²¹

The VRS Today site, offered as a link on the TAG website, provides an extensive public relations campaign established by Sorenson Communications, and calls the Deaf community to action, asking the Deaf to petition the Government, Parliament, and regional Ministers to pressure Ofcom into adding VRS as a Universal Service. The site provides pre-written letters to send to the Government as well as links to Petitions and public listings of signatories. (See Appendix C)

³²¹ www.deaftag.org.uk; TAG Relay Campaign; Aims

APPENDIX A

Access to Work Pre-Quote Form



Contact Details

Name: _____
Employer: _____
Job title: _____ Employee: Self-employed
Address: _____

Post code: _____
Email: _____
Do you use: BSL: SSE: Other Sign Language: _____
Do you have an Access to Work case officer? Yes No

Access to Work Details

Current interpreter hours agreed by ATW:
a) Per week? _____
b) Per month? _____
Please provide your Access to Work's case officer's details:
Name: _____
Address: _____

Post code: _____
Tel: _____
Email: _____

What is your expected use of the SignVideo interpreter?

- a) Making phone calls?
- b) Receiving phone calls?
- c) Short meetings?

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1

Access to Work Pre-Quote Form

- d) Team meetings?
- e) Customer / clients?
- f) Translations
- g) Other? _____

To see what the system look like in real life – please check it out by watching a video at this web link: <http://www.youtube.com/watch?v=LO089bzRyLw>

How often do you expect you will use the videophone?

- a) More than once a day?
- b) Once a day
- c) A couple of times a week
- d) Once a week
- e) Once a month
- f) Less than once a month

If employed (You may need to ask your IT department for this information)

Do you have:

- 1) IP Telephony network in your place of work? Yes No
- 2) Video Conferencing units? (videophones) Yes No

Do you anticipate using:

- 1) your own network (LAN / WAN)? Yes No
- 2) a separate broadband connection to enable you to use a videophone? Yes No

If you are self employed

Do you have broadband? Yes No

Please provide the name of your broadband service: _____

Do you have a videophone? Yes No

Do you have a webcam on your PC/laptop? Yes No

Please return this completed form to:

Significan't UK Ltd, St Agnes House, 6 Cresswell Park, London, SE3 9RD

Our Contact details

Email: enquiries@signvideo.co.uk

Tel: 0800 0242434

Fax: 0208 463 1121

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APPENDIX B



SignVideo webpage to help users locate the 'local Authority office' from which to make a video relay connection.³²²

³²² www.SignVideo.co.uk; Services; SignVideo UK location map

APPENDIX C



Telecoms equality for the BSL community

Contact Us   

Enter keywords... 

Home What is VRS? **Bringing VRS to the UK** Resources News Events FAQs  Subscribe via RSS

Bringing VRS to the UK – ways you can help

Interested in bringing telecoms equality for the BSL community in the UK? There are several ways you can make a difference in the fight to make universal VRS a reality. Follow the links below for more information.

Petition for Telecoms Equality **Sign Now** 

Write to your MP

Introducing a universal VRS service for BSL users in the UK will require support from Government and the regulator Ofcom. Ask your MP to help make the case for universal VRS to Government by writing to them directly.

Things to remember:

- If you're writing a letter, address it to the MP's name followed by 'MP'. Eg Joe Public MP. Then the letter should start 'Dear Mr Public'.
- Keep it brief, firm and polite
- Focus on your personal experience and the strength of community feeling
- Ask your MP for their opinion on the issue – you have a right to know what they think!
- Ask your MP to contact the Communications Minister, Ed Vaizey MP, with your concerns
- A handwritten letter always has more of an impact, so please write to your MP at the House of Commons **Name of MP, The House of Commons, Westminster, London, SW1A 0AA**
- Alternatively, you could send your message by email. Use the link to find their email address

[Download a sample letter](#) [Download a shorter sample letter](#)



Learn How

Tell your family, friends and colleagues to get involved – together we can make a difference and achieve telecoms equality for the BSL community.

Share Now

Ed Vaizey

Ask Communications Minister Ed Vaizey MP what the Government is doing to ensure equal access to telecommunications for Deaf people.

Learn How

Support VRS in the UK

SIGN OUR PETITION 

Latest Tweets

VRS Today! in British Deaf News! <http://on.fb.me/igI24h> about 4 hours ago from TweetDeck

It's Deaf Awareness Week this week - find out what's happening near you. <http://bit.ly/kJxXHP> 09:53:35 AM May 03, 2011 from TweetDeck

91 MPs have signed the Parliamentary motion in support of @VRS Today - equal access to telecoms for #Deaf people <http://bit.ly/fKQleY> 08:09:10 AM April 28, 2011 from TweetDeck

Share

VIDEO WALL

[Find out how to create your own video](#)

What is VRS?

A Video Relay Service (VRS) allows Deaf individuals to communicate over videophones to hearing people via an interpreter.

VRS Feasibility Study Project
Mission Consulting

Phase 4 – VRS in Other Countries
United Kingdom Page 152

British Sign Language users do not have equal access to telecommunications



 **Support VRS in the UK**
SIGN OUR PETITION >

Latest Tweets

VRS Today! in British Deaf News! <http://on.fb.me/igI24h> about 4 hours ago from TweetDeck

It's Deaf Awareness Week this week - find out what's happening near you. <http://bit.ly/kJxXHp> 09:53:35 AM May 03, 2011 from TweetDeck

91 MPs have signed the Parliamentary motion in support of @VRS Today - equal access to telecoms for #Deaf people <http://bit.ly/fKQIeY> 08:09:10 AM April 28, 2011 from TweetDeck

VRS Introduction:

British Sign Language (BSL) users do not have equal access to telecommunications in the UK. Existing text-based services are slow and outdated – they force BSL users to communicate in their second language, English.

Video Relay Services (VRS) is a proven technology which creates equal access to telecommunications for sign language users, and for the hearing who wish to communicate with them. VRS has been universally available in the US for many years, provided by several operators.

VRS in the UK is not currently universally available; it will require support from the Government and the regulator Ofcom to make universal VRS a reality for BSL users.

This website provides information on VRS and the steps you can take to help make universal VRS a reality in the UK.

Petition for Telecoms Equality

Sign Now 

APPENDIX D



Video Relay Services: Roadshow

Share this



Coming Soon

Join us on Facebook

Sign Up Create an account or log in to see what friends like.



Deaf Connections Cycle to work Wheel with the Glasgow Bike Club! Click link for more



Team Search - Team in Britain Bike Week

bikeweek.org.uk

you would like to receive information about this site, click the button below.

people like Deaf Connections.



Patricia Graham



David Lanny

Facebook social plugin



Deaf person phoning hearing person via online interpreter

Deaf Connections' Involvement in the Campaign for Video Relay Services – VRS Today!

Deaf Connections is involved in a national campaign to inform Deaf people of the benefits of Video Relay Services (VRS) and to lobby the Government for funding.

Our online interpreting service – Sign on Screen, allows Deaf people to communicate with hearing people in British Sign Language rather than English and is an excellent alternative to the current Text Relay service provided by Text Direct.

All that is required is access to a computer with a webcam or a videophone and a broadband connection. This type of service will be available on mobile phones very shortly.



Your language. Your right. Your freedom.

The campaign is coming to Scotland on the 24th and 25th February and it is important that as many Deaf people as possible come along to learn more about VRS, see it in action and more importantly, sign the petition!

The events are taking place as follows:

Thursday 24th February: Glasgow 6:30 – 8:00pm Adobe Arthouse 129 Bath Street

Friday 25th February: Edinburgh 2:00 – 3:30 & 6:30 – 8:00pm Thistle Hotel, Leith Street

<http://www.vrstoday.com/>

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UNITED STATES VRS

SUMMARY

1. Overview

Total Population:	310,877,000
Deaf Population:	400,000
Hard of Hearing Population:	2,000,000
Use Sign as Primary Language:	200,000
No. of Qualified Interpreters:	15,500
Official Language:	English
Name of Sign Language:	ASL (American Sign Language)
VRS Service Schedule:	1995 – 2002 Trials; 2002 Permanent
VRS Vendors:	9 with FCC certification, 20 others
MRS/VRS Funding Model:	VRS funded by levy on all telecommunication service providers for provision as Universal Service

2. Findings

This research summary, *VRS Models in Other Countries – United States*, provides a synopsis of the VRS environment in the United States.

Key Points:

- Relay services that support individuals with disabilities are supported by law based upon the Americans with Disabilities Act of 1990 (ADA) which established the standard of “functionally equivalent” services equal to a hearing person’s access to telephone service.
- The U.S. was early to adopt MRS and VRS
- The Federal Communication Commission (FCC) and the individual states share in the costs of providing traditional relay services (e.g. TTY, Speech-to-Speech) based on interstate vs. intrastate use
- All Internet Protocol based relay services such as IP-Relay and VRS are the sole responsibility of the FCC

- The FCC pays the interstate and IP service (including VRS) costs from the Interstate TRS Fund, through a contracted Administrator that receives, reviews, and authorizes payment for associated relay service providers
- States have their own contracts with traditional relay providers
 - States pay for intrastate non-IP relay traffic
 - States principally fund these services with surcharges on telecommunications service consumers
- Because each state independently provides traditional MRS, there are many MRS providers in the U.S.
- The FCC does not have contracts with the providers that it reimburses for interstate relay costs; it relies on:
 - Its own rules qualifying providers for reimbursement
 - The submission of relay vendor self-certified monthly invoices and reports
- Federal reimbursement for IP services was authorized before adequate safeguards were in place to protect against misuse and fraud
- By allowing an open market, the FCC encouraged entrepreneurs to enter the highly profitable VRS business, which in turn:
 - Helped to satisfy the dramatic growth in consumer demand
 - Offered choices in service providers
 - Lead to opportunities for fraudulent billing and abuse of the service
- The FCC is establishing additional regulatory restrictions on VRS providers to ensure quality of service and to better control fraud
 - These restrictions include regulations on the use of uncertified subcontractors
- New MRS services such as VRS, IP-Relay, or CapTel show significant growth
 - This reduces the use of traditional TTY relay
- The growth of the new relay services greatly exceeds the reduced use of traditional relay
- The growth of new MRS technologies initially surges (often for many years) until consumer demand is satiated, then services stabilize
- Once new services stop their initial growth, usage volumes become predictable
- Because of the open VRS market, many institutions and organizations train interpreters
- Some institutions, such as Gallaudet University, subcontract with relay providers to generate additional revenue by providing VRS call center services with interpreters

UNITED STATES VRS

RESEARCH

1. Demographics

The United States has an estimated total population of 310,877,000.³²³

The numbers of Deaf and hard of hearing in the population are difficult to estimate accurately. Gallaudet University estimates that in the U.S. there are approximately:

- 400,000 Deaf
- Over 2,000,000 hard of hearing
- 200,000 ASL users³²⁴

2. Legal Background

2.1. General Regulatory Background in the United States

The U.S. Federal Communications Commission (FCC) is responsible for interstate telecommunications, networks, broadband, and broadcasting. MRS is called TRS in the United States (Telecommunications Relay Service), and includes VRS and all other forms of relay. TRS falls under the regulatory authority of the FCC. TRS is a national program to provide functionally equivalent access to public network services by persons who are deaf, hard of hearing, or speech disabled.³²⁵

Each state also has authority to regulate telecommunications within its territory. Therefore, in addition to the federal mandates, each of the fifty states (as well as the District of Columbia, Puerto Rico, and the U.S. Virgin Islands) creates and enforces its own laws pertaining to the provision of intra-state telecommunications, including relay services. For example:

- The State of California has its own relay program, the California Relay Service (CRS)

³²³ United States Census Bureau; 2011 Update; U.S. National Census Data 2010

³²⁴ www.gallaudet.edu; Gallaudet University web site; Gallaudet Research Institute; United States

³²⁵ ; www.fcc.gov/aboutus.html; FCC website; About the FCC; What You Need to Know About TRS

- This program is defined in the California statutes (Public Utilities Code section 2881 as a “dual-party relay system”)
- It is operated under the jurisdiction of the California Public Utilities Commission

By federal law, the states were excluded from regulatory authority over the Internet and all Internet-based (Internet protocol —IP) services, including VRS. These Internet-based services remain the jurisdiction of the FCC.

The FCC established federal minimum service requirements for TRS,³²⁶ and has defined many TRS specifications and requirements including:

- The approved relay service modalities (e.g. TTY, Speech-to-speech, Spanish language relay, etc.)
- The separation of the federal government and the states’ regulatory authority
- IP based service providers’ compensation methodology
- The technical requirements of networks and systems
- The minimum qualifications for relay operators (called “Communications Assistants” or “CAs”)

These FCC requirements were, in some instances, broadly defined. For example, the FCC required that TRS providers achieve an Average Speed of Answer (ASA) of 10 seconds or less for a minimum of 85% of all relay calls, reported daily. This minimum requirement was not defined with enough specific detail to ensure that consumers were receiving reasonable access to the relay service. The lack of specificity in the FCC’s ASA minimum requirements allowed providers to average all relay traffic on a 24-hour basis and blend service modalities (such as English language TTY, Speech-to-speech, and Spanish language TTY) into a single daily reported average, resulting in some modalities receiving significantly disparate access.

The FCC does not contract directly with providers. MRS service contracts are between the providers and the individual states. The individual states can develop relay service standards that exceeded the FCC’s minimum. While not all states have the resources or the desire to create more rigorous or thorough specifications, many states refined their requirements before awarding relay service contracts. For example, higher state standards specified in the contracts include:

- More detailed traffic reporting, such as hourly and daily by modality (e.g. Speech-to-Speech or Spanish language services), abandoned calls, ASA by modality, 9-1-1 calls, etc.
- More specific restrictions on the fraudulent use of relay services (e.g. Speech-to-Speech services by those who may not have a disability)

³²⁶ FCC Regulations for the Provision of Telecommunications Relay Services (TRS) pursuant to Title IV of the Americans with Disabilities Act (ADA), Pub. L. No. 101-336, § 401, 104 Stat.327, 366-69 (adding Section 225 to the Communications Act of 1934, as amended, 47 U.S.C. § 225. <http://transition.fcc.gov/cgb/dro/4regs.html>

- Expanded requirements for CA training including:
 - Auditory requirements
 - Educational requirements
 - Typing or ASL skills
 - Training and sensitivity in Deaf culture
 - Studies in disability awareness
- Expanded state auditing authority of providers' sites and services
- Unique state TRS confidentiality statements for both CAs and supervisors
- Clear procedures for identifying, reporting, and correcting service, systems, and network problems.
- Consumer education and outreach

These additional requirements often help states (and providers) to identify and correct shortcomings in consumer service quality such as:

- Excessive wait times during busy hours of the day
- A pattern of unanswered calls for low volume services during the time period of 2 AM – 7 AM

VRS was recognized by the FCC as a transformational technology for its users and, in 2002, became eligible for reimbursement from the Interstate TRS Fund.³²⁷ At the time that VRS was approved for reimbursement by the FCC, the level of specificity in required service standards and reporting was not as detailed as that found in some state TRS contracts.

The FCC regulations have evolved over time; the following abbreviated excerpts are from the FCC's current VRS-specific regulations:³²⁸

§ 64.604 Mandatory minimum standards.

(a) Operational standards — (1) Communications assistant (CA).

(i) TRS providers are responsible for requiring that all CAs be sufficiently trained to effectively meet the specialized communications needs of individuals with hearing and speech disabilities.

³²⁷ Provision of Improved Telecommunications Relay Services and Speech to Speech Services for Individuals with Hearing and speech Disabilities, CC Docket N^o. 98-67, FNPRM 17 FCC Rcd 7779 April 22,2002; 47 C.F.R. § 64.604 © (5) (iii) (TRS Fund)

³²⁸ <http://transition.fcc.gov/cgb/dro/4regs.html>

(iv) TRS providers are responsible for requiring that VRS CAs are qualified interpreters. A “qualified interpreter” is able to interpret effectively, accurately, and impartially, both receptively and expressively, using any necessary specialized vocabulary.

(v) CAs answering and placing a TTY-based TRS or VRS call must stay with the call for a minimum of ten minutes. CAs answering and placing an STS call must stay with the call for a minimum of fifteen minutes.

(vi) TRS providers must make best efforts to accommodate a TRS user's requested CA gender when a call is initiated and, if a transfer occurs, at the time the call is transferred to another CA.

(2) Confidentiality and conversation content.

(i) Except as authorized by section 705 of the Communications Act, 47 U.S.C. 605, CAs are prohibited from disclosing the content of any relayed conversation regardless of content, and with a limited exception for STS CAs, from keeping records of the content of any conversation beyond the duration of a call, even if to do so would be inconsistent with state or local law. STS CAs may retain information from a particular call in order to facilitate the completion of consecutive calls, at the request of the user. The caller may request the STS CA to retain such information, or the CA may ask the caller if he wants the CA to repeat the same information during subsequent calls. The CA may retain the information only for as long as it takes to complete the subsequent calls.

(ii) CAs are prohibited from intentionally altering a relayed conversation and, to the extent that it is not inconsistent with federal, state or local law regarding use of telephone company facilities for illegal purposes, must relay all conversation verbatim unless the relay user specifically requests summarization, or if the user requests interpretation of an ASL call. An STS CA may facilitate the call of an STS user with a speech disability so long as the CA does not interfere with the independence of the user, the user maintains control of the conversation, and the user does not object. Appropriate measures must be taken by relay providers to ensure that confidentiality of VRS users is maintained.

(3) Types of calls.

(i) Consistent with the obligations of telecommunications carrier operators, CAs are prohibited from refusing single or sequential calls or limiting the length of calls utilizing relay services.

(vi) TRS providers are required to provide the following features: (1) Call release functionality; (2) speed dialing functionality; and (3) three-way calling functionality.

(iii) Speed of answer requirements for VRS providers are phased-in as follows: by January 1, 2006, VRS providers must answer 80% of all calls within 180 seconds, measured on a monthly basis; by July 1, 2006, VRS providers must answer 80% of all calls within 150 seconds, measured on a monthly basis; and by January 1, 2007, VRS providers must answer 80% of all calls within 120 seconds, measured on a monthly basis. Abandoned calls shall be included in the VRS speed of answer calculation.

(3) Equal access to interexchange carriers. TRS users shall have access to their chosen interexchange carrier through the TRS, and to all other operator services, to the same extent that such access is provided to voice users.

(4) TRS facilities. (i) TRS shall operate every day, 24 hours a day. Relay services that are not mandated by this Commission need not be provided every day, 24 hours a day, except VRS.

(C) Data collection from TRS providers. TRS providers shall provide the administrator with true and adequate data, and other historical, projected and state rate related information reasonably requested by the administrator, necessary to determine TRS Fund revenue requirements and payments. TRS providers shall provide the administrator with the following: total TRS minutes of use, total interstate TRS minutes of use, total TRS operating expenses and total TRS investment in general accordance with part 32 of this chapter, and other historical or projected information reasonably requested by the administrator for purposes of computing payments and revenue requirements. The administrator and the Commission shall have the authority to examine, verify and audit data received from TRS providers as necessary to assure the accuracy and integrity of TRS Fund payments.

(E) Payments to TRS providers. TRS Fund payments shall be distributed to TRS providers based on formulas approved or modified by the Commission. The administrator shall file schedules of payment formulas with the Commission. Such formulas shall be designed to compensate TRS providers for reasonable costs of providing interstate TRS, and shall be subject to Commission approval. Such formulas shall be based on total monthly interstate TRS minutes of use. TRS minutes of use for purposes of interstate cost recovery under the TRS Fund are defined as the minutes of use for completed interstate TRS calls placed through the TRS center beginning after call set-up and concluding after the last message call unit. In addition to the data required under paragraph (c)(5)(iii)(C) of this section, all TRS providers, including providers who are not interexchange carriers, local exchange carriers, or certified state relay providers, must submit reports of interstate TRS minutes of use to the administrator in order to receive payments. The administrator shall establish procedures to verify payment claims, and may suspend or delay payments to a TRS provider if the TRS provider fails to provide adequate verification of payment upon reasonable request, or if directed by the Commission to do so. The TRS Fund administrator shall make payments only to eligible TRS providers operating pursuant to the mandatory minimum standards as required in §64.604, and after disbursements to the administrator for reasonable expenses incurred by it in connection with TRS Fund administration. TRS providers receiving payments shall file a form prescribed by the administrator. The administrator shall fashion a form that is consistent with parts 32 and 36 procedures reasonably tailored to meet the needs of TRS providers. The Commission shall have authority to audit providers and have access to all data, including carrier specific data, collected by the fund administrator. The fund administrator shall have authority to audit TRS providers reporting data to the administrator. The formulas should appropriately compensate interstate providers for the provision of VRS, whether intrastate or interstate.

(F) TRS providers eligible for receiving payments from the TRS Fund are:

(4) Video Relay Service (VRS) and Internet Protocol (IP) Relay providers certified by the Commission pursuant to §64.606.

As discussed in the *Relay Services* and *Fraudulent Call Volumes and Costs* sections that follow, the FCC stated that there were management issues related to the initial provision of VRS. The FCC has initiated investigations; begun clarifying approved services in their Structure and Practices of the Video Relay Service Program, CG Docket No. 10-51; and has issued and continues to clarify VRS Fraud Orders.³²⁹

In March 2002 VRS was recognized by the FCC as a service that qualified to be reimbursed from the Interstate TRS Fund. A number of abuses of the service followed, and certain individuals and providers distorted the intention of the service for financial gain.³³⁰

To gather consumer and stakeholder feedback on the issues related to the provision of VRS and reports of fraud, the FCC initiated a number of related activities, e.g., Notices of Inquiry, Notices of Proposed Rulemakings, and public workshops.

2.2. Rights of People with Disabilities

The FCC mandated rules for TRS in response to Title IV of the Americans with Disabilities Act of 1990 (ADA) and its impact upon Title 47, U.S. Code, Section 225. The FCC's mandates pertaining to TRS are contained in Title 47, Code of Federal Regulations, Part 64 with the most recent information available on the FCC's website at www.fcc.gov/cgb/dro/trs.html.

The FCC also mandates other national telecommunications standards to ensure access. For example, it requires all states to implement 7-1-1 dialling for access to their TRS provider(s). The significance and impact of this law in the U.S. is described below in *Telecommunications Service Obligations*.

2.3. Telecommunications Service Obligations

Telecommunications Relay Services (TRS) are defined by the FCC as:

Telephone transmission services that provide the ability for an individual who has a hearing or speech disability to engage in communication by wire or radio with a hearing individual in a manner that is functionally equivalent to the ability of an individual who does not have a hearing or speech disability to communicate using voice communication services by wire or radio. Such term includes services that enable two-way communication between an individual who uses a text telephone or other nonvoice terminal device and an individual who does not use such a device, speech-to-speech services, video relay services and non-English relay services. TRS supersedes the terms "dual party relay system," "message relay services," and "TDD Relay."³³¹

³²⁹ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011

³³⁰ See video of that Workshop at http://transition.fcc.gov/live/2009_12_17-workshop.html

³³¹ FCC TRS Rules; § 64.601 Definitions and provisions of general applicability; Section (15)

Unlike the legal or regulatory foundation that supports relay services found in most other countries, the FCC definition of TRS, to satisfy Title IV of the ADA requirement of “functional equivalent,” service is interpreted to mean: services equal to a hearing person’s access to the telephone, with availability 24-hours a day, 7-days a week.³³² For example, the FCC has interpreted “functional equivalency” as access to a relay interpreter (e.g., Communications Assistant —CA) with the same immediacy telephone users have when lifting a handset to access a dial tone.³³³

Each state is independently responsible for acquiring and administrating its own TRS. Typically, TRS is an outsourced service that is contracted and managed by a state agency. For example:

- In California the relay service is known as the California Relay Service (CRS)
 - It is under the management and supervision of the California Public Utilities Commission (CPUC), which has regulatory authority of telecommunications within the state.
 - The CPUC, like similar agencies in other states, has contracted CRS to various providers over the years as a result of a competitively bid Request for Proposals and rigorous vendor selection process.

While traditional TTY relay providers must be certified or contracted by a state in order to receive federal funding for interstate calls, VRS and other forms of IP based relay services need only receive FCC approval as “common carriers” in order to receive federal funds for their services. To facilitate this approval process, the FCC has broadly interpreted its definition of “common carrier” to include IP based relay since the purpose of these services is to provide the functional equivalence of interstate telecommunications service.

2.4. Regulatory Funding of TRS/VRS

Although the law required that the carriers be reimbursed for their costs to provide relay services with only a minimum allowable profit, relay programs evolved into substantially profitable business units for carriers such as AT&T, MCI/WorldCom, and Hamilton Telephone Company. This resulted in significant competition for state relay service contracts (which then also meant additional reimbursement from the federal Interstate TRS Fund for interstate TTY relay traffic.)

At one point, in 2001, there were eight different TRS providers. Services were dominated by Sprint who had contracts with 27 states and MCI who had contracts with 13 states. By percentage of population, these two competitors represented over 77% of the United States. However, as noted below, the consumer preference for IP and video relay services has resulted in dramatic declines in traditional relay traffic, as well as diminished competitive interest in these contracts.

³³² 47 U.S.C. 225(a)(3). See also S. Rep No. 116, 101st Cong., 1st Sess. 77 (1989), discussing the requirement for functional equivalency services.

³³³ While this is the FCC’s interpretation as a goal, it also recognizes the limitations of the ability of TRS providers to achieve parity in all instances. Nevertheless, such interpretation forms the basis for its decisions and regulations.

All states are responsible for reimbursing their TRS Providers monthly for all intrastate calls. States pay rates based on individually bid and awarded contracts with their Providers. Generally speaking, states only contract relay services to a single provider; however, states may have more than one provider, as is the case in California. Each state's relay provider contract is also subject to terms and conditions that may exceed the minimum standards established by the FCC. Unique terms established by the states may include a faster average speed of answer or ASA (e.g., a daily average as low as 3.3 seconds), more detailed reports, or financial commitments for outreach and education. Furthermore, as a condition of their contracts, some states apply liquidated damages or penalties against providers' monthly invoices if the relay services do not satisfy contractual commitments.

The FCC does not contract with providers; it allows certified providers to submit invoices for reimbursement from the TRS Fund based on self reporting, declaring that they have achieved the minimum standards established by the FCC. VRS providers must produce Annual Compliance Reports. These reports typically include:

- Statements certifying current and past compliance with FCC requirements
- Updated status of the provider's adoption and deployment of new VRS requirements
- Signed certification of the report's accuracy by an authorized executive

The FCC authorizes an independent agent to administer the federal Interstate TRS Fund. The Fund Administrator receives invoices from providers that are under contract to the individual states and reimburses them for all interstate and international calls. FCC TRS rates are adjusted annually.

The current TRS federal rates through 30 June are:

- \$2.0256 USD per TTY conversation minute
- \$3.1566 USD per STS conversation minute

The FCC also reimburses, at the appropriate rate:

- 60% of all TTY and STS conversation minutes when the outbound call is to an 800 or 900 number
 - The states pay for the remaining 40% at the individually contracted per minute rates

The Interstate TRS Fund also reimburses providers of VRS at a tiered rate for all VRS calls (intra- and inter-state). The per conversation minute rates for VRS through June 2011 are:³³⁴

Tier I (0 – 50,000 minutes of service during a month)	\$6.2390
Tier II (50,001 – 500,000 minutes of service during a month)	\$6.2334

³³⁴ These rates are likely to be extended well past June 30, 2011. See http://transition.fcc.gov/Daily_Releases/Daily_Business/2011/db0415/FCC-11-62A1.txt

Tier III (500,001 or more minutes of service during a month) \$5.0668

The FCC establishes its reimbursement rates annually for VRS based on an average of the costs of operations as reported by the VRS providers (including small allowances for a other factors.³³⁵) This analysis is performed by the Administrative Agent and the resulting rates (or modified rates) are established by the FCC. The FCC does not release actual cost or reimbursement figures for individual providers or their call centers. The FCC's cost and reimbursement methodology for VRS is presently under review, as the FCC has recognized that the current methodology has significant deficiencies.

The FCC Interstate TRS Fund Administrator is responsible for accounting for payments into the fund received from approximately 5,000 telecommunications common carriers, and disbursing payments to relay providers. These relay providers report their interstate minutes monthly for reimbursement.

Each year, the federal TRS Fund Administrator submits proposed compensation rates to the FCC for consideration and approval. On April 30, 2010, the Fund Administrator (at that time it was the National Exchange Carrier Association, Inc. — NECA) submitted proposed compensation rates, demand projections, projected fund size ,and proposed carrier contributions for July 2010 through June 2011. The proposed compensation rates and fund size estimate were based on the rate methodologies adopted by the Commission in its October 26, 2007 Cost Recovery Order.

Each state has its own methodology for generating the TRS reimbursement funds for the intrastate services they will pay for. For example:

- California funds come from a surcharge paid by California telephone ratepayers as codified in California Public Utilities Code section 2881 et seq.
 - The California surcharge has a present statutory limit of one-half of one percent (0.5%) on all intrastate telephone service (excluding one-way radio paging and universal telephone service)
 - The surcharge appears on California ratepayers' telephone bills under "CA Relay Service and Communications Devices Funds" or similar designation

3. Relay Services in the United States

3.1. Types of User Services Provided

The United States was one of the earliest adopters of nation-wide VRS. This was due primarily to the status of disability rights in the U.S. and the adoption of a regulated telecommunications funded VRS model. The

³³⁵ Such as 1.6% for cash working capital, 3.2% for growth in expenses, and \$0.0083 per minute for ongoing E911 and ten-digit numbering costs, and a small percentage for profit.

FCC has imposed rules regarding VRS call types authorized for reimbursement from the TRS Fund; for example:

- 900 or 976 calls are not approved
- International users may not use U.S. VRS calls unless the call originates from or terminates with a U.S. VRS user
- Translation between languages, e.g., ASL to Spanish, are not reimbursed.
- That VRS users be supplied with a unique ten-digit VRS telephone number
- That calls must be answered in the order received, except calls for 9-1-1 services
- That VRS equipment provided by one vendor must be compatible with the technology of other certified VRS providers
- That providers may not offer financial incentives to use their service over another provider's service

The FCC did not mandate that states or businesses provide VRS. However, the FCC has mandated that certified providers offering VRS must provide service 24 hours a day, 7 days a week. It has also specified minimum standards for quality assurance (e.g., VRS providers must answer 80% of all VRS calls within 120 seconds).³³⁶

The FCC requires formal certification for providers to become eligible to receive compensation directly from the Interstate TRS Fund. In addition to providing an Annual Compliance Report, providers must renew Certifications every five years.

Certified VRS providers often have contracts with individual states for other types of relay such as TTY and Speech-to-Speech. The following providers have current FCC VRS certification, and advertise and promote their services to consumers:

- ATT
- American Network
- CAC (Communication Access Center for the Deaf and Hard of Hearing)
- CSDVRS (Communication Service for the Deaf, Inc.)
- Hamilton Relay
- Lifelinks VRS (Healinc Telecom LLC)
- Purple Communications

³³⁶ <http://www.fcc.gov/cgb/consumerfacts/videorelay.html>. This is different than the 85% of calls answered within 10 seconds for TTY relay.

- Snap VRS
- Sorenson
- Sprint
- ZVRS

Additionally, many of the certified providers subcontract their service to other relay vendors. These subcontractors focus on VRS and usually do not provide other relay services. The following is a list of the additional VRS providers (subcontractors) in the United States:

- ACE VRS
- ASL Services Holdings, LLC
- BISVRS (Birnbaum Interpreting Services)
- CallCodaVRS (CODA VRS Corporation)
- CAAG (Communication Access Ability Group)
- Convo Relay (Convo Communications, LLC)
- Deaf Link VRS (Deaf Link, Inc.)
- Gallaudet University
- Gracias VRS
- IW Relay, Inc.
- LDS VRS
- MalkaVRS (Malka Communications Group, Inc.)
- NationWide VRS
- NorthStar Relay, LLC
- OneVRS (ONE Technologies, LLC)
- PAH Relay
- PowerVRS
- PureVRS
- Say-Hey VRS (Say-Hey, Inc.)
- Sign Language Specialists, Inc.
- SkyVRS
- URRelay (NexTalk, Inc.)

- Viable VRS (Viable, Inc.)
- WINVRS (Western Interpreting Network)

The FCC is taking measures to prohibit this subcontracting arrangement and intends to have VRS provided exclusively by certified providers. The FCC planned on implementing this restriction June 1, 2011 but has now extended the implementation of the order to October 1, and then again to November 15, 2011. If not certified by that time, providers must petition the FCC for a temporary waiver or cease providing VRS until they become certified by the FCC.³³⁷

November 15, 2011 Update: As of this date, the following ‘subcontractor’ providers have been granted conditional certification by the FCC (subject to inspection by the FCC):

- Convo Relay (Convo Communications, LLC)
- ASL Services Holdings, LLC (which also included Gracias VRS)
- CAAG (Communication Access Ability Group)

As of November 15, 2011, the following ‘subcontractor’ providers have been denied FCC certification to provide VRS:

- BISVRS (Birnbaum Interpreting Services)
- CallCodaVRS (CODA VRS Corporation)
- Power VRS
- S & L Deaf Communications LLC
- Say-Hey VRS (Say-Hey, Inc.)

All VRS providers are governed by the same rules and regulations as set forth by the FCC. These rules include requirements for:

- 24/7/365 availability
- Emergency call handling
- Interoperability of technology
- No cost to the consumer for the majority of calls
- Fraud handling and avoidance
- A minimum standard of quality for video relay interpreters
 - (Discussed further in the *Interpreter Resources and Programs* section of this report)

³³⁷ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011

3.2. Current VRS Communication Technologies

VRS was authorized by the FCC in 2002 for reimbursement from the Interstate TRS Fund.³³⁸ Significant growth of both VRS and IP Relay followed, with a corresponding decline in TTY use.³³⁹

Most of the initial VRS providers in the United States used proprietary platforms to support their VRS services. Each of these platforms had different connectivity requirements; often they would not support interoperability between end-users' different hardware and software or between different VRS providers. For early adopters of VRS in the U.S. and elsewhere, interoperability was complicated by non-compatible communication technologies, such as ISDN and ADSL. 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 more open, cross-compatible approach to VRS.

VRS services are now widely available via:

- Traditional videophone hardware
- Computer videophone software applications ("clients")
- Web browser-based clients
- 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, they are moving toward an environment where users can connect to them from almost any broadband or 3G/4G connected device.

VRS users connect to the relay center using many technologies, including:

- Videophones
- Computers with webcams running video chat or proprietary VRS software programs ("clients") that are downloaded and installed on the end users' computers
- Computers with webcams running browser-based chat or VRS software programs (i.e., no software installation required on the end-users' computers)
- Mobile or tablet devices with wireless or cellular Internet connectivity

³³⁸ "The Commission authorizes Internet Protocol relay service as a recognizable TRS service. The Commission finds that IP Relay falls within the statutory definition of TRS and those IP Relay providers are eligible to recover their costs in accordance with Section 225 of the Communications Act of 1934." (www.fcc.gov, TRS history docket) "MRS" is referred to as "TRS" in the United States.

³³⁹ VRS: 1 million minutes 5/2004 grew to 9 million minutes 1/2009; IP Relay: 1 million minutes 9/2002 grew to 7 million minutes 9/2007; TTY: 3 million minutes 1/2002 declined to 500,000 minutes 1/2011. NECA Interstate TRS, Internet, CapTel and VRS Minutes; Actuals January 2002 – August 2010; Projection September 2010 – June 2011 Chart from NECA website; www.NECA.org

Each of these devices and software components has its own minimum hardware and software requirements. Regardless of what type of device or software is used, the user must have a sufficiently fast network connection to successfully transmit video images between the Deaf user and the relay center operator.³⁴⁰

Unlike the proprietary VRS platforms, the nWise MMX VRS platform is available on the open market and is currently deployed in many European Union countries (including: Sweden, Finland, Norway, and Denmark). nWise has a current VRS platform contract with *Say-Hey.tv*, a U.S. based VRS company. The MMX supports connectivity to and from relay users (including video) via a variety of gateways 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
- The public switched telephone network (PSTN)

Another commercially available VRS platform is the AuPix APS-50 which is deployed in a variety of VRS applications including Lifelinks, a VRS provider in the U.S. It also has a high level of compatibility with a variety of gateway protocols and follows the European “Total Conversation” standard.³⁴¹ These include most video and audio protocols, such as:

- Video ITU-T H.323
- Video H.264 and H.263
- Audio G.711
- Optionally, G.729

The AuPix APS-50 also conforms to the industry standard SIP protocol to support a wide range of videophones, set-top boxes, soft phones, and SIP handsets. The company says the system is also capable of transcoding between incompatible standards.

A third commercially available VRS platform is provided by IVèS, a French company. It is also compatible with a variety of gateway protocols, conforms to the industry standard SIP protocol and follows the European “Total Conversation” standard.

³⁴⁰ See this VRS Feasibility Study’s phase 5, *Technologies and Their Forecasts*, for details on hardware, software and network requirements for VRS.

³⁴¹ Total Conversation Standard as defined in the EU describes the availability of simultaneous communication via voice, text and video; Reach 112 Project; Information and Communication Technologies (ICT)

In the United States, IW Relay, operating as a subcontractor for Lifelinks VRS is listed as a customer. The IVèS platform is also deployed in France, Switzerland, Belgium and the United Kingdom.

While a majority of public and private VRS providers have developed or re-engineered their own proprietary call center platforms, nWise, IVèS and AuPix are three commercially available VRS platform solutions that have been installed by U.S. relay providers.

4. Broadband and Connectivity Infrastructure

4.1. Broadband in the United States

Although the United States was an early adopter of VRS, the broadband services that are required to support VRS are not as widely available as in other countries, including Canada.

Most countries define “broadband” as an Internet connection with a minimum download speed of 1.5 Mbps. In the United States, the FCC defines “broadband” as an Internet connection with download speeds as low as 200 kbps.³⁴²

Current initiatives to expand access to broadband are re-defining “broadband” to meet a higher standard. The 2010 U.S. National Broadband Plan set a National Broadband Availability Target that by 2020 every household and business in America should have access to affordable broadband services with *actual* (as opposed to “maximum” or “up to”) download speeds of at least 4 Mbps and *actual* upload speeds of at least 1 Mbps.³⁴³

4.2. Current Broadband Availability in the United States

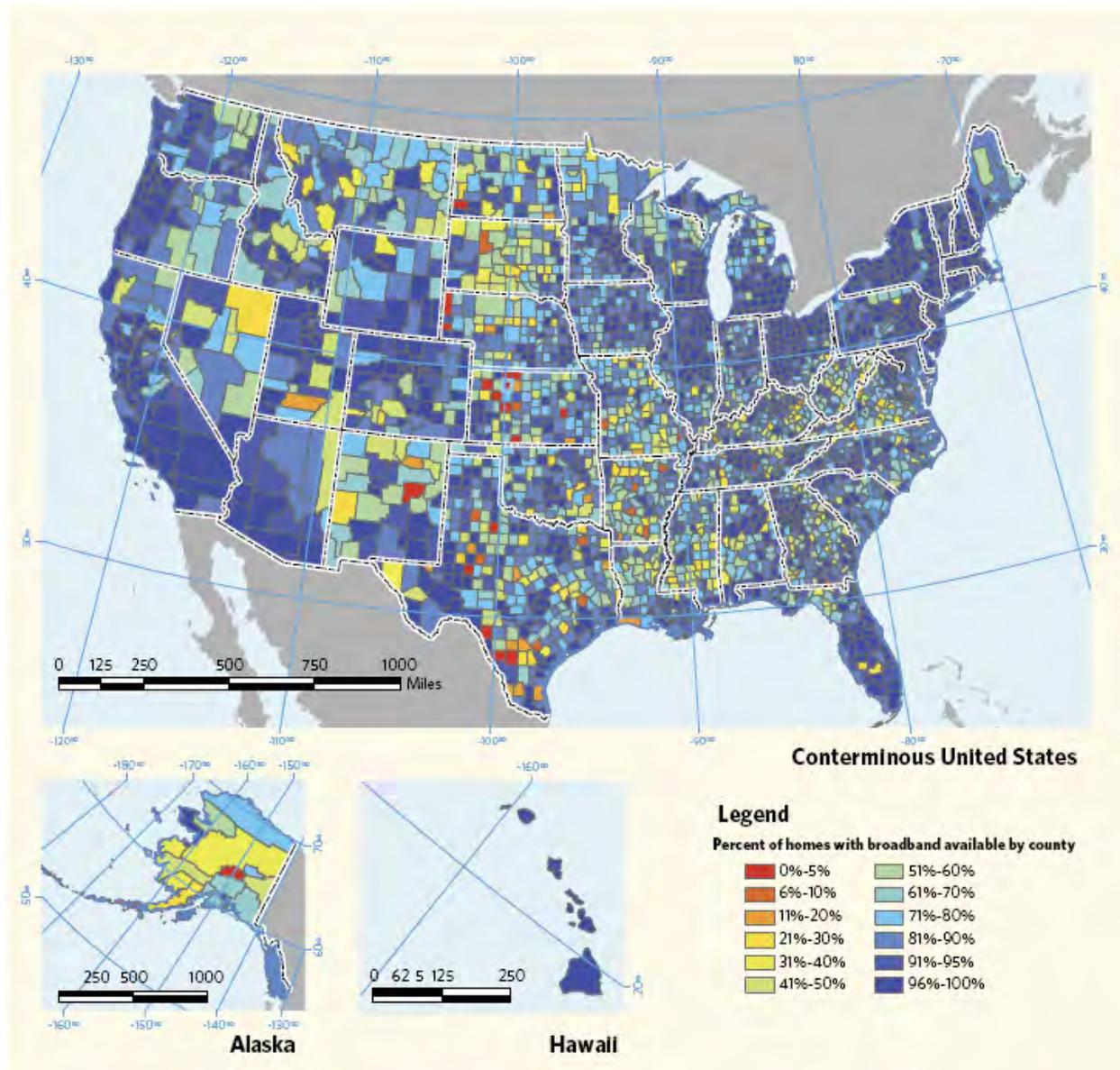
Hardwired/Landline Broadband

The U.S. National Broadband Plan reports that, as of 2009, almost 95% of the U.S. population lives in housing units with access to broadband infrastructure that meets the future target minimum download speed of at least 4 Mbps. However, usage statistics describe much lower broadband adoption rates. The Organisation for Economic Co-Operation and Development (OECD) “Households with Broadband Access” reports that as of 2009, 63.5% of United States households have broadband access (broadband defined as any speed).

³⁴² <http://www.fcc.gov/cgb/consumerfacts/highspeedinternet.html>

³⁴³ United States National Broadband Plan, 2010, Section 8; <http://www.broadband.gov/plan/>

Figure 25: Availability of 4Mbps-Capable Broadband Networks in the U.S. (by County)³⁴⁴



³⁴⁴ United States National Broadband Plan, 2010, Exhibit 3-D; <http://www.broadband.gov/plan/>

Figure 26: US Broadband Availability by Speed, (June 2010) ³⁴⁵

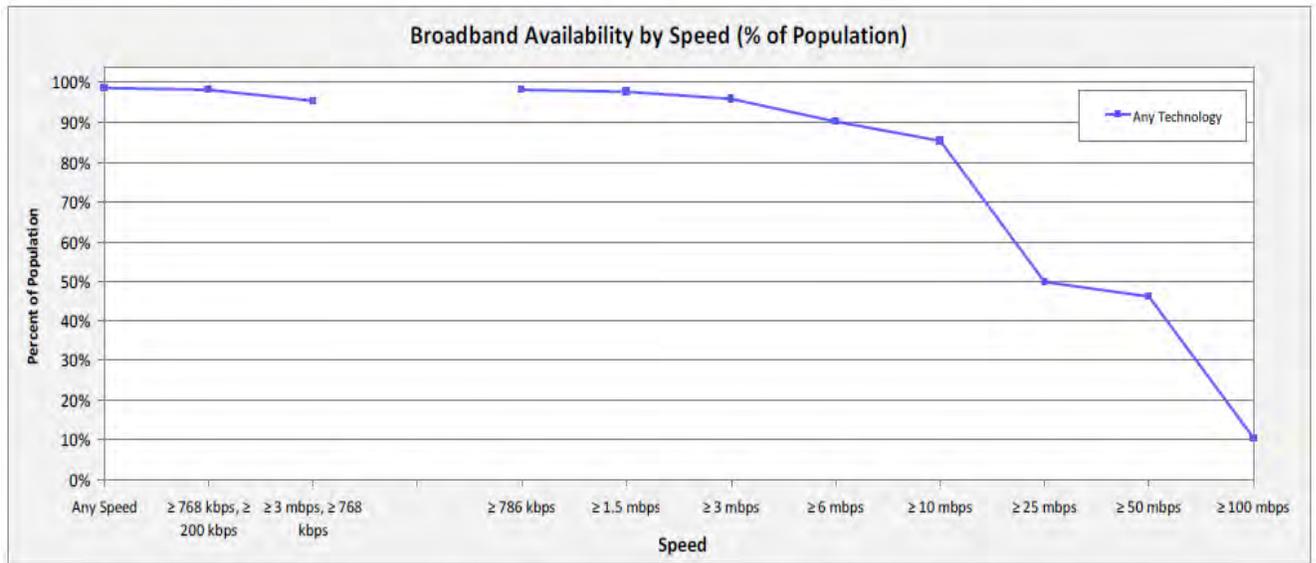
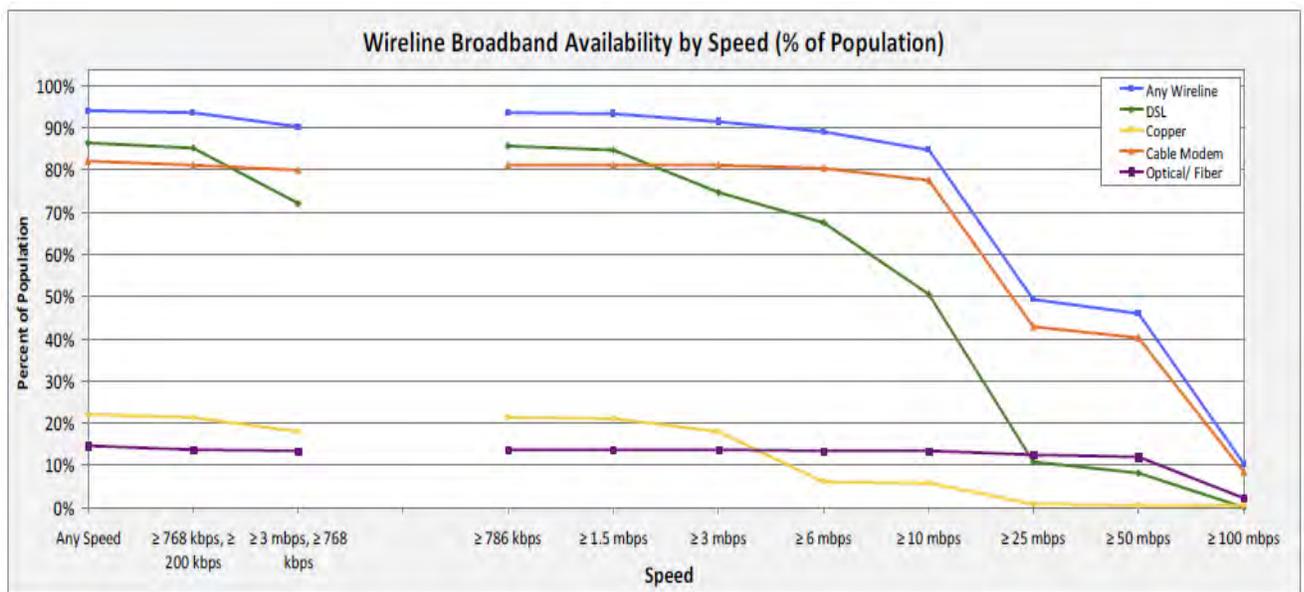


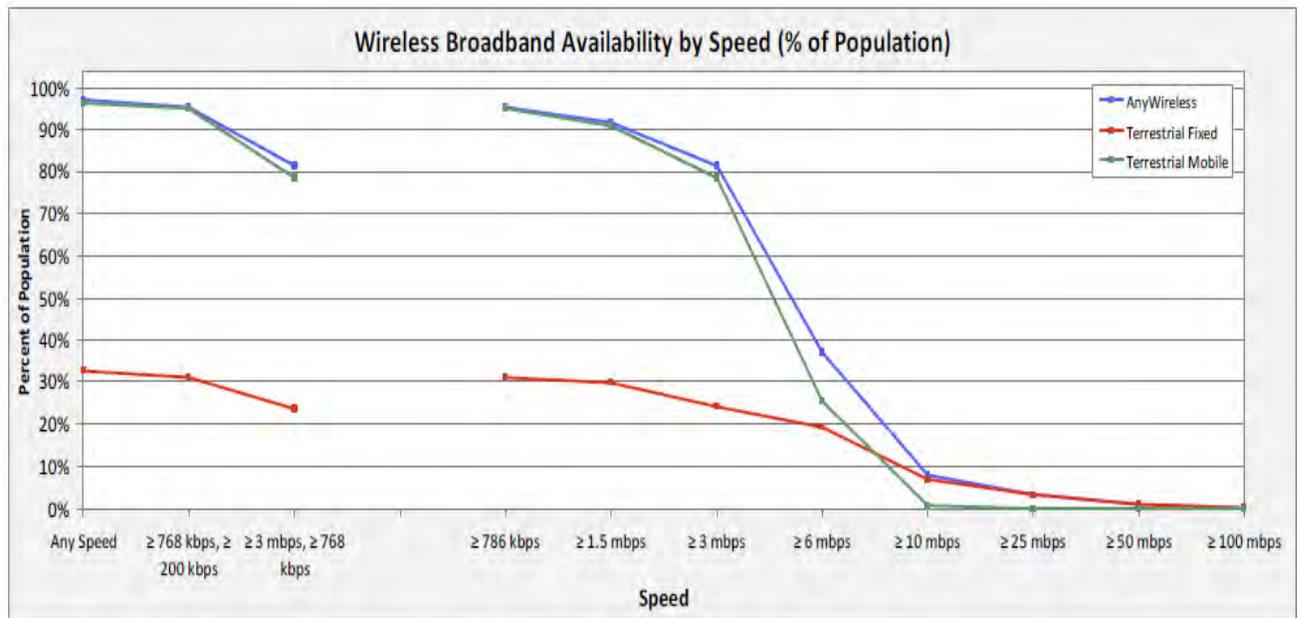
Figure 27: U.S. Wireline Broadband Availability by Speed (June 2010) ³⁴⁶



³⁴⁵ <http://www.broadbandmap.gov/download/reports/national-broadband-map-technology-by-speed.pdf>

³⁴⁶ <http://www.broadbandmap.gov/download/reports/national-broadband-map-technology-by-speed.pdf>

Figure 28: U.S. Wireless Broadband Availability by Speed (June, 2010)³⁴⁷



Cellular/Mobile Broadband Availability

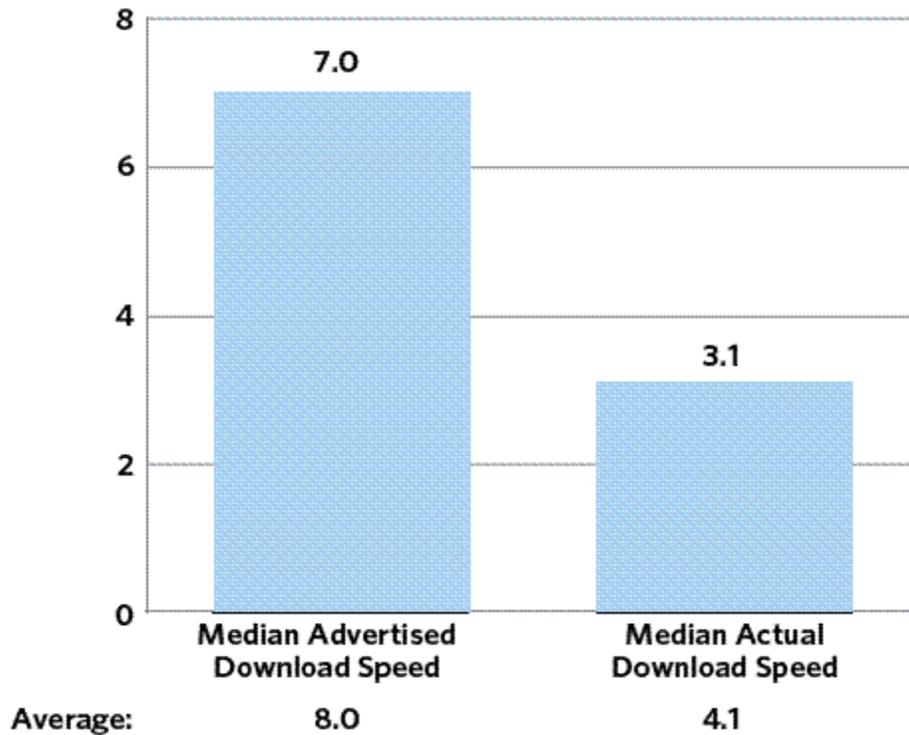
According to American Roamer, a wireless data analytics firm, in November 2009 approximately 60% of the United States was covered by 3G cellular services, however this figure is based on wireless carriers' advertised coverage maps. Actual consumer availability is less than this figure.

Advertised vs. Actual Broadband Speeds

An additional factor in considering broadband availability in the U.S. is the great disparity between advertised and actual broadband speeds:

³⁴⁷ <http://www.broadbandmap.gov/download/reports/national-broadband-map-technology-by-speed.pdf>

Figure 29: Advertised Versus Actual U.S. Fixed Broadband Residential Download Speeds (Mbps)³⁴⁸



5. VRS Usage Volumes

Until 2011, the National Exchange Carrier Association, Inc. (NECA) was the FCC’s administrator for the Interstate TRS Fund. As of July 1, 2011 the new Fund Administrator is Rolka Loube Saltzer Associates, LLC (RLSA). In the past NECA published reports that provided data related to overall usage volumes and specific trends of TRS and VRS usage.

According to a funding estimate published by the FCC, VRS in the United States has:

- A volume of approximately 100 million minutes a year
- Interstate TRS Fund costs of \$562 Million (US) a year or “\$1.123 Billion for 2010 and 2011”³⁴⁹

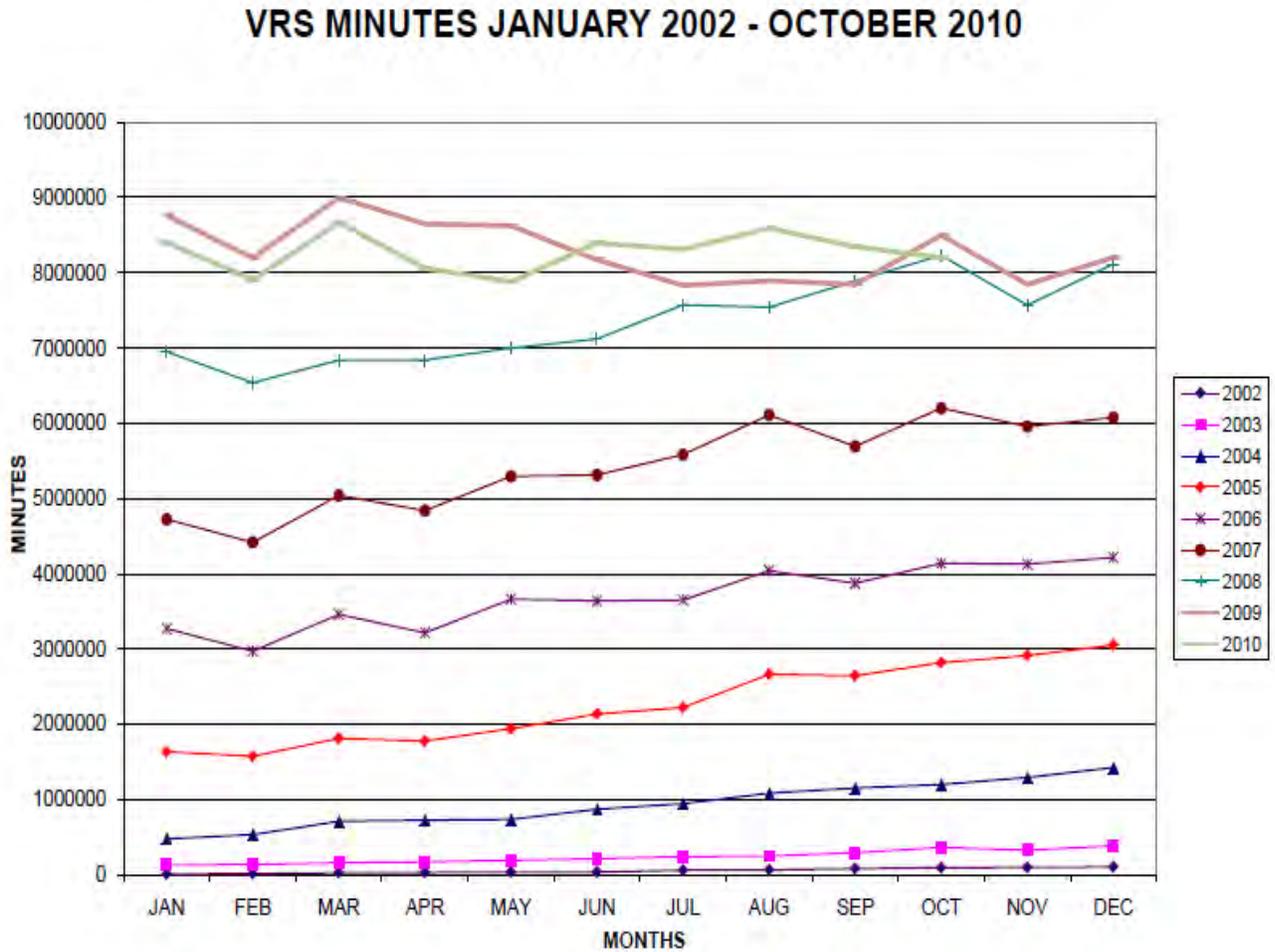
This TRS/VRS traffic is confirmed by Interstate Fund traffic volume reports provided by the NECA. These reports reflect that U.S. VRS traffic volume in 2010 was averaging:

³⁴⁸ United States National Broadband Plan, 2010, Exhibit 3-G; <http://www.broadband.gov/plan/>

³⁴⁹ Federal Communications Commission CG Docket No. 03-123; “Interstate Telecommunications Relay Services Fund Payment formula and Fund Size Estimate”; April 30, 2010

- 2,203,151 calls per month
 - An average of 8,368,705 minutes of use per month³⁵⁰ (See also Appendix A and B)

Figure 30: U.S. VRS Minutes 2002 - 2010



0106 VRS GROWTH.xls Chart3 1/10/2011

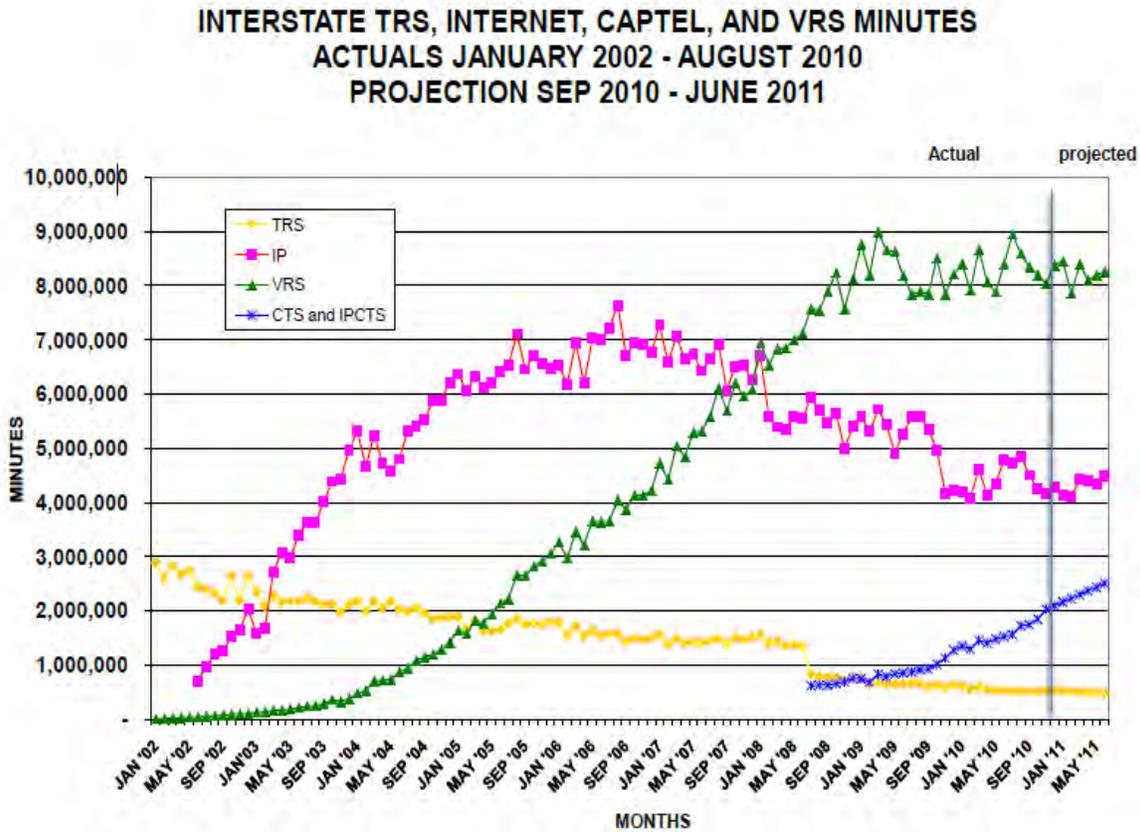
The following charts from the NECA show trends in U.S. VRS traffic.

Comments on figure 30:

³⁵⁰ National Exchange Carriers Association TRS Fund Video Relay Service Terminating Call/Minute Summary 2010

- VRS minutes expanded steadily for the first six years of service
- Monthly totals each year exceeded the same month in the previous year by 1-2 million minutes
- In 2009 and 2010, VRS traffic appears to reach a plateau of approximately 8 million minutes
- The December 2008 level for VRS is similar to December 2009 and 2010

Figure 31: Comparison of Different Modes of Relay, U.S.



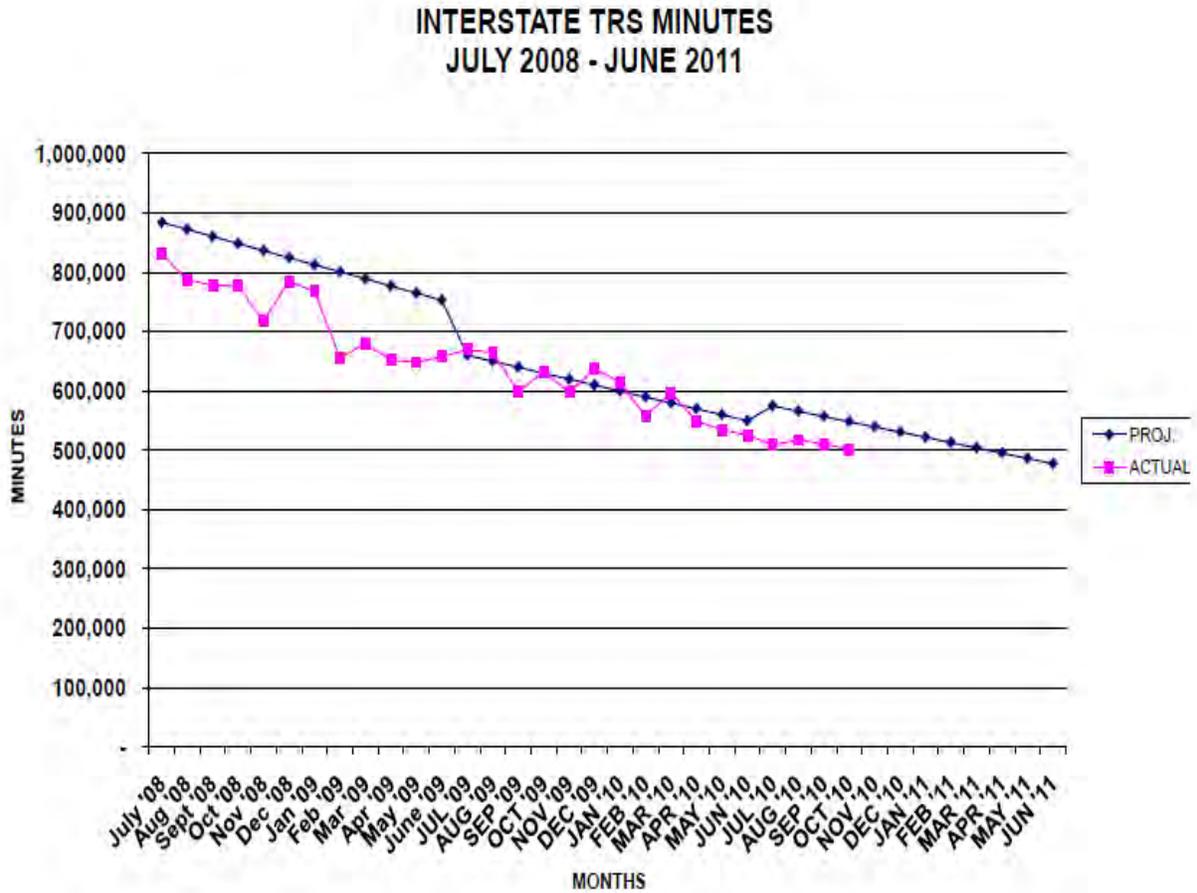
0106 IP GROWTH.xls Chart15 1/10/2011

Comments on figure 31:

- Different technologies have affected the volumes in other sectors as they progress from introduction to maturity
- Traditional TRS volume declines as users migrate to new technologies
- Growth of VRS and IP-Relay far exceed the previous TRS usage or its relative decline
- Both IP relay and VRS use had steep increases in the first few years after introduction and then appeared to level off or decline

- CapTel and IP CapTel (CTS and IPCTS) are the newest service offerings and the only relay service sector that is showing a sharp growth trend

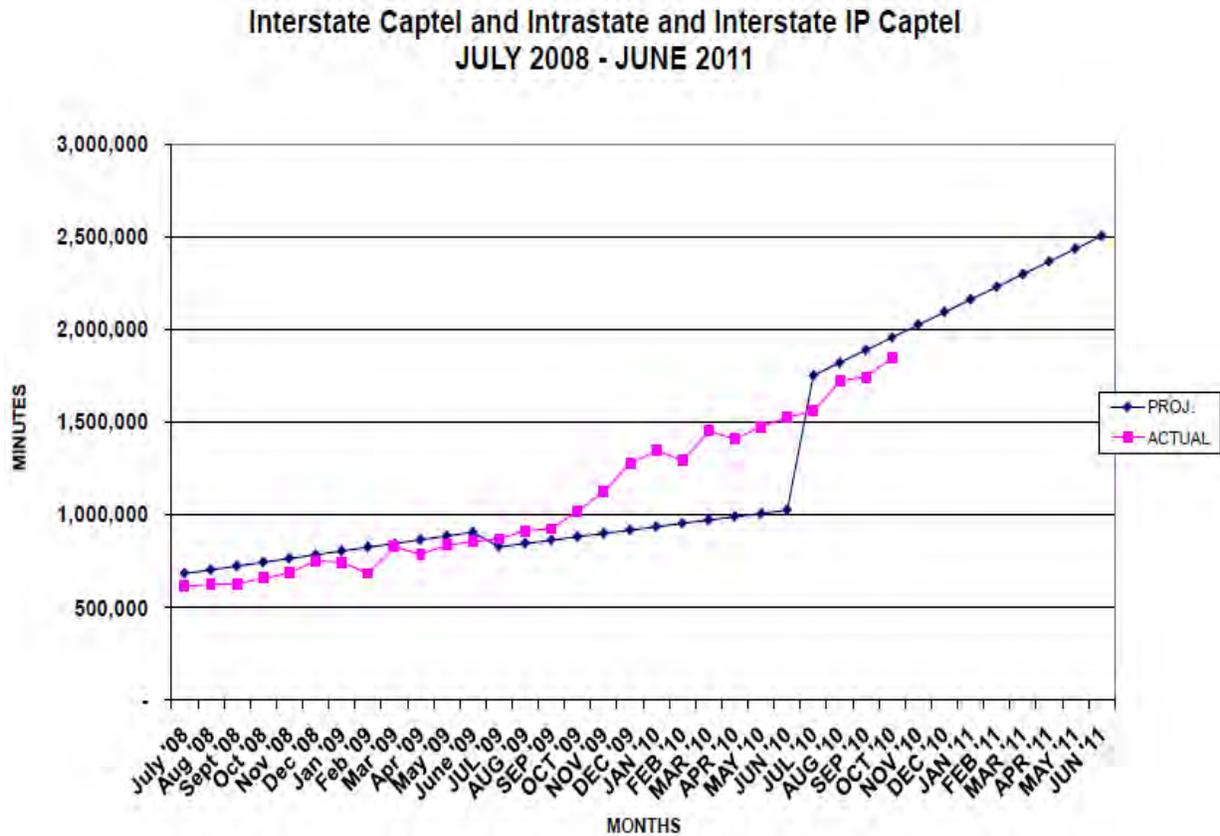
Figure 32: U.S. Interstate TRS Minutes



Comments on figure 32:

- Traditional TRS traffic volumes are declining
- July 2008 demand = 900,000 minutes
- July 2011 projection = 450,000 minutes

Figure 33: Interstate CapTel and IP CapTel Minutes, U.S.



Comments on figure 33:

- This report does not include intrastate CapTel usage as this is paid directly by the individual states that have approved this service
- CapTel and IP CapTel are the newest relay service offerings
- There were 3 years of sustained growth during the introductory period
- July 2008 = 600,000 minutes
- June 2011 = 2,500,000 minutes (projected)

NECA does not report on individual TRS or VRS providers' traffic and, because of the competitive commercial culture of VRS in the US, VRS providers are very reluctant to share operational data or make it public. Most companies provide VRS for profit.

The current VRS market is defined, new users are limited, and the sustained rapid growth of the previous decade is over. Therefore any gains made by one company are at the expense of another. The total revenue in VRS is large but finite and competition is fierce. It is therefore not surprising that none of the VRS providers responded to requests for detailed information and statistics regarding their operations.

6. Fraudulent Call Volumes and Costs

The United States VRS environment has had a high incidence of fraudulent call volumes and costs; other countries have not reported any VRS fraud or misuse. This does not necessarily mean that other countries are exempt from this type of activity; the nature and volume of fraud may be such that they are not being reported or are not triggering changes in regulatory oversight. However, it is likely that the for-profit nature of VRS in the United States, the initial relaxed regulatory environment, and the government's effort to protect the rights of the consumers all combined to create a market conducive to fraud.

When using VRS to commit fraud, offending providers took advantage of privacy rights regulations, knowing that interpreters are not allowed to report the content or particulars of any TRS calls, including VRS. As stated by the FCC in a recent Report and Order: "The (VRS) program's structure has made it vulnerable to fraud and abuse, which have plagued the current program and threatened its long-term sustainability."³⁵¹

Some widely reported methods of abuse by providers include:

- Unlawfully offering financial incentives or rewards to inflate usage volumes and therefore revenue
- Using VRS as an avenue for telemarketing ventures to generate otherwise unnecessary VRS usage
- Finding ways to justify double-recovery of costs for certain business-related calls

One well-publicized case of VRS fraud culminated in the 2009 indictment and arrest of 26 individuals for allegedly manufacturing and billing the VRS Interstate Fund for illegitimate calls. The arrests were made in 9 different states by a joint investigation of FBI, U.S. Postal Service, and FCC Investigative units. Lanny Breuer of the FCC summed up the accusations: "The individuals charged are alleged to have stolen tens of millions of dollars generating fraudulent call minutes by making it appear that Deaf Americans were engaging in legitimate calls with hearing persons."³⁵² The majority of these individuals pleaded guilty or were convicted.

³⁵¹ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011; page 2

³⁵² Lanny A. Breuer; Assistant Attorney General of the FCC Criminal Division; United States Department of Justice; Office of Public Affairs; "Twenty-six Charged in Nationwide Scheme to Defraud the FCC's Video Relay Service Program"; November 19, 2009

The FCC continues to receive allegations of abusive or fraudulent activity conducted by VRS providers or their subcontractors. Some of these allegations include:

- “VRS callers specifically requesting that their calls not be relayed by the VI (Video Interpreter) to the parties that they call;”
- “Calls placed to numbers that do not require any relaying, for example a voice-to-voice call;”
- “Calls initiated from international IP addresses by callers with little or no fluency in ASL where the connection is permitted to ‘run’ (i.e. the line is simply left open without any relaying of the call occurring;”
- “Implementation of ‘double privacy screens’ (i.e. where both users to the video leg of the call block their respective video displays, thus making signed or visual communication impossible);”
- “VRS Vis calling themselves;”
- “VI is connecting videophones/computers and letting them run with no parties participating in the call;”
- “Callers disconnecting from one illegitimate call and immediately calling back to initiate another; and”
- “Callers admitting that they were paid to make TRS calls.”³⁵³

Fraud and abuse aside, the evolving U.S. market was unique; entrepreneurs could easily enter the profitable VRS business, and this resulted in many providers eager to satisfy the rapidly expanding consumer demand for VRS and which, in turn, resulted in many choices for consumers.

As misuse developed, the FCC initially attempted to curb VRS fraud and abuse by admonishing providers about practices that generate VRS calls not typical of consumer use. The FCC also included information on the various schemes that were in violation of the FCC rules, and it released a Declaratory Ruling in which it identified categories of calls and calling practices that were not compensable from the Interstate VRS Fund.

The FCC has become more aggressive in its requirements for and administration of VRS. In a further effort to protect the viability of VRS and the Interstate TRS Fund, the FCC released a new "Report and Order and Further Notice of Proposed Rulemaking" in April 2011. The FCC proposes making changes in the "near future" to the infrastructure of the VRS program to further reduce the incentives for fraud.

Some of the new VRS rules:

“Require that VRS providers submit a statement describing the location and staffing of their call centers twice a year, and a notification at least 30 days prior to any change in the location of such centers;”

³⁵³ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011; pages 6 and 7

“Prohibit VRS communications assistants (CAs)³⁵⁴ from relaying calls from their homes;”

“Prohibit VRS provider arrangements that involve tying minutes or calls processed by a CA to compensation paid or other benefits given to that CA, either individually or as part of a group;”

“Adopt procedures for the resolution of disputed provider payment claims when payment has been suspended;”

“Prohibit compensation for VRS calls that originate from IP addresses that indicate the individual initiating the call is located outside of the United States, with the exception of callers who pre-register with their default provider for a specified time and location of travel;”

“Prohibit VRSR CAs from using visual privacy screens; require VRS CAs to terminate a VRS call, after providing a warning announcement, if either party to the call: (1) enables a privacy screen or similar feature for more than five minutes, unless the call is to 9-1-1 or one of the parties is on hold;”

“Prohibit compensation for VRS calls for remote training when the provider is involved in any way with such training;”

“Require automated recordkeeping of TRS minutes submitted to the Fund;”

“Amend the rules governing data collection from VRS providers to add requirements for the filing of data associated with each VRS call for which a VRS provider is seeking compensation;”

“Require that VRS be offered to the public only in the name of the eligible provider seeking compensation from the Fund, and when sub-brands are used, that these identify such eligible provider;”

“Require that calls to any brand or sub-brand of VRS be routed through a single URL address for that brand or sub-brand;”

“Prohibit revenue sharing agreements for CA or call center functions between entities eligible for compensation from the Fund and non-eligible entities;”

“When an eligible provider has contracts with third parties for non-CA or call center functions, prohibit the third party subcontractor from holding itself out to the public as a VRS provider, and require such contracts to be in writing and made available to the Commission or TRS Fund administrator upon request;”

“Prohibit compensation on a per minute basis for costs related to marketing and outreach costs performed through a subcontractor where such services utilize VRS;”

³⁵⁴ The term “video interpreter,” or “VI” is used to refer to a “communications assistant” (CA) who handles VRS calls. In this list, such individuals are referred to as CAs since the new rules adopted in this *Order* apply to all forms of TRS unless otherwise indicated by the FCC.

“Adopt whistleblower protection rules for current and former employees and contractors of TRS providers;”

“Require that VRS providers submit to audits annually or as deemed appropriate by the Fund administrator or Commission;”

“Require that all Internet-based TRS providers retain all records that support their claims for payment from the Fund for five years; and”

“Make permanent the interim rule requiring the CEO, CFO, or another senior executive of a TRS provider with first-hand knowledge of the accuracy and completeness of the information provided to certify, under penalty of perjury, to the validity of minutes and data submitted to the Fund administrator.”³⁵⁵

The FCC is announcing another major change in this Further Notice of Proposed Rulemaking (FNPR). Currently, there are many VRS providers that independently market and offer VRS, but are not eligible to receive payment from the TRS Fund. These providers have created subcontracting or revenue sharing agreements with eligible, certified providers. Under these arrangements, the eligible provider bills for the calls on behalf of the subcontractor. As of June 1, 2011³⁵⁶ only providers "eligible to receive payment directly from the TRS Fund" may provide VRS in the United States. Under the FCC rules, there are four types of eligible entities:

1. *“a certified state TRS provider or an entity operating relay facilities under contract with a certified state TRS program;”*
2. *“an entity that owns or operates relay facilities under contract with a common carrier providing interstate services;”*
3. *“interstate common carriers offering TRS; and”*
4. *“video relay service and IP relay providers certified by the Commission.”³⁵⁷*

According to the FCC, the primary reason for these changes is that, *“the majority of all the fraud that has been reported to the Commission has been through the use of these ineligible providers, and that all of the individuals indicted to date in the ongoing criminal investigations of fraud in the VRS industry worked for ineligible providers.”³⁵⁸* The large number of ineligible VRS providers effectively renders the FCC’s intended

³⁵⁵ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011; pages 3 and 4

³⁵⁶ Recently extended to Oct 2011.

³⁵⁷ 47 C.F.R. (Code of Federal Regulations); § 64.604©(5)(iii)(F)(1-4)(provider eligibility rules); Telecommunications Relay Services and Speech to Speech Services for Individuals with Hearing and Speech Disabilities, Report and Order and Order on Reconsideration, 20 FCC Rcd 20577 (2005)

³⁵⁸ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011; page 29

eligibility process meaningless, and has further diminished the FCC's ability to monitor and administer the provision of VRS to prevent instances of fraud.

The FCC's new rule has four main components:

1. *"We require that only entities determined to be eligible to receive compensation from the TRS Fund (as outlined above) will be eligible to provide VRS and hold themselves out as providers of VRS to the general public;"*
2. *"We amend our rules to make clear that an eligible provider is prohibited from engaging any third party entity to provide VRS CAs or call center functions (including call distribution, routing, call setup, mapping, call features, billing for compensation from the TRS Fund, and registration), on its behalf, unless that third party entity also is an eligible provider under our rules;"*
3. *"To the extent an eligible provider contracts with or otherwise authorizes a third party to provide any other services or call center functions, that third party entity must not hold itself out to the public as a provider of VRS and must clearly identify the eligible VRS provider to the public;"*
4. *"To provide effective oversight, we require that all third-party contracts or agreements be executed in writing and that copies of these agreements be available to the Commission and the TRS Fund administrator upon request."³⁵⁹*

These changes will represent a significant realignment in VRS operations in the United States. Over 75% of VRS providers currently are not certified by the FCC and, under this ruling, would be ineligible to provide services. Many have already filed for waivers to extend the time required to become eligible, and the FCC has extended the implementation date to October 2011.

Even with these changes, the FCC is still seeking additional ways of curbing VRS fraud.

7. Interpreter Resources and Programs

The Registry of Interpreters for the Deaf (RID) is the national association for professional sign language interpreters in the United States. In addition to working with community and national organizations to represent the field of interpreting, the RID is involved in advocacy and outreach matters that affect interpreters. The RID is also the leading organization in establishing a national standard of quality for American Sign Language interpreters and transliterators.

³⁵⁹ Federal Communications Commission; FCC 11-54; Report and Order and Further Notice of Proposed Rulemaking; CG Docket No. 10-51; Released April 6, 2011; page 30

The issue of VRS interpreter quality is complicated by the fact that the FCC defines VRS interpreters using language that was developed for TRS regulations (for traditional relay without sign language skills).

Both the FCC and the ADA have determined that sign language interpreters working in VRS must be “qualified.” The definition of “qualified interpreter” given by the ADA is, “[one] *who is able to interpret effectively, accurately and impartially both receptively and expressively, using any necessary specialized vocabulary.*”³⁶⁰

This definition is not specific enough to detail how an organization administering VRS would go about quantifying the training and certification required to satisfy the definition. The RID claims that this is a critical point in the set-up and delivery of a successful VRS: “Without the tools or mechanisms to identify who has attained some level of competency, hiring entities are at a loss on how to satisfy the mandates of ADA in locating/providing “qualified” interpreter services.”³⁶¹ The RID has developed the RID National Testing System (NTS), a comprehensive training and education that provides the only means for meeting this requirement for “quality” on a standardized, national level.

The NTS has been evolving since 1970, with national certification available since 1972. The NTS examinations have two components that must be passed before an interpreter is awarded certification: a written test and a performance test. This dual component test was first implemented in 1987. In the meantime, the National Association of the Deaf (NAD) was testing and certifying sign language interpreters under their NAD I through IV certification program. Since then, RID has collaborated with the NAD to combine the certifications from both organizations into a single standardized testing and certification process. This was implemented in 2003 and is still the current test and certification being offered today.

The NTS categorizes the testing and certification of the National Interpreter Certification (NIC) into three different levels. All three levels of the NIC are considered professional level certifications. These levels are:

- NIC: Certified
 - Interpreters at this level have shown basic professional-level interpreting and transliterating skills
- NIC: Advanced
 - Interpreters at this level have scored high on the performance portion of the test and have scored within the standard range on the interview portion
- NIC: Master
 - Interpreters at this level have high scores on both the performance and interview portions of the examination

³⁶⁰ Americans with Disabilities Act Title III § 4.3200

³⁶¹ www.RID.org; Registry of Interpreters for the Deaf website; about RID; State Licensure section; 2011

In addition to the NIC certifications, the RID and the industry providers recognize proficiency certifications awarded by other associations or previous versions of the new NIC standard. These include certifications from:

- The National Association of the Deaf (NAD)
- The American Consortium of Certified Interpreters (ACCI)
- The Educational Interpreter Performance Assessment (EIPA)

To help sign language interpreters stay current in the field and maintain a high skill level, RID requires certified members to earn a specific number of continuing education units (CEUs) every four years. Each CEU is equivalent to 10 hours of training.

- The current requirement is that 8 CEUs (80 hours) must be completed every four years
- 2 CEUs (20 hours) can be earned through general education
- 6 CEUs (60 hours) must be directly related to interpreting and must be categorized as professional studies
- If sign language interpreters do not complete the required number of CEUs, they will lose active RID certification³⁶²

There are many Interpreter Training Programs (ITPs) offered throughout the nation available at the local and regional levels. The U.S. Department of Education, Rehabilitation Services Administration funds many regional training efforts including: classes, workshops, mentorships, and lending libraries. There are also Distance Learning training modules available for interpreters via the Internet. In addition, many colleges and universities throughout the United States have an Interpreter Training Program that prepares individuals for professional certification testing. The RID provides the following example of Interpreter Training Program colleges in California:

³⁶² www.RID.org; Registry of Interpreters for the Deaf website; about RID; State Licensure section; Certification Maintenance Program; 2011

Figure 34: RID Search Web Page³⁶³

Find Interpreter Education Programs

Search

College Name:	Program Type:	City:	State:
<input type="text"/>	<input type="text" value="▼"/>	<input type="text"/>	<input type="text" value="CA"/> <input type="text" value="▼"/>

Find ITP

Now displaying records 1 to 13 of 13.

College Name	Program Type	City	State
American River College	Associate Certificate	Sacramento	CA
California State University at Northridge	Bachelor	Northridge	CA
California State University Fresno	Bachelor	Fresno	CA
El Camino College		Torrance	CA
Glendale Community College		Glendale	CA
Golden West College	Associate Certificate	Huntington Beach	CA
Los Angeles Pierce Community College		Woodland Hills	CA
Mount San Antonio College	Associate Certificate	Walnut	CA
Ohlone College - Interpreter Preparation Program		Fremont	CA
Oxnard College	Associate Certificate	Oxnard	CA
Palomar Community College	Associate Certificate	San Marcos	CA
Riverside Community College	Associate Certificate	Riverside	CA
San Diego Mesa College - Interpreter Training Program	Associate Certificate	San Diego	CA

Search for a post-secondary program offering interpreter education. A variety of certificates and degree programs are offered. If you cannot locate one in your area, try searching for programs with distance learning opportunities.

Although the United States has by far the highest number of qualified professional interpreters, 15,500, the demand for their services is so great that there continues to be a need for more trained interpreters to enter the profession.³⁶⁴

The passing of the ADA legislation along with the advent of new services such as VRS have created an environment that continues to expand the need for qualified sign language interpreters. Since VRS (and in most cases VRI) is provided as a profitable service in the United States, providers are able to offer higher wages. This draws experienced sign language interpreters away from other services such as:

- Educational interpreting
 - (Deaf schools, Universities, mainstream academia, etc.)

³⁶³ www.rid.org; RID website Interpreter Education Programs searchable database; June 2011

³⁶⁴ www.RID.org; Registry of Interpreters for the Deaf website; about RID; Interpreters

- Community interpreting
 - (work, social, legal, medical, legislative, business, etc.)

RID states that the issue of inadequate supply that began in the 1990s is still very prevalent in the United States interpreting industry: “This landmark legislation (ADA) transformed the face of professional interpreting and caused the demand for interpreting services to soar to unprecedented heights. The interpreting profession is still faced with an inadequate supply of individuals to meet the growing demand.”³⁶⁵ This is confirmed by the National Association of the Deaf (NAD): “There’s always a demand for skilled interpreters who can sign fluently and read another person’s signing well. The demand for qualified interpreters exists in many settings.”³⁶⁶

8. Access to Emergency Services

As of 2008, the providers of Internet-based relay services (IP relay and VRS) in the United States have been directed by new rules from the FCC governing 9-1-1 emergency calls. These are intended to ensure that the users of IP relay and VRS services receive 9-1-1 emergency call treatment that is comparable to the treatment received by traditional network relay users. The intent is to minimize “public safety risks that would result from an internet-based TRS provider’s failure to complete a 911 call properly, including passing location-identifying information to the applicable emergency services organization.”³⁶⁷

These rules apply to VRS providers regardless of the equipment or software used by consumers of Internet-based relay services. According to the FCC: “whether a consumer is placing a 9-1-1 emergency call via Internet-based TRS using customized equipment and software provided by a VRS provider, off-the-shelf hardware and software that might be purchased or acquired from a source other than the VRS provider, or some combination thereof, Internet-based TRS (VRS) providers must fully comply. ... VRS providers that are not in compliance will be ineligible for compensation from the interstate relay fund and may also be subjected to “severe penalties, including substantial monetary forfeitures.”³⁶⁸

Some of the 9-1-1 emergency call handling requirements for VRS providers under these rules include:

³⁶⁵ www.RID.org; Registry of Interpreters for the Deaf website; about RID; State Licensure section; 2011

³⁶⁶ www.nad.org/issues/american-sign-language-interpreting; National Association of the Deaf website; Interpreting American Sign Language section

³⁶⁷ Federal Communications Commission; Telecommunications Relay services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; E911 Requirements for IP-Enabled Service Providers; Report and Order and further Notice of Proposed Rulemaking, 23 FCC Rcd 11591 (2008)

³⁶⁸ Federal Communications Commission; FCC Enforcement Advisory No. 2011-05, DA 11-304; Enforcement Bureau Reminds Internet-Based telecommunications Relay Service Providers of Emergency Calling Requirements

“VRS providers must transmit all 9-1-1 calls – as well as automatic number identification (ANI, generally the caller’s 10-digit number), the caller’s registered location,³⁶⁹ the name of the VRS provider, and the communication assistant’s (CA’s) identification number for each call – to the public safety answering point (PSAP), or other appropriate local emergency authority that serves the caller’s registered location;”

“VRS providers must answer incoming emergency calls before any non-emergency call, i.e., prioritize the emergency calls and move them to the top of the queue;”

“VRS providers must route all 9-1-1 calls through the use of ANI, and, if necessary, pseudo-ANI, via the dedicated wireline E9-1-1 network to the PSAP, or appropriate local emergency authority that serves the caller’s registered location;”

“If the video relay service is capable of being used from more than one location, the VRS provider must offer the consumer one or more methods of updating his or her registered location at will and in a timely manner. At least one of those methods must allow the user to update his or her registered location from the equipment he or she uses to access VRS;”

“In the event that one or both legs of the emergency call (i.e., either between the VRS user and the CA or between the CA and the PSAP/other emergency authority) is disconnected, the VRS provider must immediately re-establish contact with the VRS user and/or the appropriate PSAP or other emergency authority.”³⁷⁰

9. VRS Education and Outreach Programs

The implementation of VRS in any country must be accompanied by public education and outreach. Some goals of these education programs are to inform consumers on how to access the services, educate consumers about the rules of service, and assist consumers in navigating the technologies.

Education and outreach are also necessary for the hearing parties involved in a VRS session, since they are often the most unfamiliar and tend to reject relay calls from Deaf people due to lack of knowledge about the service.

The FCC provides information on its website explaining what VRS is and including pertinent information regarding some of the regulatory aspects of the service as well as information on complaint filing procedures.³⁷¹

³⁶⁹ Video Relay service providers must obtain from their users the physical location at which the service will first be used when the user registers for a 10-digit number, and must provide an easy way for users to update their information if it changes. 47 C.F.R. § 64.605(a)(4)

³⁷⁰ Federal Communications Commission; Telecommunications Relay services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; E911 Requirements for IP-Enabled Service Providers; Report and Order and further Notice of Proposed Rulemaking, 23 FCC Rcd 11591 (2008)

³⁷¹ <http://transition.fcc.gov/cgb/consumerfacts/vidorelay.pdf>

In the U.S., the competitive model of VRS has created a marketplace in which many VRS providers, both large and small, compete for market share. Most providers offer extensive resources on their websites including technical information, Frequently Asked Questions (FAQ), and information on how to use and access their services.

The most successful form of consumer education was initiated by Sorenson, which provided free video phone equipment, personally delivered and set up by a Deaf installer who also provided personalized instruction on how to use the Sorenson system – all via ASL. This sustained approach garnered Sorenson market dominance, estimated by some to be between 75 -85 percent.

Many providers also conduct marketing and outreach at regional Deaf events. For example, VRS providers will set up booths at Deaf events (e.g. Deaf Expo, Deaf Awareness Day Events, etc.). They also make use of social networking sites such as Facebook and Deaf video blog websites to promote their services. Some VRS providers have a history of significant financial contributions and sponsorships to Deaf organizations who in turn make the providers services known to their members.

This type of outreach is usually marketing based and attempts to familiarize consumers with a particular company. Due to the competitive nature of the U.S. VRS market, most public education and outreach conducted by a provider will focus mainly on that particular company and will be designed to promote its services. For example, one smaller provider markets itself as a service that uses interpreters who have Deaf family members; this is done to attract consumers who prefer and value cultural mediation in their interpretations.³⁷² Other companies promote themselves as Deaf-run VRS services to promote Deaf equality in the business world.

Due to this focus on competitive marketing, many regional advocacy groups also provide public education and outreach in order to provide unbiased information related to VRS. This information includes:³⁷³

- Cultural differences between etiquettes of hearing and Deaf individuals
- Information about telephone technologies (e.g. phone menu systems)
- Strategies to ensure acceptance of calls (e.g. how to introduce the call, stating the main point, etc.)
- Options and variations among particular VRS vendors
- Legal information and American with Disabilities Act (ADA) rights in regard to VRS

In addition, many of these advocacy centers offer access to a videophone to make VRS calls for individuals who cannot afford or do not have access to the service. A national organization, the Video Relay Services Consumer Association (VRSCA), established a communication forum website to share information regarding the regulatory aspects of VRS and to encourage consumers to get involved in the rule making aspects of the FCC.

³⁷² <http://www.callcodavrs.net/>

³⁷³ <http://www.norcalcenter.org/commedu>

Lastly, as is common in the Deaf community, education often occurs through collective networking and information sharing throughout the community.

APPENDIX A

VIDEO RELAY SERVICE TERMINATING CALL/MINUTE SUMMARY												
MONTH:	JUL 2010		AUG 2010		SEPT 2010		OCT 2010		NOV 2010		DEC 2010	
STATE/CATEGORY	TERM CALLS	TERM MIN	TERM CALLS	TERM MIN								
ALABAMA	28,426	73,711	27,553	75,218	25,995	71,276	25,456	67,685	24,848	67,232		
ALASKA	2,481	8,298	2,510	8,748	2,705	8,915	2,718	8,600	2,487	8,877		
AMERICAN SAMOA	0	0	0	0	0	0	0	0	0	0		
ARIZONA	38,129	136,174	43,124	149,107	40,747	140,925	40,401	137,959	40,318	137,993		
ARKANSAS	12,884	38,893	12,943	39,023	12,985	36,983	13,128	37,843	13,412	38,708		
CALIFORNIA	185,295	599,508	206,282	633,811	198,288	616,893	197,635	615,271	183,228	600,688		
COLORADO	27,417	91,468	29,363	100,632	28,680	94,193	27,335	90,483	27,217	92,559		
CONNECTICUT	16,385	58,508	18,921	59,360	19,079	59,244	20,489	62,482	20,381	63,359		
DELAWARE	5,804	15,790	5,506	16,341	4,883	14,399	5,415	16,078	5,616	17,940		
DISTRICT OF COLUMBIA	14,108	53,145	15,817	56,009	16,332	56,289	16,820	56,356	16,435	54,792		
FLORIDA	141,685	446,248	149,275	462,787	142,817	456,515	140,187	436,350	138,013	435,505		
GEORGIA	41,505	126,044	43,378	135,665	40,827	125,837	41,412	128,887	38,568	125,081		
HAWAII	76	262	82	382	56	292	53	225	82	178		
IDAHO	3,339	10,528	3,895	12,119	3,854	12,199	3,751	11,732	3,896	12,782		
ILLINOIS	6,366	21,067	6,407	20,709	6,271	19,916	6,505	20,820	6,483	22,886		
INDIANA	66,294	209,502	69,672	220,892	67,680	213,126	67,568	215,011	67,028	215,282		
IOWA	42,710	131,931	44,892	141,775	42,049	132,584	40,347	128,447	41,006	130,900		
KANSAS	13,031	46,187	14,008	51,801	13,618	48,368	13,907	48,719	12,533	46,123		
KENTUCKY	14,968	50,338	15,781	53,091	14,452	48,497	14,400	48,095	14,405	50,433		
KY	25,979	77,772	27,318	83,860	26,736	83,524	26,185	78,783	25,229	76,632		
LOUISIANA	28,927	78,051	26,541	77,188	25,462	78,021	23,519	66,612	23,863	71,797		
MAINE	5,880	18,595	6,714	22,294	6,971	22,853	6,933	21,915	7,110	23,391		
MARYLAND	51,194	167,255	54,287	175,760	50,543	162,042	50,895	165,677	50,841	167,739		
MASSACHUSETTS	37,410	114,324	39,820	123,999	39,860	125,361	41,232	128,402	39,282	120,983		
MICHIGAN	49,790	145,041	49,871	143,286	48,916	145,022	50,322	148,842	49,098	144,786		
MINNESOTA	28,803	97,805	29,054	101,259	28,455	97,156	28,443	104,834	28,655	108,810		
MISSISSIPPI	11,188	32,184	11,423	33,721	10,760	31,457	10,216	29,621	10,591	30,168		
MISSOURI	29,705	92,719	31,834	102,701	29,278	91,229	28,941	88,582	28,142	89,567		
MONTANA	3,488	11,253	3,531	11,232	2,895	8,928	2,918	9,512	3,278	10,750		
NEBRASKA	11,357	32,857	11,930	35,518	11,527	34,813	10,379	32,809	10,541	34,062		
NEVADA	16,391	67,193	13,597	48,549	13,383	50,857	13,181	46,596	13,113	48,486		
NEW HAMPSHIRE	4,707	13,750	4,948	14,877	4,740	14,003	5,246	14,448	5,637	15,313		
NEW JERSEY	44,354	132,349	45,623	134,039	42,390	130,368	43,254	131,798	41,783	123,635		
NEW MEXICO	9,305	29,373	10,913	34,692	10,632	33,731	10,419	32,601	10,455	34,132		
NEW YORK	122,298	365,520	124,862	376,289	124,065	378,766	127,317	382,945	123,770	378,839		
NORTH CAROLINA	52,848	160,848	55,703	172,755	53,526	163,906	51,745	154,925	52,774	156,682		
NORTH DAKOTA	1,885	5,843	2,063	6,323	2,063	6,659	2,227	7,176	2,012	6,086		
Northern Mariana Islands	4	45	1	11	2	15	0	0	5	37		
OHIO	68,169	208,580	69,132	216,618	67,689	214,934	68,010	212,527	66,834	208,325		
OKLAHOMA	19,400	58,698	20,378	62,572	19,360	62,389	19,143	60,635	18,583	57,840		
OREGON	20,221	67,030	21,894	71,883	19,570	68,711	20,719	69,361	20,852	71,686		
PENNSYLVANIA	87,511	269,504	87,502	269,760	84,753	263,993	86,636	212,232	85,225	268,321		
PUERTO RICO	14,188	41,453	16,085	45,866	14,153	40,239	15,308	42,183	14,478	40,488		
RHODE ISLAND	5,847	15,275	5,844	15,727	5,859	14,909	5,472	13,310	5,127	14,114		
SOUTH CAROLINA	21,393	62,183	20,265	60,228	19,478	61,687	19,009	60,149	19,317	57,618		
SOUTH DAKOTA	4,308	13,634	4,480	15,199	3,967	12,857	4,353	15,947	4,803	17,231		
TENNESSEE	29,886	91,234	32,758	106,061	29,195	94,124	28,699	92,902	28,952	99,854		
TEXAS	139,819	441,325	145,811	469,040	137,985	448,294	138,183	438,814	134,802	436,100		
UTAH	17,388	59,639	18,174	63,508	16,873	68,811	15,181	52,602	15,800	54,779		
VERMONT	4,263	12,938	4,445	13,295	3,877	12,554	4,364	14,296	4,600	14,951		
VIRGIN ISLANDS	1,132	4,970	599	2,341	618	2,385	683	2,404	710	2,204		
VIRGINIA	38,105	128,007	38,191	130,759	37,715	127,335	38,032	123,058	37,239	124,680		
WASHINGTON	33,238	110,310	34,738	113,038	34,549	117,712	32,833	111,038	33,872	111,912		
WEST VIRGINIA	8,517	28,516	8,054	26,080	7,260	24,939	7,631	27,048	7,677	27,193		
WISCONSIN	33,098	99,804	33,875	106,886	32,009	103,070	31,441	99,723	33,671	109,579		
WYOMING	1,181	3,992	1,357	4,081	1,033	3,398	1,001	2,881	977	3,719		
SUB-TOTAL	1,730,752	5,402,145	1,804,308	5,669,141	1,729,263	5,497,465	1,726,537	5,431,005	1,707,304	5,429,537	0	0
INTERNATIONAL	34,507	184,948	33,740	178,898	34,192	177,737	34,006	179,467	32,608	176,812		
TOLL FREE NUMBERS	278,968	2,599,781	282,943	2,641,027	275,339	2,561,780	269,992	2,485,756	275,919	2,552,254		
900 NUMBERS	6	1	1	0	9	2	7	2	5	1		
OTHERS	149,613	138,903	157,472	142,981	154,752	143,610	152,851	137,759	150,665	132,938		
SUB-TOTAL	463,094	2,923,633	474,156	2,962,706	464,292	2,883,109	456,856	2,782,983	459,195	2,861,805	0	0
TOTAL	2,193,846	8,325,779	2,278,464	8,631,847	2,193,555	8,380,574	2,183,393	8,213,988	2,166,499	8,291,341	0	0
Avg. call length	4		4		4		4		4		#DIV/0!	
Providers Reporting	8		9		9		9		9		9	

2010 Nov VRSTERM CALL Summary.xls

APPENDIX B

VIDEO RELAY SERVICE TERMINATING CALL/MINUTE SUMMARY													TOTAL		STATE/CATEGORY
JAN 2011		FEB 2011		MAR 2011		APR 2011		MAY 2011		JUN 2011		TERM CALLS	TERM MIN		
TERM CALLS	TERM MIN	TERM CALLS	TERM MIN	TERM CALLS	TERM MIN	TERM CALLS	TERM MIN	TERM CALLS	TERM MIN	TERM CALLS	TERM MIN	TERM CALLS	TERM MIN		
												130,278	355,120	ALABAMA	
												12,901	43,436	ALASKA	
												0	0	AMERICAN SAMOA	
												202,719	701,160	ARIZONA	
												66,352	191,248	ARKANSAS	
												990,726	3,056,242	CALIFORNIA	
												140,012	469,313	COLORADO	
												99,255	300,953	CONNECTICUT	
												27,224	50,549	DELAWARE	
												79,512	278,591	DISTRICT OF COLUMBIA	
												711,857	2,240,405	FLORIDA	
												205,488	641,518	GEORGIA	
												329	1,340	GUAM	
												18,705	59,340	HAWAII	
												32,034	105,399	IDAHO	
												337,122	1,073,813	ILLINOIS	
												210,804	665,631	INDIANA	
												87,187	241,178	IOWA	
												74,004	250,451	KANSAS	
												131,425	400,802	KENTUCKY	
												126,312	374,668	LOUISIANA	
												33,608	109,049	MAINE	
												267,760	838,373	MARYLAND	
												167,604	612,148	MASSACHUSETTS	
												247,787	728,971	MICHIGAN	
												145,470	559,765	MINNESOTA	
												54,175	157,151	MISSISSIPPI	
												147,900	464,789	MISSOURI	
												18,110	51,674	MONTANA	
												55,734	170,056	NEBRASKA	
												69,665	281,682	NEVADA	
												25,278	72,391	NEW HAMPSHIRE	
												217,404	652,189	NEW JERSEY	
												51,724	164,330	NEW MEXICO	
												822,310	1,883,658	NEW YORK	
												266,564	810,887	NORTH CAROLINA	
												10,260	32,087	NORTH DAKOTA	
												12	109	Northern Mariana Islands	
												339,834	1,062,983	OHIO	
												96,862	302,134	OKLAHOMA	
												103,055	348,472	OREGON	
												331,627	1,043,303	PENNSYLVANIA	
												74,212	210,028	PUERTO RICO	
												28,049	73,334	RHODE ISLAND	
												99,462	301,865	SOUTH CAROLINA	
												21,911	74,868	SOUTH DAKOTA	
												150,360	484,194	TENNESSEE	
												694,600	2,233,574	TEXAS	
												83,394	299,339	UTAH	
												21,549	68,032	VERMONT	
												3,742	14,303	VIRGIN ISLANDS	
												190,282	631,850	VIRGINIA	
												169,028	564,019	WASHINGTON	
												39,139	133,778	WEST VIRGINIA	
												193,894	618,862	WISCONSIN	
												5,549	17,771	WYOMING	
												8,698,164	27,429,293	SUB-TOTAL	
												162,051	897,462	INTERNATIONAL	
												1,383,161	12,820,576	TOLL-FREE NUMBERS	
												28	5	800 NUMBERS	
												765,353	696,191	OTHERS	
												2,317,593	14,414,281	SUB-TOTAL	
												11,015,757	41,843,336	TOTAL	
#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!			4		

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Phase 5:

Technologies and their Forecasts

VRS Feasibility Study

Mission Consulting

February 24, 2012

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TECHNOLOGIES AND THEIR FORECASTS

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the fifth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 5 research summary, *Technologies and Their Forecasts*, reviews the technologies currently or projected to be available to deliver VRS to the consumer. This research includes:

- Historical background of VRS technologies
- Transmission speeds necessary for VRS
- Broadband availability to Canadian consumers
- Plans or initiatives to expand the reach of broadband
- Average costs of broadband, by type, to the consumer
- Terminal devices that support VRS
- Terminal equipment costs and complexity
- Other technical considerations
- Future technology trends

2. Summary Findings

Salient points of this analysis of current and future technologies for VRS include the following:

- Communications access technologies for Deaf and hard of hearing individuals have progressed along with general communications technology advancements.
- While a variety of factors affect the functionality of VRS, one of the most significant factors is the two-way transmission speeds between the end-user and the VRS provider.
- Canada has a very high level of available access to the Internet at speeds sufficient to support VRS, (i.e., broadband access).

- Although Canada has significant broadband *availability*, it is unclear what percentage of the Deaf and disabled population are currently *subscribers* of high-speed broadband.
- Actual versus advertised broadband speeds will need to be understood by VRS end-users when they select Internet connectivity packages.
- Internet Service Provider and Wireless Service Provider contracts, data capacities, and overage charges may present financial and service satisfaction challenges for VRS users.
- As technology devices and service costs have become more affordable, many potential VRS users are able to afford a variety of computers, laptops, tablets, and smartphones. Therefore, VRS end-users will expect VRS services that can be accessed from many different devices and network connections.
- Consumer technical assistance in the installation and operation of VRS will most likely be required.
- The explosive growth of 3G and 4G wireless networks and devices will likely increase expectations for VRS services over wireless networks and mobile devices.
- Other potential technical considerations include interoperability, fraud prevention or mitigation, quality of service, and call distribution options. These types of considerations will need to be balanced against non-technical considerations.
- Advancements in automated technologies, such as computer generated interpreting of sign language may hold the promise to provide additional video and sign language interpreting options in the future, but it is uncertain that these technologies will be robust or accurate enough to satisfy the personal interaction generally required in relay services.

3. Conclusion

Developments in technologies directly pertinent to VRS have in recent years have progressed in many areas. New highly capable technical products such as computers, mobile devices and videophones offer consumers unprecedented communication capabilities. These together with the very high availability of wired and wireless broadband to almost all Canadians, and advances in VRS provider services, all indicate that there are no technical barriers to implementing VRS in Canada.

The primary challenges to selecting and implementing the technical VRS solutions will be non-technical, such as consumer education and training, cost considerations, and other policy and program issues, which will be explored in other phases of this VRS Feasibility Study.

TECHNOLOGIES AND THEIR FORECASTS

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the fifth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 5 research summary, *Technologies and Their Forecasts*, reviews the technologies currently or projected to be available to deliver VRS to the consumer. This research includes:

- Historical background of VRS technologies
- Transmission speeds necessary for VRS
- Broadband availability to Canadian consumers
- Plans or initiatives to expand the reach of broadband
- Average costs of broadband, by type, to the consumer
- Terminal devices that support VRS
- Terminal equipment costs and complexity

- Other technical considerations
- Future technology trends

2. Historical Background

The Deaf and hard of hearing communities have used technology to communicate over telephone networks for almost 50 years. The technology that first enabled this was the development of the TTY (teletypewriter) in 1964.¹ The TTY was invented in the United States and became a de facto standard there. Later developments evolved as it was adopted in Canada and around the world. The TTY is a typewriter-like device with a keyboard, a small electronic screen to display text, and optionally a small tape printer to print the text. TTYs plug into a standard phone line jack or they use of an acoustic coupler to connect to a standard telephone handset. The text is transmitted live over the telephone network via the distinct tones generated by the different keys to another device (e.g., a TTY) that uses a similar communication protocol. There are many different TTY communication protocols. The original TTY standard was the Baudot code.² Other TTY protocols include DTMF, EDT, V.21, V.18, V.23 and TurboCode.³ These protocols have been adopted by different countries and are not always compatible. For example, V.21 is more common in the UK and some EU countries, while Baudot and TurboCode is more widely used in Canada and the U.S. In 1994, V.18 was announced as the standard TTY protocol by the ITU (the International Telecommunications Union).

As TTYs were adopted by consumers in the United States, small community-based or private relay services were developed to relay conversations between the TTY user and a hearing telephone user. Eventually these relay services were replaced by relay centers operated or contracted by the regional telephone companies. These relay centers provide message relay services (MRS) to all telephone company customers, so that the consumers with a TTY can communicate to anyone served by a telephone line and telephone. With the advent of advances in TTY technology, these larger relay centers also offered additional communication modalities such as Hearing Carry Over (HCO) and Voice Carry Over (VCO), which enable the relay operator to only relay specific portions of the call according to the desire of the consumer.⁴

The advent of text paging, cell phone texting, mobile smartphones, computers and the Internet have revolutionized the accessibility options available to the Deaf and hard of hearing all around the world.

¹ The TTY is also known as a TDD (telecommunications device for the Deaf). In Europe it is commonly referred to as a textphone, and in the United Kingdom it is called a minicom.

² The Baudot protocol runs asynchronously at 45.5 or 50 baud, 1 start bit, 5 data bits, and 1.5 stop bits.

³ TurboCode is a proprietary but popular code of Ultratec TTYs. See www.ultratec.com/support/turbocode.php.

⁴ HCO allows the TTY user to hear the voice of the distant party. VCO allows the TTY user to speak for his or her self.

In 2002 MCI⁵ started offering Internet-based access to its relay call centers. This service, which became known as IP Relay, used a text chat feature similar to instant messaging between the consumer and the relay operator. This freed the consumer from the need to have a TTY to make a relay call, and also allowed for additional features and faster transmission times. IP Relay is a “major technological advance for the Deaf community,” said Steve Johnson, MCI’s Vice President of Information Services and Solutions.⁶

IP Relay was authorized in the United States by the FCC in 2002.⁷ IP Relay services were mandated in Canada in 2009 when the CRTC directed all Canadian LECs to provide IP Relay services by July 21, 2010⁸. Significant growth of IP Relay has been documented in the United States, with a corresponding decline in TTY use. However, due to implementation delays, at the time of this writing⁹ many Deaf and hard of hearing Canadians still rely upon traditional TTY relay to communicate with voice telephone users.

Compared to signed or spoken conversation, text relay is slow and cumbersome. In a regular conversation people are able to interrupt each other as the flow of the communication goes back and forth. With most text relay, it is impossible to interrupt the other caller or at best interruptions involve delays in the communication.¹⁰ In addition, when using TTY relay or IP relay the operator usually has to ask the hearing person to “slow down” or “repeat” something they said because the relay operator cannot type as fast as the hearing person is speaking.¹¹ This creates unnatural breaks in the communication and causes a stunted and slowed dialogue. Finally, most Deaf people use sign language as their primary language and may be more limited with their writing and/or typing abilities (e.g., written French or English). Because they are depending on typed text relay to communicate with others, this slows the communication process and creates additional challenges for people with disabilities, especially in a business environment.

⁵ Known as WorldCom, later purchased by Verizon.

⁶ WorldCom News; History, Questions, Answers and Updates, 2002

⁷ “The Commission authorizes Internet Protocol relay service as a recognizable TRS service. The Commission finds that IP Relay falls within the statutory definition of TRS and those IP Relay providers are eligible to recover their costs in accordance with Section 225 of the Communications Act of 1934.” (www.fcc.gov, TRS history docket) “MRS” is referred to as “TRS” in the United States.

⁸ CRTC Broadcasting and Telecom Regulatory Policy 2009-430, at <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>. Also note that implementation is delayed in some telephone territories.

⁹ May 15, 2011.

¹⁰ Conversations between two devices that use TurboCode can interrupt each other.

¹¹ Spoken conversation averages 200 words a minute, while TTYs transmit at 60 words a minute and IP relay is limited to typing speed which usually falls between 60 and 100 words per minute. (CRTC report shows 40 – 50 wpm: Bell Canada(CRTC) 10 June 2008-100c) PN 2008-8_Attachment 2 Abridged Page 14 of 24; The Future of Bell Relay Services; The Pelorus Group; Prepared for Bell Canada; October, 2004.

Video Relay Service (VRS) is similar to text relay in that it uses a relay operator to communicate with the hearing population.¹² VRS is dissimilar to text relay in that the consumer communicates via sign language to the relay operator, at a conversational pace limited by the sign language abilities of the user. It is easy for all parties to interrupt each other as the speed of sign-to-sign communication is similar to that of an oral conversation. The relay operator is able to use sign language to interpret what the hearing person is saying at the same speed and flow, so the need to “slow down” is removed. Ultimately, the Deaf community is able to use their native language, e.g., LSQ, ASL, to communicate effectively and efficiently with others. Therefore, VRS offers a solution to many of the challenges of text-based relay communications. The technology to enable VRS has matured to a point that the available network and systems potentially make this service widely accessible.

Video relay works by connecting a Deaf consumer with the relay center operator in a two-way visual method to enable the use of sign language, a visual language.¹³ The Deaf person uses a camera capable of video transmission to capture their image so it can be seen by the video relay operator (Video Interpreter or VI). In turn, the VI has a camera 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.

The VRS user can connect to the relay center operator through any of several devices:

- a videophone;
- a computer with a web camera running video chat or a proprietary video relay software program (also called a client) which is downloaded and installed on the end user’s computer;
- a computer with web camera running a browser-based chat or video relay software program (i.e., no software installation required on the end-user’s computer); or
- a mobile or tablet device with wireless or cellular Internet connectivity.

Each of these devices and software components has its own minimum hardware and software requirements. However, regardless of what type of device or software is used, the user must have a sufficiently fast network connection, to successfully transmit the video images between the Deaf user and the relay center operator. See section 3 for information about network types and speeds, and section 6 for information about the various types of video hardware and software presently in use with VRS.

¹² Video relay operators are often referred to as “video interpreters” or VI”.

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 and do not need the assistance of a video relay operator (VI). Similarly, VRI (video remote interpreting) is different in that the Deaf user is in the same room as the hearing person. 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 Message Relay Service (MRS) and is discussed in this VRS Feasibility Study’s Phase 8 deliverable, Ancillary Services.

3. Minimal two-way transmission speeds necessary for functional VRS

The factors that affect the function and quality of VRS include the following:

- Transmission speed
- Network factors, such as latency
- Transport Protocols
- Compression/Codec
- Device Frames Per Second (FPS)
- Device video resolution
- Functional screen size (especially for mobile devices), functional camera angle

Of all these factors, a most basic consideration for the use of VRS in a home or consumer environment is sufficient two-way transmission speed, i.e. a “broadband” Internet connection.

3.1. Definition of Broadband

“Broadband” is a relative term, technically referring to a telecommunication methodology, but generally used to mean higher speed than dial-up or ISDN technologies. For home Internet connectivity, broadband usually refers to DSL or Cable connections.

“Broadband” in Canada is specified by the CRTC as connectivity with a minimum download speed of 1.5 Mbps and a target speed of 5 Mbps (as opposed to “Basic services” below or equal to 1.5 Mbps)¹⁴.

While the International Telecommunications Union Standardization Sector (ITU-T) defines broadband as 1.5 to 2 Mbps, other nations and agencies define broadband at different speeds. For example, in the United States the FCC has defined broadband as Internet connectivity with download speeds as low as 200 Kbps¹⁵. The Organisation for Economic Co-operation and Development (OECD) defines broadband as connections “providing Internet access at speeds higher than 256 Kbps¹⁶”, however they note that some European Union member States gather data based on a broadband definition of 144 Kbps. Other countries, such as Norway, have defined both wireless and fixed broadband as “access to data transmission services with a perceived bit-rate of at least 640 Kbps downstream and 128 Kbps upstream”¹⁷, and Italian coverage rates reported to the OECD were based on a broadband definition of connections enabling at least 640 Kbps download. Other nations use rates similar to or higher than

¹⁴ CRTC Communications Monitoring Report 2011, Appendix 4, Page 4, <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2011/cmr.htm>.

¹⁵ FCC “Getting Broadband”, <http://www.fcc.gov/guides/getting-broadband>. The FCC defined speed is generally too slow to effectively support VRS. See section 3.2.1 of this paper.

¹⁶ 2009 OECD Report: Indicators of Broadband Coverage, <http://www.oecd.org/dataoecd/41/39/44381795.pdf>, Page 38.

¹⁷ Ibid, Page 39.

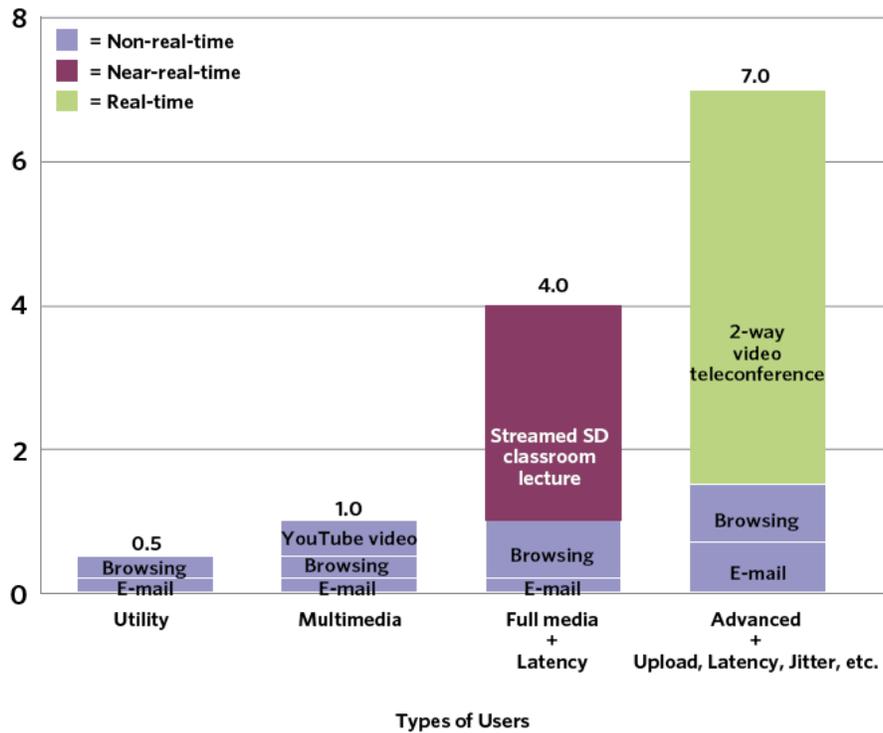
Canada's definition. Sweden for example defines broadband rates as being above 2 Mbps (download) and Turkey uses 1 Mbps¹⁸.

It bears noting that while many cable service Internet connections are faster than DSL, a cable broadband connection is a shared connection, or node. Therefore a cable consumer's Internet speed is subject to network congestion. When a node is congested, both available upstream and downstream transmission are slower than the published maximum rates.

While network speed is a primary factor affecting VRS functionality, the end-users' individual computers or local connections also are a significant factor. For example, a five-year-old PC with an inexpensive video card and web camera may not have the memory, processing power, graphics memory and speed to successfully enable VRS or run a VRS provider's software. Another example could be a scenario in which a user is connecting to VRS with a sufficiently fast and powerful computer, or a stand-alone videophone device, and a fast Internet connection -- but the fast Internet connection is shared with multiple other users in the household, all of whom are accessing the Internet at the same time. The end result may be slow or jittery video, and may even create timeouts in the connection to the video relay service. As web-accessible and Wi-Fi-ready devices become increasingly prevalent in the home, it is not uncommon for an individual who lives alone to have multiple devices accessing the home Internet connection at the same time. *Figure 1: Actual Download Speeds Necessary to Run Concurrent Applications (Mbps)* shows an example of the increased demand on a users' Internet connection with concurrent applications running.

¹⁸ Ibid, Page 39.

Figure 1: Actual Download Speeds Necessary to Run Concurrent Applications (Mbps)¹⁹



3.1.1. Reliability of Broadband Services

Another factor of consumer or home-based broadband services is that most Internet Service Providers do not guarantee minimum speeds or throughput, nor do they guarantee 24/7 functionality. However, since the Internet has become such an integral component of people’s lives most ISPs have matured home Internet service technologies sufficiently as to minimize Internet connectivity disruptions.²⁰

In conjunction with broadband network service reliability is the consideration that the device connected to the Internet is also dependent upon reliable local electrical power. These factors represent risks to all users who rely on the Internet as their only form of communication for emergency purposes.

¹⁹ United States FCC National Broadband Report, Exhibit 3-C, <http://www.broadband.gov/plan/3-current-state-of-the-ecosystem/>

²⁰ Unlike the public switched telephone network (PSTN) with a P.01 grade of service and an engineered reliability of 99.999%, there are no downtime regulations on Broadband availability to write into a service contract guaranteeing connectivity and stability.

3.2. Individual VRS Vendor Requirements

3.2.1. Vendor Platforms

Historically, most initial VRS providers used proprietary platforms to support their VRS services. Each of these platforms had different connectivity requirements, and often they would not support interoperability between end-users' different hardware/software or between different VRS providers. For early adopters of VRS in the U.S. and elsewhere this interoperability was complicated by non-compatible communication technologies, such as ISDN versus ADSL.

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 (called 'clients'), 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, providers are moving toward an environment where users can connect to them from almost any broadband or 3G/4G connected device.

Users in Sweden, for example, can call VRS using just about any device –any IP connected video telephones, web clients, or 3G telephones. Additionally, approved videophones in Sweden follow a European “Total Conversation” standard²¹ in which users can choose to use video, speech, and/or text at the same time.²² The Total Conversation methodology is at the heart of one of the leading VRS platform developers, nWise and its nWise MMX platform. The nWise MMX platform is currently being used in EU countries such as Sweden, Finland, Norway, Denmark and Germany to provide video relay services, and meets ETSI (European Telecom Standards Institute) requirements for open platforms and universal services. It supports connectivity to and from video relay users via a variety of Gateways 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.

Another commercially available VRS call center platform is the AuPix APS-50 which is deployed in a variety of video applications including Lifelinks, a VRS provider in the U.S. It also has a high level of compatibility with a variety of Gateway protocols and follows the European “Total Conversation” standard. These include most video and audio protocols such as Video ITU-T H.323, Video H.264 and H.263, Audio G.711 and optionally G.729. The AuPix APS-50 conforms to the industry standard SIP protocol to support a wide range of videophones, set-top boxes, soft phones and SIP handsets. In addition, the company says the system is capable of transcoding between incompatible standards.

²¹ 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, <http://www.itu.int/rec/T-REC-F.703-200011-I/en>.

²² See the Sweden section of this VRS Feasibility Study's phase 4, *VRS Models in Other Countries*.

Therefore while a majority of public and private Video Relay service providers around the globe have developed or re-engineered their own proprietary call center platforms, nWise MMX and AuPix APS-50 are two commercially available VRS platform solutions that have been successfully deployed in multiple countries.

An example of a country that has evolved to more open/compatible systems is Australia. Australia began video relay services on a closed, proprietary platform. Eventually Australia moved to a system which utilizes the Skype standard, since Skype is a functioning platform with a significant installation base. Furthermore, Skype is a technology familiar to most of their Deaf Internet users.

There are many other VRS vendor requirements that are determined by the technical platform of the selected VRS provider. These requirements can be divided into two categories, those that benefit the consumer (Deaf user) and those that benefit the administrative control or regulatory agency of a country. For example:

1. Consumer Requirements

- a. Call distribution to services and queues (provides equal access to next available video interpreter (VI) or to a VI with an appropriate skill set)
- b. Queue messages in video, text and voice
- c. Voice carry over
- d. Hearing carry over
- e. Accessibility and ease of use
- f. Active directory
- g. Video and voice conferencing
- h. Text function for clarifying names, places, etc.
- i. Audio and video prompts assuring user of place in queue
- j. Video mail
- k. Interoperability with other videophone or device hardware/software
- l. Quality of Service (QOS)

2. Administrative Requirements

- a. Call distribution to services and queues (provides efficiency within VI resource pool)
- b. Interoperability with database systems, invoicing systems, etc.
- c. Call Detail Record (CDR) records and reports
 - 1) Call duration
 - 2) Set-up time
 - 3) Billing info. (Long Distance vs. local or regional)
 - 4) Staffing levels, affecting average speed of answer (ASA)
 - 5) Abandoned calls
 - 6) Skill sets reports (different languages, conference calls, modalities, etc.)
 - 7) Many other reports
- d. Transfer of video call to other VI's (skill set, teaming, staffing)
- e. Measurement of users connection speeds or software compatibility
- f. Ability of VI to log into multiple queues (bilingual, etc.)

The itemization above is not a complete or exhaustive list and developers are continuing to offer enhancements. The applicable features would be determined by each country's regulatory body as it defines requirements in formal requests for proposals and in the vendor selection process, and as legislation or regulations are passed to require certain minimum services and standards. The above are examples of what individual VRS vendor requirements may contain, some of which may be optional, to illustrate how much the functionality of VRS is affected by the technical requirements that are specified.

For example, a significant consumer complaint about some early VRS providers in the U.S. was that users of one provider's VRS services were dependent upon a videophone supplied by the vendor that could not access other VRS providers or communicate point-to-point with Deaf users who did not have that vendor's hardware.²³ This lack of interoperability is declining as technology trends towards allowing open, standard IP access.

3.2.2. Vendor Connectivity Requirements

While many VRS providers or Videophone vendors specify only "high-speed Internet" or "broadband" as a speed or connectivity requirement, several specify 256 kbps upstream and down as a minimum, with 512kbps as a recommended minimum in both directions. The following table summarizes some VRS providers' specific Internet speed recommendations or requirements. Note that the minimum speeds may not produce the quality of service desired by most VRS consumers, and many consumers may elect to have significantly higher speeds.

²³ In the U.S. the lack of device interoperability by the dominant VRS provider (Sorenson) was finally 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.

Table 1: VRS Vendor Bandwidth Requirements

Vendor / Country	Minimum Upload / Download Speed	Recommended Upload / Download Speed At Least	Maximum Latency or Other Requirements
Ace Relay Service (Australia)	512 kbps up/down		Using Skype
American VRS (United States)		512 KB up/down	
AT&T Video Link (Software) (United States)		400 kbps up/down	
MMX / nWise (used by several EU providers)	Determined by individual implementation		
New Zealand Relay (New Zealand)	256 kbps up/down		
Purple – HoVRS (United States)	128 kbps up/down	256 kbps up/down	
Purple MVP videophone (United States)		256 kbps up/down	
Sorenson (United States)		256 kbps up/down	
Sprint (United States)		256 kbps up/down	
Tadeo (France)	512 kbps up/down		
Telus (British Columbia VRS Trial)	1.5 Mbps down ²⁴		
ZVRS (United States)	1.5 Mbps up/down	512 kbps up/down	Less than 100 ms latency

3.2.3. Skype

Although not a VRS provider, Skype is utilized heavily by consumers including those in the Deaf community for point-to-point video communication. VRS services are also provided over Skype such as Ace Video Relay Service in Australia.

Skype has been at the forefront of Internet video technology, and was one of the first commercial companies to bring free video communication to consumers.

While recognizing Ace Video Relay’s minimum VRS requirements above, Skype’s bandwidth recommendations are as follows:

²⁴ Application for Participation in Telus Video Relay Service Trial on DeafBC.ca, <http://deafbc.ca/wp-content/uploads/2010/06/VRS-Trial-Info.pdf>.

Table 2 - Skype Bandwidth Recommendations²⁵

Video Call Type	Minimum Download/Upload speed	Recommended Download/Upload speed
Video Call (low quality)	128 kpbs / 128 kpbs	300 kpbs / 300 kpbs
Video Call (high quality)	400 kpbs / 400 kpbs	500 kpbs / 500 kpbs
HD Video Call	1.2 Mbps / 1.2 Mbps	1.5 Mbps / 1.5 Mbps
Group (3 people) Video Call	512 kpbs / 128 kpbs	2 Mbps / 512 kpbs

3.2.4. Canadian VRS Trials

In Canada a VRS trial is currently being conducted in British Columbia and Alberta by Telus, with Sorenson as the contracted VRS provider. Telus required that participants in the trial have Telus ADSL service at a minimum of 1.5 Mbps download speed.²⁶ The minimum appropriate Telus service plan is the Telus “High Speed” plan; which has an advertised download speed of 1.5 to 6.0 Mbps, an upload speed of “up to” 1.0 Mbps, and a 75 GB/month usage cap (with an overage fee of \$2 per additional GB used). The cost for this plan is the responsibility of the trial participants, and is currently published as \$34 per month.

The Telus VRS trial also allows participants to make point-to-point calls between Sorenson provided video equipment users, without using a relay operator.

3.3. Advertised Versus Actual Broadband Speeds

Most consumers do not actually connect at the speeds advertised by their Internet Service Providers, and in fact are frequently connecting at half the advertised “up to” or maximum speed.

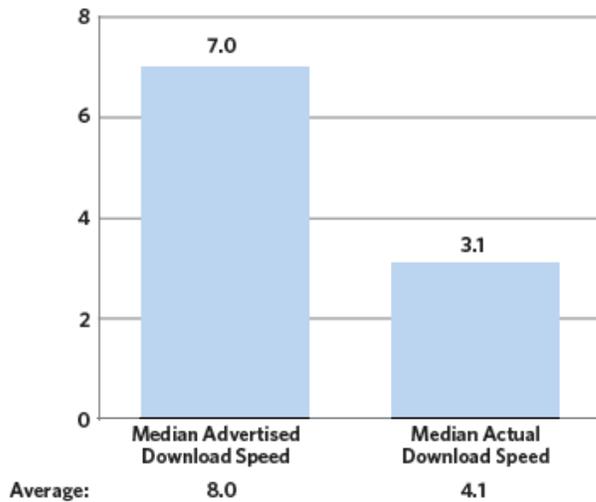
The United States FCC published the following graph in its 2010 National Broadband Report, showing the differences between advertised and actual download speeds:

²⁵ <https://support.skype.com/en/faq/FA1417/How-much-bandwidth-does-Skype-need>

²⁶ The Telus application for participation in its Video Relay Service trial does not specify the minimum upload speed. See <http://deafbc.ca/wp-content/uploads/2010/06/VRS-Trial-Info.pdf>.

Figure 2: Advertised Vs. Actual U.S. Fixed Broadband Download Speeds

Advertised Versus Actual U.S. Fixed Broadband Residential Download Speeds (Mbps)



While speeds vary significantly from one technology to another, the significant differences between actual and advertised download speeds have been shown to be “consistent and prevalent across all types of connection technologies.”²⁷ The United States National Broadband Report further states that this performance gap has been documented not only in the United States, but in other countries as well. “A study in the United Kingdom found that average actual speeds were typically about 57% of average advertised speeds. Studies in New Zealand, Australia, Italy and Ireland have shown similar results.”²⁸

Ofcom, the United Kingdom Office of Communications, indicated in an August 2010 Consumer Bulletin that while average actual broadband speeds in the UK had increased by over 25% in the previous year, the gap between advertised and actual speeds has increased more. Ofcom’s response to this research was to push ISPs to agree to “strengthen the Voluntary Code of Practice on Broadband Speeds,” introduced by Ofcom in 2008.²⁹

Ofcom stated in their draft Annual Plan 2011/2012 that many consumers complained that “they felt they had been mis-sold broadband services, as the speed they were experiencing was lower than advertised.”³⁰ Ofcom has made it a priority for future years to require service providers to provide clear, accurate information to consumers.

²⁷ US National Broadband Report 2010, Chapter 3, page 21, <http://www.broadband.gov/download-plan/>.

²⁸ Ibid, page 21-22.

²⁹ UK Ofcom Consumer Bulletin, Issue 13, August 2010.

³⁰ Section 2.24 of U.K. Ofcom Draft Annual Plan 2011/2012, January 7, 2011, at <http://stakeholders.ofcom.org.uk/binaries/consultations/draftap1112/summary/ap201112.pdf>.

The CRTC has recognized this disparity, and in its 2011-291 decision regarding targeted goals for broadband access in Canada by the end of 2015, the Commission stated that “the target speeds are to be the actual speeds delivered, not merely those advertised.”³¹

3.4. Transmission Speeds Necessary for VRS

As discussed in the sections above, there are many factors that impact a definition of the minimum transmission speeds necessary to support VRS to the user. Not only would Individual usage vary dependent on how frequently VRS calls are made, the actual bandwidth used per minute of VRS call depends on a great number of factors such as:

- The VRS provider’s proprietary compression methodologies
- Codecs and transfer protocols in use
- Network equipment in place at the call center
- Consumer equipment in place, including:
 - Videophone device or webcam type/specs
 - Videophone software in use
 - Utilities such as HCO, VCO, text/chat might add to bandwidth usage
 - Consumer cable modem or DSL router type/specs
 - Consumer firewall/antivirus software in place
 - Is packet inspection occurring?
 - Is data throttling taking place?
 - Consumer’s ISP traffic management policies, including data throttling
 - Network congestion
 - Congestion may cause more transmit/receive activity on a video call
 - Device or network errors will cause more transmit/receive activity on a video call

Basic data calculation can be made based on particular videophone device’s configuration, for example a videophone with bandwidth from 40kbps up to 512kbps. Obviously, device and network configuration will play the largest roles in these calculations. For example a camera capturing data at a very high rate will need to pass significantly more data through the network than a camera capturing data at a low rate.³²

³¹ CRTC 2011-291, <http://www.crtc.gc.ca/eng/archive/2011/2011-291.htm>

³² . For example, a Cisco representative posted the following at <http://gigaom.com/2010/06/08/why-the-iphone-4-made-att-change-its-pricing/>, regarding mobile bandwidth usage in the iPhone. This illustrates how differences in cameras (on the same device) can result in twice the bandwidth needed to support video: “The front-facing camera resolution is 640×480. At 30 frames per second, with H.264 encoding, this would result in 5 MB per minute video. The back-facing camera resolution is 1280×780. At 30 fps and H.264 encoding, this would be 12.8 MB per minute video (note that H.264 is generally more efficient at higher bitrates) Livestreaming a 5-minute video shot with the back-facing camera requires 64 MB, or 32 percent of the cheaper plan.”

The above considerations mean that there is no simple definition of a specific minimum bandwidth speed that is necessary in order for VRS to adequately function.

4. Broadband Availability to Canadian Consumers

Consumer access to broadband Internet service is required for VRS. Fortunately, almost all Canadians have access to broadband Internet services, as reflected in the CRTC's 2011 Communications Monitoring Report (CMR):

Approximately 98% of Canadian households are located within a 1.5 Mbps broadband footprint, consisting of either landline or mobile (i.e., HSPA+) facilities. On a provincial basis the footprint encompasses all households in the following 5 provinces: Alberta, Ontario, New Brunswick, Nova Scotia, and Prince Edward Island. For the remaining provinces it encompasses at least 89% of the households. With respect to Canada's mobile network, 97% of Canadians are within the mobile broadband footprint.³³

The above availability is reflective of a continuing shift from older technologies to new, and continuing competitive changes in service providers and offerings, as affirmed in the CMR:

In 2010, approximately 48% of residential customers subscribed to service bundles that consisted of local telephone service and one or more of the following services: Internet access, video, and mobile. Approximately 91% of telecommunications revenues were from TSPs [Telephone Service Providers] operating in all of the telecommunications market sectors and 68% of broadcasting revenues were from companies operating in all of the broadcasting sectors.

The alternative TSPs' share of total wireline telecommunications revenues remained relatively unchanged at 37% in 2010. The alternative TSPs' market share included the incumbent telephone companies' operations outside of their traditional territories. The incumbent telephone companies' operations outside of their traditional operating territories decreased from 8% in 2009 to 7% in 2010, other facilities-based TSPs such as cable companies and hydro utility companies with telecommunications activities increased from 23% in 2009 to 25% in 2010, and resellers remained relatively unchanged at 6%.

The cable companies were major providers of high-speed Internet service, as they had approximately 57% of high-speed residential Internet subscribers in 2010. In 2005, these companies started to provide local telephone service generally over a managed IP network, and by year-end 2010, had captured approximately 31% of local residential

³³ The Communications Monitoring Report (CMR) published July, 2011 shows data for 2010 and earlier. Quoted from page i at: <http://www.crtc.gc.ca/eng/publications/reports/policymonitoring/2011/cmr2011.pdf>.

lines to become major competitors of the incumbent telephone companies in residential markets.

The competitors of the incumbent telephone companies, which include incumbent telephone companies operating outside their traditional territories, maintained their share of telecommunications revenues. Competitors, essentially cable BDUs, had strong growth in their number of residential local lines, which increased by 15%. Competitor business lines increased 4%.

New wireless entrants collectively captured approximately 2% of the wireless subscribers and 1% of revenues in 2010. Overall, the new entrants stimulated the market as the number of wireless subscribers increased by 8.5% in 2010 compared to 7.8% in 2009. The average revenues per subscribers decreased 1.6%, from \$58.81 to \$57.86 in 2010 due in large part to the lower prices for service by new entrants.

The number of mobile phone subscribers increased 9% in 2010 from the previous year. As well, Canadians continued to embrace technologies including broadband access to the Internet as the number of residential subscribers to high-speed Internet services increased by 5%. In 2010, approximately 70% of Canadian households had broadband Internet service and 74% had high-speed Internet service..³⁴

The above CMR comments portray a cross-industry competitive market, extremely high levels of broadband availability, with Canadians enrolling in broadband via an assortment of service providers and technologies.³⁵ An overview of Internet and broadband availability is also provided in the CMR:

The Internet access industry consists of an estimated 500 entities.

Incumbent TSPs provide Internet services using mainly dial-up, DSL, fibre optic, satellite, and fixed wireless facilities. Cable companies provide Internet services using cable modem, fibre optic, and fixed wireless facilities. Utility telcos, municipalities, and other TSPs provide Internet services using dial-up, DSL, fibre optic, satellite, and fixed wireless facilities. Resellers essentially rely on facilities-based TSPs to provide them with facilities on a wholesale basis. Resellers provide mainly dial-up Internet access service, as well as high-speed Internet service, generally using leased DSL facilities and, to a lesser extent, cable modem and fibre optic facilities.³⁶

³⁴ Ibid, page i – iv.

³⁵ The CMR also confirms the blending of telecommunication and broadcasting services and markets, including increasing use of the Internet to access broadcast programs. For example, see the CMR at page iii, table 3.1.3 at page 19, and table 5.1.11 at page 121.

³⁶ Ibid, pg 137

Table 3: 2010 Internet and broadband availability at a glance³⁷

Broadband availability (excluding satellite)	
National:	96%
Urban:	100%
Rural:	85%
Penetration [actually signed up for service]	
All speeds:	77%
High-speed:	74%
Broadband (1.5 Mbps and higher):	70%
Broadband (5 Mbps and higher):	52%

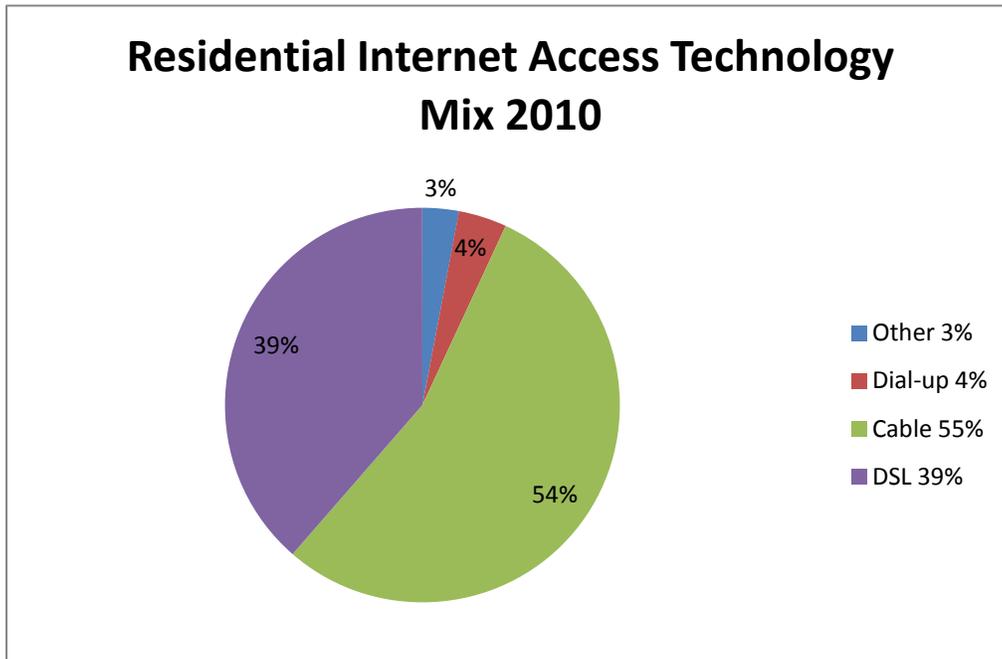
This broadband environment is illustrated in more detail in the charts and graphs of the next sections.

4.1. Current Statistics

4.1.1. Coverage

Among cable, DSL and dial-up, the CRTC indicates the following availability of Internet access to residential households.

Figure 3: Canadian Residential Internet Access Technology Mix, 2010³⁸



³⁷ Ibid, from data on page 137

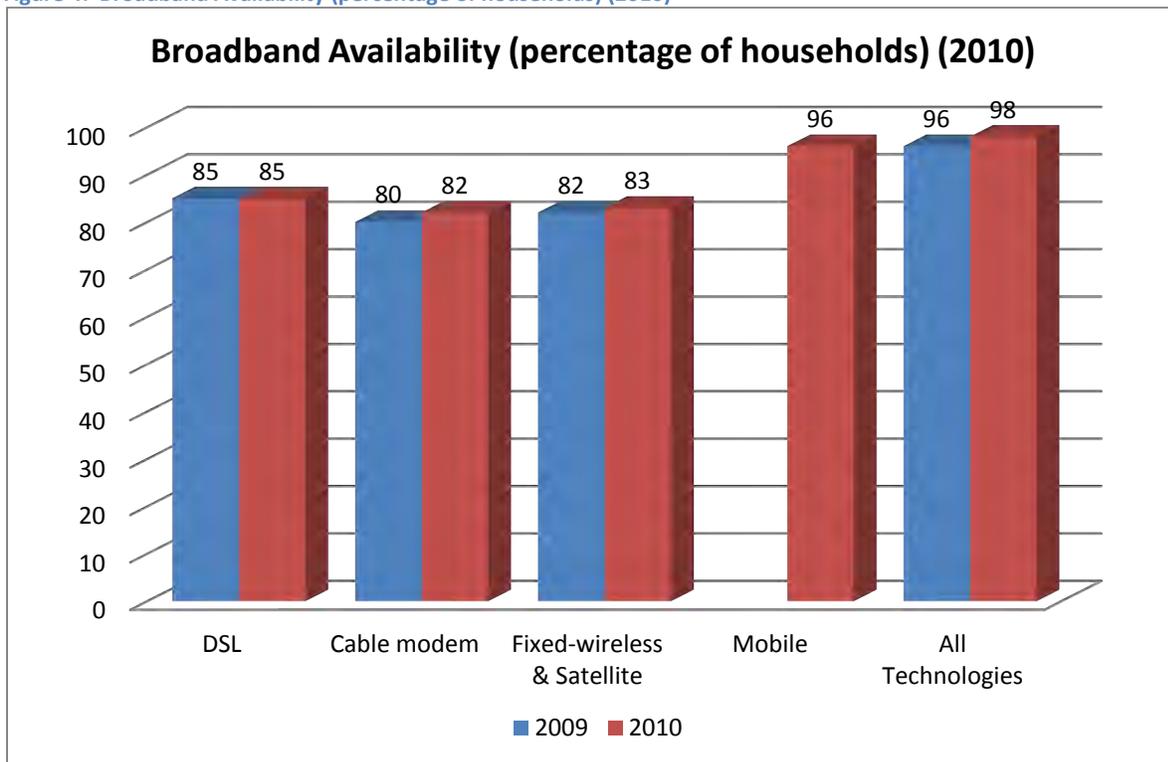
³⁸ Ibid, figure 5.3.3, page 142.

Broadband availability including wireless is depicted below.

Table 4: Broadband Availability by Technology (percentage of households)³⁹

Platform	Availability, 2010
Mobile 3G or equivalent	98%
HSPA+	97%
DSL	85%
Cable Modem	82%
Fixed Wireless	82%
IPTV (as of 31 December 2010)	22%
Digital Satellite	National

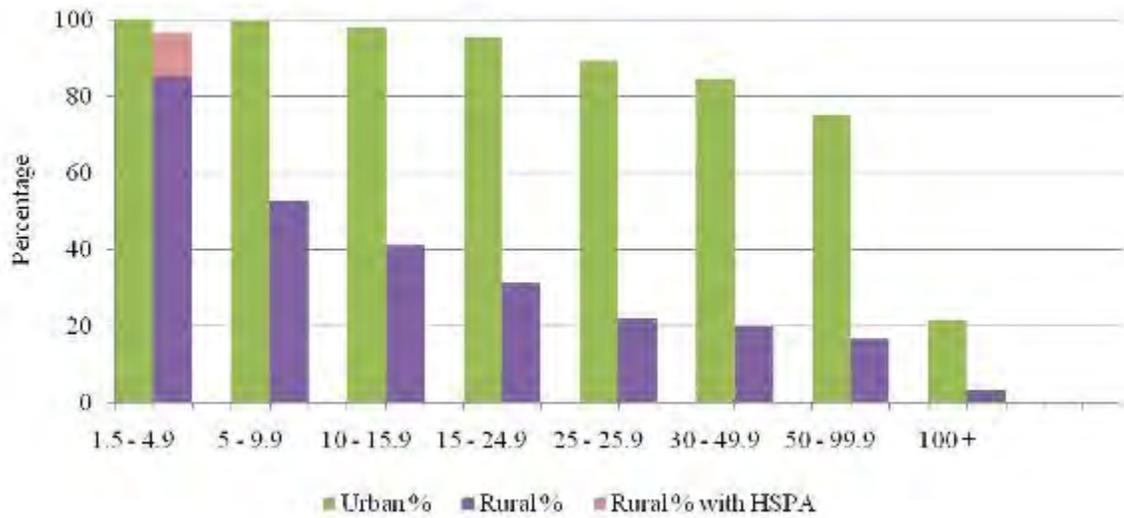
Figure 4: Broadband Availability (percentage of households) (2010)⁴⁰



³⁹ Ibid. Data from table 5.3.4, page 144.

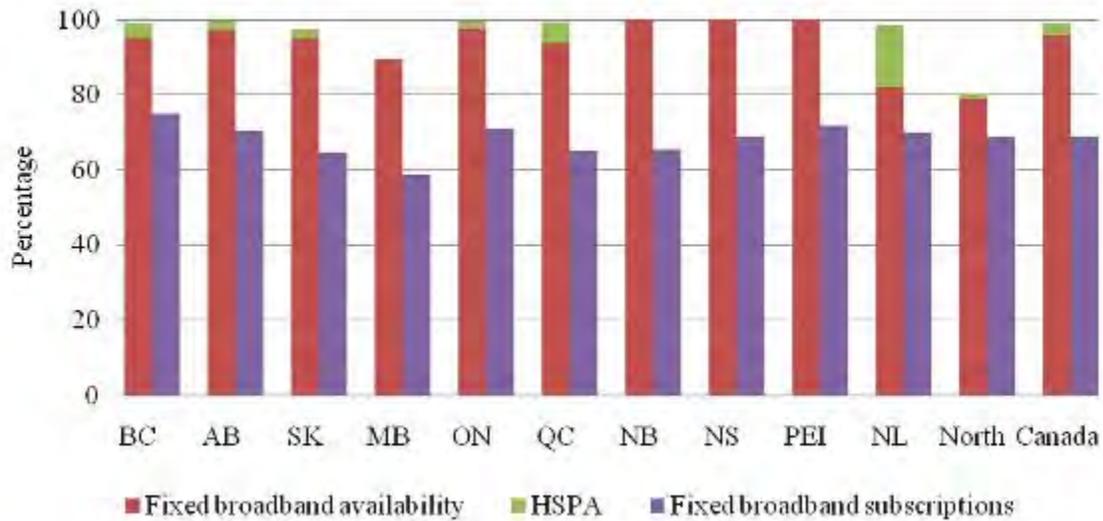
⁴⁰ Ibid, figure 5.3.6, page 144.

Figure 5: Broadband Availability - Urban v. Rural (percentage of households) (2010)⁴¹



The following chart, *Figure 6: Broadband Availability v. Broadband Subscriptions (2010)*, illustrates the difference between broadband *availability* statistics and actual broadband *subscriptions*.

Figure 6: Broadband Availability v. Broadband Subscriptions (2010)⁴²



⁴¹ Ibid, figure 5.3.8, page 145.

⁴² Ibid, figure 5.3.9, page 146.

4.1.2. Wireless Networks

According to the CRTC's CMR:

The wireless network covers approximately 20% of Canada's geographic area and is available to 99% of Canadians. The advanced wireless network which supports handsets such as smartphones and turbo sticks, is available to 97% of Canadians. Wireless market sector revenues are the largest component (43%) of total telecommunications revenues.

The wireless market sector consists of three large facilities-based national WSPs, a number of smaller regional facilities-based WSPs, and a small number of MVNOs [Mobile Virtual Network Operators].

A number of new facilities-based WSPs have recently entered, or have announced that they plan to enter, the wireless market sector.⁴³

Figure 7: Wireless TSP's subscriber market share, 2010⁴⁴

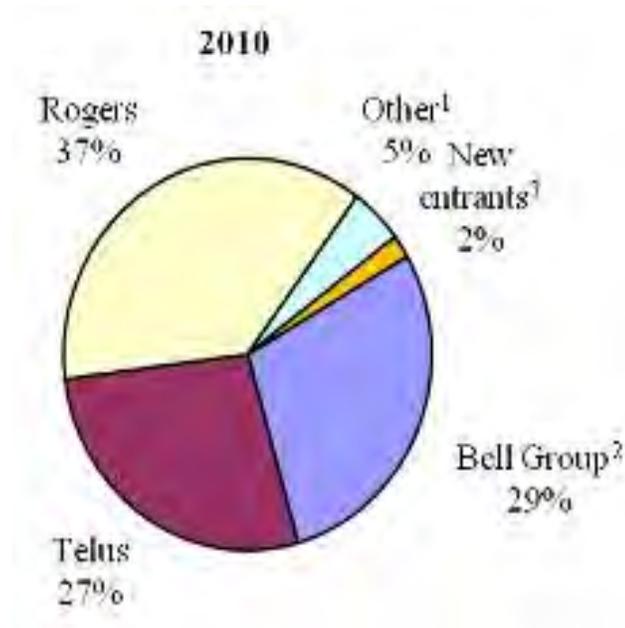


Chart notes:

1. "Other" includes MTS, Allstream, SaskTel, and smaller WSPs.
2. "Bell Group" includes: Bell Canada, Northwestel Mobility, Bell Mobility, Télébec, NorthernTel, Skyterra, Virgin, and Latitude Wireless.

⁴³ Ibid, page 155.

⁴⁴ Ibid, figure 5.5.7, page 160.

3. “New entrants” refers to the new wireless entities that acquired spectrum in Industry Canada’s 2008 AWS spectrum auction.

As indicated in the figure below, the three dominant WSPs are competitive coverage in almost all provinces:

Table 5: Wireless subscriber market share, by province (2010)⁴⁵

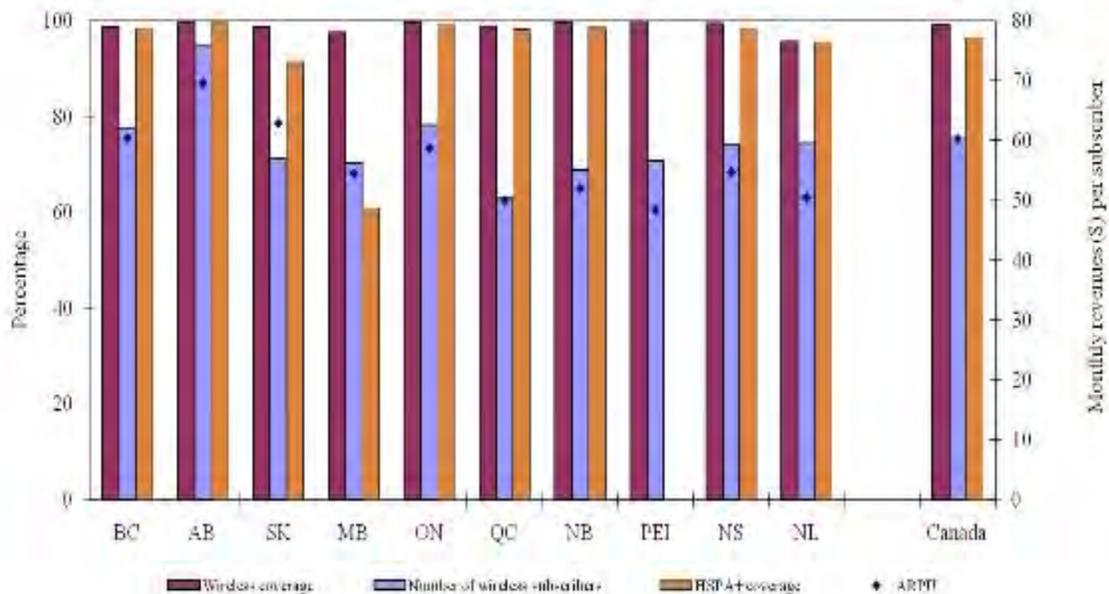
Province	Bell Group ²	Telus	Rogers	New entrants ³	Others
British Columbia	17%	40%	42%	1%	0%
Alberta	22%	50%	27%	1%	0%
Saskatchewan	4%	5%	13%	0%	78%
Manitoba	3%	10%	29%	0%	57%
Ontario	30%	20%	47%	2%	1%
Quebec	37%	27%	33%	3%	0%
New Brunswick	61%	18%	20%	0%	0%
Prince Edward Island	62%	21%	17%	0%	0%
Nova Scotia	56%	24%	20%	0%	0%
Newfoundland and Labrador	76%	21%	3%	0%	0%
The North ⁴	90%	0%	0%	0%	10%

1. “Other” includes MTS Allstream, Sasktel, and smaller WSPs.
2. “Bell Group” includes: Bell Canada, Northwestel Mobility, Bell Mobility, Télébec, NorthernTel, Skyterra, Virgin, and Latitude Wireless.
3. “New entrants” refers to the new wireless entities that acquired spectrum in Industry Canada’s 2008 AWS spectrum auction
4. The North includes Yukon, Northwest Territories, and Nunavut

Of significance for VRS, is the high rate of availability of wireless 3G service per province depicted in the chart below. However, the generally higher cost of wireless data usage can be a deterrent to usage; and lower wireless broadband speeds and data caps compared to fixed broadband access (DSL and cable) make fixed broadband a more affordable alternative where available.

⁴⁵ Ibid, table 5.5.4, page 161.

Figure 8: Canadian Wireless Population coverage and Penetration, 2010⁴⁶



4.1.3. Coverage Maps

Canada’s government web site has very detailed National Broadband Maps for cable and DSL coverage.⁴⁷ These maps illustrate both the served areas as well as identify unserved or underserved areas across Canada as of January 1, 2010.⁴⁸ Given the maturity and prevalence of digital television services in Canada, much of consumer broadband Internet access is delivered through cable Internet access, as well as DSL services, which these maps illustrate. The online versions of these maps can be viewed by region, and can be magnified to allow for very detailed geographic/data analysis.⁴⁹

Wireless coverage maps provided in the Communications Monitoring Report published July, 2011 shows data for 2010 and earlier.⁵⁰

⁴⁶ Ibid, figure 5.5.9, page 162.

⁴⁷ Available at http://www.ic.gc.ca/eic/site/720.nsf/eng/h_50010.html.

⁴⁸ Even though the online title is “Canada’s Unserved Area”, the maps illustrate both covered and non-covered areas. Individual maps may be more recently dated than 1/1/2010.

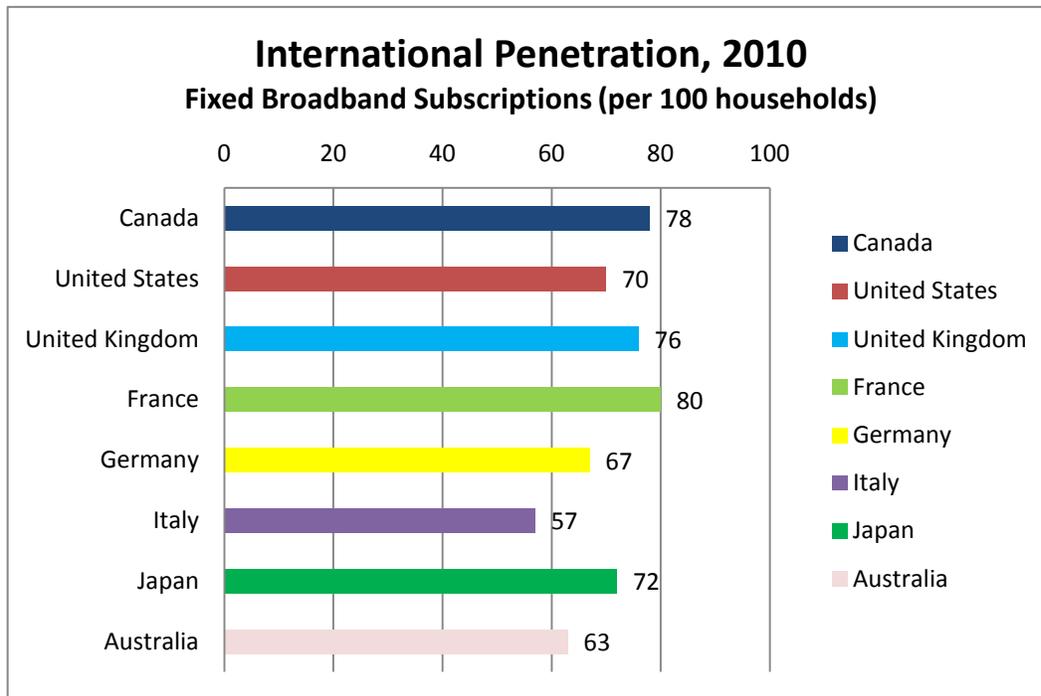
⁴⁹ Unfortunately there are no maps showing demographics of Deaf and hard of hearing populations in Canada, nor of people who use sign language. The Canadian government has been asked by advocacy groups to include such information in the design of future census programs.

⁵⁰ <http://www.crtc.gc.ca/eng/publications/reports/policymonitoring/2011/cmr2011.pdf>, map 5.5.1, page 165.

4.2. Comparison with Other Countries

Of significance to potential implementation of VRS is a comparison of Canada's broadband availability, penetration and speeds to that of other countries, particularly those that have implemented VRS. The charts below demonstrate that Canada currently has better broadband coverage, adoption rates and transmission speeds than some other countries that have VRS, such as the United States.

Figure 9: Fixed broadband subscriptions – International penetration, 2010⁵¹



⁵¹ Ibid, from figure 6.1.5, page 171.

Figure 10: Average measured broadband speeds, 2009 and 2010⁵²

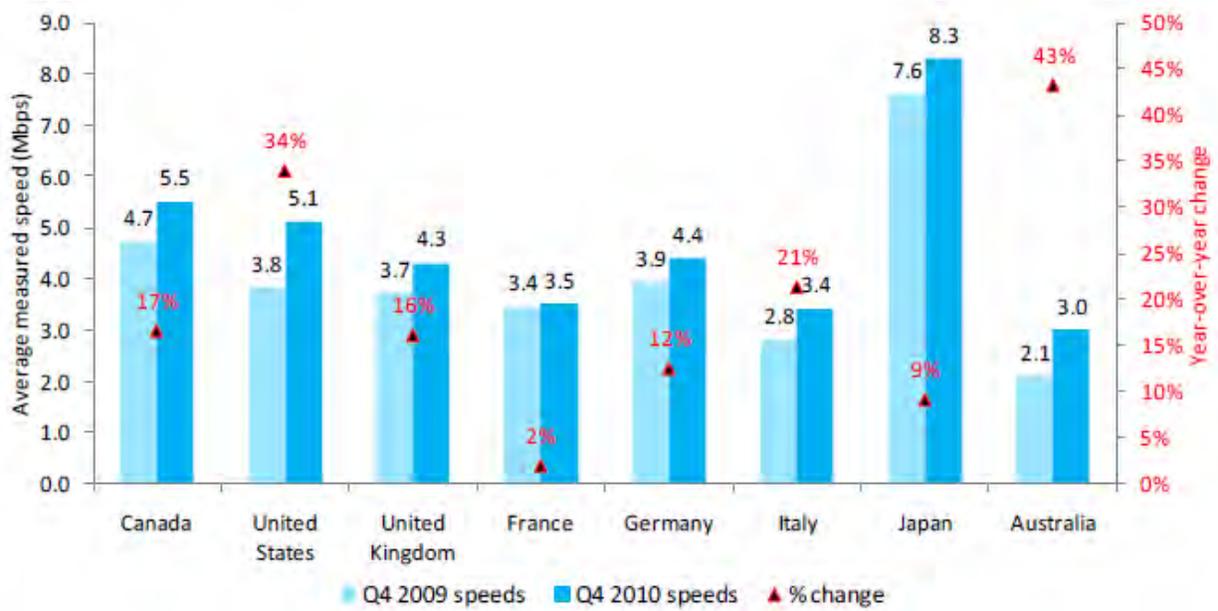
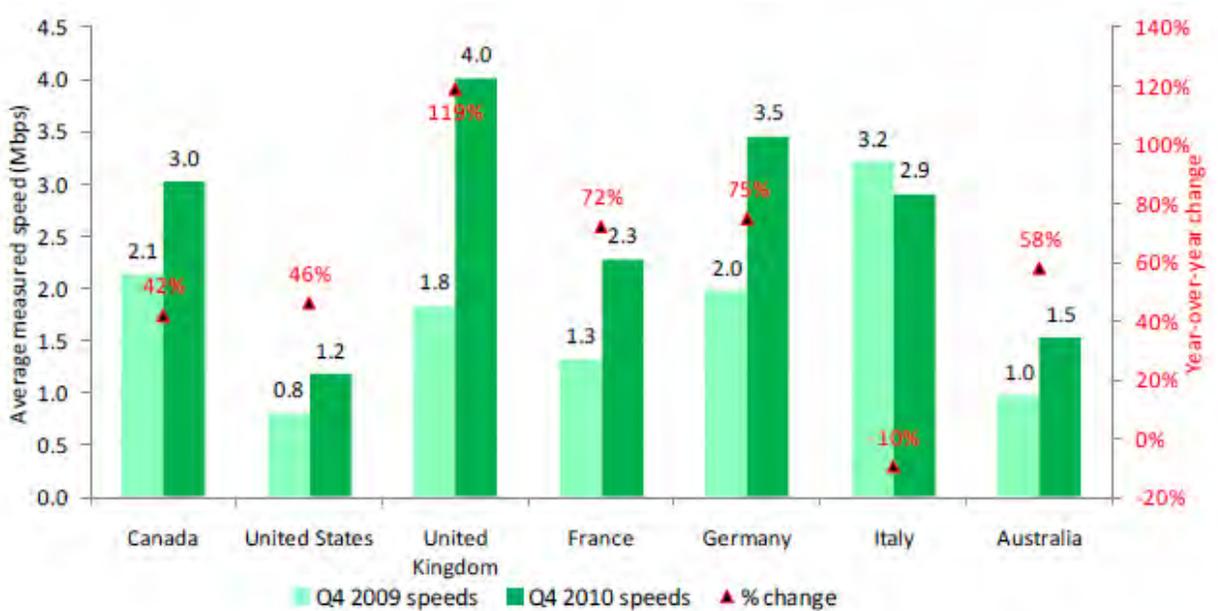


Figure 11: Average Measured Mobile Broadband Speeds, 2009 and 2010⁵³



⁵² Ibid, from figure 6.1.7, page 172.

⁵³ Ibid, from figure 6.1.8, page 173.

4.3. Broadband Expansion Initiatives

Development of further broadband coverage via new technology services and expansion of current broadband technologies continues throughout Canada via industry initiative and government sponsorship. In decision 2011-291, the CRTC established the goal that broadband access at speeds of 5 Mbps down and 1 Mbps up should be available to all Canadians by the end of 2015⁵⁴.

4.3.1. Broadband Canada: Connecting Rural Canadians

In January 2009, in response to the global financial crisis and recession, Canada implemented its Budget 2009 with a three-year economic stimulus plan titled “Canada’s Economic Action Plan”.⁵⁵ Of the almost \$60 billion designated in the Economic Action Plan, \$225 million was set aside to be used by Industry Canada for a nation-wide broadband expansion initiative.⁵⁶ The bulk of this funding is being used to expand access to broadband to unserved and underserved households in Canada through the “Broadband Canada: Connecting Rural Canadians” program. The first three rounds of this program will reportedly bring broadband connectivity to nearly 250,000 rural households in northern Canada.⁵⁷

This program is supporting the installation of network infrastructure equipment to provide broadband access in areas where there was no “business case for the private sector” to do so. Broadband infrastructure in these areas is being installed through several different technologies, including fixed wireless, satellite, wireline/wireless, fixed and mobile wireless over satellite, and DSL technologies. Approved expansion projects with confirmed funding as of February 17, 2011 are detailed at the program’s Industry Canada website.⁵⁸ A summary of project activity from the site’s program data is provided below.

Figure 12: Funded broadband expansion projects

Province(s)	Number of Projects	Approximate Households Served
Alberta	11	40,915
British Columbia	26	13,810
Manitoba	11	33,735
Newfoundland & Labrador	1	207

⁵⁴ CRTC 2011-291, <http://www.crtc.gc.ca/eng/archive/2011/2011-291.htm>

⁵⁵ <http://www.actionplan.gc.ca/eng/index.asp>

⁵⁶ <http://www.actionplan.gc.ca/eng/feature.asp?featureId=18>

⁵⁷ <http://www.ic.gc.ca/eic/site/ic1.nsf/eng/06045.html>

⁵⁸ <http://www.ic.gc.ca/eic/site/719.nsf/eng/00050.html>

Province(s)	Number of Projects	Approximate Households Served
Northwest Territories	2	1,234
Nunavut	1	11,938
Ontario	13	13,505
Quebec	26	114,381
Totals:	91	229,725

Maps of proposed broadband expansion may be accessed online at the same web address. The online maps may be selected by for Canada overall or by regions of each province, may be filtered by layered information, and may be magnified for closer review.

4.3.2. Quebec Initiative

Of notable significance is a special initiative undertaken in Quebec to expand or improve broadband access throughout the province. The Quebec government announced in April 2011 that the government would spend \$900 million by 2020 to provide high speed “next generation” Internet to all of Quebec. Twenty percent of the funds will reportedly be spent in suburban areas and the remainder in remote areas.⁵⁹ This initiative is not reflected in the above table, project lists or maps of the *Broadband Canada - Connecting Rural Canadians* program or website.

Additionally, the CRTC has, in various decisions such as CRTC 2006-9, mandated that ILECs should spend significant portions of deferral account funds to expand broadband services to rural areas within their territories. The CRTC has further directed various ILECs to use specific dollar amounts of their deferral funds to expand broadband services via certain technologies; such as in decision 2010-805, in which the CRTC approved the use of funds by Bell Aliant and Bell Canada to expand broadband access to rural communities in Ontario and Quebec using HSPA (high-speed packet access) wireless technology.

⁵⁹ See <http://free-fiber-to-the-home.blogspot.com/2011/04/quebec-announces-900m-for-provincial.html>, and page 96 of <http://www.budget.finances.gouv.qc.ca/Budget/2011-2012/en/documents/BudgetPlan.pdf>.

4.4. Alternative Community Broadband Networks

Another type of Internet access available in many communities is a “community” or “municipal” network. Traditionally these types of networks were developed in rural areas where there was no competitive market for large-scale Internet service providers to offer services to consumers. The community broadband networks can be run by local governments, colleges or universities, or even utility companies. These agencies traditionally provide robust services at competitive prices, even when other traditional service providers later enter the local market.

Community broadband networks are regionally restricted and available only to local consumers. Some of these services are based on specific needs, such as rural Internet access, or based on new technology and/or “green” technology initiatives – such as Ottawa’s “Green Broadband” Fibre-To-The-Home project.⁶⁰

Other community networks are run by cities or other local governments with the goal of providing free Internet access to members of the community. These community networks are generally non-commercial and non-profit, and are supported by community members, sponsors and/or grants.⁶¹

5. Average Consumer Broadband Usage and Costs

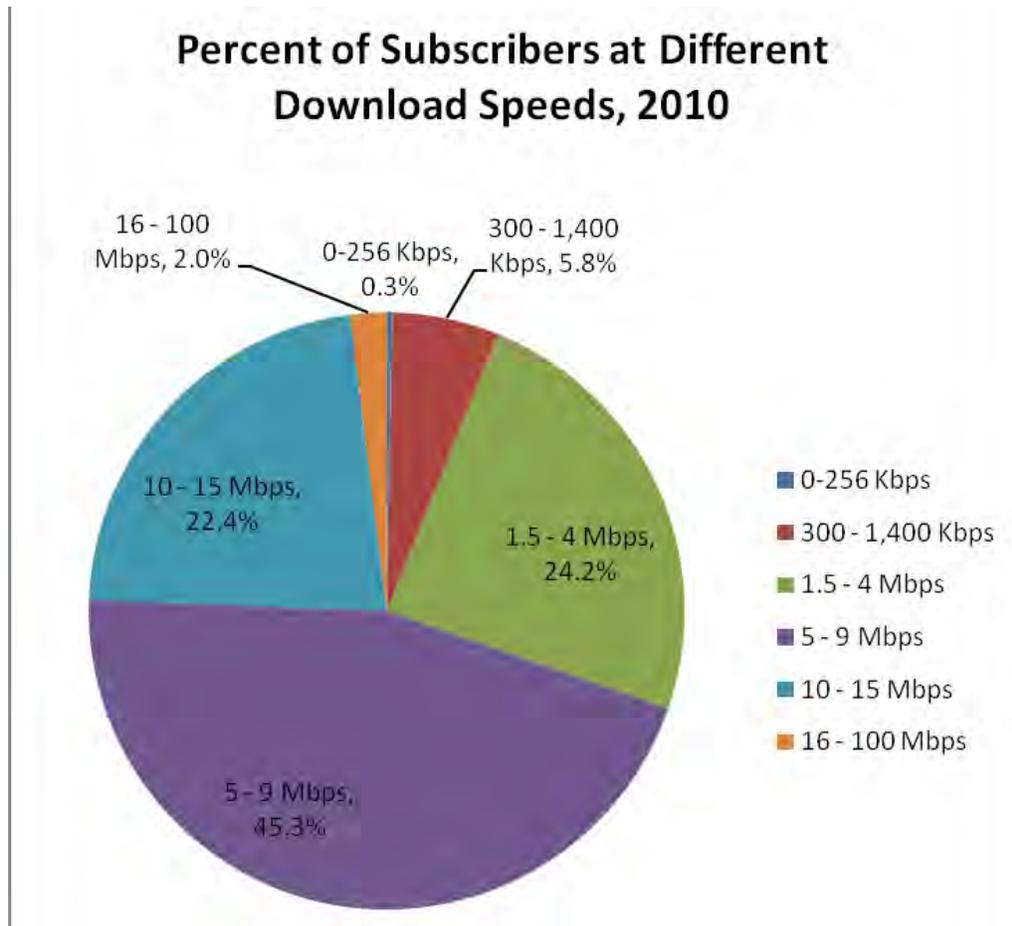
5.1. Average Broadband Usage

Canadian residential Internet usage in 2009 was dominated by usage at relatively high speeds. Less than one percent of subscribers were at a download rate of 256 Kbps or lower:

⁶⁰ See <http://www.cbc.ca/news/story/2008/12/01/tech-fibre.html>.

⁶¹ An example of a Community network in Ottawa is the National Capital FreeNet, at <http://www.ncf.ca/>.

Figure 13, Fixed Line Residential Internet Usage 2010⁶²



⁶² Data from the 2011 Communications Monitoring Report, table 5.3.3, page 141.

For each of the above tiers of download speeds, consumers averaged significantly less upload speed:

Table 6, Average Upload Speed per Download Tier⁶³

Download Tier	Average Upload Speed
0 - 256 Kbps	209 Kbps
300 to 1,400 Kbps	352 Kbps
1.5 to 4 Mbps	584 Kbps
5 to 9 Mbps	870 Kbps
10 to 15 Mbps	797 Kbps
16 to 100 Mbps	1,735 Kbps

In 2010, the average downloaded per month by Canadians with Internet access was 14.8 GB per user; an increase of 23% from the previous year. Average monthly upload in 2010 was 3.7 GB, a 9% increase from 2009.⁶⁴

5.2. Average Broadband Costs

In 2010 the average monthly fee for broadband services in Canada was \$38.96⁶⁵. A breakdown of average rates by speed tier is shown below:

Table 7: Average Monthly Fee per Canadian Broadband Subscriber (2010)⁶⁶

Download Speeds	Average Subscriber Rate
300 to 1,400 Kbps	\$28.87
1.5 to 4 Mbps	\$33.57
5 to 9 Mbps	\$42.23
10 to 15 Mbps	\$39.67
16 to 100 Mbps	\$53.71

⁶³ Ibid, data from table 5.3.3, page 141.

⁶⁴ Ibid, page 137.

⁶⁵ Ibid, data from table 5.3.3, page 141.

⁶⁶ Ibid, data from 5.3.3, page 141. Excludes terminal rental costs

The above rates can be further broken down to the following comparison of wireline, wireless, broadband, and mobile Internet service plan average monthly prices:

Table 8: Average Internet Access Plan Pricing, by Type⁶⁷

Service Type	Average Monthly Rate
Wireline Service	
Level 1 (low-volume use)	\$32
Level 2 (average use)	\$50
Level 3 (high-volume use)	\$60
Wireless Service	
Level 1 (basic user)	\$34
Level 2 (average user)	\$51
Level 3 (premium user)	\$100
Broadband (fixed technology)	
Level 1 (~1.5 Mbps, 2 GB/month)	\$35
Level 2 (1.5 – 9 Mbps, 10 GB/month)	\$50
Level 3 (10-20 Mbps, 25 GB/month)	\$63
Level 4 (20+ Mbps, 50 GB/month)	\$78
Mobile Internet (3G)	
Speed ~1.5 Mbps, data usage 2 GB/month	\$52
Bundled Services	
Wireline-Wireless-Broadband	\$134
Wireline-Broadband-Digital TV	\$123
Wireline-Wireless-Broadband-DTV	\$168

A more detailed analysis of broadband usage and costs, and cost structures, will be addressed in this VRS Feasibility Study, under Phase 10, Cost Variables and Forecasts.

⁶⁷ Data from CRTC 2011 Communications Monitoring Report, table 6.1.1, page 168.

6. VRS End-User Solutions

6.1. Diversity and Choice

Potential VRS users reflect individuals with a diversity of communication preferences, as is reflected in equipment and the user-interface offerings of current VRS providers and equipment in other countries. There are several different devices and software used for video relay services. At the most basic level, the Deaf end user will need a device capable of capturing, transmitting, and receiving video images over the Internet with a VRS provider (as well as with other users in point-to-point conversations, although that may not be a strict requirement for VRS). Transmission of video can occur via a standalone videophone device, or through a computer or mobile device equipped with a webcam and a provider's software. Some countries have implemented VRS models where it is a requirement that VRS hardware and software must be interoperable with any other VRS provider's systems. In an interoperable environment, the user may obtain a device and service from one provider and if the service is later contracted to a different provider, or if the consumer has the option and later decides to use the device with another provider's service, the investment in the initial equipment is not lost. The European Union has taken this open, interoperable concept even further, with a "total connect" methodology, which, beyond VRS communication from any device or software meeting basic functionality requirements, also requires VRS providers to provide and utilize software and hardware that allows the users to choose their desired communication modes – e.g. sign language with VCO, or sign language with text chat alongside, etc.

The choice of what kind of *device* to use for VRS may be very personal based on individual preferences, computer knowledge, and ease of use. Some users may not be aware they have access to other types of devices, or they may live in an area served by a monopoly VRS model with only one VRS vendor which only offers one video device option. Some users may have multiple devices (e.g., mobile and fixed, or devices at home and work, each with its own telephone number and/or IP address), and may also use more than one VRS service provider. Others may prefer only one device (or have more than one of the same kind of device) for ease of use, and familiarity or availability of features.

Experienced VRS users expect a VRS system that can accept calls from multiple devices and communications methodologies. When choosing an end-user *device* or *software*, knowledgeable consumers will seek basic features and functionality in the end-user interface, such as:

- Clean, simple interface
- Easily navigable buttons or menus
- Tilttable screen and/or camera
- Direct button access to call preferred VRS provider
- Direct button access to call or email VRS provider support
- Device interoperability (with other devices, other VRS providers)
- Configurable environment settings (lighting, contrast, etc.)
- Configurable communications options (VCO, HCO, text chat, etc.)
- Availability or potential inclusion of features such as:

- Video mail
- Contacts/Address book
- User profiles
- Notification features (flashers, screen pops) for incoming calls/messages

If multiple VRS providers are available to consumers, many factors can influence consumers' choice of *provider*, including ease of use, special features, perceived overall quality of the video interpreters, speed of answer, good customer service, and special promotions. User-selectable basic functions that contribute to the quality of the conversation include choice of preferred communication mode such as ASL or LSQ, contact language (sign supported English or French), VCO, HCO, lipreading, and/or close-up signing.⁶⁸

6.2. End User Variables Affect Functionality

There are many factors that affect the functionality of VRS. These include proprietary compression algorithms, bandwidth issues, and the systems displaying and transmitting the video. Device-specific hardware and software component considerations include screen size, resolution, frames per minute, memory, display drivers, processor speed, etcetera.

Two different devices or software programs can provide very different results with the same VRS system, and therefore two different users can have different results with any given VRS provider. For example, if two consumers use the same vendor's supplied VRS software for their home computer, and both have a broadband internet connection, with download speeds of 3.0 Mbps, and upload speeds of 1.5 Mbps, their VRS experiences may still be different. This will be the case if one user has a new computer with an Intel i5 processor running at 3.2GHz, 6GB RAM, a discrete graphics card with 1GB RAM, and a 21" high definition LCD monitor, while the other user has a five-year old laptop with a Pentium 4 processor running at 2.8GHz, 1GB RAM, and onboard graphics with shared memory. The second user will have a very different experience with VRS, with the video on the laptop screen appearing significantly less clear, and will likely experience jitter or stuttering in the video. While VRS vendors can list recommended minimum requirements for their hardware and software, many VRS consumers are not technical and may need assistance to select, set up or troubleshoot their devices.⁶⁹

In addition to device, software, and vendor considerations, there are factors in the end-user's home or work environment that will affect VRS functionality and perception. Beyond the basics of hardware and software compatibility there are issues such as the possibility that connectivity through a cable

⁶⁸ These types of functions are dependent upon the VRS provider services offered, as well the degree that they may be supported by the end-user's technology. However, there are no inherent technical barriers to offering these service functions. These functions will be discussed in study phase 3, Consumer Interests and Perspectives, and phase 8, Potential Related Services.

⁶⁹ Some VRS vendors in the U.S. list very low minimum requirements in order to try to capture higher market share, even though higher requirements may provide a significantly better relay experience.

broadband service may be slowed as a result of congesting during peak usage periods. Also, consumers who have never used a web camera or videophone might not know that environmental factors, such as glare from windows, fluorescent lighting, “busy” backgrounds, etcetera, will affect not only the usability of the VRS system for them, but will affect the quality of their image being transmitted. Even though VRS users see their own image and most devices and software have several settings which can be adjusted to improve video quality, these types of environmental and video quality settings may not be evident to a new or non-technical user. These factors go beyond basic “technical” support, but with the introduction of VRS many VRS consumers may need to be educated on these matters. Any company providing VRS services must, therefore, provide technical and user support which goes beyond the basics of which cable to connect to the videophone or webcam. VRS support must be competent and knowledgeable in a variety of factors affecting VRS functionality. Additionally, when a VRS solution is initially implemented, the VRS vendors will need to be partners in the communication and education efforts in order to ensure that consumers have access to information about the technology, and also to general information about what VRS is and how it can and cannot be used.

User perception is an additional factor to consider when discussing VRS technologies. One of the examples above illustrated the potential experience of two different users with computers of varying hardware capabilities. Given the same hardware configuration, however, users may have individual opinions about the design and functionality of the VRS software or device from a user interface perspective, or differing opinions about the accessibility and support from a VRS provider.

6.3. Videophone Devices

6.3.1. Videophone History and Technology

“Videophone” is a general term for a standalone device with a video camera and screen capable of transmitting and receiving video motion images. Videophones are, by definition, full-duplex devices capable of transmitting and receiving audio and video at the same time, and are not only used in point-to-point communication (i.e. two individuals with videophone devices communicating to each other), but also in videoconferencing and video telephony scenarios (including VRS).

Webcams were a technological evolution of videophones, allowing users to add a hardware video camera to their desktop or laptop computer, and to utilize software on their computer to transmit and receive video and audio through their computers, rather than through a stand-alone videophone. A webcam, therefore, may be considered the video/audio capture component of a videophone, but one which must be used in combination with specialized software and a computer with display.

The earliest videophones were propriety network-dependent, and point-to-point. Although videophones which could communicate point-to-point over plain old telephone lines (POTS) were

Figure 14, Bildtelefon T-View 100 ISDN Videophone



developed and commercially available, consumer usage of videophones did not become affordable and more common place until communication methodologies such as ISDN became available.⁷⁰

Most modern videophone devices, however, now communicate using Internet Protocol (IP) over the Internet, and as such require a broadband Internet connection to the device or computer via a network cable or wireless (e.g., Wi-Fi) connection. The bandwidth required for a videophone device or software is directly dependent on the transmission protocols being used, such as SIP, H.323, or H.324, or 3G-324M for 3G mobile networks; along with the video and audio codec (compression) used, such as H.263 or H.264.⁷¹ Different protocols have different compression requirements and capabilities, and therefore are designed for or function better on various communication mediums (e.g., the H.324 protocol combines call setup and video compression, and is therefore generally the protocol used by videophones that work on POTS lines.)⁷²

Most VRS providers use proprietary software and/or hardware in which the compression algorithms have been specifically formulated to provide better focus on the signer's face and hands, and background area is given less emphasis or focus. This is a complex process and involves not only the technical engineering aspect of the compression algorithms, but also the end-user's preferences – especially in low-bandwidth or smaller screened devices. In the United States, the University of

⁷⁰ Video over POTS produces a significantly delayed image refresh rate resulting in motion that appears as a series of sequential static pictures.

⁷¹ H.263 is widely used but does not include audio handling, and therefore a separate audio codec, such as G.711 must be used.

⁷² Video over a POTS line still does not offer high enough quality to support sign language.

Washington and Cornell University are involved in a project to investigate the technology and effects of various video compression methodologies affecting ASL communication on wireless mobile devices.⁷³ However, research projects aside, VRS provider solutions are not open-source technologies.

Many Deaf users communicate point-to-point with non-VRS specific software, such as Skype, iChat, Google Chat, etc. While these technologies are heavily used and have been extremely beneficial in providing communication tools to the Deaf community, the common perception seems to be that the compression methodologies are superior in VRS-specific software and hardware, thus providing a better video image for sign language users.

6.3.2. Videophone Device Configuration

Videophone devices sometimes require users to make configuration changes to their Internet router, in order to allow the necessary protocols to communicate over the Internet, or may require a Public (or Static) IP address in order to communicate properly over the Internet.

Some software and devices will function with no configuration changes, especially the web-based clients, but others may require specific ports to be opened on the user's firewall. Generally this is more of a concern for users in corporate or office environments, where the company networks are protected by robust firewalls. The configuration changes for these environments can be quite complicated and usually require a network administrator with access to the firewall.

Technical configuration is another area in which the VRS providers must be able to provide their users support, whether it is providing a home user with assistance with simple configuration changes, or providing detailed "pinhole" configuration for more complex firewalls.

6.3.3. Videophone Device Types

Videophone devices can be stand-alone devices which contain a screen built into the device, or separate components that require connection to an external display.

Videophones with built-in displays can have small very high resolution screens, or larger screens. Many have displays that can be tilted, which can be essential for best viewing angle as well as minimizing glare. Some videophone devices utilize touch screen technology, others use device buttons and menus, while others use remote controls.

Representative examples of videophones are depicted below, simply to provide a better idea of the range of devices available. General and technical information about these videophones are available at their referenced websites.

⁷³ See <http://mobileasl.cs.washington.edu/>.

Figure 15: Tandberg E20 Videophone (ZVRS Z20)⁷⁴



Figure 16: Grandstream GXV-3000 IP Videophone⁷⁵



Figure 17: Visiontech ONYX⁷⁶



Figure 18: Visiontech 640D⁷⁷



⁷⁴ <http://www.zvrs.com/z-series/the-z-products/z-20>; manufactured by Tanberg at <http://www.tandberg.com/>.

⁷⁵ http://www.grandstream.com/user_manuals/GXV3000_User_Manual.pdf

⁷⁶ All-in-one unit by Visiontech AB of Sweden; used with a remote control. Supports data transfer up to 640 Kbps full duplex. Data sheet at <http://www.visiontech.se/docs/onyx.pdf>.

⁷⁷ Supports data transfer up to 640 Kbps full duplex. Data sheet at <http://www.visiontech.se/docs/vt640p.pdf>.

Figure 19: Creative inPerson (ZVRS z-340)⁷⁸



Figure 20: Sorenson VP-200⁷⁹



Figure 21: OJO Personal Video Phones (PVP) (ZVRS Z-OJO)⁸⁰



⁷⁸ <http://inperson.creative.com/product/welcome.aspx?id=Information> and http://www.zstoreonline.com/VP_Z340_p/vp-z340.htm

⁷⁹ The Sorenson VP-200 is the videophone currently being used in Telus VRS Trial in conjunction with a separate display and Sorenson VRS. Sorenson publishes a VP-200 user guide, but does not publish the VP-200's technical specifications: http://www.sorensonvrs.com/assets/pdf/VP-200_User_Guide.pdf

⁸⁰ <http://www.ojoservices.com/files/pages/Ojo-1000-Spec-Sheet.pdf> and http://zvrs.com/uploads/Image/specsheet/zojo_specsheet.pdf

Videophone Accessories

In addition to the actual videophone device, accessories or software applications may be added or used in combination to enhance videophone and VRS functionality. For example, “flashers” are separate devices that can be attached to a videophone to provide visual notification of an incoming videophone or VRS call. Other methods of notification include on-screen popup windows used with computer-based VRS software, the ability to have a text or pager alert sent to a user’s cell phone, pager, or an email to notify the user of an incoming call. An example of a VRS generated text message is shown below.

Figure 22: VRS alert on a BlackBerry phone⁸¹

```
-----Original Message-----  
From: VRS Call  
To: Jane Doe  
Subject: Incoming call now from 678-555-5555  
Sent: May 6, 2011 6:14 PM  
  
A caller at 678-555-5555 is trying to reach you at 916-555-1234 through  
Purple VRS right now.  
  
You can answer this call on your P3 or other videophone, or your caller  
may be directed to leave you a Video Mail message.  
  
For more information please log in to your Purple account.  
  
Thank you for using VRS.  
  
Sent via BlackBerry from T-Mobile
```

Other common VRS utilities include:

- Video Mail, which allows a VRS interpreter (or point-to-point caller) to leave a video message for a user who is not available to accept a video call;
- Address Book or other means of storing contact information and numbers,
- User Profiles, to allow users who share the same device to quickly access their personal settings and content.

These accessories are used not only with videophones, but also with computer-based VRS client software, and will be discussed in the Phase 8 report, Potential Related Services.

⁸¹ Purple Alert message sent to a Purple VRS user. Name and phone number have been changed for privacy.

6.4. Desktop Computer Software

In combination with a webcam or other compatible video camera, desktop or laptop computers may be employed to access VRS services. VRS providers generally supply free software application which can be downloaded and installed to the VRS consumer's computer for use with the VRS providers' services. Some VRS providers offer web-based VRS client services, wherein the user simply logs into the VRS provider's website and access VRS completely online. One advantage to a web-based client is that many people have more than one computer, or they access VRS from multiple locations. Having the VRS service completely web-based, allows the users' contacts, VRS mail messages, and other customized settings and applications to be available on any computer with a webcam that can access the VRS provider's website (although some software allows access to these features from any computer).

Whether VRS access is software application-based or web-based, most VRS providers offer clients that can be installed or run on most home or office computers operating systems, including Microsoft Windows, Apple's Mac OS, or Linux. Software-based VRS services are functionally identical to using a videophone device, but the interface is generated from the software, rather than from the physical videophone. Two examples of VRS software shots are illustrated below.

Figure 23: myMMX screen shots

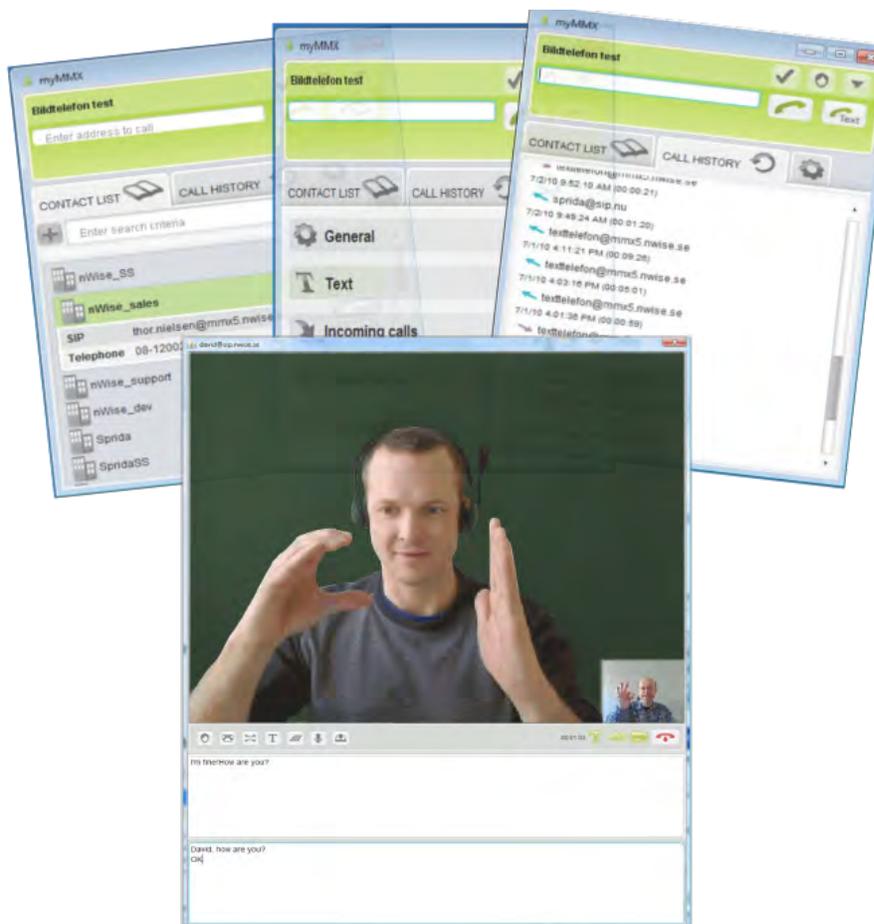
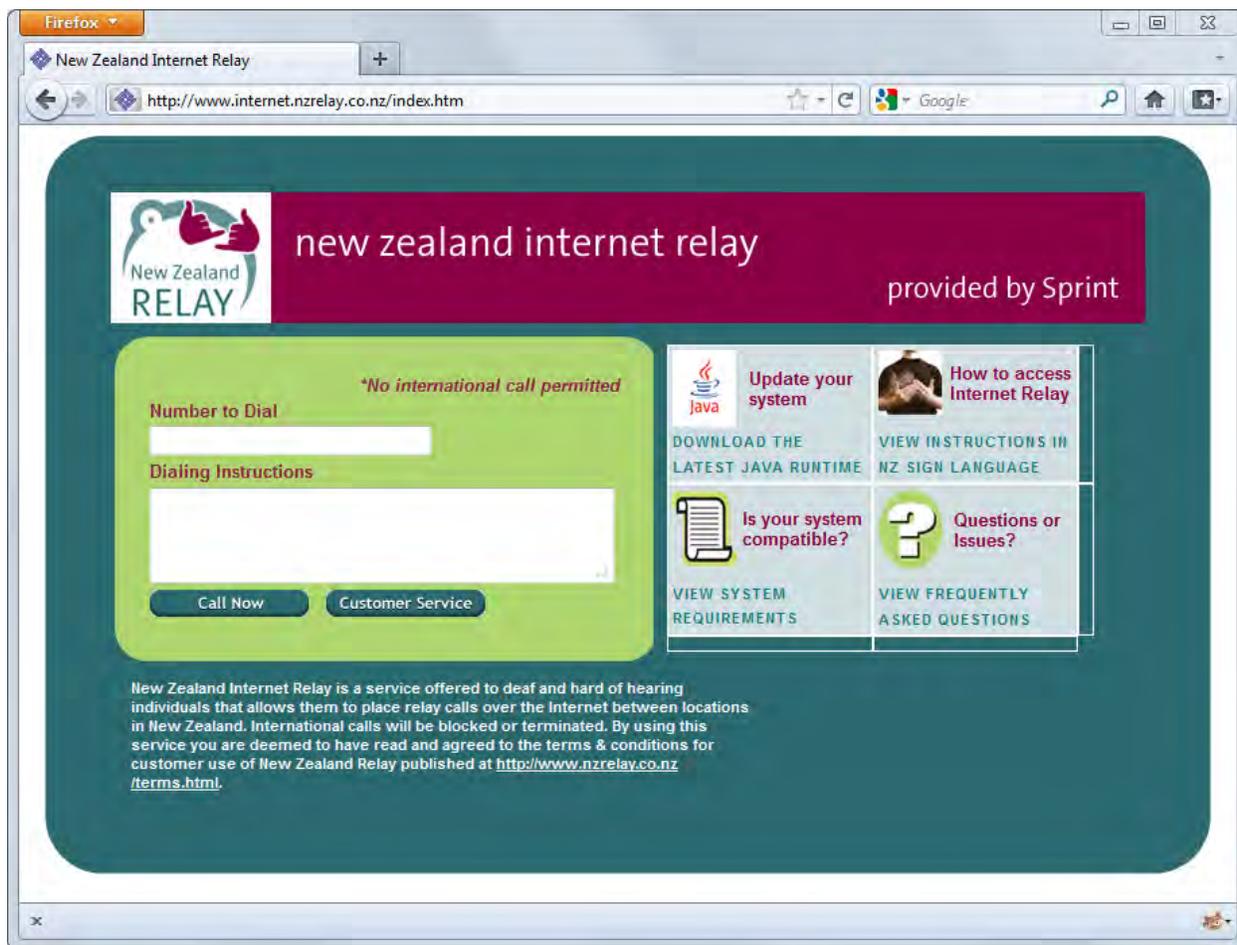


Figure 24: New Zealand Web-Based Relay Sign-On Screen



6.5. Tablet and Other Mobile Device Software (“Apps”)

When pagers and text-capable (i.e., SMS) cell phones first became available in the consumer market, Deaf users were some of the earliest adopters of these technologies. These devices allowed Deaf users to communicate anywhere, anytime with similarly equipped mobile or computer text system. In some instances, users activated Baudot signalling on their mobile device to enable communication with TTYs. The introduction of smartphones and tablet devices capable of recording, transmitting, receiving and displaying two-way live video over cellular signals has similarly heralded a revolution in communication technology. With live video-capable mobile devices, Deaf consumers can use sign language to communicate point-to-point and through video relay services from anywhere with a cellular signal with sufficient bandwidth. The merging of technologies and the trend toward IP-enabled services also means devices that have both cellular and wireless (Wi-Fi) capabilities can connect through either signal.

As indicated in section 4.1.2 and Appendix C, 3G Cellular connectivity has become available to almost all Canadians. As demonstrated in other countries, 3G has proven to provide sufficient speed for limited

VRS functionality. For example, since 2004 Sweden has had technology in place to allow 3G mobile users to use VRS services. As previously mentioned, various agencies and institutions have developed or researched improved compression algorithms to enhance sign language and especially lip-reading comprehension over 3G signals. However, the prevalence of advanced smartphone and tablet devices along with the promise of rapidly expanding 4G coverage is driving the demand for increased video communication capabilities with mobile devices. Whether 3G or 4G, smartphone usage is growing worldwide. The CRTC reports in their 2010 Annual Communications Monitoring Report that smartphone growth in Canada from the fourth quarter 2008 to the fourth quarter 2009 was 32%, while the overall growth of mobile devices was 15%.⁸²

Deaf users already have the ability to communicate point-to-point with various smartphone devices, and in many countries other than Canada, VRS providers are beginning to deploy applications to allow smartphone users to make or accept VRS calls. As smartphone and tablet costs continue to drop and/or as their capabilities increase without an increase in cost, users will increasingly adopt these technologies and use them for VRS.

It is important to note that access to mobile devices is not equally available to all users at all income brackets. Smartphones, while becoming more common, are still expensive devices that require cellular service plans with “data” access. The software (generally called an “App” on a mobile device) used for the video communication is usually free, but payment for the data access and usage minutes are the responsibility of the consumer.

While some video-capable smartphones can be obtained relatively inexpensively with the addition of a multi-year cellular service contract, some popular smartphones can cost hundreds of dollars, even with a multi-year contract agreement. In addition to the phone purchase cost, the user must have a cellular plan with data access in order to use the advanced features of the smartphone.

New “tablet” devices are becoming popular, and some now have front-facing cameras which enable live video communication. These devices, like their smaller smartphone predecessors, have Wi-Fi and cellular network connectivity, and offer a larger screen for better sign language and lip-reading comprehension.

Modern Video-capable tablet devices are still somewhat new on the market, and as such are fairly expensive. The communication methodology (from a network and IP perspective), however, is identical to that of smartphone devices, so VRS providers who are prepared to allow mobile VRS communications will easily be able to provide mobile tablet video relay services.

Some VRS providers have offered video relay services on Wi-Fi tablet or netbook-sized devices for many years. These may be single-purpose devices designed for video communications only, or may be small laptops or tablet computers which can also run VRS (such as the iPad) with or without specialized downloaded VRS applications. See following figures for examples.

⁸² CRTC 2010 Communications Monitoring Report, page 168

Figure 25: TM-9000 Tablet Videophone⁸³



Figure 26: Oplink Tablet Videophone⁸⁴



Figure 27: Viable VPad+⁸⁵

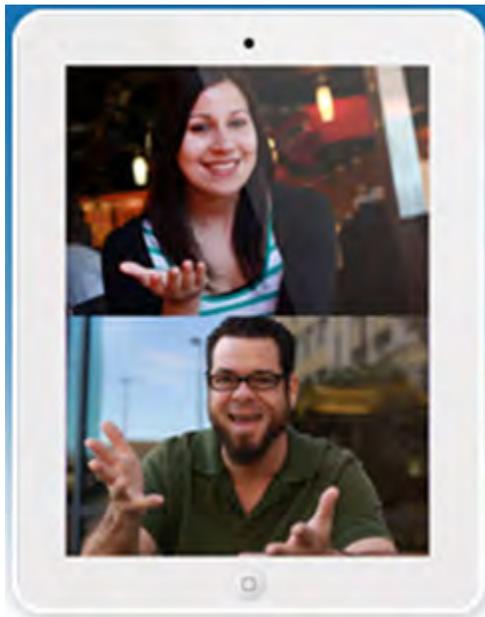


⁸³ TM-9000 (Sweden); <http://www.tmeeting.net>

⁸⁴ <http://www.oplink.fr/oplink.html>

⁸⁵ <http://www.viable.net/product/vpad>

Figure 28: iPad2⁸⁶



6.6. Other IP-based Devices Such as IP Televisions, Video Game Consoles

As analog technologies such as television and radio signals are being converted to digital, and as home access to the Internet becomes a worldwide standard, many new types of IP-based devices are being purchased by consumers for home entertainment purposes. For example, with Digital TV becoming a standard in most countries, television “sets” are now becoming blended video and computer devices. The explosion of Internet gaming has bought associated Internet-connected gaming devices (PlayStation, Xbox, Wii, etc.) into many consumers’ homes. Many of these devices have integrated web cams and communication technologies, thus enabling them to potentially be used as VRS devices. While the requirements for the use of these types of devices with VRS will vary from system and vendor, open access VRS systems which accept calls from any IP-based device may well be able to offer users VRS access through their web-cam equipped IP TV or gaming console.

6.7. Consumer Technical Assistance

The above review of VRS equipment and software reveals a range of complexity involved in the installation and/or configuration of VRS terminal equipment, and its use. This poses questions regarding the degree of technical support that VRS consumers will require during implementation of service. A review of the user guides or installation/configuration instructions available from the VRS vendors and

⁸⁶ <https://www.zvrs.com/>.

device manufacturers demonstrates significant potential complexities.⁸⁷ Some installation configurations may be as simple as “plug and play”, while other situations will require knowledgeable technical support. As with any population of users, Deaf consumers represent a cross section of technical competence, with many young people often more knowledgeable about the latest details of computer and network interfaces than their elders. In general, vendor technical assistance to consumer products is usually provided in written product user guides and set up instructions, augmented by help desk call-in and/or web chat access. For many Deaf consumers, however, written English or French are not their primary language. Additionally Deaf consumers are often restricted to vendor help desk services via traditional relay or via chat access if provided. Thus technical issues that are complex to the consumer or that use a specialized technical vocabulary, are usually not be available for explanation and discussion in the Deaf consumer’s native language, e.g., ASL or LSQ. This is a significant barrier to trouble-free adoption of VRS technology.

To overcome this barrier, some level of technical support to the VRS consumer will be required during implementation. In the United States different VRS vendors have adopted different strategies of support. While some offer comparatively minimal end user support, some provide complete personal support by delivering equipment, setting it up, and personally explaining and demonstrating its use using Deaf installers fluent in sign language. This latter approach was successfully used by Sorenson to acquire approximately 85% of the U.S. VRS market, and is being used by them in the current Telus VRS trial.

The extent and type of personalized support that will be needed will be dependent in part upon the type of equipment and VRS model selected. Multiple vendors with multiple devices and software solutions will require a variety of approaches, each tailored to the vendor systems and devices employed. However even a single VRS solution will face a variety of implementation and usage issues when deployed over a variety of computer, smartphones, mobile tablets and other popular devices. Therefore, some level of effective technical support to the consumers will be necessary.

7. Average Terminal Equipment Costs

End-user equipment hardware and software costs vary depending on the technology and the VRS model implemented. Client software, either downloaded on a consumer’s existing computer or as a website function, is usually provided by VRS vendors at no charge. When considering a standalone videophone, costs can vary from a couple hundred dollars to a thousand or more. In some countries’ VRS models equipment costs are subsidized in whole or in part, either by the VRS vendors or by a government agency. However, most VRS models cannot provide end-users with a computer or laptop on which to install the VRS software. Similarly, smartphone devices or mobile tablets, and their associated cellular and data service plans, are usually the financial responsibility of the Deaf user.

⁸⁷ For a sample of user guides with installation instructions, refer to the vendor websites referenced in this document’s footnotes.

In most competitive VRS models, users can choose their preferred VRS provider based on services as well as by the choices of equipment offered by the providers. In a non-subsidized VRS environment, however, or if a user prefers a different device from the one provided by the VRS provider, the user would need to purchase their own videophone device.

While videophone devices will vary in cost depending on features and functionality, the average consumer costs for a few videophone devices are listed in the table below.

Table 9: Estimated Videophone Device Consumer Costs

Manufacturer	Model	Estimated Costs
D-Link	DVC-2000	\$350
Grandstream	GXV-3000 or similar	\$150 - \$200
Ojo	Ojo PVP	\$190 - \$240
Sorenson	VP-200	Provided only to Deaf users in subsidized VRS model
Tandberg	E20 (business class videophone)	Provided at a discounted rate to users in subsidized VRS model.
VisonTech	VT82 /VT640D	2 Devices provided free to Deaf users in subsidized VRS model (Sweden)

Although videophone devices have often been provided to end-users on a free or subsidized basis, device accessories usually are not free or discounted. Examples of hardware accessories that typically require purchase are notification devices (such as flashing light indicators), or the physical equipment to enable pager or smartphone notification of incoming calls or messages.

Notification devices can be as simple as a small \$20 USB LED device that flashes when an incoming call or alert is received, or can be as complicated as a system connected to multiple devices to provide notification alerts throughout an individual’s home or office. More complex systems will begin in the hundreds of dollars range, and some may require professional installation.

8. Other Technical Considerations

In addition to technical considerations for functional VRS, such as available bandwidth, user hardware, mobility and software, the overall design of VRS for Canada may consider other technical capabilities to enhance the operations or management of VRS. Examples discussed below are interoperability, fraud

detection, demand and service reporting, and consumer data base services. These considerations will only be discussed at a high level, as their definition would normally be part of a detailed VRS procurement request and contract documents.

8.1. Interoperability

In the early days of VRS, communications technology was often limited to whatever network the VRS provider had invested in internally. Current communications technology, however, trends toward open, IP-accessible devices and software. Although individual VRS providers may continue to utilize proprietary devices, software, or systems, these proprietary methods do not necessarily have to limit the communication options for Deaf and disabled users in either their point-to-point communication or their video relay communication. Thus both the user devices, client software, and the VRS system design can be designed for either exclusive (non-interoperable) communications among their own kind, or can be designed for shared (interoperable) communications with other types of devices, software, or VRS providers. For example, the United States had a model that was open only to the degree volunteered by the VRS providers. Since the dominant provider (with about 85% market share) elected to have a closed non-interoperable system, the model was effectively non-interoperable for many years until the FCC ordered interoperability for all. Sweden adopted the “Total Conversation” model, demonstrating that proprietary systems can function in an open environment with multiple choices available for the end user.⁸⁸

Interoperability needs to be considered not only from the device-to-device functionality, and multiple VRS provider interoperability and administration and billing considerations, but also at the features and functionality level. Deaf users’ communications options such as VCO, HCO, text chat, language choice, and other modes of operation need not necessarily be limited by a single VRS vendor or provider.

Interoperability will be discussed in study phase 11, Potential Canadian VRS Models.

8.2. Fraud

As has been experienced in the United States, fraudulent usage and costs can be an expensive and pervasive blight on VRS. The potential for fraud is enhanced or diminished with different VRS reimbursement or cost models, which in themselves will have other benefits or drawbacks. However, depending upon the reimbursement model selected, the VRS system technology and the VRS end user hardware and/or software may also incorporate functions that may assist in mitigating the occurrence of fraud. For example end user devices or software could incorporate independent account tracking and usage reporting to oversight entities responsible for auditing relay provider’s reimbursement claims. Likewise, third party user registration (e.g., user ID and account authentication) could help ensure that costs were not accrued by non-Canadian or unauthorized (unregistered) users. All technical

⁸⁸ Note that the “Total Conversation” technology requires significant end-user equipment specifications for optimum performance, e.g., processor speed, memory, etc.

considerations for mitigation against potential VRS fraud will need to be assessed against non-technical considerations such as end-user privacy, potential barriers to ease of access, and overall increase in system complexity and costs.

Fraud will be a topic in subsequent VRS feasibility study phases.

8.3. Quality of Service

Quality of service will be a topic of discussion on its own under study phase 7. From a technology perspective, data capture of call attempts, denials and wait times from end-user software and/or from VRS provider system software could potentially provide ongoing assessments of VRS vendor quality of service. Such measures would, like those for fraud, need to be assessed against other non-technical considerations such as end-user privacy, potential barriers to ease of access, and overall increase in system complexity and costs.⁸⁹

8.4. Consumer Options

Typically VRS consumers are able to make personal choices regarding their VRS call handling and supporting information. These choices include but are not limited to language and modality of interpreting (e.g., LSQ, ASL, close up signing, signed English or signed French, hearing carry over, voice carry over, etc.), personal address books, and potentially even special topics or vocabulary (e.g., for calls to a medical environment, legal, or other speciality). These types of consumer options or preference choices can be the purview of the VRS providers, or such choices could be maintained within national or regional databases. If the data were maintained by non-VRS vendors, the data could be made available to all serving vendors, perhaps at the option of the individual consumer. Such preferences would also be maintained when and if vendors are changed out as a result of periodic bidding for award of VRS provider(s), or the possible withdrawal of a contracted service provider. While a central database is technically feasible, it would impose its own design constraints on the VRS model architecture for Canada. A central database of this type has many advantages as well as significant drawbacks, and will be discussed in study phase 11, Potential Canadian VRS Models.

8.5. Central Versus Local Call Distribution

As implied above in sections 8.1 through 8.4 there will be significant technical considerations involved with the choice of VRS architecture for Canada. Models that are regional by telephone company for example will have different technical challenges compared to a national architecture, whether or not such models involve a single vendor or multiple vendors. An architecture may have all local calls going to a regional provider, while another may have all calls going to a single point from which calls are

⁸⁹ Non-technical means of acquiring quality of service information can include customer surveys, vendor reporting, and measurement and assessment of consumer complaints.

distributed to VRS call centers based on availability of interpreters, language choice, regional or cultural issues, and other consumer choices.

9. Future Technology Trends

9.1. The Technological Progress Enabling VRS

This report has described a range of technological considerations for VRS, beginning with the original technology that enabled communications access to the Deaf and hard of hearing (the TTY). The evolving development and use of the computer, the videophone, the broadband infrastructure, and VRS provider technologies have created an environment that can potentially enable Deaf consumers to freely communicate in their native sign language with non-sign telephone users through VRS.

The latest developments in portable technology, wireless access, video-enabled smartphones and tablets have created a new level of accessibility not possible a very short time ago. Only four years ago a presentation was given by Omnitor, a technology company in Sweden, regarding the use of 3G cellular service for VRS.⁹⁰ In this presentation they described a “3G Signing Revolution” in which a large percentage of Sweden’s Deaf population were switching to wireless as their preferred technology: “70% of signing Deaf Swedes use 3G video calls as one of their favourite communication means.” The presentation described acceptance and penetration in spite of the fact that the then current wireless technology was less than adequate for this purpose. For example:

- “Picture frequency varies largely between models. The best can make 15 fps. 15 is possible to use [for sign language] but jerky, 20 is smooth and good.
- “For a long time, only one videophone gave usable performance (NEC 616). All others had too low frame rate.”
- “Still screen size, camera angle and camera low light sensitivity are common problem areas.”
- “The current 3G phones give very limited quality. Only usable for short conversations on easy topics.”
- “Now and then during a signed call, there is a need for exact spelling. Especially with current 3G videophones fingerspelling is hard.”⁹¹

Just a few years later, 4G phones and wireless devices with software programs such as ‘Facetime’ have enabled the technological fine tuning to make mobile sign language and wireless VRS a reality. In fact, mobile phones of today provide many additional communication tools that can enhance the experience of the Deaf and hard of hearing consumer outside of the VRS environment. For example:

⁹⁰ Omnitor’s self-description is to: “Improve Deaf communication and bring modern telecom development to the benefit for all.”

⁹¹ Gunnar Hellström; Omnitor; The 3G Signing Revolution; TDI-2007 Presentation

- ☑ Cell phones can use video for checking signed video mail messages.
- ☑ An application for subtitles can be used to follow dialogue while watching films in a movie theater.
- ☑ An application can enable the cell phone vibrate and flash to provide an alert when loud noises are present near the phone.
- ☑ An iPhone application amplifies sound around the user and turns it into a hearing aid device that can even adjust frequencies according to the user's preferences.⁹²

However, just because the technology is available does not mean it is accessible. As reported in this study's phase 4 report, many countries that have VRS have not yet made it available via wireless technologies, e.g. the UK, Switzerland, Czech Republic and Australia.

Thus, although a new technology may not be currently viable, this does not necessarily imply that it will take a long time to be developed. As demonstrated with mobile video, the technological evolution took only a few years to perfect. Since most MRS contracts last many years and are sometimes extended, their ability to enable new technologies should receive significant consideration.

9.2. Developments in Sign Automation

A new technology being researched is one that one day may potentially enable automation of video relay services. The European Union of the Deaf (EUD) is currently funding a three year "SignSpeak" project to "eventually" create software capable of translating between sign language and text or synthesized speech.⁹³ The stated goal of the project is to "develop a new vision-based technology for recognizing and translating continuous sign language to text (i.e. provide Video-to-Text technologies), in order to provide new e-Services to the Deaf community and improve their communication with hearing people."⁹⁴ This technology could have significant implications for the Deaf in that it could, "possibly allow the Deaf community to communicate with hearing people without having to use a relay service." While similar research has been conducted in the United States in the past, the advances in computer graphics (CGI) and faster more powerful computers provide greater possibilities than in the past.

The SignSpeak project started April 1, 2009. In addition to the EUD, whose involvement is to represent the needs of the Deaf community, the project is a collaboration of various research entities from Spain, the Netherlands, Germany and Belgium. Telefonica is the main industrial partner in this consortium.

Currently in its second year, the project is studying the "linguistic understanding of sign languages" from the perspective of machine recognition. It is creating a system to track the dominant and non-dominant hand, as well as facial expressions and body posture. In addition, it is creating the context for the translated sign by taking into account the signs performed before and after the sign. SignSpeak is using

⁹² www.leimobile.com; LEI Mobile; Facetime; Useful iPhone Apps for the Deaf; page 3

⁹³ <http://www.signspeak.eu/>

⁹⁴ SignSpeak Consortium; SignSpeak Annual Public report; 2nd year; Abstract

the same approach found in text-to-speech and speech-to-text technologies and applying them to sign language recognition. Development of this technology is a first step towards solutions that can understand and translate sign language with an acceptable degree of accuracy found in these other technologies.

The SignSpeak project outlines some of the difficulties it expects to encounter in creating efficient software capable of translating sign language. Some of these challenges include:

- “Multimodal language”: sign languages involve many simultaneous channels for communicating (hands, facial expressions, head movements, etc.)
- “Need to be more natural”: The signer needs to be understood by the machine without wearing gloves or other types of sensors or markers
- “Robustness and self-adaptation to the changing ambient conditions”: Developing automated detection and tracking techniques to minimize problems with clothing, lighting, viewpoint angle, background clutter, etc.
- Signer-dependency vs. signer-independency: First phase of the project is to work with training a SignSpeak signer for reliability and further stages will support a random signer
- Contextual translation: System needs to carry out continuous translation and not just identifying isolated signs
- Multilingual: A scientifically challenging task to be overcome by modeling and statistical methods is that there are many different sign languages and only a few grammar patterns
- Spatial reference handling: Analysis of the “spatial information containing the entities created during the sign language discourse (Considered by the Project team to be too challenging for a three-year objective and therefore not considered part of the project)
- Software integration: the need to integrate the different prototypes developed for multimodal visual analysis, sign language recognition and translation will be accomplished using a common framework
- Real time factor around 20: Initial project goal not to be a ‘real time translator’. ‘Real time factor of 20 means that 6 seconds of video will take 2 minutes to provide the translation
- Vocabulary size: Initially limited to around 4,000 words.⁹⁵

The above challenges indicate that the technology delivered by the SignSpeak project will be far from complete and will not be able to replace the human Interpreter in a Video Relay Service any time soon.

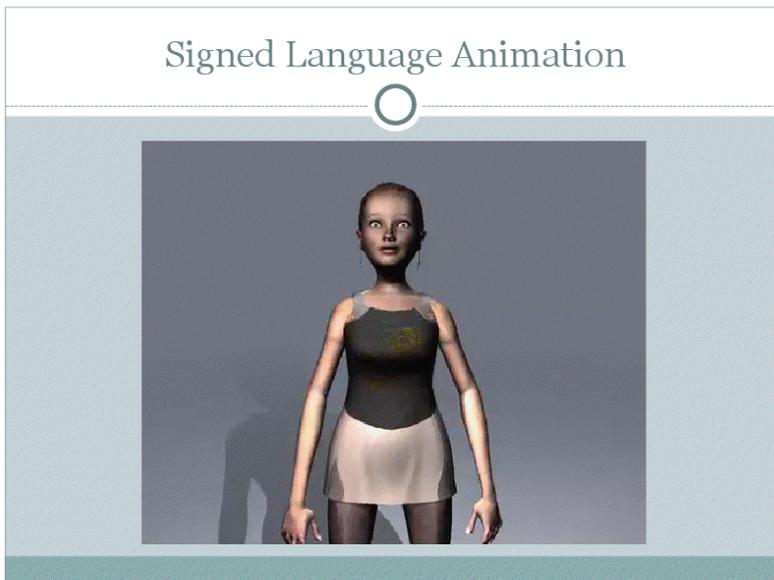
France is also experimenting with a Virtual Sign Language technology. There is a consortium of Academic, Industrial and Research partners working on the “SignCom Project” which is funded by the Agence Nationale de la Recherche (ANR), the French National Research Agency.⁹⁶ The basic goal of the

⁹⁵ SignSpeak Consortium at <http://www.signspeak.eu/en/partners.html>; SignSpeak Annual Public report; 2nd year at <http://www.signspeak.eu/deliverables/SignSpeak%20-%20Annual%20Public%20Report%20-%20year%202-v1.pdf>; SignSpeak Specifications at <http://www.signspeak.eu/en/specifications.html>.

⁹⁶ <http://www-valoria.univ-ubs.fr/signcom/en/>.

project is to “improve the quality of real-time interaction between humans and virtual agents.” By using motion capture data and building a comprehensive database of multiple repetitions of the same sign in many different contexts, the team is able to animate a virtual French Sign language (LSF) signing avatar.⁹⁷

Figure 29: The SignCom LSF virtual interpreter avatar⁹⁸



The project has oriented its goals into: 1) sign language analysis, and 2) sign language animation. The data collection for analysis included motion capture (mocap), video and annotations. They created the “vocabulary” for the avatar by initially using 12 cameras placed around a laboratory sign language interpreter to capture the motions of body markers placed on the subject.⁹⁹ Once the vocabulary database is built, they can be used to animate the avatar in various applications, although the research “will be valuable for the creation of multiple ‘intelligent and expressive’ interfaces for people who use signed languages”. The SignCom project listed two main applications:

⁹⁷ Corpus Design for Signing Avatars; by Kyle Duarte and Sylvie Gibet; Université de Bretagne-Sud, Laboratoire VALORIA, Vannes France; Author manuscript, published in “Workshop on Representation and Processing of Sign Languages: Corpora and Sign Language Technologies, Valetta: Malta (2010)

⁹⁸ <http://www-valoria.univ-ubs.fr/signcom/en/index.php?a=avatar>.

⁹⁹ The markers included: 41 facial markers, 43 body markers and 12 hand markers (six per hand). Language resources and Evaluation Conference (LREC); Valletta, Malta; May 22-May 23 2010; Kyle Duarte and Sylvie Gibet; Université de Bretagne-Sud, Laboratoire VALORIA, Vannes France; Heterogeneous Data Sources for Signed Language Analysis and Synthesis: The SignCom Project

- Interactive kiosk: “making public announcements accessible for Deaf and Hard-of-Hearing people is recognized as a [French] national priority. With the interactive kiosk, users’ gestures are captured by cameras and recognized by the system; then, responses are provided through a virtual expressive character, giving information and advice. In this case, the dialogue is guided by restrictive scenarios.”
- Virtual Reality: “LSF signs, previously recorded with motion capture (mocap), are used to drive a virtual character’s animation. Interaction is guided by the progressive construction of a 3D virtual space shared by the human user and the humanoid character.”¹⁰⁰

There are no indications of when these applications would be commercially available. However, in a July 22, 2010 update to the Corpus Abstract, they conclude: “Having collected our data, we believe that we have an excellent base with which we can create convincing animations of French Sign Language, due in large part to the intentional way we built the SignCom corpus.”¹⁰¹ In addition to the referenced presentation at the LREC conference in Malta in May of 2010, the project team has shared their experience and results at many other venues. These include: Proceedings of the Colloque A3DM 2010 in Poitiers, France June 17-18 2010; Proceedings of the Workshop Traitement Automatique des Langues des Signes (TALS 2010), Montreal, Quebec, Canada, July 23 2010; and the First International Workshop on Sign Language Translation and Avatar technology in Berlin, Germany, January 10-11, 2011.¹⁰²

There are other examples of technologies attempting to replicate the sign language translation abilities of an interpreter.

A company called iCommunicator states that although they are developing similar technology, the goal of their product is to augment not replace human sign language interpreters: “The iCommunicator is not intended as a replacement for sign-language interpreters, but as an alternative when an interpreter is not available: Classroom Settings, Daily Communication, Ad hoc Meetings, Emergency Situations.”¹⁰³

As time progresses, these technologies will be refined and supplanted by new technologies that have yet to be imagined. In the context of preparing for the possibility of deploying VRS, advancements in automated technologies such as computer generated interpreting of sign language and converting it to speech, or the use of animation and avatars, may hold the promise to provide

¹⁰⁰ www.valoria.univ-ubs.fr/signcom; Valoria University website; The SignCom Project: Sign-Based Communication Between Real and Virtual Agents; Overview; Applications

¹⁰¹ Corpus Design for Signing Avatars; by Kyle Duarte and Sylvie Gibet; Université de Bretagne-Sud, Laboratoire VALORIA, Vannes France; Author manuscript, published in “Workshop on Representation and Processing of Sign Languages: Corpora and Sign Language Technologies, Valetta: Malta (2010); hal-00505182, version 1 – July 22, 2010

¹⁰² www.valoria.univ-ubs.fr/signcom; Valoria University website; The SignCom Project: Sign-Based Communication Between Real and Virtual Agents; Dissemination; Publications and Events

¹⁰³ www.icommunicator.com; Product information

additional video and sign language interpreting options in the future, but it is uncertain that these technologies will be robust or accurate enough to satisfy the personal interaction generally required in relay services.

10. Conclusion

Developments in technologies directly pertinent to VRS have in recent years have progressed in many areas. New highly capable technical products such as computers, mobile devices and videophones offer consumers unprecedented communication capabilities. These together with the very high availability of wired and wireless broadband to almost all Canadians, and advances in VRS provider services, all indicate that there are no technical barriers to implementing VRS in Canada.

The primary challenges to selecting and implementing the technical VRS solutions will be non-technical, such as consumer education and training, cost considerations, and other policy and program issues, which will be explored in other phases of this VRS Feasibility Study.

Phase 6:

Interpreter Considerations

VRS Feasibility Study

Mission Consulting

February 24, 2012

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INTERPRETER CONSIDERATIONS

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the sixth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 6 research summary, *Interpreter Considerations*, provides a synopsis of a variety of information pertaining to potential VRS interpreters. Interpreters are critical to ensuring a Canadian model for VRS that will work for regulators, providers and consumers. This synopsis includes:

- Definition / History of the profession, types of interpreters, and languages used
- Work and processes of interpreters
- Interpreting in the VRS environment
- Accreditation and evaluation procedures in ASL and LSQ; national and provincial level.
- Estimated numbers of ASL and LSQ interpreters and forecasted growth
- Summary of questionnaire responses from: referral agencies and professional organizations
- Description of interpreter training programs in Canada
- Potential responses to a forecast shortage of qualified interpreters.

2. Summary Findings

Salient points of this analysis of interpreter considerations for VRS include the following:

- Shortage of interpreters is a concern of all stakeholders.
- Collaboration with interpreter training programs, referral agencies, and professional groups to prevent critical shortages for community interpreting is strongly suggested.
- Significant differences including preparation, skills, and consumer expectations exist between VRS and community interpreting.

- Minimum requirements for hiring ASL-English interpreters to work in VRS setting should ideally include active membership in the Association of Visual Language Interpreters of Canada plus community experience.
- Minimum requirements for hiring LSQ-French interpreters should ideally include graduation from visual interpreting diploma program at Université of Québec at Montréal or specific screening procedures.
- For Inuit and Maritime populations the addition of a Deaf interpreter may be a solution.
- Stakeholders believe community education and outreach will be needed for VRS.
- Restructuring interpreter training from diploma programs to degree programs may increase labour pool.
- Increased funding will be required for interpreter training programs to expand.
- Existing Sorenson call centres in Canada and the populations they serve may have a significant impact on the availability of interpreters for ASL-English VRS.

The research for this phase 6, *Interpreter Considerations*, included creation and distribution of three questionnaires to interpreter training programs, interpreter referral agencies, and interpreter professional organizations. Several of these organizations were then contacted for interviews and consultations regarding a variety of information pertaining to VRS for Canada. The opinions and concerns of these stakeholders are summarized in this report to provide information about potential areas of significance regarding interpreter availability for VRS in Canada.

3. Conclusion

Critical shortages of sign language interpreters are widely reported, particularly in rural areas. However, the question is not whether there are enough interpreters to support VRS for Canada, but rather how to effectively create strategies to increase the labour pool, balance community needs, and prevent 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.

Interpreter Considerations

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the sixth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 6 research summary, *Interpreter Considerations*, provides a synopsis of a variety of information pertaining to potential VRS interpreters and is closely related to the research from Phase 3 Consumer Considerations. Interpreters are critical to ensuring a Canadian model for VRS that will work for regulators, providers and consumers. This synopsis includes:

- Definition / History of the profession, types of interpreters, and languages used
- Work and processes of interpreters
- Interpreting in the VRS environment
- Accreditation and evaluation procedures in ASL and LSQ; national and provincial level.
- Estimated numbers of ASL and LSQ interpreters and forecasted growth

- ☑ Summary of questionnaire responses from: referral agencies and professional organizations
- ☑ Description of interpreter training programs in Canada
- ☑ Potential responses to a forecast shortage of qualified interpreters.

The research for Phase 6 *Interpreter Considerations*, included creation and distribution of questionnaires specific to each type of group: interpreter training programs, interpreter referral agencies, and interpreter professional organizations. The questionnaires were sent via email to the respective organizations with instructions to collect information from all interested parties within the organization, but to return only one completed questionnaire representative of the entire organization. A response rate of 66% was achieved with 23 out of 35 questionnaires 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 1: Organizations Surveyed

Type	Number Received	Number Sent
Interpreter Training	9	10
LSQ-French Training ¹	4	4
ASL-English Training	5	6
Professional Organizations²	3	9
Referral Agencies	11	16
LSQ-French Agencies	7	8
ASL-English Agencies	4	8
Total	23	35

Several of these organizations were then contacted for follow up interviews and consultations regarding information pertaining to VRS for Canada. These consultations were conducted in-person, via Skype, or through email correspondence. The opinions and concerns of these stakeholders are summarized in this

¹ Included one cued speech trainer, not technically an interpreter trainer.

² National chapter: Association of Visual Language Interpreters (AVLIC). Affiliate Chapters: Westcoast Association of Visual Language Interpreters (WAVLI) and Association of Sign Language Interpreters of Alberta (ASLIA).

report to provide information about potential areas of significance regarding interpreter availability for VRS in Canada.

2. Introduction and History of Visual Language Interpreting

2.1. Background of Interpreting Profession

Sign language or visual language interpreters³ work to facilitate communication and create a bridge between people who do not share a common language. Simply defined, interpretation takes the spoken or written language and transmits it into a signed or visual language for the purpose of facilitating communication between Deaf and hearing people. However, the procedures involved in the interpreting process are far more complex and are both cultural and linguistic in nature, crossing over different modalities. Interpreters are bilingual-bicultural professionals who interpret linguistic and cultural information, while being sensitive to environmental factors, which may foster or impede the message.

Interpreting is a fairly young profession; however there were probably family members and friends of Deaf people interpreting in some form of visual language for as long as the use of language has existed. In the beginning, interpreters were individuals who typically:

1. Had Deaf parents, siblings, or other relatives
2. Were teachers of the Deaf
3. Were members of the clergy⁴

These individuals were volunteers who interpreted out of the goodness of their hearts or an obligation to family members; at this time these services were determined adequate. The shift toward professional interpreting occurred during the 1960's and 1970's. The Registry of Interpreters for the Deaf (RID) was established in 1964 during a national meeting at Ball State Teacher's Colleges in Muncie, Indiana U.S. Following the meeting, a group of sign language interpreters, who were hired to interpret for the Deaf during the meeting, decided to stay an additional day to discuss creating a list of qualified interpreters to meet the increased demands for interpreting services. RID incorporated in 1972 and sign language interpreters from Europe, New Zealand, Australia, and Canada joined RID to take part in this shift towards establishing a professional organization for interpreters.⁵

In Canada, the profession evolved similarly, with interpreters tending to be family or friends of Deaf people. In the 1970's many Canadian interpreters were members of RID and began establishing affiliate

³ Interpreters as defined for this report refer to LSQ/French and ASL/English interpreters.

⁴ Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 262.

⁵ Ibid Pg. 263-264.

chapters such as The Manitoba RID (MRID in 1976) and Alberta RID (ACRID in 1977).⁶ However, RID was insufficient to satisfy the needs of Canadian interpreters, who wanted a professional organization that best represented the specific needs of Canada. With support and input from the Canadian Deaf community, the Association of Visual Language Interpreters of Canada (AVLIC) was founded in 1979. This collaborative effort between the Deaf community and the interpreting community is of paramount importance to AVLIC and is the basic foundation that continues to influence the professional activities of the organization.⁷

Additionally, LSQ-French interpreters were in need of a specific organization to address their unique needs. In response the Association Québécoise des Interpreters Francophones en Language Visuel (AQIFLV) was formed on September 25 1982 in Montreal, Québec.⁸ However, in October 2004 AQIFLV officially ceased operations.⁹

The profession has evolved over the last 50 years and the following theoretical philosophies show the progression from oppression to empowerment of the Deaf client.

Table 2: Philosophical Frames of Interpreting¹⁰

TIME PERIOD	PHILOSOPHY
1960's and earlier	<p>HELPER:</p> <ul style="list-style-type: none"> • Perceives Deaf as handicapped, incapable of managing personal or business affairs. • Interpreter is considered to be a caretaker whose main responsibility is to help; often steps out of role to advise and influence their clients. • Considers Deaf culture norms as inappropriate; views signed language as poorly educated version of a spoken language, such as English or French.

⁶ Ibid Pg. 267.

⁷ Ibid

⁸ http://www.deafculturecentre.ca/Common/ResearchN/Items/1_Chapter%2012.pdf

⁹ http://www.avlic.ca/files/pdf/newsletters/2005_avlic_winter.pdf

¹⁰ Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 171-178.

TIME PERIOD	PHILOSOPHY
Late 60's early 70's	MACHINE CONDUIT: <ul style="list-style-type: none"> • Considers Deaf people as responsible for their own lives, but does not recognize signed language as a true language; views spoken language as superior. • In response to the view that helper philosophy was oppressive, an extreme shift to an attempt to have no influence on the communication. • Characterized by an almost robot like verbatim translation, very rigid and inflexible.
1970's – late 1980's	COMMUNICATION FACILITATION: <ul style="list-style-type: none"> • Perceives Deaf people as a segment of the handicapped population, who are seeking inclusion in the majority non-disabled community. • Considers signed language a useful tool for less educated or less intelligent people; views spoken language as superior. • Focuses on the semantics of interpreting (e.g. lighting, clothing, visual distractions).
Current	BILINGUAL-BICULTURAL <ul style="list-style-type: none"> • Views Deaf people as part of an oppressed minority; recognizes signed language as an official language with its own culture. • Interpreter's role is to equalize communication and empowerment of the Deaf and hearing people involved. • Interpretation is defined broadly and includes linguistic and cultural mediations, and various models of complex mental processing procedures that enable interpretations to cross over linguistic and cultural differences.

These theories also show the evolvement of the shift of power from the hearing community to the Deaf community. The bilingual-bicultural theory empowers the Deaf individual by levelling the communication playing field through the recognition that culture and language cannot be separated. One recurring theme from interviews with various interpreter organizations is the importance of applying this philosophy in the training of interpreters. They report that in order to provide effective interpretations, one must have training that encompasses all aspects of the linguistic and cultural interpretation process. Only obtaining competence in the language, without taking specific training in interpreting is never adequate for interpreting work.¹¹

¹¹ Mission Consulting Interviews with Canadian interpreter professionals and training programs. See Appendix A for list of all organizations.

Interpreting, as a profession, requires a variety of complex skills and competencies that cannot simply be taught. The necessary skills need to be cultivated through experience and engagement with the Deaf community, which is very diverse and varied in its communication preferences. An interpreter must be able to recognize these differences, as well as a multitude of other nuances in a very short amount of time, in order to achieve a communication that occurs on an equivalent level to that of spoken language.

“...interpreting involves the ability to accurately represent a message expressed in one language, its meaning and intent including its cultural components, into another language with its cultural components, without changing the meaning. The goal is that the interpretation conveys the same message to those who utilize a second language as would be conveyed directly to those who receive the original message in their own language.”¹²

Typically, a sign language interpreter is a hearing individual fluent in a spoken language and a visual language (e.g. French and LSQ or English and ASL). Most sign-language interpreters either interpret, between English and ASL or French and LSQ, or transliterate, facilitating communication between English/French and contact signing—a form of signing that follows a spoken language-based word order. Other interpreters may specialize in oral interpreting for deaf, late deafened or hard of hearing persons who prefer lip reading over visual language. Other specialties include using cued speech, signing exact English or French, or interpreting for people who are blind as well as deaf by making manual signs into their hands, often referred to as tactile signing. A full analysis of the various communication preferences can be found in this study’s Phase 3 research on consumers, however it is important to note here as interpreters need to be aware of these differences and be able to accommodate various situations. This skill is usually obtained by completing coursework in interpreting.

Some assume that sign language is universal and can be understood and used by Deaf people all around the world. This is not the case; signed languages differ across the globe. In Canada, sign language interpreters provide interpretation between English and American Sign Language (ASL), or in several French-speaking territories and throughout Québec, between French and Langue des Signes Québécoise (LSQ).¹³ Although ASL and LSQ share many grammatical and structural properties and are both influenced by LSF (French Sign Language), they are in fact separate languages.

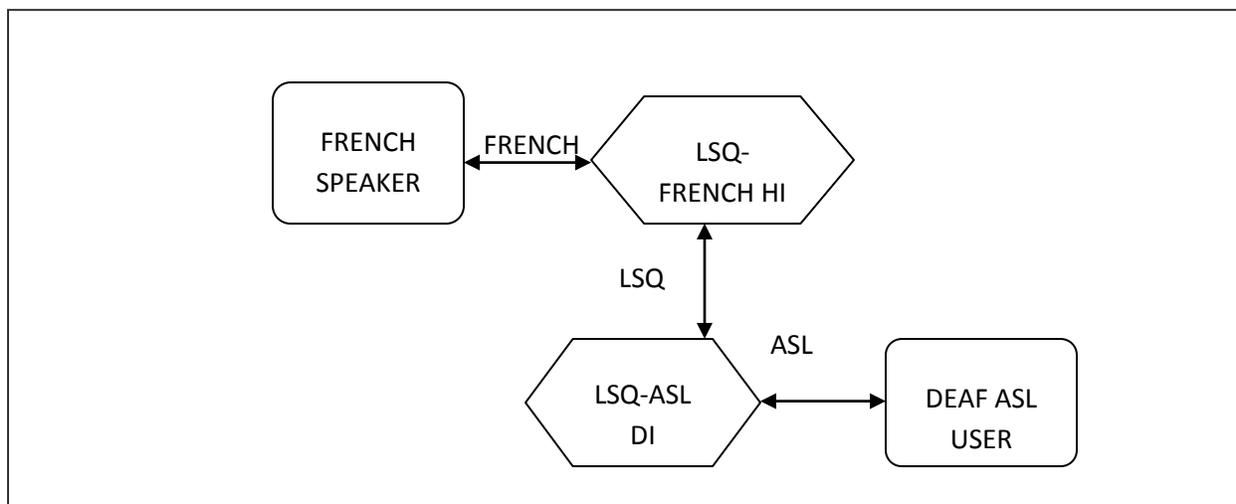
Another type of interpreter is the Deaf interpreter, or DI, who typically works in tandem with a hearing interpreter to improve communications for a Deaf person who uses a non-standard sign language, regional dialect, or some other form of visual communication. The DI has many potential uses, but most commonly is known for acting as a relay between a hearing interpreter and a Deaf consumer, with the

¹² Gordon, M.G. and Hardy, M. *Provincial Review of ASL/Deaf studies and Interpreter Education in BC*, Dec 2009, pg. 1. https://www.cacuss.ca/content/documents/Link/CADSPPE_Resources/ASL_Deaf_Studies_REPORT_FINAL.pdf

¹³ Other visual languages used in Canada include Inuit Sign Language used in Northern Canada by the Deaf Inuit population and Maritime Sign Language, which is sometimes used in Eastern Canada.

purpose of compensating for differences in language due to the consumer’s educational and language background.¹⁴ For the VRS setting, a Deaf interpreter is often called upon to facilitate communication, as the Deaf caller may be using idiosyncratic language that the hearing interpreter is unfamiliar with. The use of DIs in VRS is extremely useful because the calls coming in are from such a diverse population with many different language abilities. The concept of a Deaf interpreter in Canada has other implications due to the existence of Inuit Sign Language, Maritime Sign Language, and in regard to the two official languages, English-ASL and French-LSQ. The DI may have fluency in both ASL and LSQ and therefore can help facilitate communication between users of each language, as well as act as an intermediary between hearing ASL/English interpreters and LSQ/French interpreters.¹⁵ For example, if a hearing French speaker needs to communicate with an ASL Deaf individual, one possible solution would be to utilize a LSQ-ASL DI and hearing interpreters (HI):

Figure 1: LSQ-ASL Deaf Interpreter



This diagram shows one of the many different configurations that could be made utilizing the services of a Deaf interpreter. The LSQ to ASL Deaf interpreter may have implications on the specific setting of Video Relay Services, as a potential intermediary for ASL / English and LSQ / French users. Furthermore, the services of a Deaf Interpreter may be needed for the Inuit population and users of Maritime Sign Language. The Inuit Deaf community in the northern regions of Canada use Inuit Sign Language (ISL), which is not yet recognized as an official language. However, researchers at McGill University are working on documenting the language in order to lead to official language status. The language is described as a personal sign language that is used within the family, but many of the Deaf Inuit across the region report using similar hand signals leading to the recognition that it is more than just home

¹⁴ Boudreault, Patrick. “Deaf Interpreters.” *Topics in Signed Language Interpreting*, 2005. Pg. 331

¹⁵ Ibid. Pg. 328

signs¹⁶ or gestures within a family. There are an estimated 155 to 200 Deaf Inuit people in Nunavut, although most learn ASL in southern schools, some do not.¹⁷

According to an AVLIC interpreter who works within the Deaf Inuit population, the need for interpreting services is great. Access to interpreters is limited and mostly provided by friends or family members knowledgeable in the language, but not in the process of interpreting. In this interpreter's experience most ISL signs are produced interchangeably with ASL and resemble more of a contact variety¹⁸ of sign language. She reports she has yet to meet an ISL only user and instead encounters a contact variety combining ISL, ASL, and home signs.¹⁹ For the purposes of VRS, it may be helpful to utilize the services of a Deaf interpreter as an intermediary when taking calls from this population.

Maritime Sign Language is a signed language used by Deaf people in Canada's Maritime Provinces. Currently the majority of Deaf Anglophone Canadians use American Sign Language (ASL), but some elderly Deaf people continue to use MSL, which is believed to have originated from British Sign Language (BSL). The predominance of ASL has impinged on MSL in the provinces of New Brunswick, Nova Scotia and Prince Edward Island and has become the majority language. Estimates place the number of MSL users at slightly below 100.²⁰ MSL does not appear to be a considerable factor for VRS, but possibly another opportunity for a Deaf interpreter to facilitate communication if needed.

2.2. Forms of Interpreting

Interpreters need to be cognizant of the various forms of communication modes²¹ used by the Deaf community and be able to accommodate those forms. American Sign Language and Langue des Signes Québécoise are both visual gestural languages with distinct grammar and syntax that are not based on spoken language. This form of communication is the most often used by interpreters. However, some forms of sign language are derived from spoken language and interpreters may encounter these forms in addition to ASL or LSQ. The general term for these derivatives is *sign supported speech*, which encompasses all the forms of spoken language (e.g. French or English) based signing systems. All of

¹⁶ Home signs: system of pantomime, gestures and manual signs used within a family to support communication in place of formal sign language.

Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 105.

¹⁷ <http://www.cbc.ca/news/canada/north/story/2008/09/17/inuit-sign.html>

¹⁸ Signing that reflects a mixture of structures as a result of prolonged contact between languages.

Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 105.

¹⁹ AVLIC Email correspondence 05/17/2011

²⁰ Abstract: Canada's Maritime Sign Language, Yoel, Judith, Ph.D., University of Manitoba (Canada), 2009
<http://gradworks.umi.com/NR/64/NR64276.html>

²¹ See Phase 3 Consumers for detailed description of communication preferences.

these systems attempt to represent spoken language in a manual/visual form.²² One example is signed French, which uses mostly LSQ signs and follows French structure. Signs to represent smaller lexical units (e.g. le, la, les) are included, but these signs were created by hearing teachers to teach French.²³ Signing systems are controversial in the Deaf community, and are viewed by many as attempts to oppress Deaf people and force them to give up their cultural linguistic identity. For example, the Canadian Association for the Deaf states:

“The natural language of Deaf people is Sign language. In Canada there are two legitimate Sign languages: American Sign Language (ASL) and la Langue des Sourds du Québec (LSQ); there is also a regional dialect, Maritimes Sign Language (MSL). The capitalized term “Sign language” refers only to these and to the true Deaf languages of other countries (British Sign Language, French Sign Language, etc.) These Sign languages have been recognized internationally as legitimate languages with their own grammar, syntax, and vocabulary...

Several varieties of sign systems (pseudo sign “languages”) have been developed by non-Deaf people, such as Seeing Exact English, Signed English, Cued Speech, Manually Coded English, and others. These are systems rather than languages, because they were artificially invented instead of naturally developed. They deform the true Sign language in order to make it conform to the grammar and syntax of a verbal language (English or French). The Canadian Association of the Deaf considers such sign systems to be a form of cultural oppression.”²⁴

However, it should be noted that in Québec these other codes or systems are sometimes the only form of interpretation offered in certain regions. The Centre québécois de la déficience auditive (CQDA) makes the following comment in regard to these codes:

“Although there are different forms of interpreting, there is, for CQDA, a difference between sign language and codes. Sign languages are cultural as where codes and modes are only tools for better literacy mostly used with children. These codes and modes are very controversial in Québec, but they do exist, and are mainly used in some Québec regions as the sole form of interpretation and cannot be put aside without discriminating some Deaf and hard of hearing individuals while work is being done on sign language and Deaf culture recognition.”²⁵

²² Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 89-95.

²³ Suzanne Villeneuve (UQAM) Email correspondence 05/11/2011.

²⁴ Canadian Association of the Deaf’s Position Paper on Languages. <http://www.cad.ca/language.php>

²⁵ CQDA correspondence 07/05/2011

Another form of language that has developed from the long contact between two languages is called Pidgin, also referred to as contact varieties. For example, LSQ and French have had contact with each other for so many years that some Deaf people use a blended form of the two. Again, the views are mixed as some see this as a natural progression of modern ASL/LSQ, while others view it as an inferior form of ASL/LSQ.²⁶ Regardless of the controversial nature of these systems, the fact remains that they exist and interpreters serving the Deaf community will encounter these communication preferences. Therefore, the following is a brief overview of terms used to describe the different forms of work a visual language interpreter may be called upon to perform.

Interpretation:

- Cultural and linguistic features of a message in one language are taken in and analyzed, then transferred into *another language* (e.g. Spoken French to LSQ and LSQ to Spoken French).
- Includes tactile and up close signing for Deaf-Blind individuals.

Transliteration:

- Features of a message from one language are taken in and then expressed in a different form of the *same language* (e.g. English to signed English).
- Often includes clear mouthing of the words accompanied by sign supported speech.

A different form of interpreting is oral transliteration provided by oral interpreters for oral deaf individuals.²⁷ This form of interpreting does not include signed languages, but rather lip reading with or without natural gestures. Yet another form is cued speech or *Langage parle complete* (LPC) in Québec, which uses a manual coding system to represent individual language phonemes for the purpose of learning speech. These two forms do not use signed language or sign supported speech and as such are not often included in traditional definitions of visual interpreting. AVLIC does not include oral or cued speech in their definition and instead only represent interpreters whose working languages are ASL-English or LSQ-French. Sign supported speech requests do occur and AVLIC reports that a foundation in ASL or LSQ makes it easy to accommodate those requests.²⁸ It should be noted that oral transliteration is used in Québec and oral interpreters are employed by agencies that also provide visual language services.²⁹ In addition according to CQDA, The Québec School Board employs individuals to provide signed French and cued speech and those individuals are considered interpreters under the same

²⁶ Humphrey, J. and Alcorn, B. *So You Want to Be An Interpreter? An Introduction to Sign Language Interpreting*. 4th Edition, 2007. Pg. 96-106.

²⁷ Ibid. Pg 106; Oral deaf individuals do not use Sign language and instead use their own speech and speech reading abilities. (e.g. lip reading).

²⁸ AVLIC Email correspondence 05/31/2011

²⁹ Questionnaire responses from SIVET, SAIDE, SRIAT, and SIPSE.

professional title as LSQ-French interpreters. The CQDA states that the same procedure occurs for pidgin, oral interpretation, and LSQ:³⁰

“...College and universities hire individuals on an interpreter basis, may they do oral interpretation, pidgin, LSQ, or any other code or mode. Therefore, in Québec, a visual interpreter is not only for LSQ-French, he can do other modes and codes, in respect with the individual’s needs.”³¹

2.3. The Work of Interpreters

Interpreters work anywhere that communication between non-signing hearing individuals and Deaf people needs facilitation. The settings interpreters may find themselves in are extremely varied and encompass almost every situation imaginable. Typically, interpreters are employed either on a freelance basis as self-employed private contractors, or through organizations such as educational institutions, interpreter service agencies, or private companies. Some choose to do a combination of both types of employment, as freelance work may not guarantee the amount or kind of employment desired. However, CQDA reports that in Québec the interpreter service agencies do not allow their interpreters to simultaneously engage in freelance work.³²

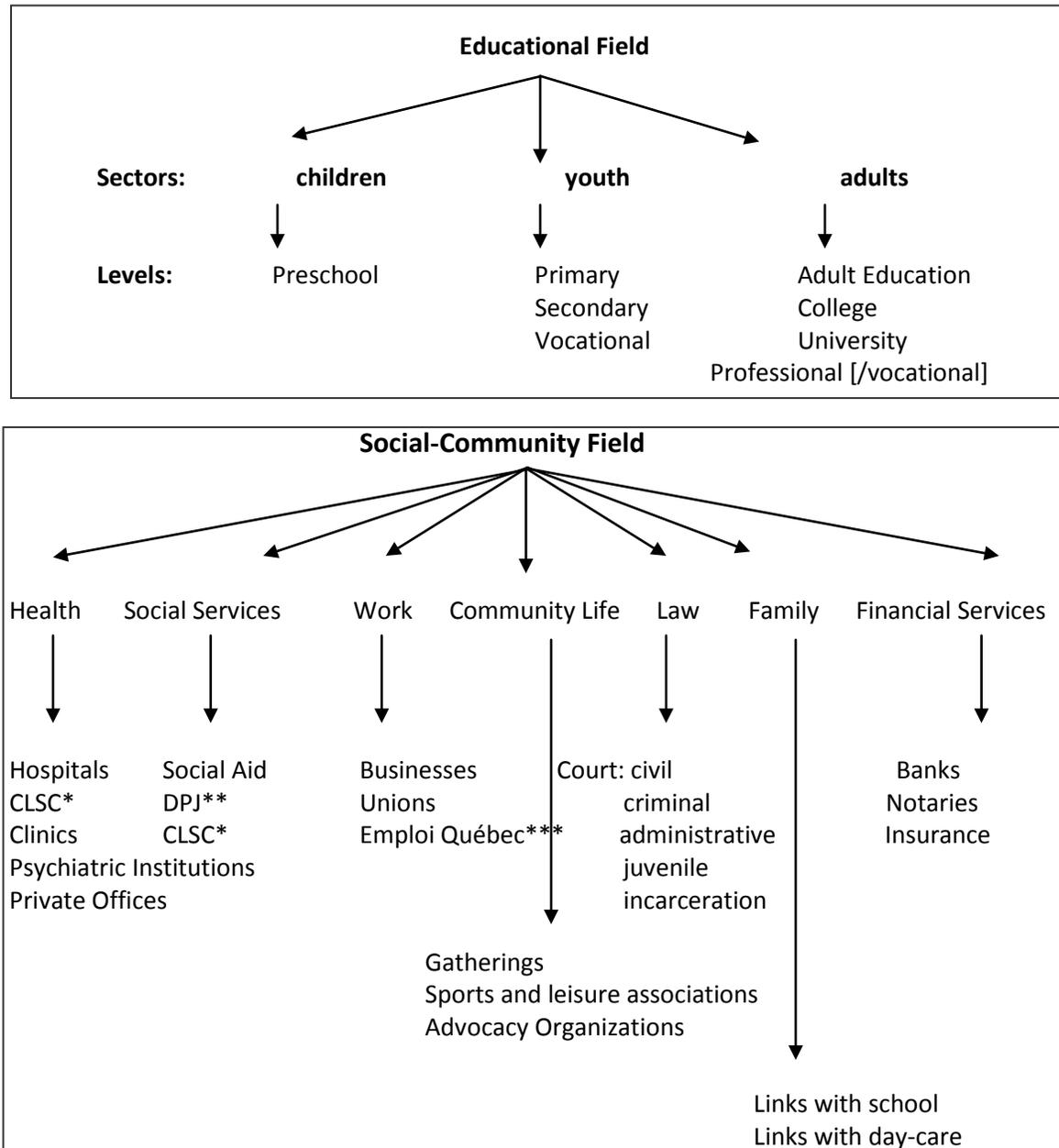
The following summary diagrams show some of the places where interpreters work:

³⁰ CQDA correspondence 07/05/2011

³¹ CQDA correspondence 07/05/2011

³² CQDA correspondence 07/05/2011

Figure 2: Areas Where Interpreters Work³³



*Local Community Service Center (Health Services)

** Youth Protection Department

*** Government-run job site for work integration grants

Other than in Québec, the self-employed freelance interpreter often performs work referred to as “community interpreting,” which usually encompasses legal, medical, mental health, religious,

³³ Diagrams from UQAM Questionnaire Responses

educational, leisure, performing arts, and vocational settings. In actuality, community interpreting can involve an extensive array of situations from individual meetings (e.g. job interviews, doctor's appointments) to large group settings (e.g. school plays, church services). Some may choose to specialize in one area and develop their skill in, for example, legislative interpreting, while others may choose a variety of assignments in order to improve their overall skills and become adaptable to all situations. They can have contracts that last anywhere from one hour to several months, depending on the nature of the assignment and the people involved.³⁴

The benefits for the freelance interpreter include greater autonomy over what types of assignments to choose and the flexibility of setting their own schedules. They can select assignments that match their interests and avoid those that are outside of their "comfort zones," leading to successful experiences. However, in areas where work is limited, freelance interpreters are at a disadvantage and may feel as though they need to accept any assignment that is available.

CQDA states that in Québec, the freelance interpreter takes on a different meaning as only the interpreter service agencies are responsible for community interpreting, such as legal, medical, mental health, health, social services, work, community life, etc. The funding for these interpreter services comes from government grants, and therefore Deaf individuals never have to pay for these services. Freelance interpreters are prohibited from working in these fields. Freelance interpreters in Québec, instead fulfill services for businesses, organizations, or individuals. They are independent interpreters often contracted directly by the Deaf consumer. According to the CQDA freelance interpreters are a problem due to the lack of a "guarantee of confidentiality, ethics, level of competence, quality, on-going training and just no place to complain about bad service."³⁵ It is not possible to determine whether freelance interpreters in Québec have the proper training or skill required as they are free to start working without evaluation.

Employed interpreters that work for educational institutions, interpreter service agencies, or corporations receive the benefit of steady employment and income, while releasing the autonomy of choosing their own assignments. Service agency interpreters also perform community interpreting, but usually do not have the luxury of selecting assignments that they are more interested in. However, an interpreter who has developed skill in one particular area will often be requested repeatedly for that area, giving them the opportunity to become specialized. Additionally, employed interpreters have more latitude to refuse an assignment that they may not feel qualified for or have ethical conflicts with due to the fact that the agency can reassign the job to another interpreter. Having other interpreters to fall back on and team with relieves the psychological stress that interpreters often feel regarding duty to their clients.³⁶

³⁴ Demers, Hubert. "The Working Interpreter." Topics in Signed Language Interpreting 2005. Pg. 206-207

³⁵ CQDA Correspondence 07/05/2011

³⁶ Demers, Hubert. "The Working Interpreter." Topics in Signed Language Interpreting 2005.. pg. 209-210

Some interpreter referral agencies provide Video Remote Interpreting (VRI) as part of their community services. Video Remote Interpreting is a form of interpretation, in which a remote interpreter is used to provide interpreting services for two or more individuals who are together in one location using video conferencing equipment. This type of interpretation often occurs when an in-person interpreter is unavailable due to geographical location, shortage of interpreters, etc. The interpreter is typically located at the service agency and provides interpretation services remotely with the use of a computer and web camera. The benefits of VRI include reduced travel time, ability to provide quality service to those in rural remote locations, and ability to offer 24 hour on demand services.³⁷

Interpreters in the educational institutions are typically divided between those who work in K-12 and those in post-secondary education. These interpreters may have a classroom with many Deaf students or work individually with one Deaf student amongst hearing classmates. The latter is the more common situation, with that interpreter often being the only one employed by the school. The number of Deaf students in the school and in which classrooms they are located will determine the number of interpreters employed by the school. Even if the interpreters are located in different classrooms, the benefit of having a colleague to team with or at the very least discuss the work is often reported as beneficial for an interpreter's stress level.³⁸

Post-secondary educational institutes tend to hire more than one interpreter, but the actual number of interpreters varies and is dependent on student enrolment. The interpreter may be a part time employee due to the nature of post-secondary education. Due to the diversity of programs and structure of post-secondary education, these institutions tend to have an interpreter coordination department on campus that handles the scheduling of interpretation services. This department can also serve as a resource centre for networking or providing the necessary materials (e.g. textbooks, course descriptions, etc.) needed for successful interpretation in this environment. Unfortunately, much is reported about the quality of interpreters in the educational setting not being up to par. For instance, in rural areas and in the K-12 setting, services are often still being provided by volunteers who are not trained in the process of interpreting, but know enough sign language to assist.³⁹ The following comments from the Canadian Association of the Deaf reiterate this point.

"We do not consider family, friends, acquaintances, social workers, teachers, educational assistants, ministers, or others to be either qualified or professional interpreters... The CAD is very concerned about the apparent lack of standards or minimal requirements for educational interpreters. It has often been said that interpreters who are not very skilful

³⁷ <http://signonasl.com/vri.html>

³⁸ Demers, Hubert. "The Working Interpreter." Topics in Signed Language Interpreting 2005. pg. 209-210

³⁹ Gordon, M.G. and Hardy, M. *Provincial Review of ASL/Deaf studies and Interpreter Education in BC*, Dec 2009, pg. 4. www.cacuss.ca/content/documents/Link/CADSPPE_Resources/ASL_Deaf_Studies_REPORT_FINAL.pdf

go into educational interpreting, if only for the chance to gain experience and confidence.”⁴⁰

The educational sector seems to exacerbate this problem by typically paying their interpreters less than what other sectors of community interpreting pay.⁴¹ CQDA also states,

“In Québec, K-11 School Board[s] have no evaluation system whatsoever to hire interpreters and some just don’t qualify for the job even though working with children and teens. CQDA has been discussing this for years with the Education departments in order to find a way of introducing better qualified interpreters in elementary and high schools.

Schools have an obligation to offer interpreting services and in their mind, a bad interpreter is better than no interpreter. In some cases, the School boards don’t have a clue about different types of interpreters and hire, to abide to the law, an interpreter that does not answer the need of the Deaf individual.

Also, freelance interpreters (all languages, modes and codes) are often hired by Deaf individuals for vocational or adult education through a bursary from the Québec Education Department. Deaf consumers then become employer. Interpreters sometime suffer delays in payments, aren’t fully paid or are not paid at all. They sometimes quit before the end of the year. Deaf students don’t always understand their responsibilities as employers, etc. The interpreter has no weight whatsoever in his work conditions, the school not being responsible for giving him a good chair, a secure environment of work, etc.”

Some corporations that have Deaf employees or frequent contact with the Deaf community may choose to hire their own staff interpreters; however this practice is rare as most choose to contract interpreters from an agency for this type of work. Lastly, many ASL-English interpreters choose to work in the video relay services environment, which is unique in that it offers permanent employment and fixed hours. The differences between video relay interpreting and community interpreting are many and have significant impact on the process in which interpreters approach their work. A summary of these differences follow in subsequent sections.

The environment an interpreter chooses to work in is based on many different factors and most elect to incorporate a combination of the different types of work. These decisions are related to the availability of assignments and the current interest and schedule of the interpreter at the time. In addition, much consideration is given to matching the consumer and interpreter based on compatibility⁴² and skill level.

⁴⁰Canadian Association of the Deaf’s Position Paper on Interpreting, at <http://www.cad.ca/interpreting.php>

⁴¹ Mission Consulting interviews with interpreter organizations.

⁴² Many Deaf, hard of hearing, late deafened or deaf blind consumers have different communication preferences,
[footnote continues on next page]

2.4. The Community Interpreting Process

Regardless of the type of community work an interpreter chooses there are steps that can be taken to ensure successful engagements. Several models of interpreting exist and focus on the cognitive processes involved and how to improve those processes. Hubert Demers, in “The Working Interpreter” from *Topics in Sign Language Interpreting*, identifies eight essential steps⁴³ that lead to accurate and successful interpretations. These steps vary depending on setting and how much time can be allotted to each step, especially in relation to the VRS work setting. In fact, many of these steps are simply not feasible for the VRS setting and become important considerations related to the significant difference between traditional interpreting and VRS interpreting.

STEP 1 THE INITIAL CONTACT

During this step the interpreter must make a professional assessment of their availability and an ethical determination of their ability to handle the assignment. At this initial contact the interpreter should have enough information regarding the assignment to determine whether to proceed.

STEP 2 GATHERING PRELIMINARY INFORMATION

Once availability is determined the interpreter will need to gain additional insight into the nature of the assignment, such as level of knowledge needed and level of language proficiency. This information is usually obtained by asking additional questions to the person contracting the service. The best approach is to determine the setting (e.g. medical, legal, education, etc.), which triggers the interpreter’s schema related to those settings and allows him/her to best assess their qualifications. Their schema usually is based on previous experiences and protocols for generalized situations; the more experience an interpreter has, the more adapted their schema is to specific situations.

STEP 3 ACCEPTING OR DENYING

Now that the interpreter has determined the nature of the assignment and has gathered enough background information to determine their own suitability; they can either accept or reject the assignment. If preliminary information was sparse or inadequate to make a determination, the interpreter relies on experience; hence an interpreter with extensive experience has an advantage. Inexperienced interpreters may not have the ability to assess the appropriateness of their skills for the task, but an experienced one will have strategies and more detailed schemas from which to make that determination.

which need to be considered when matching them to an interpreter. See Phase 3 Consumers.

⁴³ Demers, Hubert. “The Working Interpreter.” *Topics in Signed Language Interpreting* 2005. pg. 211-220

STEP 4 OFF-SITE PREPARATION

Preparation is paramount for successful interpretation; therefore during this step the interpreter can request additional assignment information, such as agendas, copies of presentations, documents, anything that allows the interpreter to get more knowledge about the topic. This step helps the interpreter to modify their schema to a more precise expectation of what will likely occur. Additional avenues are to research publically the topics or participants in order to become familiar with the terminology that will be used.

STEP 5 ARRIVING AT THE ASSIGNMENT

This step involves the actual logistics of getting to the assignment including time allotment, directions, parking, and other physical considerations.

STEP 6 ON-SITE PREPARATION

Once the interpreter has arrived and has the opportunity to meet the participant, there may be a need to be debriefed on any additions to the agenda or changes to the specifics of the communication. Information that may not have been previously obtained is now assimilated into the interpreter's schema. Decisions regarding where to stand or sit are now made with regard to lighting considerations, location of participants, microphone placement, etc., often at the direction of the Deaf client.

STEP 7 FACILITATING THE INTERACTION

Every interpreting assignment is unique, regardless of the amount of preparation time or previous experience the interpreter has with the particular situation. This step is where the actual communication facilitation begins, but as noted all the previous steps leading to this one are key elements for success. The communication must include not only the words being communicated, but the meaning behind the words. The interpreter strives for "dynamic equivalence," which is broadly defined as maintaining the chemistry between the speaker and the recipients. Much consideration must be given to the overall purpose of the communication and what the speaker's goals are.

STEP 8 REFLECTING AND DEBRIEFING

Reflecting on the assignment allows the interpreter to identify areas that were successful and those that need more development professionally. Areas that were not understood may come to mind after the fact and the interpreter must decide whether to inform the participants of the errors potentially made in the communication. Sometimes, interpreters will have the opportunity to work with the same participants and can choose to tell them then. Debriefing may be necessary if the subject or assignment was particularly taxing emotionally. When confidentiality is not a factor, it may help the interpreter to discuss the assignment with colleagues to gain emotional support.

2.5. Interpreting in the VRS Environment

With the advent of video technology and video relay services, sign language interpreters have opportunities to work more consistent hours at one location, and many times obtain positions that provide employment benefits. The VRS industry has grown exponentially in the U.S. since its initiation, given this current rate of growth, VRS will continue to be a practical place for interpreters to seek employment.⁴⁴

This unique form of interpreting creates a challenging task of remotely interpreting calls through an Internet-based video device. This is the most obvious distinction from traditional interpreting as the interpretation is done exclusively over the two-dimensional video medium. The technology is now an added factor affecting the success of the interpretation. For example, depending on Internet connection speeds and other technical factors, the transmission may be very clear on one end, but significantly unclear on the other. The transmission may begin clearly, and then deteriorate during the session. All of these factors interfere with the interpretation and interrupt the flow of conversation. Another major distinction between traditional and video relay interpreting is the increased need for multi-tasking. Interpreters are constantly multi-tasking as they perform complex mental and physical processes; VRS interpreters have the added component of having to operate highly technical equipment and software to receive and place calls for the VRS consumers. This technological component often requires additional training and increased hand-eye coordination. Interpreting and operating technological equipment both rely on the use of one's hands, which compounds the physical strains interpreters face when performing their work.⁴⁵

Several differences exist between this unique setting and that of traditional interpreting, which creates additional considerations for the training of interpreters, as well as the skills required to provide successful interpretations. Traditional abilities to prepare for an assignment are virtually non-existent and other strategies must be learned and utilized to adapt to these unique challenges of VRS interpreting. In fact, of the 8 steps discussed above for community interpreting, only step 7 exists in the VRS environment. The lack of the preparation steps also represents significant challenges to effective communication in the VRS environment.

The following table describes many of the additional differences between community and VRS interpreting.

⁴⁴ Registry of Interpreters for the Deaf; *Video Relay Service Interpreting Standard Practice Paper*; (RID 2007), at http://www.rid.org/UserFiles/File/pdfs/Standard_Practice_Papers/Drafts_June_2006/VRS_SPP.pdf

⁴⁵ Taylor, Marty. *Video Relay Services Interpreting Task Analysis Report*, 2005, Pg 8, at <http://www.unco.edu/doi/articles/VRS%20Task%20Force%20Report.pdf>

Table 3: Traditional Interpreting vs. VRS Interpreting⁴⁶

COMMUNITY INTERPRETING	VRS INTERPRETING
Live in-person communication	No live in-person contact; all through video medium
Three-dimensional perspective	Two-dimensional perspective
No physical limitation on signing space (area where signing occurs)	Restricted signing space due to video camera limitation
Relationship between parties is commonly known (e.g. doctor/patient, employer/employee)	Relationship between callers is often unknown
Sociolinguistic factors (e.g. gender, age, ethnicity) are overt	Sociolinguistic factors are not always known
Assignments are made in advance	“Immediate” assignments
Ability to accept or turn down assignments (e.g. legal or medical interpreting) ⁴⁷	Must accept all calls regardless of content or caller (e.g. young children, new immigrant with limited signing abilities, computer experts)
Potential for extensive preparation	Relies on prior experiences, not preparation
Generally works alone or with one other interpreter	Team environment
Often self-employed ⁴⁸	Works for a corporation
Interpretation is the only role	Multiple roles occur simultaneously (e.g. operator, customer service representative)
One location with a relatively limited and predictable number of consumers (e.g. number of “jobs” in a day range from 1 to 5)	Wide variety of callers and content (e.g. number of calls in a day can be over 100)

⁴⁶ Ibid Pg. 9

⁴⁷ According to CQDA, full-time interpreters in Quebec may not refuse assignments from agencies, only on-call and freelance interpreters can. CQDA correspondence 07/05/2011

⁴⁸ According to CQDA, freelance interpreters are a minority in Quebec (approximately 20%). CQDA correspondence 07/05/2011

COMMUNITY INTERPRETING	VRS INTERPRETING
Often regional signs are known (e.g. specific place names, cities, names of sports teams, etc.)	Often regional signs are unknown
Consumers see each other and are able to monitor reactions visually and aurally	Deaf and hearing parties are not able to see or hear each other or monitor reactions
Dual-tasking at linguistic and physical levels	Multi-tasking at linguistic, physical, and mechanical levels
Generally greater demand for spoken to signed language interpreting	Greater demand for signed language to spoken language interpreting
Most consumers have experience using interpreters	Many callers are inexperienced with interpreters and also are inexperienced with relay
Uses contextual and environmental cues to convey meaning	Contextual/environmental support cues are lacking
No special need for technological competence	Technology competence is a necessary skill
Very little use of intimate register, more formal or professional registers are used	High number of calls requiring the use of intimate register(e.g. husband to wife)

As previously stated, in traditional interpreting much consideration is given to matching the consumer and interpreter based on several factors, including communication preferences, gender, expertise, etc. These considerations are not feasible in the typical VRS environment due to the lack of prior knowledge between consumer and interpreter. The calls come in and the next available interpreter handles the call, regardless of whether the consumer and interpreter are well matched. This situation often results in the interpreter either transferring the call to another interpreter or utilizing the assistance of a Deaf interpreter, or the Deaf consumer disconnecting and reconnecting until they find an interpreter they like. This practice is referred to as “fishing” and happens when Deaf callers connect to VRS, evaluate the interpreter and if not confident in their skills, they disconnect and reconnect to evaluate once again.⁴⁹

The advent of VRS has vast implications for the interpreting profession. Many of the above variances need to be addressed in interpreter training programs and standards would be useful in determining who is competent to work in such a diverse environment. In Canada, several interpreting professional groups and training programs surveyed reiterated this point by stating that at minimum, graduation

⁴⁹Mission Consulting Interview with BC-VRS Committee.

from a recognized interpreter training program plus some community experience would qualify an interpreter to work in this setting.⁵⁰

3. Professional Interpreter Organizations

Included in this research, the national professional organization, Association of Visual Language Interpreters of Canada (AVLIC) and provincial affiliate chapters were contacted to elicit their views on VRS and potential deployment in Canada. Several representatives of interpreter referral agencies throughout Canada were also contacted. The information gathered from these entities is related to estimated labour pools, employment wages, current availability of interpreters for community needs, and perspectives on VRS for Canada. Also included in this section are interpreter qualifications, specifically certification and evaluation methods utilized in Canada for the purpose of accrediting the profession.

3.1. Certification, Accreditation, and Evaluation Procedures

3.1.1. ASL-English

In Canada, the evaluation of ASL-English interpreters is carried out by the national interpreter professional organization, AVLIC. AVLIC was incorporated in 1979 and has several affiliate chapters across the country. AVLIC is the only certifying body for ASL-English interpreters in Canada and utilizes the Canadian Evaluation System (CES). AVLIC created the CES in an effort to create a system that standardizes the quality of ASL-English interpretation services in Canada. The CES is a four-step sequential testing system that incorporates preparation assistance and awards the Certificate of Interpretation (COI) upon completion of all four sections. The COI is the only certification in ASL-English interpretation that is recognized by all provinces in Canada.⁵¹ AVLIC does not evaluate LSQ-French interpreters.

⁵⁰ Mission Consulting interviews and questionnaire responses. See Appendix A.

⁵¹ <http://www.avlic.ca/>

Table 4: Canadian Evaluation System for ASL-English Interpreters

Canadian Evaluation System (CES)	
Phase One:	<p>Written Test of Knowledge</p> <ul style="list-style-type: none"> • 75 multiple choice test on AVLIC and affiliate organizations, profession of interpreting, language and culture • Must score at least 70% to advance to next phase • Offered twice a year in June and November
Phase Two	<p>Preparation</p> <ul style="list-style-type: none"> • Assists test takers by providing a foundation for the Test of Interpretation (TOI) • Two mandatory workshops (interpreting narratives and interpreting interactive interviews) • Feedback and diagnostics given on videotaped sample interpreting submissions
Phase Three	<p>Test of Interpretation (TOI)</p> <ul style="list-style-type: none"> • Verifies whether an individual is at or above the standard for message equivalence between English and ASL (offered once a year) • Includes several samples of dialogue and narrative discourse of a generalist nature and various ASL contact varieties • Performances are videotaped and reviewed by raters to determine competency
Phase Four	<p>Certification Maintenance</p> <ul style="list-style-type: none"> • After successful achievement of the COI the individual must maintain active membership with fees paid in full with AVLIC and adhere to the code of ethics. • Documentation of continuing professional development activities (workshops, continuing education, and experience) must be submitted annually.

3.1.2. LSQ-French

From 1982 to 2004 the Association Québécoise des Interpreters Francophones en Language Visuel (AQIFLV) evaluated the skills of LSQ-French interpreters and oral interpreters. AQIFLV utilized a three level evaluation system:

1. Junior (one-on-one settings)
2. Intermediate (meetings)
3. Senior (conferences)

Certification in one of these levels was used by LSQ-French interpreters as proof of qualification to work for various employers (e.g. interpreter agencies, colleges, etc.) Furthermore, these three levels have become the provincial standard and although AQIFLV no longer exists, these levels are often used as in-house evaluation methods by the interpreting service agencies. Salaries for LSQ-French interpreters are also often based on these classifications. Some of these agencies also make use of AQIFLV’s code of ethics as a basis for their own ethical code of practice.⁵²

Interpreters working in Québec do not presently have a universal standard for an interpreter evaluation system for LSQ-French interpretation. Instead, different tests specific to each field are administered internally by each organization. The types of evaluation procedures used for LSQ-French interpreters in Québec are summarized in the Table 5 below.

Table 5: Evaluation of LSQ-French Interpreters in Québec⁵³

Field	Evaluation of LSQ-French Interpreters in Québec
Social/Community	<ul style="list-style-type: none"> • Regional Interpreting services have different in-house methods • Some make use of a junior, intermediate, senior classification with the applicant choosing which level to test at
Academics	<p>Primary and Secondary Level Education</p> <ul style="list-style-type: none"> • No uniform evaluation procedure • Majority of interpreters are not evaluated <p>Professional Training/Adult Education</p> <ul style="list-style-type: none"> • No uniform evaluation <p>Higher Education/CÉGEPs</p> <ul style="list-style-type: none"> • Internal evaluation procedure with no category distinction
Private Sector	<ul style="list-style-type: none"> • No evaluation unless working for Federal Government Translation Bureau • Order of Recognized Translators, Terminologists, and Interpreters of Québec (OTTIAQ) has acknowledged within its classification 2 LSQ-French interpreters⁵⁴

⁵² CQDA Correspondence 07/05/2011

⁵³ Questionnaire responses from UQAM.

⁵⁴ These recognized individuals are considered high-level professionals with accredited background experience in LSQ-French. Other applications are under review.

The lack of a uniform evaluation for LSQ-French interpreters leads to a situation where less qualified individuals who have not studied the complex process of interpreting are providing services. According to the CQDA, this is a problem that has been occurring since the inception of professional interpreting in Québec.⁵⁵ Interpreters in Québec have expressed desire for an obligatory evaluation procedure for all working interpreters in the Province. This evaluation should be directed by a professional or technical organization and administrated by a committee composed of professional interpreters and Deaf consumers.⁵⁶

3.1.3. United States Certification and Alternatives to AVLIC Certification

Some Canadian interpreters are certified by the Registry of Interpreters for the Deaf (RID) in the U.S., which allows them to refer to themselves as certified interpreters. Some members of the Canadian interpreting community contacted for this study have expressed mixed feelings regarding this practice and would prefer those interpreters use the word “registered” instead of “certified”, since certification means something different for Canadian interpreters.⁵⁷

In the United States certification is administered through RID, which offers certification in three levels and has a similar testing structure to AVLIC’s COI. The current National Interpreter Certification (NIC) testing procedures are considered to be the most current and appropriate assessment for interpreters in the U.S. The NIC exam tests interpreting skills and knowledge in three critical domains:

1. General knowledge of the field of interpreting through the NIC Knowledge exam,
2. Ethical decision making through the interview portion of the NIC Performance test, and
3. Interpreting and transliterating skills through the performance portion of the test.

In all three areas, individuals must demonstrate professional knowledge and skills that meet or exceed the minimum professional standards necessary to perform in a broad range of interpretation and transliteration assignments.⁵⁸ Depending on the test results the following classifications⁵⁹ are awarded upon successful completion:

- **NIC**
Individuals who achieve the NIC level have passed the NIC Knowledge exam. They have also scored within the standard range of a professional interpreter on the interview and performance portions of the test.

⁵⁵ CQDA Correspondence 07/05/2011.

⁵⁶ Parisot, Anne-Marie & Villeneuve, Suzanne, et al. *L’Interpretation Visuelle Aupres D’une Clientele Sourde. Portrait d’Une Profession et Etat de la Situation Sur Les Besoins de Formation*. 2008. Pg 54.

⁵⁷ Mission Consulting interviews with Douglas College, George Brown College, Ontario Interpreting Services.

⁵⁸ http://www.rid.org/education/edu_certification/index.cfm

⁵⁹ Ibid.

- **NIC Advanced**

Individuals who achieved the NIC Advanced level have passed the NIC Knowledge exam; scored within the standard range of a professional interpreter on the interview portion; and scored within the high range on the performance portion of the test.

- **NIC Master**

Individuals who achieved the NIC Master level have passed the NIC Knowledge exam. They have scored within the high range of a professional interpreter on both the interview and performance portions of the test.

The NIC replaces previous certifications that are no longer offered by RID, but are still accepted as qualification to work. Previous RID certifications include the following:

- CI (Certificate of Interpretation)
- CT (Certificate of Transliteration)
- National Association of the Deaf (NAD) Certifications:
 - NAD III Generalist
 - NAD IV Advanced
 - NAD V Master

All certifications require continued education units to maintain accreditation.

According to interviews, the average time it takes to acquire an appropriate skill level for certification in Canada can range between five to ten years after graduation from a recognized interpreter training program; as such, it has been stated that the COI is considered superior to the U.S. certification. However, the number of individuals achieving the COI is low, making up only 9% of ASL/English AVLIC active members.⁶⁰ This could be due to several factors including the cost of preparing for the test, the substantial amount of time required to gain experience, as well as the apparent infrequency of employers to require the COI.

Alternatives to the COI are often administered at the provincial level by private or government interpreter service agencies throughout Canada. For example, in Ontario, an interpreter who wishes to work for Ontario Interpreting Services (a branch of the Canadian Hearing Society that offers fee-for-service interpreting) can apply to become OIS registered. OIS registration requires an individual to complete a videotaped skills assessment and participate in a panel interview. LSQ-French interpreters are not required to take the video skills screening and instead must show proof of designation as a junior, intermediate, or senior interpreter from an LSQ-French screening committee in Québec. If the interpreter is successful they may refer to themselves as OIS registered and are eligible to work for OIS and be placed on the freelance list.⁶¹ Additionally, the Public Works and Government Services Canada administers a screening process to ASL-English and LSQ-French interpreters, which allows them to work

⁶⁰ Questionnaire responses from AVLIC.

⁶¹ Mission Consulting Interviews with OIS staff.

in federal government venues. The screening consists of both a written test and videotaped skilled assessment. Interpreters who pass this screening are referred to as Registered Linguistic Service Suppliers and can submit bids to the Translation Bureau, which is responsible for coordinating interpreting services for federal government employees.⁶² Several interpreting services in Québec make use of an external or in-house evaluation committee to ensure qualification of the interpreters hired. An evaluation is required for each of the three levels offered by the service agency (junior, intermediate, and senior). It is up to the individual taking the test which level they would like to test for. A document is issued at the end of the evaluation stating whether the candidate was successful or not.⁶³ Other examples include the medical interpreting screening and post-secondary screening both offered in Vancouver by the Western Institute for the Deaf and Hard of Hearing.

In some instances where specific screening procedures may not be in place, a solution to determining whether an interpreter has basic qualifications is to require proof of active membership with AVLIC. The criteria for AVLIC active membership is graduation from a recognized ASL-English Interpreting Program (AEIP), or for student members, current enrollment. This helps to ensure that an individual has at minimum completed training in the process of interpreting and is qualified to work at a basic entry level. AVLIC also recognizes Deaf interpreters, but no certification currently exists. AVLIC's membership criterion for Deaf interpreters includes:

- A letter of support from a Provincial Deaf Organization or Association
- A letter of support from a COI interpreter or AVLIC Affiliate Chapter
- A mixture of 40 documented hours of work as a Deaf Interpreter and professional development⁶⁴

Since LSQ-French interpreters do not have the same opportunities as ASL-English interpreters to earn a diploma or degree in interpreting, AVLIC has created the following membership criteria:⁶⁵

- Two letters of support from Deaf community members
- Two letters of support from Active AVLIC members
- Current resume
- Updated list of professional development workshops and opportunities attended
- Any additional documentation to support the application (e.g. LSQ assessment tests, documentation demonstrating understanding and compliance to the AVLIC Code of Ethics & Guidelines for Professional Conduct, etc.)

⁶² http://www.oasli.on.ca/index.php?option=com_content&view=article&id=6&Itemid=7

⁶³ Questionnaire Responses from SIVET.

⁶⁴ <http://www.avlic.ca/>

⁶⁵ AVLIC email correspondance 05/11/2011

However, the incentive for LSQ-French interpreters to join AVLIC is low, due to AVLIC's focus on ASL-English especially in the area of professional development opportunities. Many LSQ-French interpreters are reported to have difficulty reconciling the cost of membership to the actual benefit received from membership.⁶⁶ CQDA states:

“Being a member of AVLIC does not give any advantage to LSQ-French interpreters in Québec, neither in getting hired nor in getting better pay...CQDA is against requiring AVLIC membership since this membership gave absolutely no guarantee to Deaf LSQ consumers about quality, ethics, and experience of AVLIC LSQ interpreter.”⁶⁷

All interpreter referral agencies contacted and researched for this study indicated using screening procedures when hiring interpreters or when allowing them to be placed on their freelance lists.

Despite the efforts of the profession to set universal standards, many individuals who have not completed formal training in interpretation are working in the community as freelance interpreters. This is of special concern in Québec because no provincial certification for LSQ -French interpreters exists and many individuals are reported to be working as freelance interpreters without proper training, particularly in the education sector.⁶⁸

In regard to VRS work, VRS providers should work with AVLIC and local agencies in order to verify the qualifications of their interpreters. Currently the minimum qualifications required for Canadian ASL-English interpreters to work in VRS⁶⁹ are:

- High School Diploma or equivalent;
- Must be active member of AVLIC in good standing;
- 3+ consistent years working as a certified sign language interpreter in a variety of settings;
- AVLIC COI, NAD level IV/V; or a RID CI, CT, CI/CT, CSC; or NIC, NIC Advanced, NIC Master; or hold a provincial interpreter screening or have the professional interpreting experience to become a Sorenson VRS interpreter, subject to skill set verification and screening.

3.2. Estimated Number of Interpreters

Because many interpreters choose to work as independent freelance contractors and may or may not be members of AVLIC, obtaining an accurate number of qualified interpreters is complicated. According to

⁶⁶ Suzanne Villeneuve (UQAM) email correspondance 04/21/2011

⁶⁷ CQDA Correspondance 07/05/2011

⁶⁸ Mission Consulting interview Suzanne Villeneuve, Natalie Baril 04/16/2011

⁶⁹ At Sorenson call centres in Canada, either through the Telus trial or at call centres serving the U.S. See https://www4.ultirecruit.com/SOR1000/jobboard/JobDetails.aspx?_ID=455

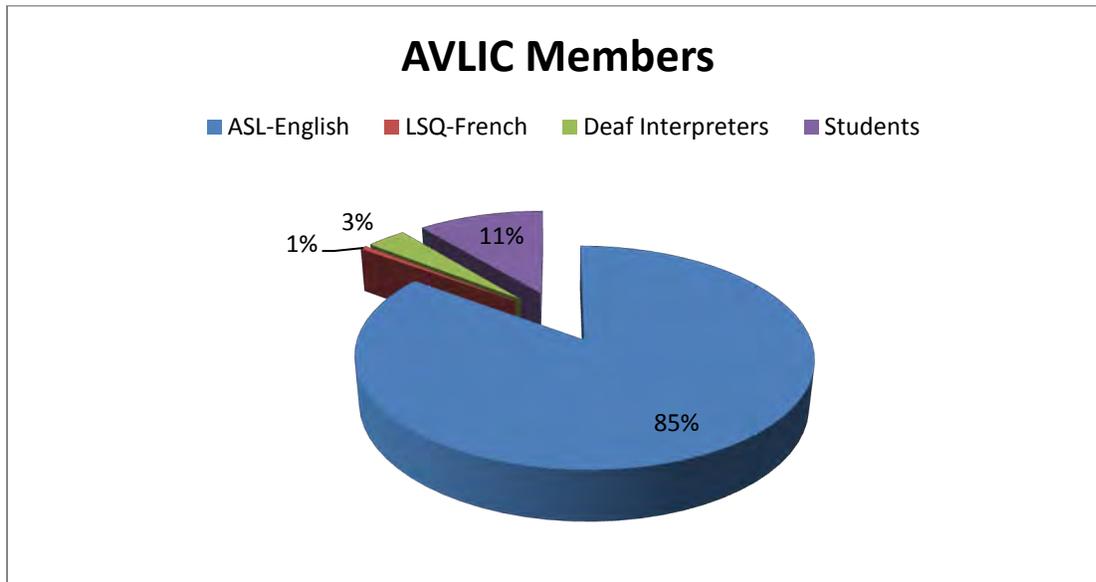
AVLIC an accurate estimate for ASL-English interpreters can be determined from their membership, but not for the number of LSQ-French interpreters.

As of April 30th 2011 AVLIC reports having⁷⁰:

Table 6: AVLIC Membership April 30th 2011

AVLIC Membership as of April 30 th 2011	
Active ASL-English	599
Active LSQ-French	4
Active Deaf Interpreters	24
Students ⁷¹	77
Total	704

Figure 3: AVLIC Membership April 30th 2011



⁷⁰ AVLIC email correspondence 05/12/2011

⁷¹ Student members are those currently enrolled in one of five ASL-English Canadian training programs.

As of summer 2010, Sorenson employs approximately 225 AVLIC ASL-English interpreters for VRS. It is possible that Sorenson currently employs non AVLIC members, because the criteria for AVLIC membership was added later and any interpreters hired before that time are still allowed to work at Sorenson.⁷² How many of these 225 VRS interpreters are serving the U.S., or are involved in the Telus-Sorenson trial in B.C. and Alberta serving Canada⁷³ was not disclosed.

Due to the lack of an official compulsory national or provincial certification, accurate numbers of qualified LSQ-French interpreters are difficult to quantify. However, some current estimates place the number of LSQ-French interpreters slightly below 300,⁷⁴ or approximately 265.⁷⁵ A comprehensive study of the status of visual interpreting in Québec was conducted in 2008 resulting in an estimated number of interpreters at between 250 and 300 individuals. This study identified 263 interpreters working in Québec.⁷⁶ A better picture of the actual number of LSQ-French interpreters comes from this data, which analyzed the working languages of the 263 respondents, however only 243 responded appropriately to this particular question. Those who only mastered French are representative of oral interpreters that do not perform in LSQ. The respondents are dispersed across Québec with the majority of oral interpreters concentrated in Québec City, Montréal, Saguenay, Abitibi, and Chaudière-Appalaches.⁷⁷ The lack of a universal standard for evaluating and “certifying” LSQ-French interpreters, as well as the inclusion of oral interpreters, creates further ambiguity regarding the true number of visual language interpreters.

⁷² Confidential correspondence with Canadian interpreter organizations.

⁷³ Sorenson only provides ASL-English interpreting services in Canada.

⁷⁴ Villeneuve, Suzanne, *La Langue Comme Outil de Prévention des Troubles Musculo-Squelettiques Chez des Interprètes Français/ Langue des Signes Québécoise: Analyse d'Aménagements Linguistiques, Biomécaniques et Temporels*, Décembre 2006. Pg. 29.

⁷⁵ Industry Canada, *Community Interpreting in Canada*. April 2007. Pg. 45

<http://www.imiaweb.org/uploads/pages/471.pdf>

⁷⁶ Parisot, Anne-Marie & Villeneuve, Suzanne, et al. *L'Interpretation Visuelle Aupres D'une Clientele Sourde. Portrait d'Une Profession et Etat de la Situation Sur Les Besoins de Formation*. 2008. Pg 33

⁷⁷ Ibid pg 36.

Figure 4: Working Languages of Québec Interpreters Surveyed

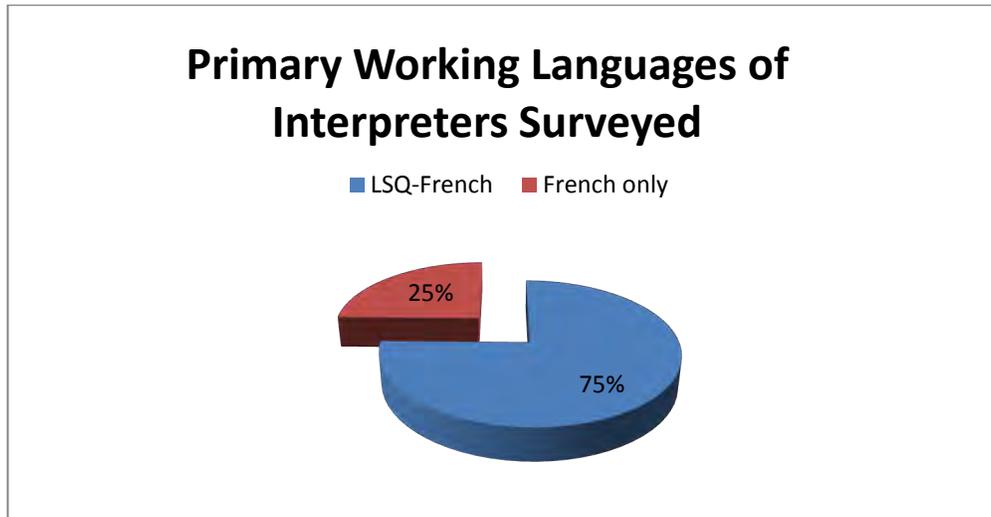


Table 7: Estimated Number of Interpreters in Québec

Estimated Number of LSQ-French and Oral Interpreters in Québec	
LSQ-French Interpreters	183
Oral Interpreters	60
No answer⁷⁸	20
Total	263

Accurate information regarding the interpreter labour pool and forecasted growth are difficult to ascertain due to several mitigating factors. In the area of growth one can look to the number of graduating students⁷⁹ to estimate how many individuals are entering the profession, but more difficult to determine is the rate of turnover in the profession. Issues that affect the retention of interpreters include health issues (e.g. carpal tunnel syndrome, musculoskeletal issues, and tendinitis), psychological stressors, and general burnout and exhaustion. Several interpreter organizations interviewed and surveyed expressed concern over these issues and recommend VRS providers be cognizant of these

⁷⁸ Provided more than one answer to the question.

⁷⁹ See Table 10 Annual Enrolment Capacity and Average Size of Graduating Classes.

issues and include strategies to reduce their incidence. Extensive research has been conducted on the factors leading to interpreter burnout and would need to be included in a more detailed contract for VRS services, but for the purposes of this study these factors are mentioned to demonstrate the challenges of the profession to sustain a labour pool large enough to satisfy the growing demands of Deaf consumers.

Additionally the CQDA states, in Québec a lack of full-time positions exists, which makes it difficult for interpreters to sustain an adequate income. CQDA reports the following information regarding retention issues:

“In Québec, one of the retention problems is lack of full-time jobs within the interpreter agencies. Many on-call interpreters need to have another job, either interpreting or not, to make a decent living. Some just leave for a full-time job in schools, colleges, or universities, become freelance or just quit interpreting. Also, the student must move from their hometown for many years, find a job in Montreal and a place to live while going through a training that usually takes more than two years.”⁸⁰

3.2.1. Pay Ranges

The range of pay for visual interpreters varies across regions and is commensurate with the experience of the interpreter. Another factor affecting pay is where the work takes place with the education sector typically paying less. Questionnaire responses from interpreter organizations across Canada have provided the following summary of pay scales.

Table 8: Regional Pay Ranges

Organization	Location	Range of Pay CAD
Red River College	Winnipeg, Manitoba	\$19 – 40
Nova Scotia Community College	Dartmouth, Nova Scotia	\$17 – 50
George Brown College	Toronto, Ontario	\$40 – 45
Ontario Interpreting Services	Toronto, Ontario	\$40 – 45 ⁸¹
Deaf and Hard of Hearing Society	Calgary, Alberta	\$28 – 50

⁸⁰ CQDA Correspondence 07/05/2011

⁸¹ \$40 for OIS registered and \$45 for AVLIC COI.

Organization	Location	Range of Pay CAD
Association of Sign Language Interpreters Alberta (ASLIA)	Edmonton, Alberta	\$25 - 65
Douglas College	Vancouver, British Columbia	\$30 – 60
Westcoast Association of Visual Language Interpreters (WAVLI)	Vancouver, British Columbia	\$35 – 50
Saskatchewan Deaf and Hard of Hearing Services	Saskatoon, Saskatchewan	\$18-30
Service d'interprétation visuelle et tactile (SIVET)	Montréal, Laval, Montérégie, Québec	\$14.67 Junior \$18.53 Intermediate 23.15 Senior
Service régional d'interprétariat de l'Abitibi-Témiscamingue (SRIAT)	Abitibi-Témiscamingue, Québec	\$15 Junior \$20 Intermediate \$25 Senior
Service d'interprétation pour personnes sourdes de l'Estrie (SIPSE)	Eastern Townships, Québec	\$19.28 Junior \$25.68 Intermediate \$32.10 Senior
Service régional d'interprétariat de Lanaudière (SRIL)	Lanaudière, Québec	\$15 – 35
Cégep du Vieux-Montréal – service d'aide à l'intégration des élèves (SAIDE)	Western Québec	\$19.40 – 27.63
Range Across all Regions		\$15 -60

The preceding pay scales are affected by several factors including region, experience, certification (e.g. COI or junior, intermediate, senior classification), setting and complexity of assignments. Many organizations reported that the education sector tends to pay interpreters on the lower end of the scale,

while the high end is reserved for those holding AVLIC certification or senior status combined with extensive experience.⁸²

3.2.2. Availability of Interpreters for Community Work

Professional interpreter organizations surveyed all report that there is a shortage of interpreters for community work, particularly in non-metropolitan areas. However, all claim to have strategies in place that result in very few interpreting requests going unfilled.

“In Ottawa we have found that working together and sharing the work has generated a beneficial side effect – more interpreting assignments are filled than would happen if interpreters work in isolation from each other. We can say, with confidence, that very few requests go unfilled, which is something we are proud of. This is a win-win outcome for the Deaf and interpreter communities in Ottawa.”⁸³

Consumer organizations surveyed for this study contradicted in part the above statement, reporting significant difficulties in obtaining interpreters.

Regional interpreting services in Québec, also often work together to ensure that requests do not go unfilled. Interpreters from one agency are often lent to another agency to fulfill requests.⁸⁴

The following table shows the monthly percentage of the average number of hours filled as reported by each agency surveyed.

Table 9: Percentage of Monthly Interpreting Requests Filled

Organization	Location	Monthly Hours Filled	Monthly Percentage Filled
Service d'interprétation visuelle et tactile (SIVET)	Montréal, Laval, Montérégie, Québec	1400	95%
Service régional d'interprétariat de l'Abitibi-Témiscamingue (SRIAT)	Abitibi-Témiscamingue, Québec	102	100%

⁸² Mission Consulting Interviews and Questionnaire Responses. See Appendix A

⁸³ Wilson, Christine. *A View of Ottawa's Approach to Supply and Demand*, 2009. Pg. 11, at http://www.avlic.ca/files/pdf/newsletters/2009_avlic_winter_spring.pdf

⁸⁴ CQDA Correspondence 07/05/2011

Organization	Location	Monthly Hours Filled	Monthly Percentage Filled
Service d'interprétation pour personnes sourdes de l'Estrie (SIPSE)	Eastern Townships, Québec	NA	99%
Service régional d'interprétariat de Lanaudière (SRIL)	Lanaudière, Québec	NA	95%
Service régional d'interprétariat de l'Est du Québec (SRIEQ)	Eastern Québec	NA	90%
Cégep du Vieux-Montréal – service d'aide à l'intégration des élèves (SAIDE)	Western Québec	2500	100%
Ontario Interpreting Services	Toronto, Ontario	2960	90%
Deaf and Hard of Hearing Society	Calgary, Alberta	900	92%
Saskatchewan Deaf and Hard of Hearing Services	Saskatoon, Saskatchewan	250	96%
Society of Deaf and Hard of Hearing Nova Scotians	Nova Scotia	500	95%

Agencies also report that in the cases where a request goes unfilled the reason is usually due to the last minute timing of the request. The ability of these agencies to maintain high percentages in spite of a shortage of interpreters is impressive and especially so for Québec, which has the greatest shortage of interpreters. Agencies state that in order to continue this level of service if VRS is implemented, they would need to work in close collaboration with the VRS providers.

3.2.3. Availability of ASL and LSQ Interpreters for Canadian VRS

Accurate statistics on 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. Canadian Association of the Deaf provides the information below:

"It is the opinion of the Canadian Association of the Deaf that no fully credible census of Deaf, deafened, and hard of hearing people has ever been conducted in Canada.

So, what statistic does the CAD cite when asked how many Deaf people live in Canada? We continue to follow the standard comparison model between Canada and the United States, which assumes that statistics for Canada will be one-tenth of statistics for the U.S. (based on the fact that Canada has one-tenth the population of the U.S.) By this measure, Canada in the year 2006 would have roughly 3.1 million people with some degree of hearing loss. Of those 3.1 million people, one-tenth or roughly 310,000 would be culturally and linguistically Deaf."⁸⁵

Culturally and linguistically Deaf implies that these 310,000 individuals use signed language as their primary form of communication and therefore are potential VRS users.

The most current census of Canada⁸⁶ from 2010 identifies a total population of approximately 34.1 million people. Using the CAD's calculation the number of potential VRS users in 2010 was 340,000. Québec's population is 7.9 million⁸⁷, which accounts for about 23% of the total population. Using this percentage, one can postulate the number of culturally Deaf LSQ users in Québec at approximately 78,200. The CQDA believes that the number is close to 7,500 and other reports state the number of LSQ users in Québec between 2000 and 7000.⁸⁸ However, this is not a full assessment of LSQ users as they are not exclusive to Québec but are found throughout Canada. Nonetheless, it is apparent that the number of potential users⁸⁹ far exceeds the number of available interpreters.

The number of estimated interpreters needed to support potential VRS users will be analyzed further in this study's phase 9, User Demand.

3.3. Perspectives on VRS

A number of themes emerged from interpreter organizations surveyed pertaining to VRS for Canada and are summarized in this section.

3.3.1. Working Conditions

- Consideration of repetitive strain injuries/musculoskeletal injuries (e.g. Carpal Tunnel Syndrome) and prevention strategies

⁸⁵ Canadian Association of the Deaf's Position Paper on Statistics.

http://www.cad.ca/statistics_on_deaf_canadians.php

⁸⁶ <http://www40.statcan.gc.ca/l01/cst01/demo02a-eng.htm>

⁸⁷ Ibid

⁸⁸ CQDA Correspondence 07/05/2011

⁸⁹ I.e., Market base X percentage of potential users

- Appropriate rest and break times for VRS interpreters
- Ergonomic considerations
- Training and prevention related to vicarious trauma⁹⁰
- Requirement to interpret sensitive, controversial or offensive conversations (e.g. swearing, intimate language, etc.)
- Clear protocols about controlling conversations (e.g., telling the person being called that this a VRS call)

3.3.2. Community Education and Outreach

Organizations report community education will definitely be necessary and should be provided to all users of Video Relay Services including Deaf and hearing individuals. This includes all the places and institutions VRS users are likely to call. AVLIC states that education is particularly important to understand the use of the equipment, the intricacies of interpreter's work, and what VRS does or does not include. For example, VRS should not be used as a replacement for situations where in-person interpreting would be superior (e.g. mental health). With reference to who should provide the training, respondents report that the VRS provider should be responsible.

3.3.3. Use of U.S. Interpreters for VRS

All organizations surveyed were asked whether VRS call centres located in the U.S. should be allowed to serve Canada. Common reasons given for affirmative answers were:

- First preference is for call centres to be located in Canada serving Canadians, but would be acceptable if quality standards and assurance are in place
- Both use ASL, however may experience regional vocabulary and language styles as potential challenges
- Québec organizations that answered yes, stated for ASL only, not LSQ

Themes for the negative answers were:

- U.S. standards are not sufficient for Canada
- ASL and regional dialects are significantly different and warrant Canadian only VRS
- U.S. culture is different from Canadian culture
- No LSQ in U.S.
- Important to preserve the French culture and language of the Québécois

3.3.4. Key Incentives for Interpreters to Work in VRS

Themes pertaining to the key incentives for VRS from the questionnaires are summarized below:

⁹⁰ Vicarious trauma results from witnessing another person's traumatic experience. See http://www.nabs.org.au/07_vicarious_trauma.htm

- Flexible hours, competitive pay, less travel time
- Stable and consistent work
- Understanding of management regarding the complexities of interpreting work
- Professional development training
- Opportunities for advancement
- Employer may pay for AVLIC membership – (not relevant to Québec)
- Employer assists interpreters to achieve COI – (not relevant to Québec)
- Teaming and support opportunity
- If Canadian Deaf are served by VRS
- Ability to balance community work with VRS⁹¹

4. Interpreter Training Programs

4.1. Background Information on Interpreter Training Programs

Interpreter training programs (ITP) in Canada have evolved over the last fifty years from volunteers, to graduates of one year programs, to the current standard of 2 to 3 year programs with a one year prerequisite certification in ASL/Deaf Studies.⁹² This evolution has reflected the growing needs of the community as Deaf people are increasingly taking their rightful place in society and require higher skilled interpretations (e.g. legal proceedings, government participation, and higher education). It is paramount that the training of interpreters matches the increasing skill levels required by the Deaf community. In response to these needs, an increased pressure exists to move interpreter training to degree programs.⁹³

Interpreter training programs in the U.S. have grown from 2 in 1968, to 14 in 1978, to 55 in 1988, to 85 in 1998, to 130 in 2008, and is now currently at 144. This remarkable growth of U.S. interpreter programs was undoubtedly strengthened by powerful legislation regarding the rights of Deaf people to access interpreter services: the Rehabilitation Act of 1973, the American with Disabilities Act in 1990, and the Individuals with Disabilities Education Act in 2004. It should be noted that among these training programs much variation exists concerning prerequisites, curriculum, and expertise of faculty; resulting

⁹¹ Only if VRS providers works with the service agencies in Quebec. CQDA Correspondence 07/05/2011

⁹² Gordon, M.G. and Hardy, M. *Provincial Review of ASL/Deaf studies and Interpreter Education in BC*, Dec 2009, pg. 2

⁹³This trend is supported by the fact that in 2012 the U.S. Registry of Interpreters for the Deaf (RID) will require all new interpreters to have a bachelor's degree in order to apply for certification.
http://www.rid.org/UserFiles/File/pdfs/News/Degree_Requirement_Extension.pdf

in a large deviation among the graduates, particularly in regard to skill level and readiness to enter the professional interpreting field.⁹⁴

In Canada, there are five ASL-English training programs and one LSQ-French training program. This number has remained fairly stable since the 1990's and has not experienced significant growth.

ASL-English Interpreter Programs (AEIP) in Canada all follow a similar curriculum and program structure. The prerequisite certificate in ASL/Deaf Studies is typically a one year program with in-depth study of ASL and Deaf culture. Those who obtain this certificate become eligible to apply to the AEIP; however the certificate does not guarantee acceptance into the program. Individuals who have obtained knowledge of ASL and Deaf culture through other means, such as CODAs,⁹⁵ family members, or other contact with the Deaf community are also sometimes accepted into the AEIP without the prerequisite certificate. The selection and screening process will evaluate those individuals' skill levels and determine whether they have met the prerequisite. The AEIPs in Canada are 2 to 3 year curriculums leading to a diploma in ASL-English interpreting. All programs incorporate a practicum where students have the opportunity to gain real life experience through placement into various settings. These programs are intended to graduate "generalist" interpreters with the expectation that specific speciality skills (e.g. legal, medical, education) will be obtained through on-the-job experience and continuing education opportunities.

The LSQ-French interpreter program follows a similar curriculum with an eight month certificate in LSQ communication and Deaf culture from Le Cégep du Vieux Montréal as a suggested, but not required certificate⁹⁶ and a two year program at Université du Québec à Montréal (UQAM) leading to a diploma in visual interpretation. Québec also offers training for oral transliteration at the Université du Québec à Trois-Rivières.

Research for this study phase, included faculty of five out of six⁹⁷ interpreter training programs providing responses to questionnaires, interviews, follow up consultation, and Internet research related to the individual programs. The participants were also asked questions concerning VRS and those responses are included under a synopsis of each program. It is important to note that in British Columbia and Alberta, Telus has contracted with Sorenson VRS to provide a trial of VRS services, which is presently scheduled to end June 30th 2011.⁹⁸ The faculty in B.C. has some experience with VRS and some of their

⁹⁴ National Consortium of Interpreter Education Centres (NCIEC). *Toward Effective Practices: A National Dialogue on AA-BA Partnerships*. Linda Stauffer, Pauline Annarino, Shelley Lawrence: Editors. 2008. Pg 8-9

⁹⁵ CODA: Acronym for Children of Deaf Adults typically refers to hearing or Deaf children who learn ASL from their parents and are raised in the Deaf culture.

⁹⁶ The certificate is listed as one way to provide qualification in knowledge of LSQ. Prerequisites include a diploma of collegial studies or appropriate experience and demonstrated knowledge of LSQ. See <http://www.registrariat.uqam.ca/Pdf/programmes/4393.pdf>.

⁹⁷ Lakeland College declined to participate due to illness and unavailability of the department chair.

⁹⁸ Community members have requested an extension to January 15th 2012.

recent graduates are currently working in VRS call centres in Canada. The VRS call centres in BC and Alberta are involved in the trial serving Canadians, but the other Sorenson VRS call centres throughout Canada are serving the U.S., reportedly causing a shortage of interpreters to serve Deaf Canadians.⁹⁹ The implementation of VRS in Canada will undoubtedly impact the already apparent shortage of qualified interpreters. Therefore it is important to include recommendations from the interpreter training community to address these issues.

In addition to the interpreter training programs, the Canadian Hearing Society/Ontario Interpreting Services were also interviewed regarding their internship program for recent AEIP graduates and the faculty at Le Cégep du Vieux Montréal regarding the certificate in LSQ communication and Deaf culture. Also included are the responses of Ecole St-Jude's Language parle complete (LPC) trainer in Québec.

4.2. Douglas College in Vancouver, British Columbia

Vancouver Community College (VCC) houses the ten month certificate program in ASL/Deaf studies, while Douglas College (DC) houses the Interpreter Education Diploma program (IEP).

4.2.1. Program Information and Enrolment

The following comments are in response to questions about the program, current enrolment, different forms of language taught, and recruitment efforts from the faculty at Douglas College.

"We offer a two-year Interpreter Education Program (IEP) focused on ASL-English Interpretation. Students graduate with a diploma in Sign Language Interpretation. (Entrance requirements include fluency in English and ASL so most students have previously attended a full-time, 10-month ASL & Deaf Studies Program at Vancouver Community College before applying to the interpreting program at Douglas College. We also have applicants from other ASL & Deaf Studies programs across Canada and, to a lesser extent, applicants who have learned ASL through other avenues.)

We offer 16 seats each fall and for the past few years have accepted 18 students. Currently, we have 14 students in their final semester and 15 students finishing their first year of study.

Average of approximately 12 graduates/year.

Graduates of the program interpret in many settings and for various populations including children, youth, and adults, and individuals who are Deaf-Blind. Consumers' language preferences range along the language spectrum from ASL to various degrees of contact sign and sign-supported speech (not cued speech), and most graduates have

⁹⁹ Canadian Association of the Deaf, Letter to Federal Communications Commission dated 4 June 2010 <http://prodnet.www.neca.org/publicationsdocs/wwwpdf/6410cad.pdf>

some experience with tactile communication for Deaf-Blind consumers. Settings include K-12, post-secondary, community, medical, mental health, legal, and VRS.”¹⁰⁰

Douglas College does not provide training in oral transliteration or cued speech, but does include mention of the various forms of contact sign an interpreter may encounter in the Deaf community. In regard to recruitment purposes, Douglas College reports:

“The interpreting program works in conjunction with the provincial interpreter association, the Westcoast Association of Visual Language Interpreters (WAVLI). WAVLI members attend various job fairs and beginning ASL classes to promote the field of sign language interpretation. Program faculty attend the ASL & Deaf Studies program twice a year to promote interpreting as a career and the Douglas College program.”¹⁰¹

4.2.2. Ability for Expansion and Curriculum Additions

In order to respond to the potential shortage of interpreters if VRS is implemented in Canada, questions were asked concerning the ability of each program to expand or accelerate the current program to accommodate more students. The responses from Douglas College faculty are:

“We do not believe accelerated training would be a viable option to adequately prepare interpreters for VRS interpreting. Our current system in which interpreters begin the interpreting program with adequate fluency in ASL to be able to focus on learning the interpreting process allows us to focus on interpretation so our graduates are eventually able to do VRS work.

It is important to not focus only on the technical aspect of interpretation but recognize that cultural understanding is absolutely necessary for proper interpretation to occur. That, along with instruction related to ethics, ethical decision-making, working with marginalized communities, etc., all add to the quality of service our graduates provide. This could not be accomplished adequately in an accelerated program.

We control the program curriculum and can introduce new topics. We recognize the importance of smaller class size for appropriate language development and learning the interpreting process. We do not have the ability at this time to expand the number of students we admit into the program.

If there were more people interested in becoming interpreters, we would need to expand our program dramatically to accept more than the current 16-18/year. This would lead

¹⁰⁰ Questionnaire Responses from Douglas College.

¹⁰¹ Ibid.

to concerns about facilities being available, funding to support this, and a possible lack of instructors.”¹⁰²

4.2.3. Douglas College Perspectives on VRS

Douglas College currently includes information on VRS in the curriculum with specific attention paid to the challenges of providing effective interpretations in that setting. Articles about VRS from an interpreting perspective are included in the required readings for students and again focus on specific demands generated from video relay interpreting. General knowledge of technology and the use of videophones are covered throughout the program and have been included in the curriculum since the inception of VRS interpreting. Furthermore, students have the opportunity to use the service to make a call, ¹⁰³tour a VRS centre, and some students are placed in a VRS centre as part of their practicum studies.

The consensus from the faculty at Douglas College concerning interpreting in the VRS setting is in relation to minimum requirements for hiring VRS interpreters. The college asserts that at minimum, graduation from one of the five AEIPs and membership in AVLIC should be required for ASL-English interpreting in the VRS environment. Currently, they are concerned about the hiring practices of VRS providers who are not following this minimum requirement.

“We are concerned about the practice of hiring unqualified (untrained) signers to act as interpreters; this includes hiring children of Deaf adults who may be fluent in ASL, but who have not studied the interpreting process, ethics, decision-making, business practices, etc... Our opinion is that VRS should use only individuals who have been educated about the interpreting process – or in other words, those who have completed a recognized interpreter education program. To hire people who have not studied interpretation would lead to poor quality service being provided.”¹⁰⁴

Douglas College thus maintains that knowing sign language and even fluency in a signed language does not qualify someone to practice the skill of interpreting. This becomes more apparent with the additional unique VRS challenges of interpreting a high volume of calls from varying Deaf consumers all with different backgrounds, signing styles, and subject matter.

Another important theme raised is that a balance between VRS interpreting and community interpreting should be maintained.

“We are also concerned about interpreters limiting themselves to working only at VRS centres. I would like to see them keep a certain number of hours for community interpreting assignments. This is important to maintain a presence and a healthy and

¹⁰² Ibid

¹⁰³ Using Sorenson equipment as part of the Telus Sorenson VRS trial in BC.

¹⁰⁴ Questionnaire Responses from Douglas College.

*positive relationship with the Deaf community. It will also help to keep their ASL abilities more natural-looking and avoid being 'boxed' in by the constraints of the VRS medium.*¹⁰⁵

Potential VRS providers for Canada need to be aware of these concerns; collaboration with training programs and community interpreters may be warranted.

4.3. Lakeland College in Alberta¹⁰⁶

4.3.1. Program Information and Enrolment

Lakeland College located on the University of Alberta campus offers a one year ASL/Deaf Studies certificate program. This certificate is the prerequisite for the two year Sign Language Interpretation diploma program also offered at the college. The certificate is stated as the best way to acquire the competencies needed to apply for the diploma program, but applicants who have achieved proficiency in another form are also welcome to apply. Applicants who show advanced sign language skills and knowledge of Deaf culture are invited to take part in a selection process used to determine eligibility for the program. Typically, this process involves a screening process, personal interviews, and possible transition coursework.¹⁰⁷

The Sign Language Interpretation diploma program began in August of 2008 with a capacity of 16 students. The first intake had 15 students and was estimated to have 11 graduates in December 2009.¹⁰⁸ The second cohort is currently undergoing training and all 11 students are expected to graduate in December 2011.¹⁰⁹

4.4. Red River College/University of Manitoba

4.4.1. Program Information and Enrolment

The ASL-English Interpreting Program (AEIP) is a joint effort of the Red River College (RRC) and the University of Manitoba; it is unique in that upon completion, students are awarded the diploma in interpretation and a degree in linguistics from the University. The prerequisite for the AEIP is a one year Deaf Studies program. The AEIP is a three year program where students take classes at both the college

¹⁰⁵ Ibid.

¹⁰⁶ Lakeland College declined participation due to Department Chair being on long term illness leave. No other faculty feels competent to give the in-depth answers needed for such a survey.

¹⁰⁷ http://www.lakelandcollege.ca/programs/human_services/sign-language/courses.aspx

¹⁰⁸ Provincial Review of ASL/Deaf studies and interpreter education in BC, Gordon, M.G.; Hardy, M. Dec 2009 pg. 29

¹⁰⁹ Email from Debra Russell 05/25/2011

and the university. Specifically, classes in linguistics and ASL structure are taken at the University of Manitoba, while ASL-English interpreting courses are taken at Red River College.¹¹⁰

The AEIP can now accommodate up to 20 students, but enrolment is not full at this time:

“Currently, there are 14 students in year 1; 8 in year 2; and 2 in year 3. There are 2 students graduating for 2011. However, in the past we have had a graduating class of 5. We are expecting an increase over the next few years. For instance, next year we hope 6 students will graduate, and possibly within the next 2 years there will be 12 graduates.

There will be 2 graduates from our interpreter training program this year, which I know is a smaller than usual number. We are anticipating however that that number will increase significantly in the next few years, which will mean there will be more interpreters entering the work force. The development of VRS services in Canada could provide those future interpreters with an additional opportunity for employment that is flexible and which could accommodate their varying schedules.”¹¹¹

The low number of graduates is expected to change as the college is undergoing a program renewal and many curriculum changes are planned. Some of these changes are expected to generate more interest in the program through greater involvement from the Deaf community. A major component for the success of a training program is the involvement of Deaf mentors for the students to interact with.

In regard to recruitment efforts, the college and university both utilize open house events annually in order to attract and inform potential students about the interpreting program. They also have a booth at the annual Career Symposium, to recruit students and enhance interest in the program.

Graduates are trained to work with Deaf/deaf, hard of hearing, hearing, and Deaf/Blind communities which accounts for a large array of consumer groups and needs. RRC reports a strong foundation in ASL is the best way to ensure an interpreter’s ability to handle various forms of communication that may be used by the consumers they encounter, and graduates of the program receive that foundation. They are also skilled to interpret any interaction at their discretion, as a large focus throughout the program is on ethics and knowing which assignments are appropriate for new graduates. No training is offered in oral transliteration or cued speech.

4.4.2. Ability for Expansion and Curriculum Additions

In response to questions regarding the ability to expand or accelerate training to accommodate a potential shortage of interpreters if VRS is implemented, the faculty had the following comments:

¹¹⁰ <http://me.rrc.mb.ca/Catalogue/CourseDescriptions.aspx?ProgCode=AMESF-DP&RegionCode=WPG>

¹¹¹ Questionnaire responses from Red River College.

“First of all we need more trained ASL instructors to be teaching ASL. Right now, the program only has space for 20 students. In order to increase that number we would require funding not only for staff but for lab space too.”¹¹²

Furthermore, Red River College and the University of Manitoba believe accelerated training is not a viable solution due to the complexity of the interpreting process. At the present time, they do not include any in-depth training on VRS or VRI. However, they are undergoing a program renewal and intend to incorporate VRS/VRI training into the curriculum. Sorenson in Winnipeg has offered opportunities for the college to offer practicum courses at their call centre, however at this time faculty has declined the offer. As a community based program, the faculty expressed concern that involving Sorenson might alienate many of the Deaf community. It is reported that many Deaf community members are extremely displeased with Sorenson setting up call centres in Canada and “stealing” interpreters out of the community to work for the U.S. As such, Red River College will only consider working with Sorenson if the service is offered to Canadian consumers.¹¹³

4.4.3. Red River College and University of Manitoba Perspectives on VRS

The faculty had the following comments in response to what the most important considerations for VRS from the perspective of interpreter training:

“The most important requirement is that the interpreters that are hired must have graduated from a recognized interpreter training program. In addition I feel it is important that the interpreters are proficient in ASL, English and must have well-developed message equivalency skills. Due to the immense variety in interactions that an interpreter may find himself or herself facilitating it is important that the VRS interpreters have a breadth of knowledge.

A major issue for interpreters working in VRS is a lack of background knowledge relating to the communication being interpreted. In live events, interpreters may obtain documents and information pertaining to the event that contextualizes the event and the participants. In VRS this is usually not possible; untrained and less-experienced interpreters frequently do not have the expertise to manage this aspect of VRS work.”¹¹⁴

The faculty also expressed concern that the Sorenson VRS call centre in Winnipeg, Manitoba was hiring inexperienced interpreters. They report that after pressure from the Deaf community Sorenson changed the hiring criteria to include AVLIC membership, although those hired before the new

¹¹² Ibid.

¹¹³ Skype interview Red River College 05/17/2011

¹¹⁴ Questionnaire Responses from Red River College.

requirement are still employed. They feel that this is an important consideration and needs to be remedied if Canada is to implement a national VRS.¹¹⁵

4.5. George Brown College in Toronto, Ontario

4.5.1. Program Information and Enrolment

George Brown College (GBC) is currently the largest of the five ASL-English interpreting training programs in Canada. Similar to the others, GBC has specific admission requirements including completion of a minimum of 200 hours of ASL instruction, which is best acquired through a one year ASL Deaf Studies certificate or equivalent. The AEIP is three years in duration and prepares students to work as effective sign language interpreters. The curriculum combines theoretical and practical learning experiences intended to enhance the student's linguistic knowledge and further their awareness of Deaf culture.¹¹⁶

The program has the capacity to take in 27 students annually making it the largest of the ASL-English programs in Canada. Currently, the enrolment numbers for the AEIP are:

- First year 19 students
- Second year 22 students
- Third year 13 students

On average the college graduates between 10 and 14 students per year. The focus is purely on ASL-English, but as stated in other colleges' responses, faculty at GBC believe that a strong foundation in ASL prepares interpreters for any of the contact varieties they may encounter out in the Deaf community. No specific training in oral transliteration or cued speech is included in the curriculum.

"We train for a diverse Deaf community in Ontario which include the general Deaf and hard of hearing population that use ASL, Deaf professionals, and Deaf immigrants."

The faculty at GBC described efforts to conduct recruitment and outreach to potential ITP students as follows:

"We host monthly information sessions during the college year at the college. We also do outside recruitment such as going to the Canadian Hearing Society (CHS) to present in their ASL classes as an example. We host booths at community events such as Mayfest and Junefest and participate at the annual College Fair."¹¹⁷

¹¹⁵ Skype interview Red River College 05/17/2011

¹¹⁶ <http://www.georgebrown.ca/Marketing/FTCal/comsrv/C110.aspx>

¹¹⁷ Questionnaire Responses from George Brown College.

GBC states that the biggest challenge in recruiting students to the AEIP is lack of language proficiency to satisfy the admission requirements. They report many students are not able to cognitively and linguistically process languages or tend to not have the bicultural sensitivity required for interpreting work and therefore are not accepted into the program.

4.5.2. Ability for Expansion and Curriculum Additions

At the present time GBC indicated that they would not be interested in expanding their ability to admit more students over the current maximum (27) due to the complex nature of interpreter training and the fact that smaller class sizes allow for more individual interaction with instructors. However, they do believe that curriculum expansion to include more topics on VRS would be feasible and would develop resources to expand training to further include topics pertaining to VRS. In addition, consideration is now being given to developing post graduate studies for AEIP graduates.

Another challenge to expansion or recruiting more students is limited funding and lack of qualified ASL instructors. However, GBC offers a 15 month fast track ASL and Literacy Instructor Program for Deaf and non deaf individuals who are fluent in ASL. One of the goals of this program is to increase the number of qualified ASL instructors.

4.5.3. George Brown College Perspectives on VRS

Third year students take a course in “Entrepreneurial Skills for Interpreters,” which introduces students to Sorenson through a field trip to their Toronto call centre. Discussions are also underway to engage in a partnership with Sorenson to provide practicum opportunities for students, but are currently on hold as the Sorenson office is relocating and hiring a new manager.

The key considerations for VRS from a GBC interpreter training perspective are summarized as:

- Best incentive for Canadian interpreters to work in VRS is if the service is for Canadians
- Certification or registration with OIS¹¹⁸ or other agency is essential in providing a standard level of interpretation.

In regard to skills needed for VRS:

“From our perspective of interpreter training, we believe that the most important considerations for VRS work are: bilingual competency in ASL and English with correct grammar and register variants, success in managing the cognitive and linguistic processing during interpreting, making sound ethical decisions, an understanding of cross-cultural dynamics and power imbalances in the Deaf and non-deaf communities.”¹¹⁹

¹¹⁸ Ontario Interpreting Services. See Section 3.1 Certification, Accreditation, and Evaluation Procedures.

¹¹⁹ Questionnaire Responses from George Brown College.

It is the faculty's belief that these competencies are best obtained through graduation from a recognized interpreter training program and a few years of experience interpreting in the community.

4.6. Nova Scotia Community College

4.6.1. Program Information and Enrolment

Nova Scotia Community College (NSCC) offers a one year Deaf studies certificate program, which serves as the prerequisite for a two year ASL-English interpreting program. Similar to all the other programs, this prerequisite is the recommended way to achieve the skills necessary to enrol in the AEIP, but in some cases other equivalents will be considered as part of the screening and selection process. The program can accommodate a maximum of 16 students and current enrolment is:

- AEIP Year 1: 10 students
- AEIP Year 2 5 students

On average, NSCC graduates 8 to 12 students per year. Students are trained to be general entry level interpreters and learn how to be flexible to accommodate different variations of ASL, however no training in oral transliteration or cued speech are included. In order to recruit students, the college holds monthly information sessions for potential and interested students and twice a year visits ASL classes to inform about the programs.¹²⁰

4.6.2. Ability for Expansion and Curriculum Additions

The faculty at NSCC states that they are always looking for ways to improve their program and that if a significant increase in ITP graduates is necessary to support VRS, they would be interested in expanding and adding topics to accommodate the need. In reference to the challenges of meeting an increased demand such as, lack of funding, lack of interested students, and lack of qualified instructors, NSCC believes that none of these challenges are insurmountable and they would be up to the challenge. However, increased government funding would be necessary for expansion.

4.6.3. Nova Scotia Community College Perspectives on VRS

VRS represents a small percentage of the overall curriculum. However, the faculty states that there are some practicum opportunities in this environment through the local Sorenson VRS call centre, which includes training and the opportunity to interpret mock practice calls.

The most important consideration for VRS from NSCC's perspective is to ensure access to quality video relay and interpreting services. They also state that given the opportunity to be supervised and team with a seasoned interpreter, that a graduate of a recognized interpreter training program could handle VRS work.

¹²⁰ Questionnaire Responses from Nova Scotia Community College.

In addition, the faculty had the following comments regarding challenges for VRS in Canada:

“Like so many efforts launched in Canada, the biggest challenge is making a service economically viable in a country with so many square kilometers and a relatively small population that is spread far and wide. As a Canadian, as an interpreter and as a teacher of interpreters, it is a source of embarrassment that our Deaf and hearing colleagues don’t have access to a service that has long been technically possible. We are keen to see VRS come to Canadians!”¹²¹

4.7. CÉGEP du Vieux Montréal¹²²

4.7.1. Program Information and Enrolment

Cégep du Vieux Montréal (CVM) offers a 570 hour full time intensive day program spread out over an eight month period resulting in a Certificate of Collegiate Studies (AEC) in Communication and Deaf studies. This certificate serves as one of the ways to establish LSQ knowledge equivalency for admission to the visual interpreting diploma program at the Université du Québec à Montréal (UQAM). However, it should be noted that many final year students in this program choose to begin working as interpreters without continuing on to the UQAM program.

“Final-year students in the AEC in Communication and Deafness become communicators and have a solid grasp of Québécois sign language which allows them to begin studies in visual interpretation. Some decide to take this training in order to specialize in their field: special education, social work, speech therapy, teaching; others decide to change course to become interpreters. By our count, for most cohorts, 50% of final-year students continue their studies in interpretation at university in order to perfect their knowledge and to learn the profession of interpretation. Moreover, many final-year students of the AEC decide to become practicing interpreters after their collegiate education.”¹²³

Each year between ten and twenty students enroll in the AEC with an average of 15 graduates per year. Although not an interpretation training program, the college does graduate students that are capable of communicating in LSQ and transliteration forms of communication. Faculty states that students are trained to work with the “deaf and hard of hearing of all ages.”

“The AEC does not offer a program in interpretation. However, this program is the only one to offer a credited training in LSQ (180 hours) and in transliteration¹²⁴ (90hours); the communicators are equipped to communicate effectively with the deaf. There are other

¹²¹ Ibid.

¹²² All quoted comments have been translated from French to English.

¹²³ Questionnaire Responses from Cégep du Vieux Montréal.

¹²⁴ Oral no sign language interpretation.

*courses in the program, notably: cultural aspects of deafness, the history of deafness, non-verbal communication, specialized communication, an internship of 57 hours within the deaf community, etc.*¹²⁵

The faculty is very active in conducting recruitment efforts for potential students as listed below:

- *Recruitment through social networks*
- *Advertisement in our program guide for the Cégep du Vieux Montréal*
- *Advertisement on our website*
- *Advertisement in the visual interpreters section of the Student Integration Assistance Service (SAIDE)*
- *Our program is listed in the admission requirements, knowledge of LSQ section, for the Visual Interpretation Certificate program*
- *During events within the deaf community: ExpoSourds, etc.*
- *Advertisement with our deafness partners*
- *Guidance counselors in secondary schools and other services in Québec*
- *Word of mouth and more*¹²⁶

Some students continue on to the UQAM program and others take the AEC program to specialize in a specific area related to their current employment, such as teaching, speech therapy, social work, and special education. Recruitment efforts are directed at all potentially interested students.

4.7.2. Ability for Expansion and Curriculum Additions

The college reports current training of visual interpreters in Québec is insufficient to adequately meet the education needs of students.

*“There are presently gaps in the training of visual interpreters in Québec since training in visual interpretation is incomplete: content, period over which it is spread, practical experience, etc. Our establishment and UQAM have submitted this problem to the Ministère de l’Éducation, du Loisir et du Sport [Ministry of Education, Sports, and Leisure] and we are awaiting a decision from the relevant authorities.”*¹²⁷

CVM is also an employer of interpreters through the service organization Cégep du Vieux-Montréal – service d’aide à l’intégration des élèves (SAIDE). CVM states that with additional funding for the program they could offer expanded training through the service agency, dependent on their ability to attract qualified faculty.

“The Cégep du Vieux Montréal has several resources for teaching visual interpretation. In the past when requested, our establishment offered visual interpreters training in

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ Ibid.

occupational health and occupational safety as well as training in perfecting visual interpretation.

If you have the financial resources to support a visual interpretation program, we could, through one of our service centres, offer an intensive training adapted to your needs.”¹²⁸

CVM reports that the biggest challenges to meeting an increased demand for visual language interpreters from a training program perspective are:

- Insufficient number of experienced interpreters
- Lack of intensive training in visual interpretation
- Lack of financing
- Lack of a specialized teaching laboratory

4.7.3. Cégep du Vieux Montréal Perspectives on VRS

VRS is not currently covered in the curriculum at CVM, however the college reports having some experience with VRI through internal pilot tests. These tests did not have adequate equipment for accurate transmissions, but CVM remarks that the service was beneficial and would alleviate the problems associated with sending interpreters to distant locations. CVM further comments that this type of service would help alleviate the shortage of ASL-English interpreters available in Québec by allowing ASL Deaf users to access, via video an ASL-English interpreter.

CVM stated that the following forms of communication should be available for VRS: “oral, natural gesture-supported speech, sign supported speech, and LSQ.” CVM believes oral interpretation could also help those who might not be deaf, but mute, by giving them a voice and therefore should be included in the provision of VRS for Canada.¹²⁹

The most important considerations regarding VRS for the faculty at CVM are linked to significant concerns about maintaining interpreter availability for the community.

“To offer a service while maintaining awareness of the needs of the community in order to avoid mortgaging the current organizations that supply visual interpretation services in Québec, more specifically in the Francophone LSQ sector. The Anglophone ASL sector can, in our opinion, more easily benefit from resources in the other provinces and in the United States.

There should be collaboration with the different LSQ visual interpreter employers in Québec and the VRS.

¹²⁸ Ibid.

¹²⁹ Ibid.

For LSQ interpreters, we are concerned that the implementation of this service will empty the pool of qualified visual LSQ interpreters who are currently employed by interpreter employers. Is it possible to envision that the future employees of the VRS will maintain a % of availability for their current employers? Or again, must one think that the different LSQ interpretation services in Québec will work in partnership with a VRS call center so that some of their staff will work as interpreters when they do not have any assignments? I believe that this could be considered for us, and for the SIVET [Visual and Tactile Interpreting Service].”¹³⁰

CVM reports the biggest challenge to successful VRS for Canada; specifically Québec is the current inadequate level of training. The problem has been reported to the Ministry of Education, Sports and Leisure in Québec, but no decision has been made.

4.8. Université of Québec at Montréal¹³¹

4.8.1. Program Information and Enrolment

Université du Québec à Montréal (UQAM) offers a part time two-year LSQ-French diploma program consisting of nine 45-hour courses. The faculty consists of Deaf and hearing teachers with all practical workshops taught by both a professional interpreter and a Deaf teacher in a team environment. After these courses are completed a 150-hour internship is required and consists of 25 hours of seminar, 35 hours of observation, and 90 hours of interpreting. During the internship students are expected to complete and present a research project related to the interpreting field. The internship is supervised by a professionally recognized interpreter. Towards the end of the internship, students undergo a final evaluation process. Occasionally, some students do not meet the requirements to graduate and are offered an opportunity to continue their internships; staggered across three terms equivalent to one full year.¹³²

UQAM can accommodate 45 students per year. In April 2010 the school had 45 applicants and 33 were selected. Unfortunately, the attrition rate is extremely high with initial class sizes starting at between 25 to 35 students and with approximately 5 graduates per year. Many of the students are able to find work before completing the program due to several employers not requiring the diploma. Therefore, UQAM reports that many LSQ-French interpreters are beginning professional careers without having finished adequate professional education.

“The loss rate is very high in this program. Most of the students find a job during the training and no employer requires the diploma which makes it possible to postulate that the majority of students enter professional life without having finished their degree

¹³⁰ Ibid.

¹³¹ All quoted comments have been translated from French to English.

¹³² Questionnaire Responses from Université du Québec à Montréal.

course. Out of cohorts, varying from 25 to 35 students at admission, the graduation rate for the three previous years has been 8 (2007), 2 (2008), and 6 (2009).¹³³

The comments of CQDA regarding the high rate of attrition are:

“Attrition also comes from the time to really get the diploma. The fact is that not many interpreters can go through this program in only two years. Many students have complained that courses have been often cancelled due to lack of registration. Because the certificate cannot be obtained in one year like all others, it is quite difficult to have students from other regions move to Montreal, find a part-time job during their more than two-year studies. Many just start interpreting part-time and study part-time. Furthermore, after getting through all this, interpreters that go back to their region are not sure to find full-time jobs and make a living at interpreting. CQDA believes that because there is no provincial certification and that employers, mainly interpreting agencies, have their own in-house evaluation and don’t always pay more for an interpreter holding a certificate, students tired of stretching a supposed two-year certificate just to go to work.”¹³⁴

The training at UQAM is typically offered in LSQ-French, but they have the ability to train ASL-English interpreters also.

“The training is usually offered from French into LSQ and from LSQ into French. However, we have adapted this training (2008/2009) for a small cohort of English/ASL interpreters in response to a request from the Agency of Health and Social Services of Montréal which subsidized the project. We would be ready to renew the experience, modifying certain conditions. For this training, we produced pedagogical material adapted to the teaching of English/ASL interpreting and we still have this material for other possible cohorts.”¹³⁵

The program at one time did offer training in oral transliteration, but encountered difficulty attracting students. A report on visual interpreting in Québec makes comment on oral transliteration training as follows:

“Originally, the certificate at UQAM had two specializations: the gestural and the oral. The oral transliteration was closed in 1996 because the number of applications for admission was not enough. Other universities in the province have offered oral component of training for one or more cohorts (Université of Québec in Abitibi-Témiscamingue, UQAT, Université of Québec at Chicoutimi, UQAC) according to the

¹³³ Ibid.

¹³⁴ CQDA Correspondence 07/05/2011

¹³⁵ Ibid.

needs of their region or attempted to offer this program (Université of Québec at Trois-Rivieres, UQTR). All of them closed (except UQTR which provides the formation occasionally (when the number of students is enough). Barriers to provide or maintain the oral component of the active program were the low number of participants, their spread over large areas, job requirements at the time (a non-recognized) in schools, job insecurity and conducting private training earlier responding to more urgent needs. These elements have helped reduce the number of potential students. Since 2007, a program oral interpretation, however, is offered in continuing education by the Université of Québec at Trois-Rivieres (continuing education does not provide a diploma as in regular education, but EU (unit of education). This program is intended primarily for interpreters already employed in the school boards.”¹³⁶

From this same report, the recommendation for structuring future visual language interpreter training programs is to have a general interpreting curriculum, including foundations in the linguistics of the two working languages LSQ and French. It should also include specific courses on transliteration and the various areas of work (e.g. academics, legal, social community). Due to the limited amount of workers and the closing of several programs exclusive to oral transliteration, the report recommends a more generalized curriculum, such as that referenced earlier.¹³⁷

UQAM states that their students do not receive specific training in specialized areas (e.g. academics, medical, legal). They are trained similarly to the other training programs in Canada to become generalists with the appropriate knowledge and aptitude to work among the diverse deaf community. Although, if given the opportunity to restructure the program to a 4-year baccalauréat, it may be possible to include further specializations, including VRS.

UQAM conducts recruitment and outreach to potential students during the winter and fall sessions of LSQ language courses that request it. These courses are offered by rehabilitation centers and by some associations. These promotions are also run during winter session at Cégep du Vieux Montréal in their Communication and Deaf studies program. They indicate that their difficulty lies not in attracting students, but in retaining them.

4.8.2. Ability for Expansion and Curriculum Additions

UQAM’s response concerning ability to expand training and introduce new topics is:

“The primary obstacle to the training of visual interpreters is the absence of recognition of the diploma. The employers that hire interpreters without recognizing the diploma participate in the loss of cohorts in the training programs. Otherwise, the material equipment, financing, human resources (number and qualification) are sufficient to

¹³⁶ Parisot, Anne-Marie & Villeneuve, Suzanne, et al. *L’Interpretation Visuelle Aupres D’une Clientele Sourde. Portrait d’Une Profession et Etat de la Situation Sur Les Besoins de Formation*. 2008. Pg 14.

¹³⁷ Ibid.

welcome numerous cohorts. The average target of the UQAM is a minimum of 44 students per class. The sectional software labs are equipped to teach with the aid of new communication technologies and the annual budgets allow each department to equip itself with technical tools and software adapted to specific teaching needs.

We can without difficulty admit a greater number of students. What's more, we have already developed a plan for a baccalauréat including course contents on the specifics of the VRS. The teachers are the most experienced in Québec in terms of teaching the interpreting and linguistics of LSQ. They are locally and internationally recognized for their professional expertise and their research. They are innovators and are fully informed about the new technologies. Moreover, the teachers offered in the UQAM Certificate in Interpreting benefit from the support of the LSQ and Deaf Bilingualism Research Group, whose research findings regularly enriches the course contents and methods of evaluation.”¹³⁸

With reference to the feasibility of accelerated training for VRS, the faculty had the following comment:

“A temporary training could be developed on request via the UQAM Business Services. Initially, this training could be custom designed to quickly (one trimester) satisfy the needs for knowledge specific to the VRS. This supplementary training could be taken by interpreters who already have training. The financial responsibility would then be assumed by the employer. Candidates who have not received any training in visual interpreting would take the fundamental training, which currently ends in two years, to which a VRS module would be added.”¹³⁹

UQAM states that no limit exists on the amount of students they could accommodate in their program. They further report that they have never had to make those kinds of decisions and the most students ever enrolled at one time was 45. If there was a need, UQAM believes it is capable of reorganizing and accommodating additional students.

4.8.3. Université de Québec at Montréal Perspectives on VRS

UQAM states that because VRS service has never been offered in LSQ-French, this topic has not been included in the curriculum. They do have a brief description of the difference between live and remote interpreting in a methods and practices course and plan to include VRI and VRS if baccalauréat training is approved.

The concerns of the faculty at UQAM are similar to the other training programs surveyed and relate to proper training. Faculty reports that the only way to ensure qualified interpreters and a quality service is to require completion of training at the Université level; particularly due to the very specific

¹³⁸ Questionnaire Responses from Université du Québec à Montréal.

¹³⁹ Ibid.

challenges involved in interpreting work. Furthermore, not doing so leads to serious ramifications for the Deaf consumers.

“...the reputation of the service is dependent on the quality of the service given. It is useless, even dangerous, to offer a mediocre service (serious interpreting mistakes can have regrettable impact on the deaf and hearing individuals.) Moreover, duly trained interpreters will be more assiduous and regular in their commitment. The fact that they are equipped with the tools and knowledge to overcome the difficulties of the career has a direct impact on the appreciation of a worker for his or her own work and therefore his or her desire to maintain it.”¹⁴⁰

The key incentives for interpreters to work in VRS from the perspective of UQAM include:

“Regularity of employment, fewer travel required to go to assignment locations, work within a team of interpreters (therefore the possibility to consult peers in case of difficulty). On the other hand, the working conditions would have to be more advantageous than what currently exists in the other sectors (academic and social-community) in order to attract the best candidates. Furthermore, if the VRS would offer our students the possibility of doing an internship, the students would have the opportunity to develop appreciation for this sector.”¹⁴¹

The most important considerations for VRS concerning interpreters from UQAM’s perspective are:

“It is essential to plan to offer good working conditions to the interpreters employed:

- *Working hours that are favorable and sufficient for making a living;*
- *Favorable salary (to attract the most experienced who would have a taste for changing working environment, but who already have good conditions elsewhere);*
- *Continuing education offered by the employer (e.g.: technical and ethical);*
- *Concern for professional injury to the interpreters (musculoskeletal troubles);*
- *Clear response protocol for calls (e.g.: if a client is naked or impolite);*
- *Etc.”¹⁴²*

Pertaining to potential VRS in Québec, UQAM believes the most logical location for an LSQ-French call centre is in Montréal, where the majority of LSQ-French interpreters are located. This would also allow a close relationship between the VRS provider and the training program.

¹⁴⁰ Ibid.

¹⁴¹ Ibid.

¹⁴² Ibid.

4.9. Canadian Hearing Society/Ontario Interpreter Internship Program (IIP)

4.9.1. Program Information and Enrolment

Ontario Interpreting Services (OIS) is a department within the Canadian Hearing Society (CHS) and offers interpreting services for the Ontario area. The Toronto office of OIS/CHS offers a ten month Interpreter Internship Program (IIP) for graduates of an accredited Interpreter Education Program. The graduates may have recently graduated or have been working in the field for a while.¹⁴³ The internship involves nine months of training in Toronto and one month of experience as a staff interpreter in one of the CHS regional offices. Four interns are accepted per session and currently the program is running two parallel sessions for a total of eight interns per ten month period. Most graduates go on to become staff or freelance for OIS. This unique program is funded by the Ministry of Health.¹⁴⁴

The specific requirements for entrance into the program are as follows:¹⁴⁵

- Graduate of an accredited Interpreter Education Program
- Completion of an OIS Interpreter Internship Program Application
- Completion of the IIP Entrance Screening
- Eligible to work in Canada

The program includes:

- Classroom instruction with both Deaf and hearing trainers
- One-to-one feedback from trainers and interpreter-mentors
- In-depth critical analysis of L1 and L2¹⁴⁶
- Hands-on interpreting experience in a safe environment under the guidance of experienced staff and freelance interpreters
- Access to OIS video/text resources and innovative lab facilities
- Emphasis on specialized areas such as medical and mental health settings

Ideally, the program would like to attract interpreters from regions currently without, or with limited interpreting resources and as such are offering a subsidy to those who move to the Toronto area for the duration of the program. Interns are also paid a \$26,000 per annum salary, which is pro-rated over a 10 month period.¹⁴⁷

¹⁴³ <http://www.chs.ca/en/ois-internship-program-faqs/index.php>

¹⁴⁴ <http://www.chs.ca/en/ois-internship-program/interpreter-internship-program-5.html>

¹⁴⁵ <http://www.chs.ca/en/ois-internship-program-faqs/index.php>

¹⁴⁶ L1 = First language acquired (e.g. French) and L2= second language acquired(e.g. LSQ)

¹⁴⁷ <http://www.chs.ca/en/ois-internship-program-faqs/index.php>

The IIP focuses on training interpreters to work with the general Deaf community and focuses on ASL, but also trains to other consumer needs. As such, most of the training is related to community interpreting (e.g. medical, legal, employment, etc.). OIS does not train for education interpreting services. All of the hearing trainers in the program are nationally certified (COI from AVLIC), and the Deaf trainers are all qualified ASL trainers, of which one has experience as a Deaf interpreter.¹⁴⁸

In regard to outreach and recruitment efforts OIS states:

“Our interns come from established Interpreter Education Programs. We have a close working relationship with George Brown College and conduct workshops and tours for students annually. We also recruit through interpreter organizations such as OASLI and AVLIC as well as well known Deaf run web sites – Robert Denny and Deaf Connect. We have a presence at places such as Mayfest and are also well known by reputation.”¹⁴⁹

This program has been in place since 2002 and has experienced great success with only one person who did not complete the internship.¹⁵⁰ Furthermore, 75 percent of those who have completed the 10 months go on to become OIS registered¹⁵¹ compared to only 33 percent success rate for those who do not go through the internship. Although the internship program is not a training program, the model used is very successful at better preparing graduates for interpreting work.¹⁵² This model could potentially be utilized by a VRS provider to accelerate training for VRS.

4.9.2. Ability for Expansion and Curriculum Additions

In response to questions regarding expansion and curriculum additions, OIS states:

“We are always looking to expand training opportunities and topics – the curriculum is constantly being reviewed following feedback from graduating interns. We are not planning to expand the number of interns we admit as we see our small class size and intensive feedback as the key to our success. Unlike interpreter education programs we are able to offer individualized programming and intensive one to one feedback.

Our main challenge is that to increase this program would be a huge increase in resources. We are not willing to water down this intensive, but highly successful program.”¹⁵³

¹⁴⁸ Ibid

¹⁴⁹ Questionnaire Responses from Ontario Interpreting Services

¹⁵⁰ Ibid.

¹⁵¹ OIS registration refers to the screening process administered by OIS to qualify interpreters to work in the field.

¹⁵² Mission Consulting Interview with CHS and OIS, 04/13/2011

¹⁵³ Questionnaire Responses from Ontario Interpreting Services

Due to the focus on community interpreting OIS is not interested in providing training for VRS, but is willing to share their model of training to VRS providers for the purpose of accelerating training for recent graduates. The program does include training on Video Remote Interpreting (VRI) in the form of a two day module, which they plan to expand as community interpreting moves toward VRI.

4.9.3. Ontario Interpreting Services' Perspectives on VRS

OIS believes that the most qualified interpreters are those with the AVLIC Certificate of Interpretation and as such those individuals should receive priority both in hiring and pay scales for VRS work; however they concede that nationally there are not enough COI interpreters for this purpose. Therefore, they state that if a good mentorship system is in place, it could be possible, with training, to continue to improve the level of service offered by non COI interpreters and possibly graduates of interpreter programs. They also believe VRS providers should offer ongoing training and assist VRS staff to attain the COI level.

In reference to using U.S. interpreters or U.S. certification for VRS in Canada, OIS had the following comments:

"It should be noted that RID (the American certification) is not recognized in Canada and has not been approved by the Canadian Deaf community. It should not be viewed as equal to AVLIC as their rating system is very different and the standards fall below the Canadian national standard. Only Canadian certified interpreters (COI) are recognized as being 'certified' in Canada. VRS may look to some of the provincial or federal registrations as a means to verify a certain industry standard, but should only look to AVLIC as a certifying body.

It should be the goal of VRS to attract or encourage their employees to seek Canadian certification, not certification from another country.

The American model is often a very English like form of signing. Canada uses a purer form of ASL. Also the American certification is much lower than Canada's. Quality of service will be sacrificed if it is located in another country. There are many interpreter programs in the US and very little similarity in terms of graduate's skill level. You are more likely to 'know what you are getting' if you are hiring Canadian trained interpreters."¹⁵⁴

OIS has not had much experience with VRS; however they had the following comments regarding VRS in the U.S. and Sorenson VRS in Canada:

"My understanding is that the interpreter qualifications vary greatly – from highly skilled to recent grads. Little support is given to interpreters in the current company located in

¹⁵⁴ Ibid.

Ontario and the interpreters I know who works for VRS complain that they are not well supported.”

The most important consideration for VRS in Canada from the perspective of OIS is:

“The service should be quality service and reflect the Canadian standards – not an American model that is transposed onto a Canadian landscape.”¹⁵⁵

4.10. Other Forms of Communication

Included in this section are the summarized questionnaire responses of cued speech and oral transliteration courses, both located in Québec.

4.10.1. École St-Jude- Langage Parlé Complété

École St-Jude offers courses in the training of Langage Parlé Complété (LPC) and is not an interpreter training program. These courses offer a basic training in LPC and can last four days or seven evenings with some additional support training lasting three to four days. Typically, these courses are provided to parents of children in the school program using LPC, special education teachers and speech therapists. Interpreters who work in the school system are also involved in learning LPC for the purpose of working with these children. No certification exists for LPC and instead assessments are performed privately on a contract basis.

In order to expand this type of training, the program reports that additional funding and human resources would be necessary. Currently, the program is not operating at full capacity and could accommodate more participants. The current funding provided by Ministry of Education, Sports and Leisure in Québec will end June 2011. École St-Jude reports that in regard to VRS one important consideration is the technical aspect, which would need to be very clear and without delay, in order to see the change between codes. Additional considerations related to VRS are below:

“The use of LPC and Cued English is still not very widespread in Canada. One challenge would be to raise awareness about these communication methods so as to eliminate any prejudice. Usage is increasing in the Montérégie and several other regions in Québec. The number of potential users is expected to increase as well. Training is relatively easy to schedule owing to the short period of time involved.

I think it would be important to include LPC and Cued English in the process, even if they are relatively new communication methods. In the long run, their increased use will enable those who need these services to access them.”¹⁵⁶

¹⁵⁵ Ibid.

¹⁵⁶ Questionnaire Responses from École St-Jude.

It is unclear what the potential demand for this service will be or if it is a viable option for VRS, as it appears to be used in schools primarily as a way to teach speech. However, as stated earlier the use of cued speech is controversial in the Deaf community and some organizations contacted for this study have expressed disapproval at its inclusion in potential services for Video Relay. On the other hand, the CQDA reports that many LSQ-French interpreters that have difficulty finding full-time work will often learn cued speech in order to obtain additional work. Furthermore, the CQDA believes that VRS should not discriminate against individuals who use other forms of communication.¹⁵⁷

4.10.2. Université of Québec at Trois-Rivieres

Since 2007 *Université of Québec at Trois-Rivieres* (UQTR) has offered continuing education¹⁵⁸ training in oral transliteration. The training is an intensive program organized into three sessions of fifty hours, resulting in 150 hours. Interpreters may take this training as a way to incorporate oral transliteration into their skill set and therefore be able to accommodate the needs of the oral deaf population.

“The goal of this training is to instruct students in specific concepts concerning deafness, communication, and the role of the interpreter when interacting with his or her client. It also aims to develop skills and attitudes that are necessary for oral interpreting so that the interpreter can adapt to the specific needs of the clients, in accordance with their age and the interpreting situations, all while respecting the other individuals involved in the service.

Gain experience in oral interpreting, in different environments and in adjusting to the needs of clients, both children and adults, in order to develop a more effective use of the tools used by oral interpreters during the transmission of a message or during other tasks (preparing material, information on his or her role).

Acquire the basic theories of LPC. Master the LPC code. Be able to adapt to the needs of the deaf or hard of hearing child and to his or her specific needs in a learning environment. LPC is taught to children by speech therapists.”¹⁵⁹

¹⁵⁷ CQDA Correspondence 07/05/2011

¹⁵⁸ Unit of Continued Education (UEC) is a method of acknowledging non-credited advanced education that corresponds to ten hours of work and attendance.

¹⁵⁹ Parisot, Anne-Marie & Villeneuve, Suzanne, et al. *L’Interpretation Visuelle Aupres D’une Clientele Sourde. Portrait d’Une Profession et Etat de la Situation Sur Les Besoins de Formation*. 2008. Appendix 3.

4.11. Summary of Interpreter Training Programs

Table 10: Average Annual Enrolment Capacity and Average Size of Graduating Class-ASL-English

Program	Annual Maximum Intake	Annual Average Number of Graduates
Douglas College	18	12
Lakeland College	16	11
Red River College/University of Manitoba	20	4
George Brown College	27	12
Nova Scotia Community College	16	12
Totals	97	51

Table 11: Average Annual Enrolment Capacity and Average Size of Graduating Class-LSQ-French

Program	Annual Maximum Intake	Annual Average Number of Graduates
Cégep du Vieux Montréal	25	15 ¹⁶⁰
Université of Montréal at Québec	45 ¹⁶¹	6
Totals	70	21

¹⁶⁰ Although only one of the suggested certificates for the program at UQAM, faculty states that some graduates begin work as LSQ/French interpreters upon graduation from this program, while others (50%) continue on to obtain a diploma in visual interpreting from UQAM. UQAM would prefer all employers require the diploma.

¹⁶¹ Many of these students do not finish the program and begin work as interpreters. UQAM strongly recommends requirement of the diploma. Additionally, UQAM reports that they can accommodate any number of students, but currently strive for 45.

Even with a shortage of interpreters, student retention is still a challenge as evidenced by low numbers of graduates when compared to maximum enrolment numbers. It is possible that VRS will create an increased interest in the profession leading to lower student attrition rates and more graduates. ITPs report that based on feedback from students the programs offered should be restructured to degree programs in order to retain and attract more students. Respondents suggested that a four year degree program could be structured as follows:

- First Year: One year prerequisite required by all programs currently.
- Second Year: Marks the beginning of the interpreter training currently.
- Third Year: Second year of ITP currently.
- Fourth Year: Added curriculum and more practicum opportunities to better prepare graduates.

All programs report that their graduates do not have difficulty finding work and that a shortage of interpreters still exists; especially outside of the metropolitan areas, and specifically in the education sector. Moreover, all programs asserted that VRS providers for Canada should only hire individuals who meet the minimum requirements stated earlier and preferably will require a few years of community interpreting to gain experience with the Deaf community. Other themes of significance that emerged from the interpreter training questionnaires were:

- Desire for balance between community work and VRS work
- Need for collaboration between interpreter trainers and VRS providers
- Strong need for VRS and VRI in remote and rural areas
- Incentive for interpreters to work in VRS is if the service is for and by Canadians
- Need for uniform standard of evaluation in Québec

Another important consideration that was identified during these consultations is related to the shortage of qualified ASL/LSQ instructors¹⁶² and how to increase that labour pool in order to meet the increased demand for qualified interpreters. For instance, George Brown College mentioned a fast track program to train for qualified ASL instructors. A similar program existed in Vancouver at Douglas College, but due to the inability of many potential Deaf instructors to afford the tuition, was cancelled due to low enrolment rates. Recommendations from the Provincial Review of ASL/Deaf studies and Interpreter Education in BC include:

“The Ministry of Advanced Education and Labour Market Development and the Ministry of Housing and Social Development consider financial support for those Deaf individuals who are interested in taking the ASL instructor program.”¹⁶³

¹⁶² No LSQ instructor training exists in Quebec per CQDA Correspondence 07/05/2011

¹⁶³ Gordon, M.G. and Hardy, M. *Provincial Review of ASL/Deaf studies and Interpreter Education in BC*, Dec 2009, pg. 41

5. Potential Responses to a Forecast Shortage of Qualified Interpreters

Recommendations, comments and concerns to address the shortage of interpreters in Canada from the various professional groups surveyed are summarized below.

5.1. Accelerated Training Options

It is the process of teaching interpreting and recognition of the complexity of the profession that is of great importance to those interviewed, which makes the concept of accelerated training not feasible. However, after an individual has graduated from an interpreter training program, it is feasible for that person to receive accelerated training as evidenced by the internship model at CHS. This type of training could be provided as a way to attract recent graduates to VRS. In the U.S., VRS providers have worked with interpreter training programs and some offer recent graduates a school-to-work training program to bridge the gap that exists between recent graduates and their ability to enter professional interpreting environments. The training is designed to increase skill levels of recent graduates so that they can competently enter the VRS work environment. Included in the training are educational work internships and specifically designed courses to prepare students to pass the test for certification. In exchange for the training, students sign contracts with the provider.¹⁶⁴ This is similar to the OIS internship program and may be an effective way to prepare recent graduates to meet the demands of professional interpreting in the VRS environment.

5.2. Increasing Labour Pool

Increased funding to expand interpreter training programs throughout Canada may be needed to increase the labour pool. Additionally, moving diploma programs to degree programs may increase interest in the profession. In Québec, it is imperative that an evaluation standard be implemented and for employers to require the diploma in visual interpreting from UQAM as the basis for qualification. Offering signed language classes in secondary education as a foreign language elective may increase the amount of individuals exposed to it, therefore resulting in a greater interest in the interpreting profession. Student loan forgiveness and financial grants for qualified students could be offered by the government or VRS providers in order to increase the number of graduates.

5.3. Balance between Community and VRS Interpreting

Balancing work between VRS and the community is a common concern of the interpreting organizations interviewed. They feel that it is critical to provide a solution to the impact VRS will have on the availability of community interpreters. VRS providers should show understanding and sensitivity to this issue by offering a service that accommodates a balance between VRS interpreting and community interpreting. They believe it is the providers' responsibility to engage the community to make sure that

¹⁶⁴ http://www.sorensonvrs.com/november_2010#STWk

a drain on the interpreter pool is not occurring. VRS providers need to involve the Deaf community and the interpreting community when implementing service in Canada. Those interviewed hope that VRS companies will offer opportunities for individuals to balance their time between VRS and community work, especially if the community is experiencing a shortage of qualified interpreters. This could be achieved through sub-contractor situations or other forms of collaboration between interpreter service agencies and VRS providers.

This concern is greatest in Québec, where the shortage of qualified interpreters is highest. VRS providers would need to work directly with the interpreting agencies and training programs in Québec, in order to prevent a critical shortage of interpreters for the community. According to UQAM faculty surveyed in Québec, it is most practical to locate an LSQ-French call centre in Montréal, where the highest concentration of interpreters exists.¹⁶⁵ This will also allow the VRS provider to work collaboratively with the regional service agencies and offer practicum opportunities to the students of visual interpretation at UQAM.

5.4. Sorenson Call Centres in Canada

The presence of Sorenson call centres in Canada currently employing Canadian ASL-English interpreters and serving U.S. consumers is a significant area of concern in relation to determining whether there are enough interpreters to work in VRS for Canada. The Canadian Association of the Deaf made comment on the situation in a letter to the FCC in the U.S.:

“The unique point of our concern is that our interpreters were taken from the Deaf Canadian community by VRS providers without the Deaf Canadian community being provided any of the benefits of the VRS itself. We are not allowed to access those VRS’s. At least those Deaf Americans who are made to suffer the same kind of reduction in community interpreting services are permitted the trade-off benefit of accessing VRS interpreting. While the Commission may feel little concern for the situation of Deaf people in Canada, it should take into consideration the humanitarian fact that American VRS should do no harm to Deaf people outside the U.S. As it stands now, American VRS is a predator that is doing profound damage to the lives of Deaf Canadians without any offsetting benefits to us. For the above reasons, the CAD and SRC recommend that either American providers of VRS be required to locate all of their call centres in the U.S., or that the Commission permit the extension of reimbursable VRS calls to include calls originating and terminating in Canada that are made through the providers that have established call centres in this country.”¹⁶⁶

¹⁶⁵ Parisot, Anne-Marie & Villeneuve, Suzanne, et al. *L’Interpretation Visuelle Aupres D’une Clientele Sourde. Portrait d’Une Profession et Etat de la Situation Sur Les Besoins de Formation*. 2008. Pg 34.

¹⁶⁶ <http://prodnet.www.neca.org/publicationsdocs/wwwpdf/6410cad.pdf>

The approximate 225 interpreters currently working in these call centres may or may not have contracts that prohibit them from working for other VRS providers. This is a significant issue affecting accurate estimation of the number of interpreters available to work in VRS for Canada. AVLIC expressed concern related to a further shortage of interpreters if Bell Canada is not interested in partnering with Sorenson.

“There are already numerous Canadian interpreters employed by a VRS company; should Bell Canada not be interested in partnering with the already established company then there may be an insufficient number of interpreters.”¹⁶⁷

While the continuation of Sorenson’s employment of interpreters in Canada for a new Canadian VRS may have an impact upon the availability of interpreters for community interpreting and VRS, there are many other factors that will ultimately determine such impact, including type of Canadian VRS model selected, VRS payment schemes, VRS hiring and training requirements, interpreter training program availability/funding, etcetera.

Other organizations reported they believe many of the interpreters working in Sorenson’s Canadian call centers would rather work for a Canadian company and if given the opportunity, would do so. Additionally, it may be feasible to utilize U.S. call centres to serve Deaf Canadians, but opinions on this are mixed.¹⁶⁸ This of course is not a viable option for LSQ-French consumers.

6. Conclusion

Critical shortages of interpreters have been well documented¹⁶⁹, nonetheless the desire for VRS is high amongst the Deaf and interpreting communities. The issue becomes not whether there are enough interpreters, but rather how to create strategies to increase the pool, balance community needs, and prevent critical shortages. All of these strategies can effectively be created through close collaboration with interpreter agencies and training programs, as well as the Deaf community, when implementing video relay services. Again, the area where this is of paramount importance is in the Francophone community. As reported by the agencies in Québec, these agencies have demonstrated expertise in managing the shortage of interpreters by the impressive ability to maintain above 90 percent fulfillment of all interpreter requests. Therefore, the comments and advice provided by these organizations earlier in this report should be considered when implementing VRS in Canada.

Managing potential shortages could also in part be accomplished through subcontracting arrangements or simply through close collaboration, depending on the model chosen for VRS in Canada. Furthermore, potential shortages may affect the way in which VRS is initially implemented and phased in over time (e.g. hours of availability, type of services offered).

¹⁶⁷ Questionnaire responses from AVLIC

¹⁶⁸ See Section 3.3.3

¹⁶⁹ Provincial Review of ASL/Deaf studies and interpreter education in BC, Gordon, M.G.; Hardy, M. Dec 2009 pg. 6

INTERPRETER CONSIDERATIONS

APPENDIX A: LIST OF ORGANIZATIONS

Professional interpreter organizations, service referral agencies, and interpreter training programs, and other organizations consulted for this study's Phase 6 research are provided as Appendix A to this report, as follows:

INTERPRETER TRAINING PROGRAMS

1. Douglas College – Program of Sign Language Instruction
New Westminster, British Columbia
Cheryl Palmer, Coordinator
Nigel Howard, Instructor
Sara MacFayden, Instructor
2. Red River College/University of Manitoba
Winnipeg, Manitoba
Rick Zimmer, Coordinator, Deaf Studies and ASL-English Interpretation Program
Dr. Terry Janzen, Dept. Of Linguistics
3. George Brown College – ASL-English Interpreter Program
Toronto, Ontario
Corene Kennedy, ASL-English Interpreter Coordinator
Phyllis Beaton-Vasquez, Professor and Curriculum Review Leader
Nancy T. Blanchard, Professor
4. Nova Scotia Community College
Dartmouth, Nova Scotia
Denise Smith, Coordinator
Jana Delaney-Wilson, Faculty
5. Cegep du Vieux Montréal
Montreal, Québec
Emile B.-Levesque, Coordinator
Brigitte Clermont, Instructor

6. Université du Québec à Montréal
Montreal, Québec
Anne-Marie Parisot, Professor and Program Director
Suzanne Villeneuve, Professor
7. Canadian Hearing Society – Internship Program
Toronto, Canada
Sheila Johnston, Provincial Manager
8. École St. Jude – Cued Speech
Kathleen Bull, Coordinator
9. Viseme- Oral Interpreting
Québec
Marie-Josée Paradis, President
Mireille Beaudoin, Vice-President
10. Lakeland College/University of Alberta¹⁷⁰
Kirk Ferguson
Debra Russell

PROFESSIONAL ORGANIZATIONS

1. Association of Visual Language Interpreters of Canada (AVLIC)
Christie Reaume, President
2. Westcoast Association of Visual Language Interpreters (WAVLI)
Jessica Siegers, President
Nicole Pedneault, Professional Development Chair
Robyn Albert, Professional Standards Chair
3. Association of Sign Language Interpreters of Alberta (ASLIA)
ASLIA Board of Directors

¹⁷⁰ Declined participation due to illness of faculty chairperson. Debra Russell provided information about size of cohort and number of graduates.

SERVICE REFERRAL AGENCIES

1. Deaf and Hard of Hearing Society (DHHS)
Calgary, Alberta
Duane Gillissie, Manager of Interpreting Services
2. Saskatchewan Deaf and Hard of Hearing Services
Saskatoon, Saskatchewan
Jerry Markin, Manager of Communications
3. Ontario Interpreting Services (OIS) at Canadian Hearing Society (CHS)
Toronto, Ontario
Cheryl Wilson, OIS Director
Beverly Dooley, Provincial Manager, Service Delivery and Operations
4. Society of Deaf and Hard of Hearing Nova Scotians
Nova Scotia
Frank O'Sullivan, Executive Director
Rosalind Wright, Regional Manager Cape Breton
Betty MacDonald, Deaf Community Member
Cindy Boutilier, Interpreter Services Coordinator
5. Service d'interprétation pour personnes sourdes de l'Estrie (SIPSE)
Sherbrooke, Québec
Joanne Deschenes, Director
6. Service régional d'interprétariat de Lanaudière (SRIL)
Joliette, Québec
Diane Miron, Coordinator
Christine Desjardins, Instructor
7. Service régional d'interprétariat de l'Abitibi-Témiscamingue (SRIAT)
Rouyn-Noranda, Québec
Rémy Mailloux, General Director
Ginette Massicotte, Manager of Interpreting Services

8. Service d'aide à l'intégration des élèves (SAIDE)
Montréal, Québec
Emile B.-Levesque, Coordinator
Brigitte Clermont, Instructor
9. Service d'interprétation visuelle et tactile (SIVET)
Montréal, Québec
Natalie Baril, Director of Interprétation
10. Service régional d'interprétariat de l'Est du Québec (SRIEQ)
Québec
Denise Thibault, Director
11. Service régional d'interprétation visuelle de l'Outaouais (SRIVO)
Gatineau, Québec
Giles Gauthier, President
David Joseph, Treasurer/Secretary
12. Western Institute Deaf and Hard of Hearing¹⁷¹
Vancouver, British Columbia
Janice Lyons

OTHER ORGANIZATIONS AND INDIVIDUALS

1. British Columbia VRS Committee
Vancouver, BC
Lisa Anderson, Communications Officer
Nigel Howard, CRTC Liaison
Sarah Hrycenko, Alberta-BC groups Liaison
2. University of Alberta
Edmonton, Alberta
Debra Russell, Chair of Deaf Studies

¹⁷¹ Did not complete questionnaire; provided comments.

3. Centre Communautaire des Sourds de l'Est du Québec
Jacques Boudreault
4. Centre de la communauté sourde du Montréal Métropolitain (CCSMM)
5. CQDA
Monique Therrien

SURVEYED – NO RESPONSE

1. Association of Visual Interpreters New Brunswick
2. Manitoba Association of Visual Language Interpreters
3. Newfoundland Association of Visual Language Interpreters
4. Ontario Association of Visual Language Interpreters
5. Maritime Association of Professional Sign Language Interpreters¹⁷²
6. SLINC Sign Language Interpreters of the National Capitol
7. Sign Language Interpreting Associates Ottawa (SLIAO)
8. Academic Interpreters of Ottawa (AIO)

¹⁷² Participated in the Consumer Survey Town Hall held in Nova Scotia.

Phase 7:
Quality of Service
VRS Feasibility Study

Mission Consulting
February 24, 2012

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QUALITY OF SERVICE

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the seventh of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 7 research summary, *Quality of Service*, provides an overview of considerations for the Quality of Service (QoS) of VRS, including:

- Technical Considerations
- Operational Considerations
- Interpreter Considerations
- Oversight and Enforcement
- Consumer Outreach and Education
- Feedback and Improvement Mechanisms

This Quality of Service research summary provides a high level overview of QoS factors that should be considered in planning and implementing VRS in Canada. This research summary is not intended to provide specific recommendations of QoS measurements or thresholds.

2. Summary Findings

Salient points of this analysis include the following:

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.

Operational QoS considerations

- QoS in operational factors should be required, and monitored by the VRS administering agency.
- Standards should be defined for a variety of operational factors, including reliability, redundancy, technical problem resolution, network blockage/throughput, average speed of answers, 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.
- 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 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 before the implementation of VRS.
- Active QoS reporting, review, notification of 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.

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.
- Consumer complaint and feedback mechanisms will be critical to achieve and maintain high quality performance of VRS.
- Advisory committee participation will be a key component of VRS quality of service.

A summary of QoS considerations with suggested relative weighting of importance is provided in the table below. Note that a “low” weighting does not mean that its threshold or minimum requirement of that item should be set at a low level. “Low” only means that its importance relative to the importance of other QoS factors is less than factors identified as “medium” or “high”. Likewise a “high” rating does not mean that its threshold or minimum requirement should be set at a high level. Importance is more a measure of relative emphasis that should be placed in the overall design of the service and its contract. The actual adoption and implementation of QoS factors will affect VRS usage and costs, and will be discussed again in this study’s phase 10, Costs, and phase 11, VRS Models. Also, depending upon how a QoS factor may be incorporated into the model, many QoS factors are expected to change as VRS services mature over time. For example QoS for average speed of answer (ASA) may be initially longer than desired when VRS begins, but as more interpreters become available over the implementation/ ramp-up years, the ASA standard may shorten.

VRS QUALITY OF SERVICE FACTORS	IMPORTANCE	TYPE OF QoS
<i>Vendor QoS Technical Factors</i>		
Network blockage/throughput	High	Required e.g., p.01
Average speed of answer (ASA)	High	Initial Goals e.g., 120 seconds
Call queuing	High	Required by defined call type
Answering of 9-1-1 calls	High	Required training & short ASA
Technical problem resolution and reporting	High	Required defined process

VRS QUALITY OF SERVICE FACTORS	IMPORTANCE	TYPE OF QoS
Technical staff knowledge and competence	High	Required expectations defined
Technical redundancy	Medium	Mixture of Goals & Requirements
Technical reliability	Medium	Required expectations defined
<i>Operational QoS Factors</i>		
Restrictions of fraud and misuse	High	Required clear rules
Extension of QoS (including ASL/LSQ, ASA, etc) to non-relay functions such as customer service and technical support	High	Required objectives defined
Equipment and service interoperability	Medium	Required expectations defined
Employment of Deaf in vendor operations	Medium	Goals expectations defined
<i>Consumer QoS Factors</i>		
All communication, outreach and education to end users is communicated in ASL, LSQ, and jargon free English and French	High	Required defined rules
End user technical requirements are clearly identified	High	Required defined rules
Availability of end user technical support	High	Required expectations defined
Availability of end user bandwidth and equipment	Medium	Market availability support defined
Consumer and public education and outreach	Medium	Recommendations defined rules
<i>Interpreter QoS Factors</i>		
Minimum interpreter standards	High	Required defined rules
Specialized and ongoing interpreter monitoring and training	High	Required defined goals
Special signing experience and skills	Low	Recommendations defined goals
Minimum speech and auditory standards	Low	Recommendations defined thresholds
Maximum interpreter engagement durations	High	Required e.g., 20 minutes
Other interpreter working conditions	High	Required various

VRS QUALITY OF SERVICE FACTORS	IMPORTANCE	TYPE OF QoS
<i>Oversight and Enforcement QoS Factors</i>		
Clearly defined QoS requirements	High	Required clear definitions
Active reporting, review and notification of QoS status	High	Required expectations defined
Consequences for non-compliance	Medium	Required expectations defined
<i>Feedback and Improvement QoS Factors</i>		
Automated measurement and reporting	High	Required expectations defined
Periodic QoS assessments	Medium	Recommended expectations defined
Complaint/Improvement processes	Medium	Required processes defined
Active Consumer Advisory/Monitoring Committee	High	Required roles defined

3. Conclusion

There are a wide range of QoS 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.

All stakeholders (including representatives of the Deaf user community) should be included in the planning and definition of QoS standards.

QoS factors for VRS may be specified and managed by the regulatory agency and managed by its staff or by an administrative agency or designee(s). 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.

QoS standards have been established in other counties, but they vary between countries and between providers. Actionable QoS requirements and the consequences for not meeting them should be clearly delineated in VRS provider contracts.

The ongoing success of a VRS system will require continued monitoring and possible modification of these QoS standards and requirements. Several of the requirements (such as ASA) 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 are necessary to ensure quality improvement and customer satisfaction.

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 ensure the best possible Canadian VRS program.

QUALITY OF SERVICE

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the seventh of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 7 research summary, *Quality of Service*, provides an overview of considerations for the Quality of Service (QoS) of VRS, including:

- Technical Considerations
- Operational Considerations
- Interpreter Considerations
- Oversight and Enforcement
- Consumer Outreach and Education
- Feedback and Improvement Mechanisms

2. Overview of 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. Finally, to ensure consumers receive a reliable VRS experience, VRS contracts may: include QoS and reporting requirements thereby clarifying the providers' legal commitment to achieve measured performance standards; provide the authority to audit and confirm compliance; and establish reasonable reporting standards, problem resolution process, and, if required, a defined penalty process for failure to perform contractual commitments.

Phase 7 of the VRS Feasibility Study, Quality of Service, references and relies upon information contained in other research phases. These include Phase 3 – Consumer Interests and Perspectives, Phase 4 – VRS Models in Other Countries, Phase 5 – Technologies and their Forecasts, and Phase 6 – Interpreter Considerations. As with these other research summaries, any relevant QoS related information that is subsequently identified as being applicable to a Canadian VRS model may be incorporated into the final VRS Feasibility Report.

3. Technical QoS Considerations

In order to ensure an end-to-end quality VRS experience for consumers, minimum technical requirements must be met by the VRS providers' systems and networks, as well as by the consumers' "end-user" devices (such as a PC, mobile tablet, or similar equipment) and its supporting network. While provider requirements may be specified in their contracts, consumers' technical requirements must be clearly disclosed by both the provider and administrative program outreach and education efforts.

3.1. Provider Network and System Requirements

A VRS provider must create and maintain a network which guarantees unblocked access to its VRS system platforms. VRS providers' platforms include hardware and software components to support VRS communications, software to manage, monitor, control and report on the network and VRS systems, software to manage, monitor and report on interpreter activities, as well as a suite of customer service software to manage and report user preferences and customer service issues and their resolution.

A provider must be required to provision network services and bandwidth sufficient to handle the IP network traffic generated by video relay 'calls', as well as their related voice calls. As discussed in the

Phase 5 summary report concerning technology factors, there is no global formula which can be used to determine exactly how much bandwidth or what network resources should be made available for any given VRS system or provider. Each provider must make these calculations based on the specific or proprietary software and hardware they intend to deploy, along with factors such as the number and location of VRS call centers, the number and location of interpreters and customer service personnel, fluctuation and peaks in VRS traffic volumes, etc.

Poor video quality or inaccessibility to the Video Relay Services may occur if network and system QoS is not sufficiently managed. VRS providers must have personnel on staff (or on contract) to monitor their network activity and service issues on a 24/7 basis. Additionally they must report service impacting issues to management and program administrators, as well as resolve such matters following clearly defined procedures and escalation processes.

In order to ensure that system and network QoS factors are adequately addressed and continually monitored, minimum service standards and service level agreements (SLAs) should be included in VRS provider contracts.

A significant factor is system, network and data security. Security includes not only hardware and software security to prevent hacking, denial of service attacks, viruses, botnet and other trojans; but also the security, confidentiality, and privacy of consumer data. All security measures should be safeguarded by adherence to clearly defined rules and policies that apply to all personnel and business practices.

3.2. Consumer Network and System Requirements

The consumers' Internet network connection and "end-user" equipment must be of sufficient speed and quality to successfully achieve the quality and communications offered with the VRS providers' networks and systems.

In order to maximize the quality of the consumer's experience and reduce frustrations related to a VRS provider's service, it is often the responsibility of the VRS provider to inform consumers of the minimum network connectivity, hardware and software specifications, as well as to assist with technical support. While still maintaining interoperability, individual providers may utilize different proprietary systems, and therefore each provider may have different minimum requirements. Community stakeholders and administrative agencies may also participate in pre-installation consumer education concerning technical requirements.

The end-user requirements must be readily available in the consumers' native language (LSQ, ASL, French, English, etc.), must be clearly communicated, and must be free of technical jargon and ambiguity. The use of video training aids can be effective in communicating technical issues and frequently asked questions. Additionally, customer services must be available to answer questions, and technical support must be available to assist end users with configuration and troubleshooting. These efforts will help to reduce consumer frustrations and help ensure that consumers have a successful VRS experience.

The primary minimum technical requirements and concerns which will need to be communicated to consumers are:

- Bandwidth requirements - including Internet connection speeds and issues that may result from network congestion factors
- Equipment requirements: e.g., camera and screen resolution requirements
- Installation set up of user device hardware and software (proprietary or generic), and training

3.2.1. Bandwidth and network congestion factors

If a consumer's home or other Internet connection is too slow or too congested, the end result will be VRS video that is choppy or subject to freezing or disconnection. The perception of the end user will be that the VRS service is of poor quality and limited usefulness.

Consumers must be provided clear information related to the minimum and recommended download and upload speeds for their Internet connections.

Additionally, consumers must be educated to understand potential network congestion factors. If consumers are on cable Internet connections, their network connection speeds are subject to variation and, in particular, a significant slowdown during peak usage periods. This is also true for consumers using the Internet at a shared service location (such as a school, library or public environment) that may be subject to significant network congestion issues. Mobile connectivity such as cellular is also subject to cell tower and network congestion issues. As reported in study phase 5, there is a significant difference between advertised bandwidth speeds and actual speeds.

VRS consumers on corporate networks may also have difficulty with network congestion, unless the corporate network prioritizes Internet (and specifically video) traffic. "Converged" VoIP networks are especially susceptible to this type of problem, as many converged VoIP networks prioritize voice traffic, de-prioritizing traffic which is considered less important or non-real-time. VRS users in these types of environments must have the information available to communicate to their network support personnel regarding which ports must remain open, and information regarding network traffic and speed requirements.

3.2.2. Equipment requirements

In addition to bandwidth, another important component in the overall quality of VRS is the videophone device being used by the end user. If the camera and display are not of sufficient quality, it will be difficult for the Deaf user and the interpreter to understand each other's sign language (especially when fingerspelling is blurred), and the overall VRS quality will appear poor. VRS providers must clearly communicate minimum requirements for compatible video devices or computer requirements for downloading VRS software.

There is a videophone standard that was developed to easily allow video phone calls between countries. The Common Interface Format (CIF) has a resolution of 352 X 288 active pixels and a refresh rate of 30 frames per second.¹ The majority of videophones and video devices currently distributed or recommended by VRS providers include the CIF standard as a technical specification. The Viable VPAD, Sorenson's VP-200, D-Link DVC-2000, Ojo PVP 1000, Grandstream GXV-3000, and many smart phones including the iPhone, are all examples of videophone solutions that list the CIF standard for video resolution as well as the 30 frames per second frame rates.

Even in VRS models in which equipment is provided to end users, minimum specifications must be defined and communicated for end users who wish to use their own devices, or who wish to have multiple VRS devices.

3.2.3. Set-up and training

While consumer devices are becoming more and more user friendly, many people are not technically knowledgeable, and find the task of installing or configuring new computer or electronics equipment extremely daunting.

Even if a Deaf user is proficient with computer technology and feels comfortable setting up new equipment, if the user is not familiar with video-specific settings and installations, the equipment may not be set up in the optimum configuration, resulting in low quality video and ultimately a poor quality VRS experience.

Instructions for the installation and configuration of VRS equipment and services must be provided in clear, easy-to-understand formats in the preferred language of the user's choice. Instructions should also be provided in multiple formats, for example not only written text instruction documents, but video or multi-media instructions.

Deaf users whose preferred language is ASL or LSQ may not be comfortable reading technical instructions in written languages (such as English, French, etc.), and it is therefore imperative that set up instructions be available in sign language. Addressing the challenges of the equipment and software set-up, as well as a successful initial introduction to the new service has proven both a concern and an opportunity by VRS providers worldwide.

To address these issues consider the current set-up and customer introduction practice model of Sorenson Communications, the largest VRS provider in the United States with approximately 80% of that VRS market.² This company provides consumers with its own video phone device, which is installed and

¹ Keith Jack and Vladimir Tsatsulin; Dictionary of Video and Television Technology; Gulf Professional Publishing; 2002; page 52

² Federal Communications Commission (FCC); CG Docket No. 03-123; Reply To Comments On NECA's Proposed Payment Formulae and Fund Size Estimates For the Interstate TRS Fund For the 2010-11 Fund Year; quote from NECA data; page 5; May 21, 2010

tested in the consumer's home by Deaf technicians. These installation specialists are then also able to educate the end user in sign language on all aspects of their VRS equipment and available services.

4. Operational QoS Considerations

High volume call centers have long employed very sophisticated technologies to manage their networks, call processing platforms, and personnel. These systems also have elaborate reporting capabilities, reflecting issues within the networks and systems, as well as the activities and efficiencies of call takers. VRS platforms represent the evolution of these call center systems. As detailed in this study's Phase 5 – *Technologies and their Forecasts*, VRS platform standards for member countries of the EU require multi-mode capabilities (i.e., voice, TTY, video, web chat). While many providers have developed their own proprietary VRS platforms, systems are also available in the marketplace that meet the EU VRS processing requirements.

There are many system settings that allow the VRS providers to have direct control over many QoS considerations, as well as specific reports that reflect service quality, and/or confirm the providers' compliance with contract requirements. The following VRS provider operational issues have direct impact on Quality of Service issues including the reliability of the service and the experiences of the consumers.

4.1. Reliability and Redundancy of VRS Networks and Platforms

Consumers quickly learn to rely on their relay services. For most consumers, once VRS is introduced it will be expected to be reliable. Redundancies in network devices, routes, on-site servers and other VRS platform systems, as well as uninterrupted power supplies and power generators, will help ensure that any network or system failure that threatens to impact service will result in the least disruption to consumers' VRS. Regardless of the model selected for consideration for a Canadian service, VRS networks and systems must have safeguards built into their design to perform diagnostic analysis of their performance and to inform network and system administrators of blockage, failures and irregularities.

4.2. Training of Personnel to Identify and Resolve Technical Issues

While the networks and systems may have diagnostic capabilities and technical issues may be rapidly reported, this does not resolve the problem. Providers' management and technical personnel must have a thorough understanding of their VRS systems and networks, and be trained to follow written policies and procedures to take the necessary steps to isolate the source of the problem, inform the correct technical personnel to both begin fixing the issue while also applying alternative solutions to minimize service disruption, and communicate issues, progress and resolution to stakeholders. Included in these policies and procedures would be a detailed disaster and system-outage contingency plan for various levels of potential service-impacting events, from planned events such as a system software upgrade to the unexpected complete loss of a provider's VRS facility.

All service-impacting issues should be reported to the administrative agency on a frequent basis. Outages lasting more than a brief period or occurring with significant frequency (such as an outage of more than five minutes or two failures in a seven day period) should be immediately reported to administrative agency personnel via email, along with regular status updates, and a full description of the issues and the solutions upon resolution.

Before service contracts are awarded, providers must agree to have these policies and procedures in place, and also be committed to train and reinforce training for personnel on resolving technical problems as well as their communications responsibilities. In doing so, should a service-impacting failure occur, these precautions will greatly reduce the length of time it takes to resolve a problem and inform stakeholders, including consumers.

4.3. Network Blockage/Throughput

VRS providers must follow standards in place for acceptable network blockage rates in order to ensure the quality of the experience for the end users. This is commonplace in call center service contracts. Network blockage and throughput should be separately measured for VRS calls that are delivered over a TDM voice network, and for those that are delivered in an Internet Protocol (IP) format.³ All providers working in the VRS environment must agree and be contractually bound through Service Level Agreements (SLAs) or other means to meet or exceed these defined standards. Additional information on network blockage may be found in section 6.1, *Clearly Defined and Specific QoS Requirements*, below.

4.4. Average Speed of Answer (ASA)

Contracts for call center services routinely include minimum standards for average speed of answer (ASA) to ensure consumers' "calls" are being answered in a predictable and timely manner. Critical issues in defining ASA include:

- Defining when a call is determined to have been answered. Is the call answered at the point when an automated system interacts with the consumer, or when an interpreter is actually engaged on the call?
- Defining ASA reports so that they do not include data elements that misrepresent the consumers' experience. If a provider offers both ASL and LSQ services, but averages all calls into one statistic, efficient processing of one language may greatly distort poor service for the other. For example, large numbers of ASL interpreters, handling significantly more ASL/English VRS

³ The U.S. TRS (MRS) standard is network blockage at rates equivalent to the public switched telephone network, p.01: not more than one call in 100 blocked during the busy hour (of an average day), and for TRS also on a daily basis. See paragraph 65 on page 28 of www.fcc.gov/Bureaus/Common_Carrier/Orders/2000/fcc00056.doc.

calls, might influence the averaged ASA to disguise a lack of sufficient numbers of LSQ/French interpreters.

- Defining the time period to be measured. While providers may be able to answer calls quickly during certain periods of the day, week or month, there may be extended period when very few new calls are answered, and then only after waiting for a long time.

Accurate reporting of ASA is critically important to hold providers' accountable for their service level, to fairly measure one provider's services against others, and to provide administrators and regulators with meaningful data as they manage the service and plan for the future. Additional information on ASA may be found in section 6.1, *Clearly Defined and Specific QoS Requirements*, below.

4.5. Call Queuing

VRS call queuing QoS standards usually stipulate that VRS calls should be accepted and queued to be answered in the order that they are received. Typically no preferential treatment for any call is allowed, except in two instances: 1) emergency 9-1-1 calls, and 2) other specialty calls requiring special language or other skills that have been previously scheduled via appointment, if allowed in a provider's contract.

While an existing VRS provider may be able to leverage personnel located at multiple sites by distributing Canadian VRS calls to facilities that handle other countries' VRS traffic (e.g., United States if allowed), or that provide other services such as VRI, conflicts in call queuing and prioritization may result. These issues and options will need to be considered and resolved in the preparation of the Canadian VRS contract requirements.

4.6. Handling of Emergency Calls

VRS providers may be mandated to accept 9-1-1 calls in a similar manner to TTY relay and IP relay. Whether mandated or voluntary, any VRS provider accepting 9-1-1 calls must have strict quality controls in place to ensure that 9-1-1 calls are answered immediately. Besides priority queuing of 9-1-1 calls, other 9-1-1 quality control issues must also be considered. For example, the VRS providers and the VRS administering agency must have worked with local and provincial Public Safety Answering Points (PSAPs or 9-1-1 call centers) to document any appropriate 9-1-1 call routing procedures in the caller's service area. This issue is of extra concern and complexity when VRS calls are accepted from Deaf users via mobile devices. Additionally VRS interpreters and call center managers must be trained in 9-1-1 call handling procedures and issues. Close and regular communication between the VRS providers, PSAPs, the 9-1-1 administering agencies, and the VRS administering agency regarding 9-1-1 call handling procedures should take place.

In addition, the provider's website must have clear and precise instructions for the users on how they should contact emergency services through 9-1-1. These instructions should be provided in both sign language and text, i.e., LSQ and French, and ASL and English.

Within the suite of VRS traffic reports required from providers, a clear accounting of emergency calls is required to confirm service availability, performance, and to facilitate the improvement of future outreach and education for Deaf consumers.

4.7. Fraud and Misuse

Fraud and misuse of VRS has been well documented in the United States. Examples presented below included providers who were well known as established contractors to State and Federal relay programs, as well as other providers and VRS subcontractors who generated VRS call activity to bill for services that were not between Deaf consumers and the parties they typically communicate with. Some of these activities included organized VRS telemarketing calls that were intended to maintain interpreter billing at the maximum number of minutes per hour and hours per shift. Other instances relied on the anonymity of the video interpreter (VI) to conduct questionable businesses (e.g., VI to VI calls), harassment of others, or taking advantage of Deaf consumers by artificially putting a call on hold in order to take a rest break.

If unchecked, fraud or misuse of VRS may ultimately impact overall program QoS in that it affects the use and availability of network and interpreter resources, as well as reducing the limited funds for VRS programs. Each VRS provider must develop and implement procedures and policies to identify, report, and minimize or prevent fraud and misuse. In addition, the administrative agency must proactively monitor these fraud prevention methods to ensure the providers are not contributing to the abuse. Much of the VRS fraud in the United States occurred because of lack of active oversight of the providers.

All stakeholders must agree on definitions of fraud and misuse, as well as a process to deal with the identification and avoidance of these events. For example, managers in VRS call centers may need the authority to disable accounts or block IP addresses of users attempting to abuse or misuse the services. These managers must have the authority to identify potential abusers of the system and take subsequent action.

Not all forms of fraud and misuse are easily detectable. VRS providers must, therefore, have systems analysis procedures in place that can automatically flag callers' accounts or IP addresses which may exceed certain thresholds (over a certain number of minutes of use in one week, for example) as suspicious. Requiring VRS consumers to establish user accounts may potentially be helpful in deterring or identifying fraud or misuse; although this would be a controversial prerequisite.

Potential fraudulent activity can also be suspected on legitimate VRS calls. For example a Deaf user receives a VRS call from an individual attempting to scam or mislead the Deaf user. All stakeholders must decide if interpreters are allowed to act as advocates for their Deaf clients, and point out calls or situations which may be "scams", or if they are required to be interpreters only, and not offer any input into the nature of the call. These are issues of policy in which consumer representatives should have primacy of input.

When using VRS to commit fraud in the United States, some offenders took advantage of privacy rights and regulations, knowing that interpreters are not allowed to report the content or particulars of

relayed conversations. According to the FCC, *“Except as authorized by section 705 of the Communications Act, 47 U.S.C. 605, (video relay interpreters) are prohibited from disclosing the content of any relayed conversation regardless of content even if to do so would be inconsistent with state or local law.”*⁴

Furthermore, fraud within VRS in the United States was exacerbated by the fact that many of the providers themselves were committing acts to improperly bill the federal relay program for millions of dollars. Due to the increased costs associated with fraudulent activity by the providers in the United States, in 2011 the FCC added the following requirement for a formal review and sign-off by an executive of a VRS provider’s reports: *“Make permanent the interim rule requiring the CEO, CFO, or another senior executive of a TRS [MRS] provider with first-hand knowledge of the accuracy and completeness of the information provided to certify, under penalty of perjury, to the validity of minutes and data submitted to the Fund administrator”*.⁵

Depending on the service model selected for VRS in Canada, regulatory and legal precautions established before service contracts begin may greatly mitigate the risk of fraud and misuse by defining appropriate billing parameters for the entity that employs interpreters.

4.8. Responsiveness to Diverse Communication Preferences

The ability to define preferences at the beginning of each call and to request specific communication modalities may be seen as basic Quality of Service by some Deaf users. Preferences may include the development of consumers’ choices to be maintained on the providers’ platform. Requirements for how a call is handled may also be provided on-demand with each call, such as the ability of the user to decide who will introduce the VRS call to the called party. In a VRS model that allows consumers to specify their communication call handling preferences, the VRS provider must be able to respond to requests even when certain choices are not used as frequently as others. Some special communication preferences (such as specialty vocabulary requests) may be dependent on the availability of interpreters with certain skill sets. If these capabilities are not available, or their availability is extremely limited, the end user may perceive this a lower quality unless procedures (such as call appointments or special hours) and suitable consumer education are appropriately used to mitigate these challenges.

⁴ 47 CFR 64.604; Federal Communications Commission (FCC); Code of Federal Regulations – Title 47; Telecommunication; Part 64 Miscellaneous Rules Relating to Common Carriers; Subpart F: Telecommunications Relay Services and related Customer Premises Equipment for Persons With Disabilities; 64.604: Mandatory Minimum Standards; (2) Confidentiality and conversation content; page 266

⁵ Federal Communications Commission (FCC); Further Notice of proposed Rulemaking (FNPRM) FCC 11-54; CG Docket No. 10-51; Adopted April 5, 2011

4.9. Extension of Quality of Service to Non-VRS Functions

Quality of Service standards should also be applied to providers' non-VRS functions, such as customer service and technical support. Customer support representatives must be readily available during reasonable business hours. Furthermore, they must be able to communicate in the Deaf user's preferred language, or consumers must be allowed to use a VRS interpreter to communicate with customer or technical support personnel.

Additionally, standards such as ASA, disaster recovery, etc., should be applied to these non-VRS services as well. Users should not have to wait on hold for unreasonable periods of time to communicate with customer support representatives. Establishing what is considered a reasonable average wait time, and the method and frequency for providers' to report on these activities, may be defined in contract requirements.

4.10. Interoperability

A factor of importance to consumers in the United States was the compatibility of end-user VRS video device equipment or software with equipment or services of other VRS providers and users. With multiple VRS providers in the U.S., consumers wanted to be able to place VRS calls to any provider, even when their video devices were provided by one provider. They also wanted to be sure to be able to make point-to-point (non relay) video calls between end user equipment supplied by different VRS providers. While VRS end user equipment was primarily not interoperable for a number of years, the FCC finally ordered interoperability as a result of strong consumer demand.

Interoperability can be an issue with multiple positions and viewpoints, including divergent provider perspectives. However, the views of Canadian consumers should be of paramount consequence since ultimately the service is for their use and benefit and they may expect VRS to function in the same manner as a regular telephone which can call anyone regardless of who manufactured the telephone set.

5. Interpreter QoS Considerations

The foundation of any VRS system is the quality and availability of interpreters. Even if VRS is implemented with the best and newest technology, and its availability is well-communicated to the Deaf community and the general public, the provider must be able to hire and train qualified interpreters. If consumers believe that the interpreters lack the necessary skills, may not be functioning in an ethical manner, or if a desired service is not provided, the VRS system as a whole may be deemed a failure.

The most expensive element to be managed in any call center is the labour cost and training of personnel. The challenges of hiring, training and retaining qualified VRS interpreters will be the most challenging Quality of Service issue for potential providers, including:

- the limited number of qualified interpreters;

- the VRS-specific training required to meet consumer expectations;
- the physical demands of video interpreting;
- the emotional stress often experienced by relay operators;
- the conflict between management’s desire to maximize the percentage of every hour that VIs are on calls, with the reduced quality and attention a VI will have if stressed, tired or otherwise overworked; and
- the availability of other employment options if VIs elect to work for another VRS provider or engage in another form of sign language interpreting.

5.1. Minimum Interpreter Standards

Training and certification standards may be combined with levels of experience in order to achieve a minimum acceptable level of quality for interpreters, and implementation of these standards may be somewhat dependent on the VRS model chosen. However some standards and requirements must be established to ensure VRS providers adhere to minimum required standards for sign language interpreters, and that ideally there is a professional testing program to confirm that these standards are achieved and maintained. Different countries have established different requirement or procedures for defining VRS video interpreter standards.

In the United States the FCC regulations for VRS were written using language developed for traditional MRS and VI standards are somewhat vague: *“Sign Language Interpreters working in VRS must be ‘qualified’...one who is able to interpret effectively, accurately and impartially both receptively and expressively, using any necessary specialized vocabulary.”* In the United States, the Registry of Interpreters for the Deaf (RID) is the leading organization that has established a national de facto standard of quality for American Sign Language interpreters.⁶ RID has developed comprehensive training, education and testing, called the RID National Testing System (NTS) providing National Interpreter Certification (NIC) which has three different levels (Certified, Advanced and Master). VRS providers may or may not elect to hire only NIC certified or equivalent video interpreters.

In the United States, where there are many VRS providers consumers may choose between, consumers develop their own opinion regarding the quality and professionalism of the providers’ interpreting personnel. If they are not satisfied with their VRS experience with one provider, they are free to use another. This market-driven competitive element ostensibly creates an incentive for providers to hire, train and maintain the highest quality VI personnel.

Finland has a National Register of Interpreters that is maintained by many stakeholders: the Finnish Association of the Deaf, the Finnish Association of the Hard of Hearing, Finnish DeafBlind Association

⁶ Registry of Interpreters for the Deaf, at www.RID.org.

and the Finnish Association of Sign Language Interpreters. Once an interpreter has completed the training to become a professional, they apply to be accepted by the members of the cooperation to be listed in the register. *“The intention of the Register is to serve the Deaf and Hard of Hearing users to ensure quality and gauge the number of resources in the field.”*⁷

German sign language interpreters are not required to be members of the Association of Sign Language Interpreters. The VRS provider TeSS markets the fact that all VRS interpreters have Master’s Certificates (which take 5 years to complete). The other VRS provider, TeleSign, states that they do not use interns or trainees as interpreters. Although there is no requirement, German Sign Language Interpreters may take the State Interpreter Examination (Staatliche Prüfung). Upon passing the examination, the interpreter receives a “State Approved” Sign Language Interpreter Certification.⁸

In France there is no national interpreter certification and no national register for sign language interpreters. There are various university programs that offer interpreter training, some last 2 years others take 3 years to complete. VRS provider Websourd and the sign language interpreter agency Interpretis are collaborating to develop additional formal University training programs for sign language interpreters. This lack of certification and organizational administration leads to uncertainty when it is applied to the management of a national video relay service and staffing for a level of quality. *“We don’t know who’s working full-time; no data, no statistics about it.”*⁹

In Canada, the Association of Visual Language Interpreters of Canada (AVLIC) has a national testing system for ASL. They have developed the Canadian Evaluation System (CES) which helps interpreters achieve the Certificate of Interpretation (COI). However it takes seven to ten years to attain the certificate, only 9% of AVLIC members have earned it. There is no other national interpreter certificate for the remaining 91% of interpreters, although many take provincial examinations to work in their community. In addition, there is no national interpreter testing or certification for LSQ. Quebec service agencies evaluate and certify the quality of their own LSQ interpreters.

One challenge in introducing a nationwide VRS program may be reaching a consensus among consumers, providers, and regulators in determining the nature of VRS interpreter qualifications.¹⁰ There may be a need to qualify them by a combination of experience, education, certification, and testing. Testing of potential VRS interpreters may be required when standards of experience and certification are not available or practical. In this case, the establishment of VRS interpreter testing

⁷ Suomen Vottomakielen Tulkit ry; Finnish Association of Sign Language Interpreters; Education and Training

⁸ Bundesverband der Gebardensprachdolmetscherinnen Deutschlands e.V.; Federal Association of German Sign Language Interpreters; Annual Country Report 2008/2009

⁹ Mrs. Guylane Paris; President; Association Française des Interpretes en Langue de Signes (AFILS); 2010 Interview and French Country Report for the European Forum of Sign Language Interpreters (efsl)

¹⁰ In this instance, qualifications and standards for VRS interpreters also pertain to supervisors, and should also be established for other positions that will have direct consumer interaction, such as customer service, technical support, and etcetera.

standards is critical, and testing may be best carried out by an independent organization without a conflict of interest, i.e., not the VRS provider.

5.2. Specialized and Ongoing Monitoring and Training

Beyond the expectations for minimum qualifications, Canadian VRS interpreters may need to have additional training in ethical issues related to transparency, privacy and confidentiality, roles and responsibilities, and the conflicts, processes and remedies that may be employed when fraud or misuse is encountered or is suspected of being perpetrated upon Deaf consumers. These are issues that have specific application within VRS that are distinct from community interpreting issues. VRS providers can be required to provide this type of training before interpreters are permitted to handle live VRS calls.

Some consumers have expressed a preference to begin VRS even if the skills of the interpreters have not matured to a highly professional standard.¹¹ Accordingly if there is a need to initially begin VRS with a lower than ideal qualification standard, there should be the expectation and requirement that VRS interpreters achieve a specified standard or levels of proficiency within a defined timeframe.

Regardless of the initial requirements, interpreters should receive regular refresher training to reinforce the established standards, to address situations unique to VRS, and to improve or maintain high VRS quality. To ensure optimum quality of service VRS supervisors should regularly monitor the performance of the provider's video interpreters and their calls including using scripted test calls. Consistent rotating reviews should be scheduled to ensure that all video interpreters are assessed, feedback is provided, and additional training and follow up are provided as needed. All supervisors should be highly skilled interpreters in either ASL or LSQ, and not simply call center managers. Regular meetings of supervisors can facilitate assessment criteria and the discovery and agreement of best practices. Additional participation and contribution by qualified Deaf interpreters and others with specialized understandings is also highly valuable. Ongoing professional development offered by the VRS provider and/or by third parties is important for personnel retention and for continuous service improvement.

5.3. Special Signing Experience and Skills

As previously mentioned, the availability of special interpreter signing experience and skills may be perceived as a Quality of Service concern. These skills can be medical, legal or educational experience and vocabulary skills, or interpreters with certain business or education backgrounds and experience. Deaf users who have experience with quality community interpreting or VRI in which they can request interpreters with specialty vocabulary or skill-sets may expect to see these same options in a VRS environment. If these options are not available, Deaf users may perceive a VRS vendor or the VRS system as a whole to be of low quality. However, interpreters with these skills may be rare, and their

¹¹ See this study's phase 3, Consumer Interests and Perspectives.

availability may be very limited. The implementation of specialty VRS signing skills may not be offered initially, or may be a service which needs to be scheduled in advance until sufficient numbers of specialized interpreters can be trained and available.

If specialty skills cannot be offered, reasonable limited expectations should be communicated clearly to VRS users, perhaps on the web site, in FAQs, and by other outreach means. VRS should be set up in a way in which consumers know in advance what is available, so they are not disappointed in the service.

5.4. Minimum Speech and Auditory Standards

Applicants for video interpreter positions should be screened for appropriate speaking skills including enunciation, pronunciation, and voice tones appropriately matching the context, register, and affect of the conversation. Although speech standards typically are either not addressed or left up to the discretion of the VRS provider in other countries, minimum speech standards should be developed to ensure optimum quality communication.

Although hearing acuity is a logical requirement for an interpreter to possess, there are typically no minimum requirements or thresholds established for video relay service interpreters. None of the other countries currently providing VRS, either in trial or as a permanent service, have included a minimum auditory standard for interpreters in their VRS service contracts. There have been minimum auditory standards required for Speech-to-Speech services; however, this practice seems to be limited to that specialized mode of relay which does not have a video component.

Speech and auditory standards should be set at levels that enable clear communication but do not unduly diminish the availability of interpreters for VRS.

5.5. Interpreter Engagement Durations

Interpreter engagement standards must also be defined, and monitored by VRS providers, in order to ensure quality. Community interpreters, for example, often work in teams and trade off interpreting duties every 20 to 30 minutes, or on a predefined timeframe. However in a VRS call center environment, a video interpreter has the potential to be tied up on a VRS call for a very long duration.

Clear standards should be defined and communicated not only to the VRS providers and interpreters, but also to the Deaf end users, so that all individuals are clear on what to expect before a VRS call begins. For example, if a VRS call extends so long that the call needs to be handed off to another interpreter, all parties involved must know what to expect, and when. Standards should be in place to ensure that the relief interpreter is brought on to the call early enough to understand the context, tone, and other particulars of the call and style of communication, and that any special interpreting instructions from the Deaf person have been transmitted to the relief interpreter. Most VRS providers will accomplish a smooth transition from one interpreter to another by allowing 10 – 15 minutes of ‘overlap’; where the new interpreter will sit beside the current interpreter and observe context, vocabulary, tone and other particular details that affect the communication flow. There can also be a

technical aspect to handing off a call if interpreters are dispersed among multiple call centers. In this case, the technology must be such that transition is smooth and without disruption to the conversation.

5.6. Other Working Condition Considerations

In addition to engagement durations, there are other 'working conditions' that affect the quality of a VRS call. These include:

- Consideration of repetitive strain injuries/musculoskeletal injuries (e.g. Carpal Tunnel Syndrome) associated with signing, and prevention strategies.
- Appropriate rest and break times for VRS interpreters and supervisors.
- Ergonomic considerations.
- Training, prevention, and counselling related to vicarious trauma.¹²
- Requirement to interpret sensitive, controversial or offensive conversations (e.g. swearing, intimate language, etc.)
- Availability of confidential counselling for interpreters and supervisors.
- Clear protocols about controlling conversations (e.g., telling the person being called that this a VRS call).
- Ongoing training, peer groups and supervisor review/participation.

Within the work environment individual work stations must have sufficient sound controls to ensure that relayed conversations cannot be overheard by adjacent interpreters or callers on nearby phones. Access by non-essential personnel should be strictly controlled.

The VRS working environment and considerations are unique, and are usually not adequately addressed by normal business labor laws, especially in a preventative context. The above are all working condition factors that will affect the quality of a VRS interpreter's ability to engage each consumer with quality video relay communication. Ideally the contracting or oversight agency should address these QoS factors into the VRS provider contracts.

6. Oversight and Enforcement

Prior to the implementation of the VRS system and as a consideration of the final selection of the VRS model, the VRS regulatory agency must determine who will be responsible for the day-to-day oversight and enforcement of VRS quality standards. By establishing reasonable service standards, reporting requirements and invoice documentation requirements in advance, VRS providers will be contractually

¹² Vicarious trauma results from witnessing another person's traumatic experience (or participating in their communication about such an experience). See http://www.nabs.org.au/07_vicarious_trauma.htm.

bound to perform at a professional level. Additionally, consumers will have greater confidence that VRS provider's are being managed and driven to deliver consistent and reliable services.

Some goals of an ideal VRS program may need time to be fully achieved. If so, initial and periodic milestones should be established, and providers should be held accountable in their efforts to meet these expectations.

Effective oversight and enforcement is dependent upon many issues, including the following.

6.1. Clearly Defined and Specific QoS Requirements

Quality of Service standards requirements, as described in general in this report, should be clearly defined to specific detailed levels which can be monitored. Some of the most common QoS requirements are as follows:

- Normal ASA (Average Speed of Answer) – How long it takes from the arrival of the call to the relay center platform until the time it is answered by a live interpreter ready to handle the call.
- Emergency ASA (Average Speed of Answer) – Same as above, but measured only for Emergency calls that need to be directed to a 9-1-1 PSAP (emergency, fire, medical).
- Call Blockage, voice calls – The measurement of how many calls per 100 do not make it to a relay station because all agents/trunks are busy and therefore the caller receives a busy signal or hangs up before the call is answered by an interpreter. (This can also be measured separately for Emergency vs. non-Emergency calls).
- The level of complaints received by the service – The number and nature of complaints by users to the Customer Service number, and their resolutions. These can be coded and prioritized by the nature of the complaint.

The defined standards for these requirements differ among countries already providing video relay services. However, these are quantifiable measurements that can be defined and reported for any period of time in order to provide evidence of the level of service that is being provided. Ultimately, it is up to the regulatory agency (hopefully with input from the consumer association groups, as well as potential providers) to determine what goals for each of these indices will provide a realistically achievable level of service. Most countries have different requirements for VRS compared with traditional text or IP relay. For examples, see the table below.

Table 1: QoS factors in other countries

QoS Factor	New Zealand	Australia	United Kingdom	United States
Normal MRS ASA	85% < 15 seconds	[no standard]	90% < 15 seconds	85% < 10 seconds
Normal VRS ASA	85% < 120 seconds (future)	[no standard]	[no standard]	80% < 120 seconds
MRS Call Blockage	5 per 100	5 per 1000	3 per 100	1 per 100 (P.01)
Customer Complaints	[no standard]	< 2% of all calls	< 5% of all calls	[no standard]

Unlike in the United States where there is a legal obligation to provide “functional equivalency” through VRS, in Sweden queue times during peak hours have been reported to be comparatively long. The procurement contract from the Swedish Post and Telecom Agency includes minimum goals for VRS, but only as a recommendation: 70% of all VRS calls should be answered within 30 seconds and wait-time should not exceed 60 seconds for 90% of calls.¹³ In Australia the only ASA requirement is for Emergency Text calls to be answered within 10 seconds 99% of the time. In New Zealand, although they have current MRS ASA requirements, they are waiting to introduce VRS service metrics until the service matures: *“In a capped funds environment it is not practical or reasonable to introduce an Average Speed of Answer Service Quality Measure (SQM). However, the Ministry’s longer term objective when funding becomes available to allow the VRS to be staffed to meet that traffic demand profile, is that 85% of VRS calls will be answered within 120 seconds.”*¹⁴

There may be several QoS categories with each actionable QoS requirement clearly detailed, and the required reporting methodology specified. This report does not determine what the minimum requirements for Canada should be. In fact, by seeing how many variations of service models and consumer expectations there are throughout the world, it is reasonable that each country should determine its own minimum requirements. The requirements should be a balance between what consumers’ believe is reasonably good service, the service volume considerations from the providers’ perspective, the implications of limited interpreter resources, and program cost considerations. The ongoing success of VRS will require the continuing monitoring and possible modification of the established QoS standards, as agreed upon by stakeholders.

¹³ Hecht, Robert; Swedish Post and Telecom Agency; Post och-Telestyrelsen; Interview with Mission Consulting March 2011

¹⁴ New Zealand Ministry of Economic Development (Manatū Ōhanga); Request for Proposal for Telecommunications Relay Services; page 52; August 17, 2010.

6.2. Active Reporting, Review and Notification of QoS Status

Depending on the VRS model implemented, VRS providers may be required by contract to report on a number of QoS standards. VRS providers can be required to implement automatic periodic reporting (daily, weekly, monthly, etc.) and on an ad-hoc basis when requested.

The regulatory agency responsible for administering the VRS system should establish the reporting procedures required of the VRS providers, as well as develop internal procedures for the review and monitoring of submitted reports. Procedures should be defined to handle situations in which providers are not meeting QoS standards, and when providers fail to provide sufficiently accurate reports needed to make QoS status determinations.

In a VRS model that includes multiple providers, the providers may be hesitant to report on data and operational indices that they claim may be used by the competition. While their concerns may or may not be valid, the regulatory agency nevertheless still has the responsibility to ensure that the services provided meet the consumers' expectations and the contracted quality standards. The agency should have the right to request and audit reports that enables it to gauge and confirm Quality of Service, and ultimately authorize payment for services. An agreement may be reached whereby certain data and reports are still delivered to the regulatory agency, but are not made public (for a specified time or as mutually agreed). Another approach could be to redact any company or consumer identification from these reports as they are made public. Precaution should be taken to ensure that public disclosure is made for issues that reflect a provider's inability to deliver the consumer services according to the terms of the contract.

6.3. Consequences for Non-Compliance

Whenever possible, compliance with required standards should be encouraged in the spirit of providing a VRS system of the highest possible quality to the community. Even in a competitive VRS model, a collaborative, collegial approach can be encouraged among the VRS providers. Communication, forums, and even meetings amongst the providers to collaborate on best practices can be encouraged. In these discussions challenges that are encountered by the providers may be addressed and solutions developed that may require administrative consideration.

In most service contracts there are two ways of addressing non-compliance: 1) timely corrective action by certain due dates, or if unsuccessful, 2) penalties - including financial considerations. Whenever possible the primary means for addressing non-compliance is to establish the problem resolution process in advance, including the timeframes for corrective action, escalation of unresolved events, and the reporting process. Just as there may be penalties for poor performance, there may also be additional rewards for extraordinary performance. Agreed upon processes will reduce the administrative burden for the regulatory agency and help ensure that issues are resolved as soon as possible.

In a competitive VRS model where consumers have the ability to choose their provider, posting QoS reporting summaries and end user satisfaction levels may create an additional incentive to ensure that

providers maintain systems, networks, and interpreter QoS standards. Non-competitive models may require additional QoS specifications and enforcement penalties to ensure professional services.

In any model, the standards and requirements should be clearly defined and communicated to all parties, including consequences for non-compliance. The primary focus should be on finding ways to motivate improvement. While penalties can have their affect, the VRS provider should be considered a service partner. Ultimately it is not in the consumers' interest to place the provider in significant financial or operational duress. A cooperative and collegial environment between the VRS provider and the administrative agency should be promoted as much as possible in order to facilitate creative and acceptable solutions to problems that will inevitably arise.

7. Consumer Outreach and Education

Consumer knowledge of a VRS program is a key factor in the success of a new program. This requires a well planned introduction of the service to potential consumers in both the Deaf and hearing populations.

Effective initial communication will help create reasonable expectations. Ongoing education and outreach programs will help move this new service into the mainstream of consumer options for communication with and from the Deaf.

7.1. Public Education

If an individual is not comfortable with a new technology, the technology will not be used or it will not be used to its potential. If potential users (both Deaf and hearing) are not aware that a new form of relay service is available, they will not engage the service. While it may not be considered as an obvious element of Quality of Service, public education is integral to the success of the program.

VRS administrators and providers cannot rely on word of mouth to advertise the availability of a newly implemented VRS. A public education campaign should be undertaken to ensure that *all* Deaf and disabled users, as well as potential hearing users, who can take advantage of VRS are aware of its existence and know how to use it.

Public outreach regarding VRS education campaigns to Deaf users can be more effective utilizing advocacy groups, healthcare professionals, government agencies, schools and universities, etc. This approach takes advantage of built-in efficiencies in communicating through large established and respected organizations.

However, a public education campaign must include non-Deaf individuals from businesses, schools, and government agencies as well. In short, the general population must be made aware of the availability and basic functionality of VRS so that when a Deaf user places a VRS call, the receiving caller is not confused or reluctant to accept the call. Deaf consumers in the Canadian VRS trial have expressed frustration with situations in which they attempted to call agencies such as banks or Revenue Canada and were not able to conduct their call because the agency did not understand what VRS is, or did not

have business policies in place allowing Deaf users to conduct business through an interpreter. Likewise, such public businesses and agencies need to know they can initiate calls to VRS users.

Even though VRS is well-established in the United States, public education and outreach is still under discussion. Currently, the consumer groups are recommending that the FCC separate and distinguish outreach efforts from marketing, suggesting that outreach should focus on education:

“Legitimate outreach efforts should include education of Deaf, hard of hearing, deaf-blind and speech-disabled individuals as well as the (hearing) individuals in other sectors of the general community, and businesses so they can effectively communicate via VRS services. Additional outreach efforts to recipients of VRS calls are necessary in order for these services to be functionally equivalent to voice telephone services. The Consumer Groups therefore recommend that the Commission contract a third-party unaffiliated with any VRS provider to engage in education and outreach activities and to fund the activities from the Interstate TRS Fund.”¹⁵

This is the model currently used in Australia. The education and outreach component of MRS and VRS in Australia is provided under contract with an independent third-party company called Westwood Spice, and the cost is covered by the same MRS fund that also pays for MRS/VRS services.

An often overlooked component of an education or outreach campaign is to the actual Internet Service Providers (ISPs) themselves. VRS relies heavily on Deaf users’ Internet connection provided by their ISP. If the ISP customer and technical support staff do not know what VRS is, or do not understand that Deaf users rely on services such as VRS in order to communicate, then they will not understand Deaf individuals’ specific customer service and technical support needs. For example, difficulty in obtaining technical support was another frustration Canadian VRS trial users expressed. In some instances Sorenson indicated that a particular problem was not with their VRS system, but that it was a Telus network related problem. When the Deaf users contacted Telus, the Telus support representatives did not know about VRS, or that a VRS trial was being conducted on their network. This lack of communication and education can result in Deaf users’ dissatisfaction with VRS as a service.

8. Feedback and Improvement Mechanisms

8.1. Automated Measurement and Reporting

Continuous automated measurement of performance factors such as Average Speed of Answer, network blockage, emergency call prioritization and other factors should be maintained during all

¹⁵ Federal Communications Commission (FCC); Comments in Response To Notice of Inquiry; CG Docket No. 10-51; Telecommunications for the Deaf and Hard of Hearing, Association of Late-Deafened Adults, Inc., National Association of the Deaf, Deaf and Hard of Hearing Consumer Advocacy Network, American Association of the Deaf-Blind; August 18, 2010

normal VRS operational hours. Thresholds should be established that notify the provider's operational managers and supervisors when conditions approach or exceed the thresholds so that corrective actions can be taken. Automated monitoring of performance indicators and staffing conditions can also be used to forecast interpreter staffing needs by time of day, day of week, and by language and skills. Although this type of ongoing monitoring and staffing assessment is usually performed by the VRS provider as a normal business operation, the VRS administrative authority can ensure in its VRS contracts that modern work force management tools are employed by the VRS provider to obtain desired cost efficiencies and the desired quality of service performance.

While standards compliance and provider reporting should be automated, the ability to perform periodic reviews of all QoS components should be required of VRS providers. These periodic reviews should be stipulated in the providers' contracts, and the results should be matters of public records (especially in a government-subsidized model).

8.2. Periodic Quality of Service Assessments

Providers' contracts should also stipulate that the administering agency (or their assigned representative) has the authority to conduct periodic QoS site audits and remote testing, including anonymous covert QoS assessments. Quality of interpreting is a nuanced subject to measure. Independent assessments can be periodically conducted by interpreter educational organizations and other specialized stakeholders that do not have a conflict of interest. Such assessments should be undertaken with the view of offering suggestions for how VRS can be improved, rather than as a form of audit and punishment.

In addition to professional assessments, the consumers of the service should be periodically surveyed to determine their views of the quality of service and to identify areas of improvement and suggestions. Surveys can be done online, in the mail, and through community public education and outreach events (newsletters, town hall meetings, Deaf events, etc). These types of assessments can occur on an ongoing, periodic, random, or ad-hoc basis. Both Deaf and hearing users should be consulted. The resulting information can be used by the administering and regulatory agencies to manage the VRS program and to identify specific needs for additional consumer education or vendor improvement. For example, if one provider is seen to consistently receive more complaints for a specific region or time of day, the administrative agency can work with that provider to focus its efforts and ensure a timely solution. In another example, a pattern may emerge among all providers regarding a specific complaint throughout the service. The authorizing agency might then have insight into an issue that may affect the entire program, and would thus be in a position to take action to mitigate the issue.

Lastly, providers should be required to perform their own internal periodic audits, reviews, and tests. The resultant documentation should be submitted to the administering agency on a predefined schedule. Providers should also be required to conduct and report on QoS specific investigations in response to atypical situations or complaints as determined by the administering agency.

8.3. Establishment of Complaint/Improvement Reporting

Constructive feedback is imperative in the successful development and implementation of any new system. Multiple methods of obtaining end user feedback should be required of all VRS providers (submission of online forms, ongoing online blogs and forums, customer service representatives who sign, etc.) The administering agency should also attempt to obtain independent feedback (through consumer advocacy organizations, online surveys, etcetera) beyond what is submitted by the providers. Consumer feedback and complaint programs should be designed to allow consumers to provide information anonymously if they so choose, as well as with personal information that can facilitate a personal response or follow up from the provider.

Before beginning service, providers should have a complaint documentation process in place that identifies the time an issue is identified, nature of the problem and its resolution. Trends in consumer complaints must be analyzed and where these are not isolated events, corrective measures initiated to avoid reoccurrence. Customer complaint forms and summary reports should be provided to the administrative agency with the provider's monthly reports in support of their invoicing.

Reporting should be separated between technical feedback and interpreter quality feedback. Due to the confidential nature of personnel information, feedback regarding an individual interpreter's quality or performance may not be made available to the public in its original data format. VRS provider supervisors should review all consumer complaints and comments to ensure that improvements are realized and appropriate information is passed on to customer service personnel that can be used to respond to the consumer.

Expectations for customer service, complaint, and follow up requirements can be established in the service ordering language, whether by regulatory agency or by service RFP/contract.

In the United States the requirement for constructive feedback is minimally mandated through the FCC's Code of Federal Regulations 64.604. It states the requirement for consumer complaint logs is a functional standard that must be adhered to by all providers:

*"States and Interstate providers must maintain a log of consumer complaints including all complaints about TRS (MRS) and VRS in the State, whether filed with the TRS provider or the State, and must retain the log until the next application for certification is granted. The log shall include, at a minimum, the date the complaint was filed, the nature of the complaint, the date of resolution, and an explanation of the resolution."*¹⁶

¹⁶ 47 CFR 64.604; Federal Communications Commission (FCC); Code of Federal Regulations – Title 47; Telecommunication; Part 64 Miscellaneous Rules Relating to Common Carriers; Subpart F: Telecommunications Relay Services and related Customer Premises Equipment for Persons With Disabilities; 64.604: Mandatory Minimum Standards; (c) Functional Standards; (1) Consumer complaint logs; page 268

8.4. The Role of a Consumer Advisory Committee

A consumer advisory committee can play a critically positive role in the development, outreach, and monitoring of a new VRS program. As direct representatives of their constituencies, such a committee can provide guidance to ensure the experiences and concerns of VRS users are taken into account before and as changes to the program are made. A consumer advisory committee also lends an additional level of credibility to the effort to keep consumer issues in the forefront. A consumer advisory committee can also help plan and guide the effective dissemination of information about the program to consumers.¹⁷

9. Conclusion

There are a wide range of QoS factors to consider in provisioning VRS. These include issues related to the provider network, staff, and operations; consumer issues; as well as community education, outreach and feedback.

All stakeholders (including representatives of the Deaf user community) should be included in the planning and definition of QoS standards.

QoS factors for VRS may be specified and managed by the regulatory agency and managed by its staff or by an administrative agency or designee(s). 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.

QoS standards have been established in other counties, but they vary between countries and between providers. Actionable QoS requirements and the consequences for not meeting them should be clearly delineated in VRS provider contracts.

The ongoing success of a VRS system will require continued monitoring and possible modification of these QoS standards and requirements. Several of the requirements (such as ASA) have evolved 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 are necessary to ensure quality improvement and customer satisfaction.

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 ensure the best possible Canadian VRS program.

¹⁷ Advisory Committee participation will also be addressed in this VRS Feasibility Study's phase 11, Potential Canadian VRS Models.

Phase 8:
Potential Related Services
VRS Feasibility Study

Mission Consulting
February 24, 2012

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POTENTIAL RELATED SERVICES

EXECUTIVE SUMMARY

1. Overview

This report represents the findings of the eighth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 8 research summary, *Potential Related Services*, provides an abstract of several key potential VRS related service enhancements, including:

- ☑ Video Relay Interpreting (VRI)
- ☑ Video voice mail and related message answering services and associated issues
- ☑ Non-ASL and non-LSQ forms of video communication
- ☑ The ability to select specialized vocabulary interpreters, or interpreters with preferred characteristics
- ☑ French-ASL and English-LSQ video translation service
- ☑ Integration or interface with emergency services

2. Summary Findings

The potential related services of this research phase are presented in a summary analysis rather than in detail. Salient points of this analysis include the following:

Initial service offering should consider the basic functionality of the service, service evolution (product lifecycle management) and the governance model related to its evolution and the costs associate to launch or modify features in the market place should VRS be offered in Canada. Regulation or policy decisions will need to be considered.

Feature rich VRS will have to be balanced against user demand, ease of use and cost. The CRTC may have to determine what problems VRS is intended to solve or equal.

Video Remote Interpreting (VRI):

- VRI has the potential to make interpreting available for many ad hoc, short duration, or remote interpreting needs.
- VRI may significantly impact the availability of interpreters for VRS and community interpreting, particularly if it is a subsidized function of VRS.
- There are no technical barriers to implementing VRI as a part of VRS.
- There are no regulatory precedents that would indicate that VRI should be considered or allowed as a part of subsidized VRS.
- If VRI is not included within VRS, it will require considerable VRS oversight to ensure that VRI is not being included within VRS billing.

Video Voice Mail:

- Video voice mail is a common feature offered by most VRS vendors.
- Video voice mail should not be difficult or expensive to provide.
- A precedent for video voice mail has been established with an equivalent function within IP Relay.
- Video mail does not represent a potential for misuse or fraud, and should require little or no administrative oversight.

Non-ASL and non-LSQ forms of Video Communication:

- There are no technical barriers to including Non-ASL and non-LSQ forms of video communication within VRS.
- The inclusion or exclusion of these forms of communities can be quite controversial, with stakeholder communities holding divergent views.
- The predominant consideration for offering these services is that they will allow many late deafened people who do not know ASL or LSQ to potentially communicate using alternative visual modalities.
- The predominant consideration against offering these services is that they will take additional funding and interpreter resources, which may be scarce.
- There are no CRTC rulings indicating that these services would be allowed or denied.

The Ability to Select Specialized Interpreters:

- There is no technical barrier to designing VRS to allow consumers to request specialized interpreters.
- This feature may have limited application or may require significant delays in fulfilling such requests if there is a shortage of interpreters.

- Costs to implement the service would be minimal, except that additional interpreter training may be needed.
- There are at present no CRTC rulings that would preclude this feature from being offered within VRS.
- The level of effort for effective oversight of this feature can vary depending upon the VRS model chosen.

French-ASL and English-LSQ Video Translation:

- Translation is not a part of Canadian TTY relay or IP Relay, and there are no CRTC rulings addressing it.
- Some multi-lingual countries offer limited translation services within their VRS.
- The ability to provide translation services with VRS may be difficult to achieve due to lack of multi-lingual interpreters or because multiple interpreters may need to be involved in a single conversation.
- Including translation within VRS may represent a significant opportunity for misuse and fraud, and may require significant administrative oversight.

Integration or interface of VRS with Emergency Services:

- TTY relay and IP Relay are required to relay emergency calls to 9-1-1 centers (PSAPs) throughout Canada. It is a manual process that does not include automatic identification of the caller's phone number or address.
- It is reasonable to expect the CRTC to also require VRS to similarly relay emergency calls to PSAPs.
- The design and implementation of the integration between VRS and PSAPs can be very simple and inexpensive, with limited functionality; or can be very complex and expensive, with more automated functionality.
- Measuring the effectiveness of VRS to PSAP communications will require cooperation between the VRS vendor(s), the VRS oversight authority, telephone companies, the PSAP authorities, and the VRS consumers.
- The complexity of the oversight will be directly related to the complexity of the solution.

3. Conclusion

All of the potential VRS service optional features discussed in this phase are possible:

- Video Relay Interpreting (VRI)
- Video voice mail and related message answering services, e.g., call notification
- Non-ASL and non-LSQ forms of video communication

- The ability to select specialized vocabulary interpreters, or interpreters with preferred characteristics
- French-ASL and English-LSQ video translation service
- Integration or interface with emergency services

Several of these features are easy to implement, while others may be significantly problematic. Some challenges are technical while others are operational, and others are dependent upon policy considerations. The implementation of VRS need not be delayed until all issues of these features are resolved.

POTENTIAL RELATED SERVICES

RESEARCH SUMMARY

1. The VRS Feasibility Study

This report represents the findings of the eighth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 8 research summary, *Potential Related Services*, provides an abstract of several key potential VRS related service enhancements, including:

- Video Relay Interpreting (VRI)
- Video voice mail and related message answering services and associated issues
- Non-ASL and non-LSQ forms of video communication
- The ability to select specialized vocabulary interpreters, or interpreters with preferred characteristics
- French-ASL and English-LSQ video translation service
- Integration or interface with emergency services

2. Video Remote Interpreting (VRI)

2.1. The Application of VRI to VRS

Video Remote Interpreting (VRI, also known as Video Relay Interpreting) is a form of Video Relay Service in which a remote interpreter is used to provide interpreting services between two or more individuals who are together in the same room or venue. The individuals needing the interpreting services can be in any type of location – a government, medical, or private office, a school, or even a home. For example, if two co-workers, one Deaf and one hearing, need to hold a conversation but no interpreter is available in their office, a VRI “call” could be made. The two co-workers would connect to a remote interpreter via a high speed Internet connection using a videophone device capable of both voice and video. The Interpreter would translate the Deaf employee’s sign language for the hearing employee, and visa versa.

Video Remote Interpreting can be used in both scheduled and unscheduled (on-demand) applications. For example, VRI would be considered unscheduled when is used at a reception desk, when a Deaf guest needs to communicate with a hearing receptionist or employee. With a videophone device at the reception desk, the users can contact a remote interpreter who can provide live interpreting services. Hospitals, schools, and government offices are all areas in which VRI is used for interpreting when there has not been sufficient advance time to schedule on-site interpreters. VRI is also useful for ad-hoc or brief conversations which would be too short in duration to schedule an on-site interpreter.

VRI may be considered by some to be a form of Community Interpreting in certain situations, as when local interpreters are not available to be physically present to provide interpreting services, such as in a remote rural area, but can be available via the Internet from a distant location.

Many VRI providers and users stress that a VRI interpreter is not a replacement for in-person interpreting services, but that VRI can serve as a substitute when an on-site interpreter cannot be arranged.

2.2. Cost and Capability to Provide VRI

The equipment to access a remote interpreter using VRI is exactly the same as that which is needed to place a VRS call but with a microphone and speaker. The users requiring the interpreting service must have a high speed Internet-connected videophone device, which can be either a standalone videophone, or a computer or mobile device with a web cam, microphone and speaker.¹ At the service provider’s site, the equipment and services to enable VRI are identical to that required of VRS. The hardware and software cost to the VRI consumers and to the VRI providers would be identical to that of VRS. If VRI services were made available to Canadians as a function of VRS, in theory no special equipment or

¹ Or a separate telephone line and speakerphone can be used to provide the voice connection and audio. See this study’s phase 5, *Technologies and Their Forecasts*, for a more in-depth discussion of the required technologies.

operational barriers or costs, other than to support the demand for handling the additional volume of VRI calls, would be necessary.²

2.3. Congruity of VRI with MRS Regulations

Some countries have VRS regulations that allow vendors to provide both VRS and VRI services from one (or more) call centers. In France, for example, Viable France provides both VRS and VRI services, as well as sells and distributes proprietary videophone products for use with both services.³

Other countries, however, have regulations that preclude VRI within the government subsidized models of VRS. For example, in the United States all forms of relay service paid under the authority of the federal government are required to be “functionally equivalent” to a telephone call; that is, between two parties at different locations. Therefore VRI is not authorized by the FCC for reimbursement from the national Telecommunications Relay Service (TRS) fund. To the extent that it is provided by VRS providers in the United States, it is offered to users on a for-profit, fee basis.

However, functional equivalency is not an established legal basis for MRS in Canada as it is in the United States, and the CRTC has not yet established precedents against the potential provisioning of video relay services to two users at the same location.

In Canada, VRI services are already being provided by some business entities and advocacy groups such as the Canadian Hearing Society. Since VRS (and VRI) have not yet been mandated or regulated by the CRTC, these current VRI services are functioning outside of the present scope of MRS regulations.

2.4. Potential Impact of VRI on Interpreting Services

As long as VRI is paid for by consumers or businesses, instead of at free or deeply discounted rates reimbursed as a MRS funded offering, VRI should not materially change the demand for, or availability of, community interpreters. In this case VRI would be forced to compete for community interpreting services, which often provide a superior quality of service. In this scenario, VRI would usually only be more competitive with community interpreting services when any of the following conditions occur:

1. The need for interpreting cannot be scheduled in advance and the need is imminent.
2. The interpreting session is expected to be very brief.
3. The location where interpreting is needed is at a significant distance from the location of available interpreters.
4. Local interpreters do not have a special skill set, e.g., vocabulary, needed by the parties.

² The potential additional costs to accommodate VRI calls within any Canadian VRS model will be reviewed in this study's phase 10, *Cost Variables and Forecasts*.

³ <http://www.viable.fr/>

However if VRI is paid for as a part of VRS, its use could impact the interpreting services business and the availability of community interpreters. The above VRI situations would result in a much higher frequency of VRI services versus on-site community interpreting for the same situation. This use of VRI may not significantly reduce the user demand for community interpreting, but would require more interpreters to meet the combined needs of VRI, VRS, and community interpreting. The largest competitive impact of VRI upon community interpreting will be in the normal settings of community interpreting, in which the present fee-based on-site interpreting would need to compete with government subsidized VRI services. Also hearing users may consider VRI services to be not only cheaper, but also more convenient, even though the Deaf user may consider the quality of VRI to be inferior to that of on-site in-person community interpreting. The hearing community would need to be educated as to the drawbacks of VRI compared to community interpreting; but even so, the low cost (or free) service and the convenience of simply calling in when needed, may cause VRI to be frequently selected over community interpreting.⁴

2.5. Administrative Oversight of VRI

If VRI were included within Canadian VRS, the requirements and demands for its administrative oversight would be the same as for VRS. If VRI were not included within VRS, some additional oversight would be needed to avoid misuse of VRS. Examples of misuse might be users calling VRS for conducting VRI calls with or without the knowledge of the VRS provider, or VRS providers that incorporate their cost of VRI calls into the reimbursement practices of its VRS operations.

The experience in the United States is that it can be problematic to define VRI (compared to VRS) for all situations. For example while two people in the same room are clearly VRI, would it be VRI or VRS if they were in two adjacent rooms, or perhaps in two adjacent work cubicles? Is the separation of the parties simply to create a VRS environment? Would it have occurred if interpreting were not needed or if an on-site interpreter were available? If the two parties are in a large building or campus in which communication between parties is usually by phone, would registered users with the same address be precluded from using VRS because the system might have indexed the users to be at the same location, i.e., address, and thereby classified the call as VRI? These are some of the administrative challenges of separating VRI from VRS. In the United States it has been found that while regulations may make some of these situations partially clear, ultimately it is up to the users and the vendors to not abuse the rules, either unknowingly or purposefully. While the United States federal government has the ability to enforce its regulations via withholding of payment, financial penalties and even incarceration, it has almost no administrative tools or ability to monitor compliance or abuse in a manner that ensures effective ongoing oversight regarding VRI.

⁴ VRI users would also avoid the common practice of charging for a minimum time period, such as one or two hours, that is common with community interpreting.

3. Video Mail and Related Message Answering Services

3.1. The Application of Video Mail to VRS

Voice mail systems for telephone hearing users typically allow the mail box holder to receive and listen to stored messages. The hearing person listens to computerized or pre-recorded voice prompts, and navigates through “menus” choices, selecting options by either entering digits or in some cases by speaking simple words recognized by the system. These voice mail systems are prevalent in many organizations, and are used when retrieving voice mail from cellular provider services and even remotely accessed home answering machines. However, these voice retrieval systems are not suited to Deaf users, and are significantly difficult to use through any form of MRS, including VRS.⁵

Therefore, most VRS providers now offer a video mail messaging option. If a VRS center places a call to a Deaf individual and the individual is not available, the VRS interpreter can leave a signed message on behalf of the hearing caller.⁶ Because Video Mail is commonly used in other countries’ VRS systems, many Canadian consumers may consider it as a necessary component of VRS. Some VRS providers offer users the ability to create a profile and sign on to the VRS provider’s web site, and thus access their video mail from anywhere they can sign in. This type of service is especially valuable to users in households with multiple Deaf individuals, users who travel frequently, individuals who access VRS services through community locations (e.g., kiosks or libraries), or who wish to check personal messages from work. Retrieval and viewing of video mail does not involve interpreter interaction or time.

Video mail can also be supplemented by the same type of message alerts that are available for incoming VRS message alerts.⁷ These include flashers, notification devices, pagers, etcetera. Pager or cell phone notification systems are also commonly offered by VRS providers. This is the ability to send a notification to a pager or cell phone when an incoming VRS call is being received, or when a new VRS Video Mail message has been left. The pager or cell phone and associated cellular service, of course, are not provided by the VRS provider. Many VRS providers also allow the users to configure an email or Instant Message to be sent for the same purposes, and can be received on multiple devices.

Another common utility often included in VRS provider software is an address book or other means of storing contact information and numbers. When receiving notification of a video message from someone entered in a user’s personal VRS address book, the name of the calling party may also be displayed.

⁵ It is difficult for the interpreter and Deaf user to transfer information quickly enough over relay to be able to respond to the prompts before the system “times out”.

⁶ This feature can also be available through VRS providers in point-to-point video calls without a relay interpreter, in which case the signed video message is left by the caller. Such messaging is not a function of relay, but is an ancillary service of VRS providers in point-to-point video calls.

⁷ See this study’s phase 5, *Technologies and Their Forecasts*.

3.2. Cost and Capability to Provide Video Mail

Since most VRS vendors already offer video mail functionality, there is no anticipated technical barrier to providing video mail through VRS. Vendors typically limit their video mail storage and streaming costs by limiting the number of messages stored and/or by length of time stored. Likewise no significant additional costs to provide the service are anticipated. Users may incur minor costs to acquire notification devices, but may do so for VRS calls regardless of whether video mail is offered. The degree of user expense for devices for message notification is dependent upon the individual choice of devices and services. Users may experience normal costs associated with network access and usage to retrieve video mail messages. If access to video mail messages is not part of a government funded VRS, then some VRS vendors may elect to charge users to retrieve messages.

3.3. Congruity of Video Mail with MRS Regulations

There are no CRTC MRS regulations for including or excluding video mail from potential VRS in Canada. However, IP Relay as adopted in Canada has established an accepted precedent by offering text message storage initiated by the IP Relay operator in a similar manner as would be the case for video mail. For IP Relay messages, the Deaf customer receives a text message on the customer's "Make a call" page on the IP Relay web portal.⁸ Since Canadian IP Relay offers message storage and remote retrieval, other than possible cost considerations, CRTC regulations would not appear to restrict a similar video message storage and remote retrieval service.

From a functional viewpoint, video mail offers Deaf users access to the storage and retrieval of messages in an equivalent manner to what is a commonly accepted component of the prevalent voice communication technologies and services afforded to hearing users. In this sense it is congruent with existing IP Relay services and with potential VRS.

3.4. Administrative Oversight of Video Mail

Issues associated with the administrative oversight of video mail are similar to that of VRI, except on a much smaller scale. Video mail does not represent a significant potential for misuse or fraud.

⁸ Bell Canada, *Bell IP Relay Service Description*, version 0.93, Q4 2010, page 14.

4. Non-ASL and Non-LSQ Forms of Video Communication

4.1. The Application of Non-ASL and Non-LSQ Communication to VRS

The history and definitions of the different types of interpreting are described in this study's phase 6 subject, Interpreter Considerations. However a brief description of some of these non-ASL and non-LSQ forms of communication follows as they apply to Potential Related Services.

In general, sign language allows Deaf or speech disabled users to visually communicate without speech or hearing. Formal sign language, whether ASL or LSQ (or another sign language), is a structured, complete language with its own syntax and grammar. In VRS, interpretation occurs between the signed language and a spoken language (such as English or French).

Other forms of sign language besides ASL and LSQ and other methods of translation, however, do exist. There are many non-ASL and non-LSQ forms of communication in use in Canada by various individuals or groups of people. These types of communication, also known as visual or sign supported speech, include signed transliteration, cued speech, lip reading, oral transliteration, finger spelling, etc. These all are methods of translating spoken speech (e.g., English or French) into a non-ASL or non-LSQ visual form. These forms of sign supported speech often require specific training or skill sets in order to be used effectively.

VRS can also be supplemented by other forms of non-LSQ and non-ASL formats within the same VRS screen, such as text (French or English). Text with video can be provided as captioned streaming text, as chat via instant messaging, or as chat software on web based systems.

Likewise VRS can be designed to support audio along with video for consumers who sign and speak but cannot hear (using a voice carryover or VCO feature), or for consumers who sign and can hear but cannot speak (using a hearing carryover or HCO feature). Video can also be a part of a non-VRS relay such as speech-to-speech relay, in which the interpreter's comprehension of the speech disabled user's communication may be greatly facilitated by being able to see the speech disabled person's expressions and movements.⁹

4.2. Cost and Capability to Provide Other Visual Communication Services

There are no technical barriers for a VRS provider to offer other forms of visual or sign supported speech, including signed transliteration, cued speech, lip reading, oral transliteration, and finger spelling. None of these modes of communication require any additional technical equipment or systems. However, adding scrolling captioned text within a video session can be technically and operationally complex to provide, although it is offered by some current VRS providers with advance notice and

⁹ Speech-to-speech relay is not presently offered in Canada, and is not a part of this VRS Feasibility Study.

potentially at an additional cost to the user. While chat is easy to provide, it is not congruent with fluid signed communications. Audio with video as either HCO or VCO is also easy for VRS providers to offer.

The demand for certain of these services may be higher in certain provinces or regions, and also may be higher or consistent in certain groups of individuals. For example, late deafened people usually do not know ASL or LSQ, but may have learned to lip read and could use VRS with oral interpreters to read the interpreter's lips. In those countries that allow VRS to offer visual communications in addition to the formal signed language, there are no available statistics of the percentage of demand for these services compared to that of the formal signed language.¹⁰

Potential VRS providers in other countries have demonstrated that they can provide these types of services if they have staff available that has been properly trained to do so. One advantage of providing these services in a VRS call center is that users may be able to reach specialized interpreters who may not be available in their geographical areas for in-person interpreting.

4.3. Congruity of Non-ASL and Non-LSQ with MRS Regulations

The current CRTC documents that discuss VRS define it as a service for people who use sign language, and offer ASL and LSQ as examples of sign language.¹¹ In this sense the CRTC has not explicitly restricted its description of VRS to ASL and LSQ. It is possible that the CRTC may define VRS to include non-ASL and non-LSQ forms of signed and unsigned communication. It may be noted that the CRTC's description of VRS is lacking detail, including basic definitions of features, functions, capabilities, minimum qualifications, and etcetera. It is understood that the CRTC is requesting information from this study, from its authorized VRS trial, and perhaps from other sources such as consumer advocacy groups, institutes of higher education and others, as part of its normal deliberative processes to determine the nature and scope of VRS for Canada. It should be noted that expectations and opinions among different consumers and their advocacy organizations may differ significantly regarding the appropriateness of including various non-ASL and non-LSQ forms of communication within VRS.¹²

¹⁰ VRS in France, Germany and Sweden provide some forms of non-signed language communication, sometimes in a restricted offering by time of day or day of the week. See this VRS feasibility study's phase 4 subject, *VRS in Other Countries*.

¹¹ Paragraph 24 of *Broadcasting and Telecom Regulatory Policy CRTC 2009-430*, at <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm> states: *Unlike TTY Relay or IP Relay, Video Relay enables communication with a relay operator using sign language. As such, Video Relay provides significant benefit to those persons with hearing and speech disabilities who communicate via sign language (e.g. American Sign Language (ASL) or Langue des signes québécoise (LSQ)).* Also see Appendix 1 of CRTC 2009-430.

¹² Refer to this VRS feasibility study's phase 3, *Consumer Considerations and Perspectives*.

4.4. Administrative Oversight of Other Visual Formats

Including other forms of visual communication within VRS should pose no significant additional administrative burden for oversight of VRS. Definitions of allowable or funded services would need to be developed and such services would need to be sought within any procurement and contract for Canadian VRS. Awarded VRS provider(s) would need to be given the authority to prevent non-allowed communications from occurring over its funded VRS services.

5. The Ability to Select Specialized Interpreters

5.1. The Application of Selecting Specialized Interpreters to VRS

The ability to request specialized interpreters is a normal practice in Community interpreting, in which there is an attempt to match a consumer’s communication needs and preferences to the abilities of available interpreters. This type of matching is more difficult to achieve in a VRS setting where calls are not scheduled in advance. “Specialized” can encompass a range of skill sets or cultural experiences, such as:¹³

- Specialized vocabulary or experience (such as medical, legal, etc.)
- Regional/cultural knowledge including place names, unique nomenclature or dialects (such as the unique signs of Maritime sign users)
- Gender of the interpreter (e.g., a female consumer can select a female interpreter to voice for her)

VRS can be designed to permit consumer requests for preferences within personal registration profiles, and/or can be offered as options each time a VRS call request is made. Intelligent VRS systems could indicate estimated wait times for certain types of requests and allow the consumer to choose to wait or to take the first available video interpreter who may not have the abilities requested.

5.2. Cost and Capability to Select Specialized Interpreters

The ability of VRS providers to offer consumers the ability to select interpreters that have specialized skills, knowledge or attributes will be highly dependent upon the availability of those interpreters at the time of the VRS call. Some of the knowledge, such as specialized medical or legal vocabulary, or place names, can be learned with additional training. Other knowledge or skills (such as Maritime or Aboriginal signing) may be more difficult to obtain. Therefore the costs to add these services are not related to equipment but are related to interpreter training and background, and the availability of interpreters.

¹³ In the context of potential Canadian VRS, the ability to select ASL or LSQ would be considered basic to the service, and would not be considered a “special offering”.

5.3. Congruity of Interpreter Selection with MRS Regulations

Since matching consumer needs with interpreter skills is a normal practice of community interpreting, it may be viewed by consumers as a normal expectation of a fluent interpreting experience, and one that from the consumers' point of view should naturally be accommodated within VRS. There is nothing within CRTC MRS regulations that would preclude this type of service choice. Rather, the constraint will be, to what extent should regulations require this type of choice if it cannot be practically fulfilled due to a lack of trained or certified interpreters with the skill sets required? Should in fact the potential for consumer choice in interpreter skill sets be a regulated or a freely competitive offering, or a blending of the two? What kinds of extra wait times might VRS consumers face, and to what extent might this conflict with regulatory expectations for prompt service? These types of issues will need to be considered. Because conflicting effects of selection may occur, even without a general interpreter shortage there could be significant wait times for certain selected specialties, or they may need to schedule calls in advance to ensure availability of specialized interpreters. VRS users would need to be educated of this, and there would need to be some monitoring to ensure that users do not select or request specialized or higher skilled interpreters unnecessarily.

5.4. Administrative Oversight of Specialized Interpreter Selection

Administratively, the effectiveness of consumer choice of VRS interpreter skill sets and their consequences on overall service parameters, can be measured and reported by the VRS provider(s) to an oversight agency or contracting entity. In this regard oversight should not be burdensome to the agency, but should allow consumers, providers and an oversight body to make informed policy and operational decisions that will facilitate the most responsive VRS possible.

The requirement of choice of offerings can be developed within regulation (social policy regulation), service governance, within solicitations and contracts for services, or if a competitive VRS model is selected it can simply be left to competitive supply and demand.

6. French-ASL and English-LSQ Video Translation Service

6.1. The Application of Translation Service to VRS

Some countries restrict VRS to relayed communication between the native sign language and the native spoken language, e.g., ASL and English, or LSQ and French. Other countries that include more bi-lingual or multi-language native languages, authorize communications between different languages groups

such as ASL and Spanish as long as the relayed communication is between a deaf modality (signed language) and a spoken language.¹⁴

Since Canada has two official languages the consideration of whether or not to allow cross language translation to be part of the interpreting function of a potential VRS offering will be a significant decision. A consideration against it is that hearing people who speak French are not provided a paid translator if they call an English speaking person or organization. A consideration for it is that ASL and English are already two very different languages, so what is important is that the relayed communication is between a Deaf visual language user and a hearing spoken language user regardless of the actual languages chosen. Ultimately this will be a political policy and cost decision.

6.2. Cost and Capability of Translation Services

Even if allowed, the ability to provide VRS translation services will be greatly constrained by the very limited availability of video interpreters who are fluent in combinations of at least three languages and are proficient in simultaneous translation and interpreting between ASL, LSQ, French and English. With the anticipated scarcity of qualified interpreters for ASL to English, and LSQ to French, it is likely that the unavailability of interpreters with the additional necessary cross training and fluency for translation services will simply preclude such translations from being a VRS possibility. Alternatively multiple interpreters could be used on the same call, but at a greater expense to the VRS provider.¹⁵ Use of a third interpreter would slow the call flow and potentially impact the accuracy of the translation.

6.3. Congruity of Translation Services with MRS Regulations

TTY relay and IP Relay services throughout Canada are not currently mandated by the CRTC to provide French to English and English to French translation services, and such translations are not advertised to consumers as a component Canadian relay services. Canadian IP Relay does not perform English/French translations. VRS regulations have not yet been developed by the CRTC, but it is doubtful that it would mandate translations since it has not done so for TTY relay and IP Relay. It is possible however that the CRTC might allow translation services within VRS and authorize reimbursement of providers that elect to offer it at regular VRS rates.

¹⁴ See phase 4 of this VRS feasibility study, *VRS in Other Countries*. VRS in some countries limit the availability of translation between language types to certain days or time of the day.

¹⁵ An example of two interpreters on the same call is provided by the current use of Deaf interpreters serving as the third translator/interpreter, the argument being that the use of a Deaf interpreter will not impact any potential hearing-able interpreter shortage. Canada does not currently certify Deaf interpreters, but there is a process by which Deaf interpreters may become members of AVLIC.

6.4. Administrative Oversight of Translation Services

If translation services are allowed, any agency that is responsible for administrative oversight of VRS will need to ensure that the service is not abused as a primary way to achieve live French to English and English to French translations in lieu of relay's primary purpose to facilitate conversations between Deaf users and hearing users. This will especially be the case if oral interpreting (non-ASL and non-LSQ) is provided within VRS. The opportunity for extensive public misuse and vendor fraud is considerable, and not necessarily reportable or easily preventable.¹⁶

7. Integration or Interface of VRS with Emergency Services

7.1. The Application of Emergency Services to VRS

Deaf and hard of hearing consumers who use TTY relay services are usually encouraged to directly dial 9-1-1 when they have an emergency. Nevertheless, many TTY users prefer to use relay services to communicate with 9-1-1 Public Safety Answering Points (PSAPs).¹⁷

Calls relayed to 9-1-1 PSAPs by Canadian TTY relay services do not enter the PSAP via normal 9-1-1 trunks and do not provide their original caller's automatic number identification (ANI) or automatic location information (ALI), which are provided with most voice calls to 9-1-1.¹⁸ Additionally, many PSAPs are not set up to receive TTY calls directly, and TTY users are forced to use their relay service to communicate an emergency with their local PSAP.¹⁹

The CRTC required Canadian IP Relay service providers to relay emergency calls to PSAPs even though limitations exist.²⁰ Direct connection and communication to PSAPs using a variety of non-TTY texting services do not exist because of network and PSAP equipment incompatibilities.²¹

The network and PSAP equipment incompatibilities associated with text communications, are also similarly prevalent for video communications. An eventual technical solution called Next Generation 9-1-1 (or NG9-1-1) is not yet in any active planning phase in Canada, and is not anticipated to be an

¹⁶ The potential for misuse and fraud would also extend to TTY relay and IP Relay if the CRTC approved translation in all forms of relay (and in fact be most significant for IP Relay).

¹⁷ PSAPs are the call centers maintained by local jurisdictions to receive and respond to 9-1-1 calls for emergency assistance.

¹⁸ The delivery and display of ANI and ALI are referred to as "enhanced 9-1-1" or "E9-1-1". 9-1-1 calls without ANI and ALI are referred to as "basic 9-1-1" or "B9-1-1". In addition, some rural or small municipality PSAPs do not have equipment capable of receiving ANI and ALI.

¹⁹ See CRTC 2009-430, paragraph 30, at <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>.

²⁰ Ibid, paragraphs 36 and 37.

²¹ See CRTC 2010-224, paragraph 3 at <http://www.crtc.gc.ca/eng/archive/2010/2010-224.htm>.

implemented solution in the foreseeable future. If PSAPs were able to directly take video 9-1-1 calls, they would need trained PSAP operators who could sign ASL and/or LSQ. This would put a very significant demand upon available interpreter resources, to the significant detriment of community and VRS interpreting.

The Canadian Telus VRS trial does not permit relaying of emergency calls to PSAPs. Other countries have a variety of integration or interface policies regarding VRS and 9-1-1. For example in the U.S., the FCC has mandated that all VRS consumers register their location with their preferred VRS provider. With registration they receive a 10-digit telephone number which is used by all VRS providers to facilitate a database lookup in order permit the VRS provider to connect with and relay the call with the VRS user's primary PSAP.²² VRS providers that allow consumers to request emergency services will need to have a means of prioritizing emergency calls, so that callers do not experience delays when they reach congested VRS networks or call centers.

7.2. Cost and Capability of Emergency Services within VRS

The cost to ensure that Canadian VRS providers will be able to relay emergency calls to PSAPs will be dependent upon the degree that:

- consumer information (e.g., address) will be provided,
- the information will be accurate and automatically provided,
- the identification of the appropriate PSAP will be accurate and automatic, and
- the information can be automatically transferred when a call is transferred from one PSAP to another PSAP.

Simple non-automated solutions (the VRS interpreter asking the user for their address and looking up the associated PSAP) will cost very little compared to sophisticated solutions such as provided in the United States. The complexity of the solution will also be affected by the VRS model chosen (such as one vendor nationwide, versus multiple vendors). Whatever the solution that is ultimately selected, the implementation of VRS in Canada need not wait for the final design and implementation of integration of VRS with 9-1-1 emergency services.

7.3. Congruity of Emergency Services with MRS Regulations

The CRTC has placed a high priority on ensuring that all Canadians have access to 9-1-1 services.²³ At present many Canadian PSAPs are not capable of directly receiving TTY calls, and none of the Canadian PSAPs are capable of receiving IP communications, whether text or video. Consequently the CRTC has required TTY relay services and IP Relay services to relay emergency calls from consumers to PSAPs,

²² See phase 4 of this VRS feasibility study, *VRS in Other Countries*.

²³ See CRTC 2009-430, paragraph 28, at <http://www.crtc.gc.ca/eng/archive/2009/2009-430.htm>.

even though this option has significant limitations. If the CRTC were to mandate VRS, it would be reasonable to expect that the CRTC would seek ways to provide access to PSAPs via VRS as it has done for TTY relay and IP Relay.

7.4. Administrative Oversight of Emergency Services

Administrative oversight of integration or interface of VRS with 9-1-1 services will primarily be dependent upon monitoring and reporting by the VRS vendor(s). Coordination with Canadian PSAP authorities, the telephone companies, the VRS vendors, and consumer organizations will help the oversight entity understand the issues and verify the effectiveness of services. The complexity of the oversight will be directly related to the complexity of the solution.

8. Conclusion

All of the potential VRS service optional features discussed in this phase are possible:

- Video Relay Interpreting (VRI)
- Video voice mail and related message answering services and associated issues
- Non-ASL and non-LSQ forms of video communication
- The ability to select specialized vocabulary interpreters, or interpreters with preferred characteristics
- French-ASL and English-LSQ video translation service
- Integration or interface with emergency services

Several of these features are easy to implement, while others may be significantly problematic. Some challenges are technical while others are operational, and others are dependent upon policy considerations. The implementation of VRS need not be delayed until all issues of these features are resolved.

Phase 9

Forecasts of VRS User Demand

VRS Feasibility Study

Mission Consulting

February 24, 2012

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FORECASTS OF VRS USER DEMAND

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the ninth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 9 research summary, *Forecasts of VRS User Demand*, provides an estimate of the VRS user demand in Canada including:

- Estimates of number of ASL and LSQ VRS users versus population
- Forecasted total VRS traffic (minutes of use)
- Forecasted growth of VRS usage over time
- Correlated VRS interpreter demand
- Potential impact of VRS traffic on TTY-relay and IP-relay traffic
- Potential impact of Video Remote Interpreting (VRI) and other ancillary services
- Impact of selected Quality of Service factors

2. Summary Findings

Salient points of this analysis include the following:

Challenges in Accurate VRS Forecasting

- Significant challenges make forecasting the potential usage of VRS problematic, including lack of verified statistics on the size of the Canadian signing population.
- The methodology of VRS usage forecasting in this study is primarily based on correlating the U.S. VRS experience to the Canadian environment.
- The VRS usage demand estimates that of approximately 34,000 Canadian sign language users, 15,345 will become consumers of VRS.

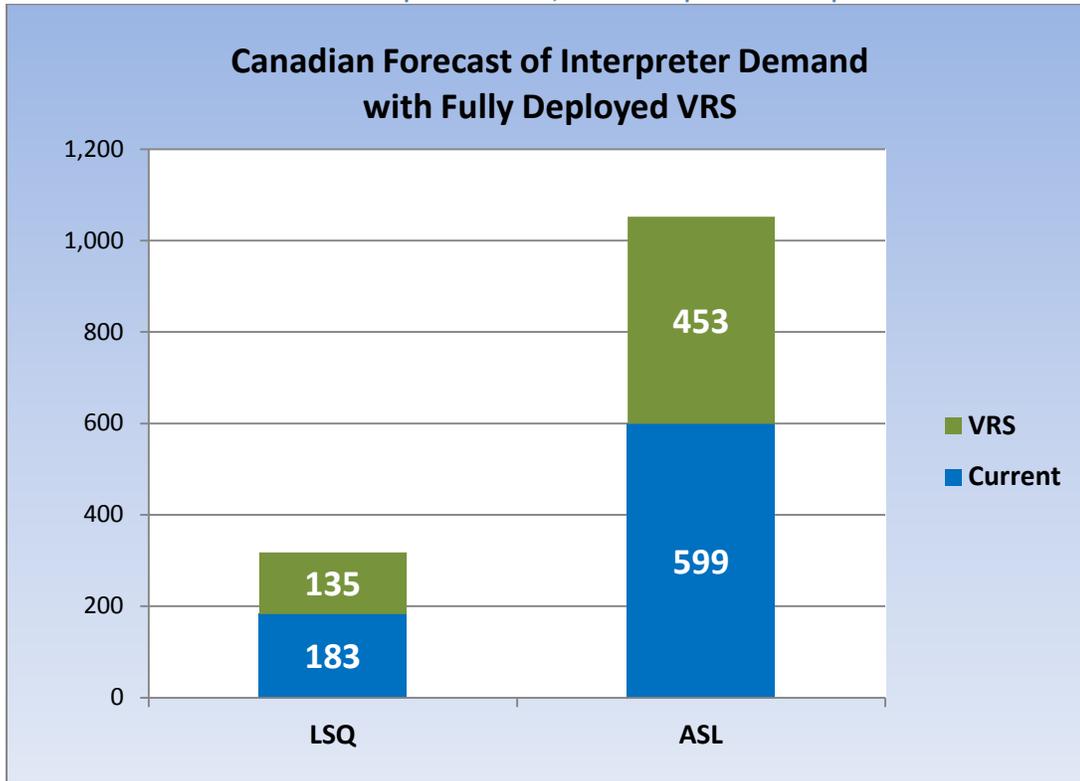
Usage Forecasts and Variables

- Assuming an average 444.5 minutes per consumer (70 percent of the U.S. usage per person), a fully deployed and subscribed 24 x 7 VRS is forecast to generate approximately 6,820,853 annual minutes of use.
- The key variables that may materially increase or decrease the demand for VRS include the number of VRS consumers and the average number of minutes that they use the service. While U.S. correlations for these variables are used for forecasting Canadian VRS, the numbers assumed as a baseline for the Canadian VRS forecasts cannot be verified.
- Approximately 77% of the VRS traffic will be for ASL/English relay, and 23% will be for LSQ/French relay.

The Challenge of a Shortage of Interpreters

- There are a number of potential challenges to reaching the forecasted 6,820,853 minutes of use, including lack of available interpreters to work in VRS, potential lack of funding which may constrain the availability of the service, lack of consumer VRS equipment, and other factors. The largest challenge is the lack of the necessary ASL and LSQ interpreters.
- The forecasted numbers of full time interpreters needed for a fully deployed and subscribed VRS are 181 ASL and 54 LSQ. However, due to the demands of the job, the VRS interpreters are expected to only work between 10 and 20 hours a week with a 25% efficiency.
- The numbers of part-time interpreters averaging 15 hours a week that are needed to fulfill the full time VRS positions are 453 ASL and 135 LSQ.
- If the part-time VRS interpreters average more or less than 15 hours a week, or if their efficiency is greater or less than 25%, the needed number of part-time VRS interpreters may be significantly different than 453 ASL and 135 LSQ (see section 4.3).
- Compared to the estimated number of existing interpreters, the additional numbers of qualified VRS interpreters are shown as follows:

Figure 1: Canadian Forecast of Canadian interpreter demand; numbers of part-time interpreters



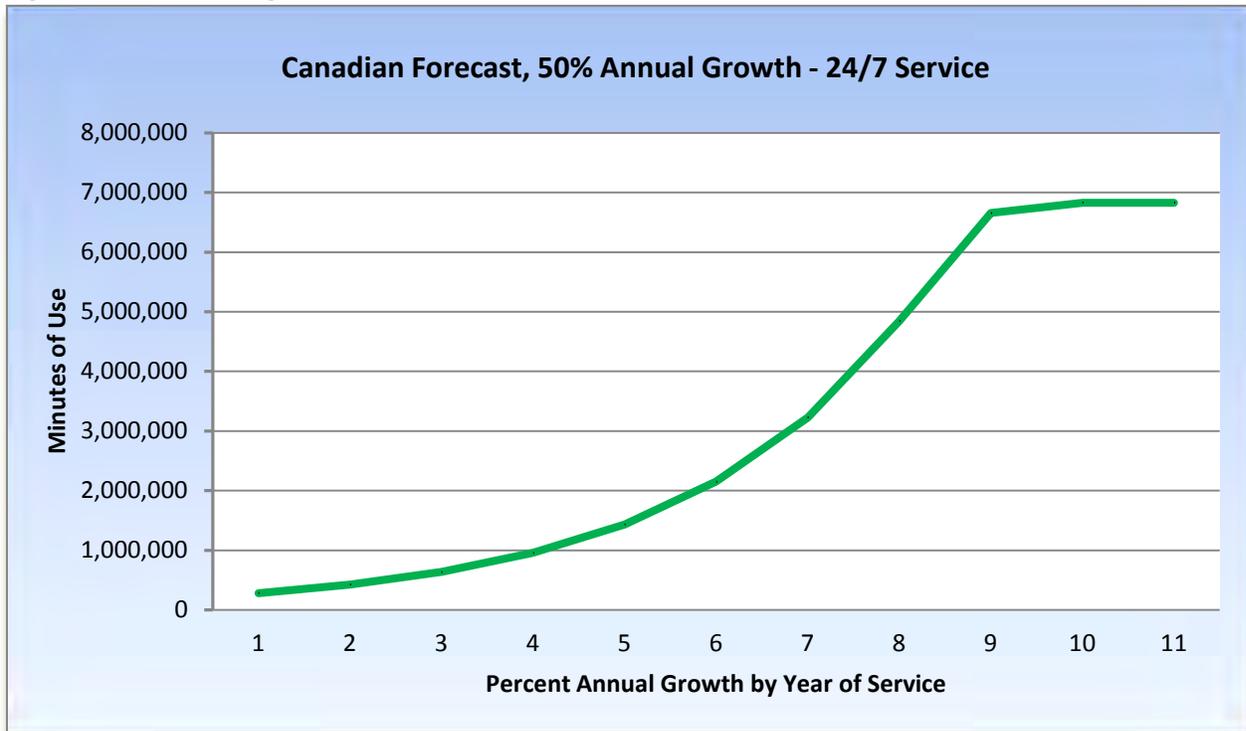
- The ASL and LSQ Deaf communities report that there are presently not enough interpreters to serve the needs of the communities.¹
- An estimated one-third of the current ASL interpreters are working for a VRS company providing service to U.S. consumers. Current LSQ interpreters have no standards of 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 consumer demand for VRS will likely be constrained over a period of time as qualified interpreters are developed.

Demand Over a Ten Year Period

- Adjusting the forecasts of VRS demand to a ten year period (beginning with 500 users per month and increasing 50% annually; and where the full attainment of the estimated total minutes of use is reached during the tenth year) to allow for interpreter development results in a demand curve as follows:

¹ See this studies phase 3, *Consumer Interests and Perspectives*.

Figure 2: 50% annual VRS growth, 24/7 service



- The selection of the type of model of VRS for Canada can impact the adoption rate, including potentially starting the service with a higher number of users and minutes in the first year.²
- The number of part-time VRS interpreters forecast to be required for the above 50% annual growth rate is as follows:

Table 1: Canadian Forecast of VRS minutes and number of part-time interpreters over 11+ years

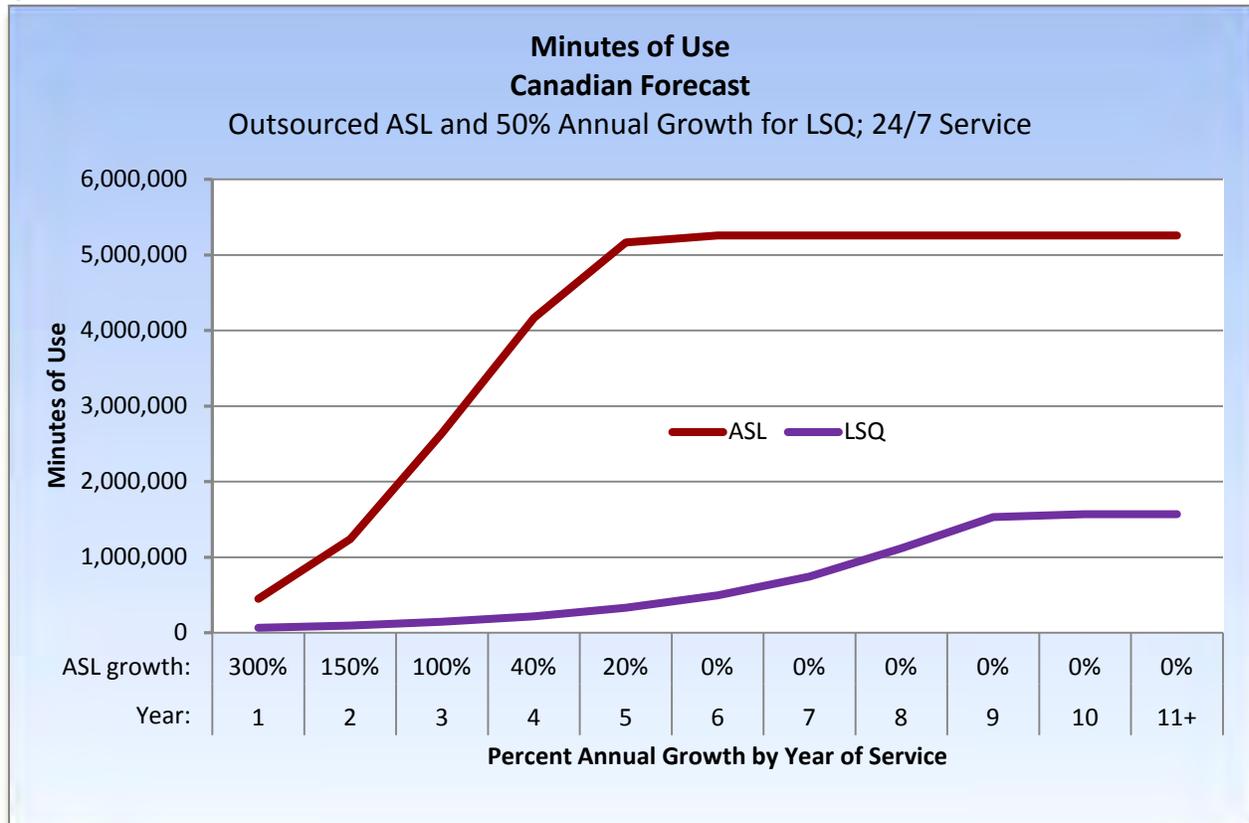
Year	Number of users (at 50% annual growth)	Annual minutes (ASL & LSQ)	Total VRS interpreters required (ASL & LSQ)	ASL VRS interpreters required (at 77%)	LSQ VRS interpreters required (at 23%)
1	751	282,723	24	19	6
2	1,127	424,715	37	28	8
3	1,691	637,388	55	42	13
4	2,537	956,342	82	63	19
5	3,806	1,434,754	124	95	28
6	5,709	2,152,391	186	143	43
7	8,564	3,228,623	278	214	64
8	12,846	4,843,232	418	321	96
9	15,345	6,656,384	574	442	132
10	15,345	6,828,525	589	453	135
11+	15,345	6,828,525	589	453	135

² See this study's phase 11, *Potential Canadian VRS Models*.

Other Considerations

- Other restrictions can be implemented that will reduce or delay anticipated consumer usage, including restricting the service to 8:00 AM to 8:00 PM, Monday through Friday, which is estimated to reduce both consumer demand and interpreter demand by about 17%.
- Outsourcing the Canadian ASL VRS to a provider located in the United States will remove the constraint of lack of interpreters on Canadian ASL user demand. LSQ VRS cannot be outsourced since LSQ interpreters are only located in Canada. Forecast usage rates of an outsourced ASL, contrasted with LSQ VRS provided from within Canada, is shown below:

Figure 3: Canadian Forecast – VRS forecast minutes of use for U.S. outsourced ASL, contrasted with Canadian LSQ



- The potential demand for Video Remote Interpreting (VRI) is unknown, and there is little data from other countries that can be used to reliably forecast the effect of including VRI within Canadian VRS.

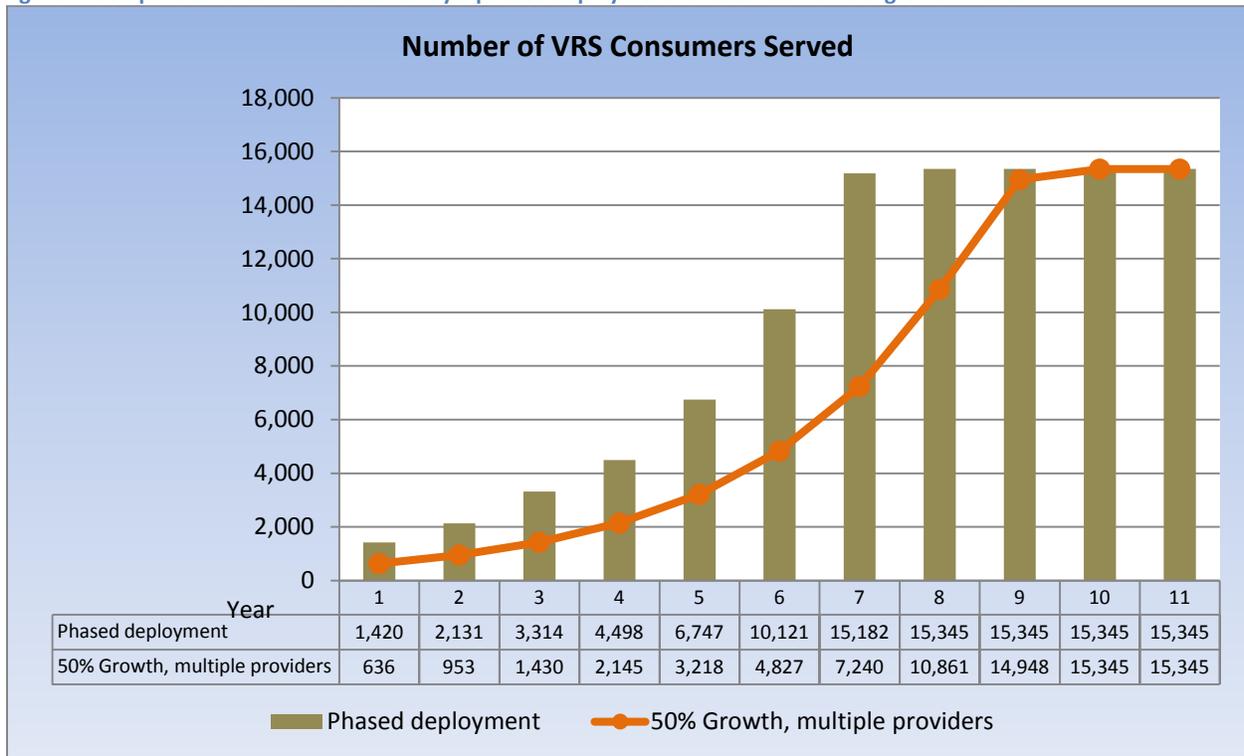
Potential Offsets

- TTY-relay use has been declining due to the availability of other text based communication technologies. A further and continuing decline of TTY-relay as a result of VRS is anticipated but this reduction is not forecast to be proportionate to the expansion of the new VRS services.

Additional Factors that May Affect Canadian Consumer Demand for VRS

- The consumers’ ability to afford hardware, software and broadband services, as well as possible fees or charges associated with the service.
- The consumers’ technical competence, as well as the age and ability of the consumer to adapt to new technologies.
- Preparation of consumers’ hardware, software and network to ensure adequate video quality and ease of use.
- The successful introduction of the VRS experience to consumers on both sides of the conversation so that they have a positive experience with VRS.
- The model of VRS selected for Canada.³ For example a two-phased approach with the first phase of VRS provided by interpreter training programs and interpreter agencies is forecast to increase the availability of interpreters and thereby initially serve more consumers. The chart below, compares the number of consumers served by a phased deployment to the number served by the 50% annual growth model:

Figure 4: Comparison of consumers served by a phased deployment versus a 50% annual growth model



³ Potential models are discussed in this VRS Feasibility Study’s phase 11, *Potential Canadian VRS Models*.

3. Conclusion

By applying reliable traffic data from the U.S. and reports from various sources, this research summary estimates the number of likely Canadian VRS consumers and their usage at full VRS saturation. It also estimates the number of video interpreters needed for both ASL and LSQ to respond to the VRS traffic at various stages and at full saturation. These estimates are presented as a ratio of current U.S. data (the U.S. Ratio), and adjusted to accommodate conditions in Canada (the Canadian Forecast).⁴ The Canadian Forecast data portrays VRS in Canada at significantly less usage than the U.S. Ratio's equivalents. The Canadian Forecast data assumptions are presented in sections 3.3, 4.0, 5.2, 5.3, 7.2 and 8, and are conservatively estimated, especially when compared to the VRS experiences of non-U.S. countries or the unique Canadian environment. Therefore the Canadian Forecast estimates (provided in this Executive Summary) might still be considered to be higher than may be actually experienced.

Although forecasts for users, traffic and interpreters are provided, achieving the realization of a VRS program will be dependent on its greatest restriction, the availability and quality of ASL and LSQ video interpreters. Other factors, including funding and the consumer experience will also influence user demand.

Nevertheless, consumer interest in VRS is very strong, as demonstrated in this VRS Feasibility Study Report's phase 3, *Consumer Interests and Perspectives*, and usage is expected to be strong if consumers are given the opportunity to access the service.

⁴ The U.S. Ratio data forecasts are not presented in this Executive Summary.

FORECASTS OF VRS USER DEMAND

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the ninth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

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- Potential impact of Video Remote Interpreting (VRI) and other ancillary services
- Impact of selected Quality of Service factors

2. Forecasting VRS Usage

This phase of the VRS Feasibility Study will endeavour to estimate the market for VRS in Canada, in terms of the population of potential VRS users and forecasts of VRS traffic (e.g. minutes of use). Admittedly, forecasts related to any new service are highly speculative.

2.1. Challenges in Accurate VRS Forecasting

To arrive at a reliable forecast of VRS user demand requires accurate data regarding the size of the user population. There have been many examples of companies, regulatory agencies and advocacy groups attempting to gather this data, and use it for forecasting VRS potential consumers. In their written reports, these groups vary in their estimates of the user population, and often refer to the difficulty in collecting accurate population data, while offering disclaimers regarding the accuracy of forecasts.

In 2004 the Pelorus Group prepared a report for Bell Canada to examine the feasibility of adding IP relay and VRS to the current Canadian relay services. When analyzing the size of the Deaf Community at that time they stated:

“There are no official numbers with regard to the size of the Deaf community since all results are self-reporting. Furthermore, the disability of deafness ranges from profoundly deaf to somewhat hard of hearing, limiting a precise definition. As such, any quantifications of size are estimates based on association reporting and statistical analysis.”⁵

Two years later, in response to the CRTC’s directives Bell Canada submitted a proposal to the Commission related to IP Relay and Video Relay Services. A section of the report related to forecasting the potential usage for these services and the size of the Deaf community. In part, this proposal stated:

“It is very difficult to find statistics on Deaf and/or Hard of hearing persons in Canada thus even harder on Bell Canada’s territory.”⁶

In 2008, GoAmerica/Purple Communications (a VRS provider in the United States) responded to the CRTC after a public hearing about VRS in Canada:

“The above referenced estimates were never meant to be definitive VRS projections and should not be treated as such. The reason is simple – while we have expertise in VRS, nobody can claim to have enough expertise in the Canadian VRS market to make such assertions.”

⁵ The Pelorus Group; “The Future of Bell Relay Services; prepared for Bell Canada; October 2004; Bell Canada (CRTC) 10Jun08-100c; PN 2008-8_Attachment 2; Abridged; page 8

⁶ Bell Canada; “Bell Canada Deferral Account Proposal for IP Relay and Video Relay Service”; July 2006

“We do not know how many Deaf Canadians know ASL/LSQ.”

“We cannot easily predict the number of minutes each Deaf Canadian will use VRS.”⁷

About that same time, Canadian telecommunications company TELUS responded to questions from the CRTC about the final stages of implementation of its Canadian VRS trial, stating:

“TELUS does not have a current estimate as to the cost per minute to provide VRS if the service were to be fully implemented.”

“At the present time, TELUS cannot estimate a cost per minute for VRS because TELUS does not know what the market demand of the service will be, how many VRS calling agent interpreters will be needed and the availability of interpreters for LSQ.”

“TELUS cannot use the current traditional message relay service usage as estimates for VRS because VRS services are fundamentally different services.”

“TELUS does not have estimates as to the migration of minutes from traditional message relay services to each of IP-Relay services and VRS services.”

“However, TELUS cannot estimate the extent and the speed of such migration at this time.”⁸

During a subsequent presentation by the Canadian Council on Disabilities (CCD) to the CRTC there was a question asked in regard to how many Deaf sign language users exist in Canada. CCD states the Canadian Association of the Deaf (CAD) would be in a better position to answer this question:

“It is the opinion of the Canadian Association of the Deaf that no fully credible census of Deaf, deafened, and hard of hearing people has ever been conducted in Canada.”⁹

“CAD submits that it is never going to be able to arrive at a precise estimate [of VRS usage] because the information necessary just does not exist and never will. There is, for example, no accepted data as to how many sign language users there are in Canada and no accepted means to collect such data. There is years of experience in the USA that can

⁷ Response to the CRTC’s Request for Further Information Following GoAmerica’s November 21, 2008 Presentation at CRTC Public Hearing Telecom Public Notice CRTC 2008-8; Unresolved Issues Related to the Accessibility of Telecommunications and Broadcasting Services to Persons with Disabilities; December 23, 2008; pages 3-5

⁸ TELUS Communications Company; CRTC Response to Undertaking PN 2008-8; TELUS Undertaking #1; November 28, 2008; Page 3 of 9

⁹ Canadian Association of the Deaf’s Position Paper on Statistics at www.cad.ca/statistics_on_deaf_canadians.php

be looked at. There is no reason that the Canadian experience will vary greatly from that in the USA once the catching up process has been completed.”¹⁰

2.2. VRS Forecast Methodology

Clearly, it is a challenge to provide reliable forecasts for the number of potential VRS users, their initial and long-term traffic estimates, and interpreter requirements.

Nevertheless, it is fortunate that there are sources for related data and consistencies in various reports that, when applied to projections for VRS in Canada, provide the foundation for this analysis. These sources include data from a number of other countries that have provisioned VRS and provide some insight into their differing models, published reports on VRS requested or published by regulators and stakeholders in a number of countries including their estimates of usage, and current and potential VRS providers who have offered proposals and reports related to actual and forecasted average usage.

While all relay providers have proven to be reluctant to share their detailed traffic data and their internal personnel forecasting methodology, the most robust data comes from the U.S., including detailed MRS data that may be used to extrapolate the numbers of users and the impact of IP Relay, captioned telephone services and VRS on traditional MRS traffic.

Ideally, in order to confirm and possibly modify forecasts based on these various sources, this background data should be considered along with the traffic reports and other results of the current limited VRS trial in Canada being conducted and managed by Sorenson Communications of Canada, ULC (Sorenson) and Telus.

This analysis will assess and apply:

- Available Canadian demographic data;
- Estimates of potential user demographics offered by Canadian consumer advocacy groups, educational institutions and other entities;¹¹
- Analysis of Canadian MRS volumes;
- Estimates of the number of qualified interpreters in Canada provided by consumer advocacy groups, educational institutions, interpreter agencies, and other entities as reported in this study’s phase 6, *Interpreter Considerations*;
- MRS and VRS data gathered from other countries and reported in this study’s phase 4, *VRS Models in Other Countries*, as well as data made public following the release of that summary;
- The impact of VRS implementation on the MRS and IP-Relay traffic; and

¹⁰ Canadian Association of the Deaf; CAD; CRTC Public Hearing Telecom Public Notice CRTC 2008-8; Unresolved Issues Related to the Accessibility of Telecommunications and Broadcasting Services to Persons with Disabilities; October 6, 2008

¹¹ These are described more fully in this VRS Feasibility Study’s phase 3, *Consumer Interests and Perspectives*.

- Data from the Telus-Sorenson VRS trial, if made available

The United States is the only country where fairly unrestricted use of VRS is available¹² on a 24-hour a day, seven days a week, basis. As there is significant volume of related data for the U.S., including TTY, captioned telephone relay services, IP-Relay, and VRS, the relay traffic patterns and implications are the most reliable basis from which to forecast what a full deployment of VRS in Canada might represent.

Additionally, comparisons with similar reports from other countries and their VRS acceptance, growth and volumes were utilized to validate the report's assumptions and calculations.

From that "full deployment model" forecast, estimates are then offered based on a multi-year deployment and acceptance of the 24/7/365 model. As this is being offered without the benefit of knowing which model the CRTC will use if they approve VRS, including variables such as the hours of operation or the future availability of resources such as interpreters, these full deployment forecasts do not incorporate these variables. From these forecasts, projections are also offered for a 12-hour service day, and the relative service availability and required resource implications of a limited schedule.

Therefore, this report has compiled comparable data scenarios that lead to a logical presumption of market size and future usage for VRS in Canada, followed by possible phased deployment estimates. Following the introduction of a widespread VRS service, and as it becomes integrated into the traditional relay offerings, the usage forecasts would be expected to be adjusted to reflect actual deployment rates and calling pattern behaviour.

Before any forecasts were calculated, a baseline of the Canadian VRS market (without VRI or speech reading) was established. There are many opinions about the size of the Deaf population and which of these are likely candidates to use VRS. Section 8.1, *Potential VRS Consumer Populations/Demographics*, provides a review of these issues and the reason certain numbers have been selected. This attempt to reconcile conflicts between the respective numbers of different reporting agencies, service organizations and stakeholders, created the following baseline estimates:

¹² VRS in the U.S. does not allow VRI when both the user and the hearing party are in the same room. Other limitations include the recent discovery of a VRS-dependent telemarketing company that generated VRS traffic and relay revenue for a particular provider; a practice that has now been ruled inappropriate.

Table 2: Canadian demographic estimates

Canadian Demographic Estimates	
Total 2010 Canadian population	34,100,000 ¹³
Total population in Canada with some form of hearing loss	3,400,000 ¹⁴
Total population identified as profoundly deaf in Canada	340,000 ¹⁵
Total sign language users (as primary language, both ASL and LSQ)	34,000 ¹⁶
Total potential ASL VRS users in Canada	26,100 ¹⁷
Total potential LSQ VRS users in Canada	7,900 ¹⁸
Total reported sign language Interpreters in Canada	782 ¹⁹
Total reported ASL interpreters in Canada	599 ²⁰
Total reported LSQ interpreters in Canada	183 ²¹

3. Canadian VRS Forecasts

VRS traffic volume, like all relay traffic, varies greatly by time of day, day of the week, day of the month. Traffic forecasts developed and presented in this study are annual projections based on usage in similar circumstances. Where traffic patterns are not available, MRS data may be used to reflect demand peaks of relay services.

¹³ Statistics Canada website, data also cited from Phase 3 report.

¹⁴ Using the formula that 1 in 1,000 of those identified as profoundly deaf use Sign as their primary language. Roots, James, *The Politics of Visual Language* 1999, pg. 5.

¹⁵ Ibid

¹⁶ Ibid

¹⁷ At 77% of total potential ASL VRS users in Canada.

¹⁸ At 23% of total potential ASL VRS users in Canada.

¹⁹ Addition of Reported ASL interpreters and LSQ interpreters (599 + 183 = 782)

²⁰ AVLIC email correspondence 05/12/2011; data also cited from this study's phase 6, *Interpreter Considerations*, page 27

²¹ Ibid; page 29

3.1. TELUS VRS Trial Data

At the direction of the CRTC, Telus is currently conducting a video relay service trial in the provinces of British Columbia and Alberta. The trial began in July 2010, and has been extended to run for 18 months, until January 2012. The implementation was approved by the CRTC in Telecom Decision CRTC 2008-1. One of the main goals of the trial is “to provide accurate market information for the Commission to decide whether VRS should be implemented in Canada.”²²

Efforts to forecast the future VRS traffic patterns and volumes in Canada may benefit from the application of consumer and traffic data generated during the current VRS trial. Unfortunately at the time of this phase of the Feasibility Study, the Telus trial data is unavailable to third parties for calculating forecast demand based on their actual Canadian usage statistics.²³

Trial data related to the number of participants, their rate of introduction to the service, the number of calls, the average call time, and traffic patterns during approved hours of operation during the trial may be useful. The lessons learned and the challenges identified in the trial should be applied to other attempts to accurately plan for VRS in Canada.

If meaningful trial data is released by the CRTC, Telus, or its VRS contractor (Sorenson) prior to the submission of this VRS Feasibility Study’s Final Report, that information will be analyzed and, if appropriate, incorporated.

3.2. Canadian VRS Forecast Using United States Data

While there may be cultural and consumer-preference differences between the services for the Deaf in the U. S. and Canadian markets, their similarities are very strong, particularly for ASL users. The U.S. remains the only country that has deployed VRS on a full time basis, over enough years to provide a reliable full saturation deployment guideline.

There are many reasons why the U.S. market serves as a good example for predicting future usage patterns in Canada, including:

²² CRTC Telecom Decision CRTC 2011-384; “TELUS Communications Company – Request for a further drawdown from its deferral account for accessibility initiatives”; June 2011

²³ According to their filings, “TELUS is filing certain information in this answer in confidence with the Commission pursuant to section 39 of the *Telecommunications Act*. This type of information comprises sensitive marketing and costing information, including a breakdown of internal and outsourced costs. These data are consistently treated in a confidential manner by the Company and cannot be disclosed to third parties by nature of the Company’s contractual agreements. In addition, the release of these data would provide TELUS’ competitors with sensitive commercial and cost information not otherwise available to them, causing the Company direct and specific harm. TELUS therefore requests that the Commission neither publish nor reveal the confidential information to any other person.” TELUS Communications Company; Response to Interrogatories; VRS Extension Request; May 3, 2011

- Geographical familiarity - similar by proximity
- Similar philosophy about providing superior services for its citizens with disabilities
- Similar telecommunications platforms and technologies
- Similar cultures for day-to-day relay services and behavioral patterns (calling patterns)
- Both countries aim for 24/7/365 availability for VRS
- Similar regulatory environment for relay services
- Both have used similar mechanisms for funding relay services
- The U.S. provides VRS in three languages (ASL, English and Spanish)

The number of people in the U.S. that use VRS at least once a year is unknown.²⁴ However, an estimate can be made based on the fact that approximately 239,000 10-digit VRS phone numbers have been assigned to people,²⁵ and many people in the U.S. who use VRS have multiple 10-digit numbers.

Reasons for having multiple numbers include:

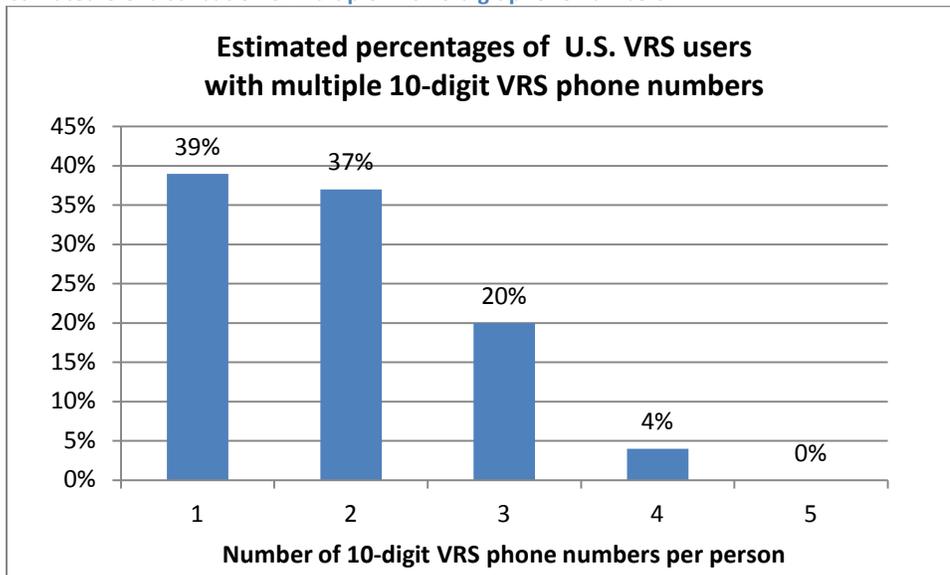
- To distinguish between different video devices, e.g., a videophone, a mobile device, a computer.
- For devices at different locations, e.g., work and home.
- Multiple devices in the same residence, e.g.: in a two-story residence or a one-story residence that is spread out.
- Distinguish between two or more VRS providers (each provider issues its own 10-digit numbers).
- Changing providers, e.g., when leaving Sorenson but keeping the VP200 (most other VRS providers can now accommodate the VP200), the original number from Sorenson is retained even though a new number is obtained from the new provider.)
- Deaf leader/advocates who want to experience more than one vendor in order to be knowledgeable about the various offerings.
- Due to the strong emergence of mobile devices compatible with VRS.

An estimated distribution as shown in the following chart (Figure 5) results in an estimated total of 155,748 people in the U.S. who use VRS, with a ratio of 10-digit numbers to users of about 1.5 to 1, i.e., the average user has 1.5 phone numbers (239,000 VRS phone numbers / 155,748 users = 1.53 numbers per person).

²⁴ In a Mission Consulting conversation with the FCC on October 21, 2011, FCC staff stated they did not know the number of U.S. VRS users; <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021739255>.

²⁵ As of February 2011 there were approximately 239,000 10-digit numbers and 210,000 unique resource identifiers per TRS Advisory Council minutes of April 14, 2011, at <http://www.r-l-s-a.com/TRS/AdvisoryCouncilMinutes4-11-2011.pdf>.

Figure 5: Estimated U.S. distribution of multiple VRS 10-digit phone numbers²⁶



The resulting 155,748 U.S. VRS users represent approximately 39% of the Deaf ASL population in the U.S.²⁷ While there are no available statistics to corroborate the percent of people who prefer sign language as their primary language choice that also use VRS, the FCC has indicated that it considers that the number of people who use VRS is “low” compared to the number who could be using it.²⁸

Finally, we seek information about other reasons why potential users do not actually use VRS. What factors, including practical, economic, or informational, contribute to the apparently low adoption rate?²⁹

When the ratios of the total population to the number identified as the Deaf population in the respective baselines from Canada and the U.S. are compared the results are similar. Therefore, aside from possible cultural and consumer-preference variables, an argument can be presented to use existing

²⁶ Although there is no available statistical data to support the distribution shown in this chart, a reasonable attempt to quantify distribution as depicted herein provides a more accurate estimate of the number of people who use VRS in the United States, than would be the case without any distribution or adjustment for multiple phone numbers.

²⁷ This percentage is in line with the percentage of VRS users of the signing population experienced in other VRS countries such as Denmark, Sweden, Finland, Norway, and Germany, where usage typically ranges from 10% (Denmark) to 50% (Sweden). See the study’s phase 4, *VRS Models in Other Countries*.

²⁸ The “low” usage rate only applies to relayed video calls (using an interpreter), not to point-to-point video calls which occur about five times more than relayed calls. (Mission Consulting private correspondence with U.S. VRS providers.)

²⁹ At paragraph 47 of FCC Notice of Inquiry, In the Matter of Structure and Practices of the Video Relay Service Program, document 10-111 released June 28, 2010, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-111A1.doc.

VRS usage patterns in the United States to extrapolate and forecast data applicable to the introduction of VRS in Canada. This approach would include projections for numbers of users and minutes of use, as well as forecasting the number of required interpreters at full deployment.

To further compare the two countries, a statistical baseline for the United States must be established. As significant data exists for reporting on U.S. relay services, this information is included in the baseline. With consideration for the accuracy of conflicting data sources, the following baseline estimates are used in this forecast.³⁰

Table 3: U.S. demographic estimates

United States Demographic Estimates	
Total 2010 U.S. population	310,877,000 ³¹
Total Deaf ASL user population in the U.S.	400,000 ³²
Total number of VRS users in the U.S.	155,748 ³³
Total identified sign language interpreters in U.S.	15,500 ³⁴

At this time, the FCC does not require U.S. relay providers to submit detailed VRS reports on hourly or daily traffic activities, unlike the detailed MRS traffic reports required by certain individual states. Furthermore, very little independent validation and verification was required by the FCC for U.S. VRS providers in conjunction with their invoices for services provided. Therefore when considering the total U.S. VRS traffic volumes and average speed of answer (ASA) performance, these are highly averaged statistics. As such they often do not reflect possible service level variations, such as long wait times in high volume periods or in low volume languages (i.e. Spanish). However, for forecasting total VRS volumes and averages, this data is as accurate as is publically available.

The baseline to which this analysis endeavors to initially forecast is the full saturation of VRS in Canada, similar to the adjusted penetration ratios and current traffic patterns documented in the U.S. VRS market.

³⁰ See this study’s Phase 4, *VRS Models in Other Countries*.

³¹ United States Census Bureau; 2011 Update; U.S. National Census Data 2010

³² Note that this estimate is without statistical basis: “...misunderstandings and misrepresentations of what is known about the demography of deafness and ASL use in the Unites States are widespread. ...there has never been a true study of ASL use in the general U.S. population... no statistics exist.” From [How Many People Use ASL in the United States? Why Estimates Need Updating](#), Ross E. Mitchell, Travas A. Young, Bellamie Bachleda, and Michael A. Karchmer, Gallaudet Research Institute Gallaudet University at http://research.gallaudet.edu/Publications/ASL_Users.pdf.

³³ See section 3.2, above.

³⁴ www.RID.org; Registry of Interpreters for the Deaf website; about RID; Interpreters

This forecasting methodology was also recently employed by Ofcom in a VRS feasibility study published on July 28th 2011 for VRS in the UK. The Ofcom report utilized almost identical points of data from the U.S. for their calculations that are being applied in this analysis to forecast the “full saturation model” in Canada.³⁵

From our Canadian *full deployment* projection, phased introduction models are postulated. These “take-up” or adoption projections, for the gradual introduction of VRS in Canada, are highly dependent on many variables. These include:

- A strategic plan to expand the service *within* the likely limitations of the number of qualified interpreters and available VRS provider facilities
- The consumers’ preexisting experience with point-to-point video and broadband services
- The consumer’s ability to afford hardware, software and broadband services, as well as possible fees or charges associated with the service
- The consumer’s technical competence, as well as the age and ability of the consumer to adapt to new technologies
- Preparation of consumers’ hardware, software and network to ensure adequate video quality
- Outreach to inform users of reasonable expectations from the service
- The successful introduction of the VRS experience to consumers on both sides of the conversation so that they have a positive experience with VRS
- Communication preferences of the consumers and whether those preferences are offered³⁶
- A commitment to fund the service if it grows at a higher than anticipated rate
- The VRS model selected for Canada³⁷ - for example some models may allow for a more rapid initial deployment than are projected in section 5.2 of this phase 9.

Also, as perhaps may have been experienced in the Telus VRS trial, the initial volume of traffic and perceived consumer adoption rate can be impacted by the number of users allowed into the program, by issues such as limitations in equipment distribution/installation, and by registration requirements.

Notwithstanding restrictions as described above, once an initial level of traffic is determined, the longer term forecast can be revised by applying estimated growth rates onto the Canadian initial (such as the first year’s) deployment statistics.

³⁵ Ofcom; UK communications regulator; “Review of Relay Services”; July 28, 2011, at http://stakeholders.ofcom.org.uk/binaries/consultations/review-relay-services/summary/relay_services_final.pdf.

³⁶ For further detail regarding communication preferences, see this study’s phase 3, *Consumer Interests and Perspectives*.

³⁷ See this study’s phase 11, *Potential Canadian VRS Models*.

3.2.1 Initial Application of U.S. Full Saturation and Usage Statistics

A compilation of estimated U.S. and forecast Canadian VRS demographics are presented below.

Table 4: U.S Population and VRS usage

U.S. Population and VRS Usage	
Total population	310,877,000
VRS users	155,748 ³⁸
VRS users as a percentage of total population	0.050% ³⁹
Actual reported 2010 VRS traffic minutes	98,836,425 ⁴⁰
Estimated average annual VRS minutes per user	635 ⁴¹

Table 5: Canada forecasts at VRS usage saturation, using U.S. Ratios

Canada Forecasts at VRS Usage Saturation using U.S. Ratios	
Total population	34,100,000
Forecast ASL & LSQ VRS users (at 0.050% of population)	17,050
Forecast number of ASL VRS users (at 77% of users)	13,128
Forecast number of LSQ VRS users (at 23% of users)	3,922
Estimated average annual VRS minutes per user	635
Forecast of Canadian VRS annual minutes	10,826,750

3.3. Canadian VRS Forecast Using Adjusted U.S. Data

Although forecasting Canadian VRS numbers as presented above from the U.S. data as it is offered by NECA and FCC results in 17,050 total users and 10,826,750 annual minutes, there are a few important reasons why these numbers may be too high for Canadian VRS.

³⁸ See section 3.2.

³⁹ $155,748 / 310,877,000 = 0.000501$

⁴⁰ Actual 2010 annual VRS traffic of 98,836,425 minutes; NECA Video Relay Service Terminating Call/Minute Summary July 2009 – June 2010.

⁴¹ Calculation of 98,836,425 minutes divided by 155,748 users = 634.6 minutes per user.

First, recent discussions with the FCC indicate that the number of minutes of fraudulent VRS calls experienced in the U.S. may not yet have been sufficiently dealt with, and that there likely is still a significant number of minutes that may be due to fraud or misuse of VRS.⁴² An estimate of the percent of minutes that may still be attributed to fraud and misuse was not provided by the FCC, except to say that the approximately 10% decline in VRS minutes in 2009-2010 potentially represents only a minor portion of the number of minutes that may still be inappropriately being billed to VRS. Assuming that Canada does not adopt a high reimbursement rate and payment scheme that encourages such fraud and misuse, it would therefore be reasonable to assume that the total number of minutes forecast for Canada should be based on a number of U.S. VRS minutes that is further reduced from the current U.S. experience.

The question is what level of further reduction is appropriate for forecasting purposes? A ten percent further reduction would seem to be conservative if the current reduction only represents a small portion of the actual fraud that is occurring. A twenty percent reduction might be more realistic. However, for conservative estimating purposes only a 10% reduction will be used. This means that due to potential continuing U.S. fraud and misuse, the 10,826,750 annual minutes of VRS forecast above for Canadian VRS should be adjusted downwards by 10%, to 9,744,075 minutes.

Second, an argument can be made that because the U.S. does not require interpreters for VRS to be RID certified, and because the VRS providers hire many individuals who are not RID certified (because they are available and they are less expensive than RID certified interpreters), the quality of the interpreting may be less than if only RID certified interpreters were used. Reduced quality of interpreting results in slower conversations from repeating signs, finger spelling of words that should be signed, slow signing, more time trying to understand and confirm understanding of each party, etcetera. This slower conversation time results in calls that are longer than would have been experienced with more skilled interpreters. However, because Canada has very few ASL certified interpreters and no LSQ certification, and since it is not yet known what level of proficiency Canadian VRS may or may not require, no adjustment in the number of minutes based on longer calls than necessary due to poor interpreter skills will be made at this time for forecasting purposes.

However, there are two more factors that suggest that the number of users and the number of minutes experienced in the U.S. are disproportionately higher than will be experienced in Canada. The next (or third) factor is that in the U.S., the very high reimbursement rates based on what the providers claimed, together with the model that allows any company that meets minimal conditions to be reimbursed at these high rates, led to very aggressive marketing campaigns (including free consumer equipment and setup) on the part of the U.S. VRS providers. Providers applied enormous emphasis and resources toward getting people to sign up and to use their VRS devices. Thus the total percentage of VRS users recruited in the U.S. and their number of minutes may be significantly higher than the percentage in Canada if Canada does not adopt a similar model that encourages the VRS vendors to engage in such aggressive marketing, product placement, and usage.

⁴² See <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021739255>.

The last reason the number of users and the number of minutes may be higher using only the U.S. data is based on timing. When VRS was introduced in the U.S., other efficient forms of text communication had not yet been adopted by both the Deaf and hearing populations. There was a greater need for VRS at that time. This was also the case in Sweden where VRS began to be available in the late 1990's. In both countries, this also resulted in high VRS adoption rates. However, in countries that have adopted VRS after the prevalence of cell phone texting, email, and IP chat became popular, such as Denmark, Finland, Norway and Germany, these countries have experienced a significantly lower percentage of VRS users and few VRS minutes per user. This has been the case even though in many of these countries VRS has been a free public service, often with free consumer devices. Discussions conducted as part of the research for this study relative to usage in these countries suggest that typical VRS users are mostly between the ages of 30 and 50, and that people below 30 generally prefer to use the prevalent text modes of communication indicated above instead of VRS.⁴³ (This is similar to young hearing people in most developed countries today preferring text over voice.)

Without the aggressive marketing and pressure imposed by vendors to use VRS, and considering the general adoption of texting in lieu of voice across all strata of society today, and considering that many people who are Deaf and sign have never adopted an accommodation of the voice telephone culture and may prefer to continue to rely upon texting instead of VRS (unlike in the U.S. where the early availability of VRS and the lack of text communication encouraged many people to adopt VRS), the adoption of VRS and average usage per person are expected to be significantly less than in the U.S.

Therefore, it is reasonable to expect the Canadian adoption rate to not be as high as in the U.S. This is also presently being experienced with the much slower adoption rate than forecast for Canadian IP-relay, potentially for the same reason.⁴⁴ Combining the above factors suggests that the adjusted number of users and minutes should be further reduced for a more accurate forecast. A recommended further reduction of 10% of users and 30% of minutes per user is recommended,⁴⁵ resulting in a total of 15,345 people who will eventually use VRS [17,050 x 0.9], and a total of 6,820,853 annual minutes [9,744,075 x 0.7], with an average of 444.5 annual minutes per person (37 minutes per person per month).⁴⁶

⁴³ A market survey is expected to be conducted in 2012 in Sweden, Norway and Finland to examine the patterns of usage, age groups, etc.

⁴⁴ While Deaf advocates have stated that the low take up rate for IP-relay may be due to the program design that requires consumers to have an account with the telephone company that offers the IP-relay service, Bell Canada has stated that even among customers who have both Bell telephone and IP services, the IP-relay adoption is far below forecasts.

⁴⁵ 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 VRS.

⁴⁶ A forecast average of 37 minutes per user per month may still be high, when compared with Sweden, which is currently experiencing 23 minutes per month per user (calculated the same way as the average number of minutes is calculated in this study: 1,120,000 annual minutes divided by 4,100 people who use the service at least once a year). Actual *monthly* usage in Sweden is 1,200 people using VRS at least once during the month with an average of 43 minutes per user. This reflects that many Swedish people only use VRS a few times a year. This is in an

[footnote continues on next page]

The above numbers of this Canadian Forecast are shown in Table 6 below:

Table 6: Canada forecasts at VRS usage saturation, using Canadian Forecast

Canada Forecasts at VRS Usage Saturation using Canadian Forecast	
Total population	34,100,000
Canadian Forecast of ASL & LSQ VRS users (equates to 0.045% of population)	15,345
Forecast number of ASL VRS users (at 77% of users)	11,816
Forecast number of LSQ VRS users (at 23% of users)	3,529
Estimated average annual VRS minutes per user	444.5
Forecast of Canadian VRS annual minutes	6,820,853

The forecasts in the remainder of this analysis will depict numbers (shown as “U.S. Ratio”) that are based on the U.S. equivalent forecasts from section 3.2, *Canadian VRS Forecast Using United States Data*, and also numbers (shown as “Canadian Forecast”) that are based on the revisions provided in this section 3.3, *Canadian VRS Forecast Using Adjusted U.S. Data*. **The “Canadian Forecast” represents the most probable forecast for Canada for a fully deployed 24 x 7 VRS at an eventual maximum usage rate.** The “U.S. Ratio” numbers are shown for comparative purposes only.

4. Interpreter Staffing Forecasts

4.1. VRS Interpreter Staffing Variables

Forecasts for the number of interpreters required to support VRS are dependent on many variables. These include:

- The types of approved services supported - such as only sign language versus also including other service modalities like speech reading or Video Remote Interpreting (for individuals within the same room).
- Reductions in hours of operation – such as offering VRS only during a set number of hours a day and not on a 24-hour basis, or reduced hours of operation on certain days of the week.

environment in which Sweden provides videophone equipment to all VRS users for free, and has had VRS longer than in the U.S. (people have learned and accommodated the voice telephone culture.)

- Constrictions on user access to VRS – such as limiting the consumers to a fixed number of minutes of use per week or month, or restricting use to only governmental and business applications.
- The natural inefficiencies when all interpreters are not qualified to answer all calls – such as the reasonable and anticipated equal access for both LSQ/French and ASL/English service, even though there will be times when one language service is very busy and the other may have interpreters waiting for calls.
- The skill level of the interpreter and their individual ability to efficiently set-up a call understanding the consumers’ individual requests and needs.
- The policies of the relay provider – such as the number of minutes an interpreter may be required to engage in VRS calls per hour, or the frequency and length of breaks.
- The availability and deployment of interpreters fluent in ASL/English and LSQ/French.
- The use of full time and part time personnel.
- Limitations on other provider personnel resources – such as limitations on the number of installers who may be required to set-up consumers’ equipment before relay services may begin.

4.2. VRS Staffing Forecasts

Without the benefit of applying historical VRS traffic patterns for Canada, the individual skills of the interpreters, the policies of the selected providers, and the other considerations presented above, the number of interpreters required for VRS are estimated below. Ratios and assumptions are based on prevalent VRS and interpreter experience in the U.S., using figures of the dominant U.S. VRS provider’s projections for VRS in the United Kingdom (U.K.).

VRS has been deployed in the U.K. since 2004, but as a limited service available only to the workplace.⁴⁷ The U.K. Office of Communications (Ofcom) is the regulatory agency over public relay, and is in the process of assessing the potential of a public VRS for the U.K. Ofcom has published a report titled, *Review of Relay Services* (Ofcom report) in which it forecasts VRS usage and costs.⁴⁸ As part of the influence and debate on this topic, the Ofcom report references a separate report titled *Video Relay Service in the UK*. This latter report was written by a firm called Europe Economics and paid for by Sorenson Communications (the EE/Sorenson report).⁴⁹ While Ofcom disagrees with a significant part of the economic benefit analysis of the EE/Sorenson report, the report does provide significant information

⁴⁷ VRS in the U.K. is a limited commercial service funded by a government “Access to Work” program, and also charged to some public agencies that use the service. See this study’s phase 4, *VRS Models in Other Countries*.

⁴⁸ Ofcom, *Review of Relay Services*, July 28, 2011, available at: http://stakeholders.ofcom.org.uk/binaries/consultations/review-relay-services/summary/relay_services_final.pdf.

⁴⁹ Available at <http://www.vrstoday.com/wp-content/uploads/Revised-Final-Europe-Economics-Report.pdf>. “VRStoday.com” is a website hosted by Sorenson to ostensibly represent U.K. sign language users’ views regarding the need for VRS in the U.K.

in its forecasts for the U.K. concerning interpreter demand forecasts. For the most part the report uses interpreter data based on the U.S. experience.⁵⁰

For the U.K., the EE/Sorenson report forecasts that 1,080 full time equivalent (FTE) VRS interpreters are needed to handle 31,008,000 annual minutes of VRS, or about 29,000 VRS minutes per FTE VRS interpreter (VI) per year for a free VRS operational 24/7 without access restrictions. Applying 29,000 VRS minutes per FTE VI to the U.S. Ratio (high forecast) of 10,826,750 total annual minutes of Canadian VRS, results in a total requirement of 373 total FTE VIs each working 37.5 hours a week. Applying 29,000 VRS minutes per FTE VI to the more probable Canadian Forecast of 6,820,853 total annual minutes of Canadian VRS, results in a total requirement of 235 total FTE VIs each working 37.5 hours a week.

However, the EE/Sorenson report points out that in the U.S., eighty percent of the interpreters do not work full time for VRS. It states that U.S. interpreters typically work between 10 and 20 hours a week with an interpreter efficiency of 25%. Ofcom uses an average of 15 hours a week in its projections and an interpreter efficiency of 28%. These numbers are corroborated by Mission Consulting from past confidential VRS research assignments and experience within the VRS industry. Video interpreting is a physically and mentally very intense activity, and few VIs choose to work within VRS for a long period. Most VRS firms employ VIs in shifts of 4 hours or less, and as stated above, usually only 10 to 20 hours a week. Therefore, for the purpose of determining how many additional interpreters will be needed for Canadian VRS, it is necessary to assume that VI's will be employed part-time as is common industry practice. Using an average of 224 eight-hour work days in a year (applying adjustments for holidays, vacations, sick time, and training) for an average 34.5 hour work week, and an average of 15 hours per week per VI, the percent of work time per VI is 43.5% resulting in a factor of 2.5 for the number of actual interpreters needed to fulfill each FTE position.⁵¹ Thus, for the equivalent U.S. Ratio (high forecast), 933 fully trained sign language interpreters (each interpreting an average of 11,600 annual VRS minutes) are needed in Canada in order to provide staffing equivalent to 373 FTE VIs.⁵² For the more probable Canadian Forecast, 588 fully trained sign language interpreters (each interpreting an average of 11,600 annual VRS minutes) are needed in Canada in order to provide staffing equivalent to 253 FTE VIs.

⁵⁰ The proprietary operational data provided in the report is referred to as based on the "general U.S. experience". However since Sorenson is estimated to handle 80 to 85 percent of all U.S. VRS traffic, "general U.S. experience" may be considered almost synonymous with the experience of Sorenson Communications.

⁵¹ Actually a factor of 2.3 adjusted for the difference in work week (37.5 vs. 34.5 hours) resulting in a factor of 2.5.

⁵² 11,600 annual minutes also represents a 25% efficiency for a 15 hour work week. At 28% (the Ofcom estimate) the number of annual minutes would be about 13,100 per VI. The 25% rate can be used for a 24x7 service, while the 28% rate can be used for a service that does not operate on the weekends and at night. See section 7 of this paper. Minutes of use throughout this feasibility study represent minutes of relayed conversation time. Non relay time is spent on required breaks, waiting for calls, call set up, call wrap up, training, and other duties.

The EE/Sorenson report suggests that for the U.K., the total number of needed VRS part-time interpreters will be supplied in large part by the existing pool of interpreters.⁵³ However in Canada this is not a practical assumption. There are presently 599 ASL Canadian interpreters (members of AVLIC); however an estimated one-third of these are already employed by Sorenson providing VRS for U.S. consumers. The result is a present significant shortage of ASL interpreters. Requests for community interpreting are not being met.⁵⁴ While some percentage of the existing interpreters may end up working in VRS, more interpreters are needed to provide more community interpreting to meet the current demand. Likewise, the need for LSQ community interpreters is also not satiated. While LSQ interpreters are not working for U.S. VRS, the LSQ interpreter environment has the challenge that there are no LSQ interpreting standards, and the training program reports that many students do not complete their interpreting curriculum because they can get interpreting work without a training certificate. Thus LSQ faces the double challenge of not enough community interpreters and no established interpreter certificate or proficiency standard.⁵⁵ In Canada's community interpreting environment, it would likely be a significant hardship if there was a depletion of skilled interpreters who are currently servicing the Canadian Deaf population. For these reasons neither the existing ASL or LSQ interpreter pools should be expected to diminish the number of interpreters necessary for Canadian VRS.

Statistics Canada and other sources cite 20.1% to 24.8% ratio of French speakers to the total population.⁵⁶ We have applied a 23% LSQ and 77% ASL ratio to this study, including the relative percentage of needed LSQ and ASL interpreters. Applied to the existing numbers of LSQ and ASL interpreters, the total of each to support VRS is shown in the following chart. Like all forecasts, this will need to be confirmed as the service is deployed, in the event that there may need to be a higher (or lower) ratio of VRS interpreters for each language group.

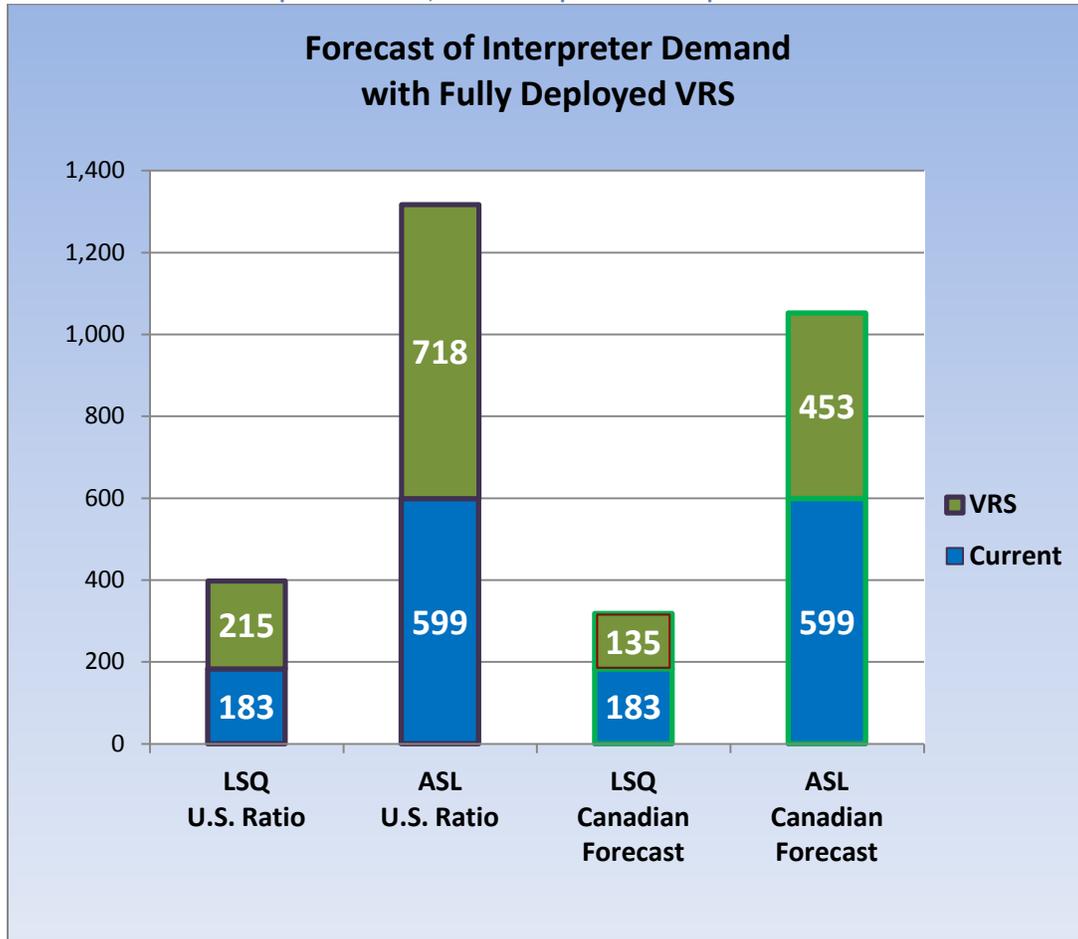
⁵³ Paragraph 2.29 of the EE/Sorenson report states that VRS in the U.K. will be supplied by the existing pool of 519 certified British Sign Language interpreters and by a larger unknown pool of uncertified interpreters that Sorenson claims are available but not working due to lack of demand (interpreting jobs). At paragraph 2.36 the EE/Sorenson report states that these uncertified and non-working interpreters only need interpreter training supplied by the VRS provider in order for the uncertified interpreters to be able to adequately interpret in a VRS setting. Ofcom does not address the Sorenson assumption that such minimal training is sufficient. For its Canadian VRS trial Sorenson initially used this approach, hiring interpreters that were not AVLIC members and thus had not graduated from a university sign language program. VRS trial users interviewed by Mission Consulting for this study reported that during this period the interpreting quality was so bad that they would often disconnect and call back multiple times until they obtained an interpreter with sufficient skills. It has been reported that Sorenson has subsequently changed its practice and currently only hires AVLIC members for the trial.

⁵⁴ The Canadian Hearing Society (CHS), which provides extensive community interpreting, reports that 30% of the requests that it receives for interpreting services cannot be met due to a shortage of interpreters. Gary Malkowski, CHS communication with Mission Consulting, 9/28/2011. Also see this study's phase 6, *Interpreter Considerations*.

⁵⁵ See this study's phase 6, *Interpreter Considerations*.

⁵⁶ This matches the data gathered by IPSOS when they conducted an online survey of 1,299 Deaf and hard of hearing people for this study's phase 3, *Consumer Interests and Perspectives*. Within the survey the ratio of ASL/English to LSQ/French was in the range of 4 or 5 to 1 (25% or 20%). However, the survey was not randomized.

Figure 6: Forecast of Canadian interpreter demand; numbers of part-time interpreters



For the equivalent U.S. Ratio (high forecast) an additional 933 interpreters are estimated to be needed (215 for LSQ and 718 for ASL) for a fully mature VRS serving 17,050 sign language users 24 x 7 at an average of 635 annual minutes per user.⁵⁷ For the more probable Canadian Forecast an additional 588 interpreters are estimated to be needed (135 for LSQ and 453 for ASL) for a fully mature VRS serving 15,345 sign language users (3,529 LSQ and 11,816 ASL) 24 x 7 at an average of 444.5 annual minutes per user.⁵⁸ These numbers are for a fully deployed and fully adopted VRS.

4.3. Key VRS Interpreter Demand Variables

The demand for LSQ and ASL interpreters to fulfill the needs of a potential Canadian VRS is dependent upon a number of factors as suggested in section 4.1. However, three variables are key to the demand

⁵⁷ The numbers of full time equivalent (FTE) interpreters represented by these numbers for the U.S. Ratio (high forecast) are 372 total: 86 LSQ and 287 ASL.

⁵⁸ The numbers of full time equivalent (FTE) interpreters represented by these numbers for the Canadian Forecast (probable forecast) are 235 total: 54 LSQ and 181 ASL.

estimates. The first is that the number of VRS consumers may be higher or lower than the number of users forecasted. The second is that the average number of annual minutes per user may be larger or smaller than that forecasted. The third is that the average number of VRS hours worked per part-time VI may be more or less than the 15 hours per week forecasted. All of these variables will be shown below compared to the two baseline forecasts (U.S. Ratio and Canadian Forecast) previously used. Of the two, the Canadian Forecast baseline is presumed to represent the probable baseline for Canada. Potential combinations of these variables are not depicted.

4.3.1. The number of VRS consumers may vary

The interpreter demand forecast for a 24 x 7 fully subscribed service is based on the assumption that there will be 15,345 VRS users in the Canadian Forecast, (or 17,050 users in the U.S. Ratio forecast). However, as described in this study's phase 3, *Consumer Interests and Perspectives*, there are no reliable statistics on the number of sign language users in the U.S. or Canada. The forecasted number of Canadian VRS users is based on the best estimates available, as well as comparing an estimated U.S. Deaf population with the calculated (estimated) number of VRS users. The actual number of Canadian VRS users may differ from the 15,345 (or 17,050) forecast. The difference will affect the total number of VRS minutes, and therefore will affect the demand for VRS interpreters.

The following table depicts the forecasted number of part-time VRS interpreters needed, associated with potential changes in the number of VRS users. The baseline forecast is shown in bold.

Table 7: U.S. Ratio – 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%	13,640	8,661,400	746	172	574
-10%	15,345	9,744,075	840	194	646
0%	17,050	10,826,750	933	215	718
+10%	18,755	11,909,425	1,026	237	790
+20%	20,460	12,992,100	1,120	258	862

Table 8: 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

4.3.2. The average number of VRS minutes per consumer may vary

In the U.S. Ratio forecast, the average number of minutes per VRS consumer is forecast at 635 annual minutes, or 53 minutes a month. In the Canadian Forecast, the average number of minutes per VRS consumer is forecast at 444.5 annual minutes, or 37 minutes a month. Both forecasts are for a fully subscribed service with maximum usage. However, the Ofcom report for potential VRS in the U.K. offers three widely varying projections: 30 minutes per month per user, 50 minutes, and 100 minutes. While this study's forecast for Canadian VRS is based on the average U.S. consumer's usage rate or an adjustment to it, an increase (or decrease) in VRS minutes actually used by Canadian consumers of VRS will make a proportional increase (or decrease) in interpreter demand.

The forecast of the demand for the number of part time VRS interpreters based on the U.S. Ratio average of 635 annual minutes of VRS use per average consumer are shown below in Table 9 for a 24 x 7 VRS servicing 17,050 consumers, each averaging: 735 annual minutes, the baseline estimate of 635 annual minutes, and 535, 435 and 335 annual minutes. A similar forecast of part time VRS interpreters for the Canadian Forecast is shown in Table 10 with a different range of annual minutes. In both tables the two baseline forecasts are shown in bold font.

Table 9: U.S. Ratio – Changes in interpreter demand for variances in minutes per user, for 17,050 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%)
335	28	5,711,750	492	113	379
435	36	7,416,750	639	147	492
535	45	9,121,750	786	181	605
635	53	10,826,750	933	215	718
735	61	12,531,750	1,080	249	831

Table 10: 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

While the above tables are illustrative of the effect of potential differences in consumer usage, they may also be used to gauge the effect of potential restrictions on consumers' usage that may be imposed by policy in order to limit or control the need for VRS interpreters.

4.3.3. The number of hours worked by VRS interpreters may vary

Based on the typical VRS staffing experience in the U.S. stated by Sorenson in the EE/Sorenson report and adopted by the Ofcom report, the forecasted number of hours worked per week by the typical Video Interpreter is 15 hours at an average VI efficiency of 25% resulting in approximately 11,600 annual minutes of VRS per part-time interpreter. However the Canadian experience may be that the average interpreters engaged in VRS may work more or less than 15 hours a week, and therefore may relay more or less than the 11,600 annual minutes. An increase or decrease in the average working hours can have a dramatic impact on the overall number of interpreters needed for a full 24 x 7 fully subscribed VRS experiencing 10,826,750 (U.S. Ratio, Table 11) or 6,820,853 (Canadian Forecast, Table 12) annual minutes of use, at 25% interpreter efficiency, as shown in the tables below. The baseline forecasts are shown in bold.

Table 11: U.S. Ratio – Number of part-time interpreters needed for different hours worked per week; 10,826,750 annual minutes

Average hours worked per week	Annual minutes relayed per part-time VI	Total VRS interpreters needed (LSQ & ASL)	LSQ VRS interpreters needed (at 23%)	ASL VRS interpreters needed (at 77%)
10	7,733	1,400	322	1,078
15	11,600	933	215	718
20	15,467	700	161	539
25	19,333	560	129	431

Table 12: Canadian Forecast – Number of part-time interpreters needed for different hours worked per week; 6,820,853 annual minutes

Average hours worked per week	Annual minutes relayed per part-time VI	Total VRS interpreters needed (LSQ & ASL)	LSQ VRS interpreters needed (at 23%)	ASL VRS interpreters needed (at 77%)
10	7,733	882	203	679
15	11,600	588	135	453
20	15,467	441	101	340
25	19,333	353	81	272

5. Forecast of Canadian VRS Adoption Rate

The preceding sections present VRS forecasts when all forecasted consumers are using VRS and are doing so at a forecasted maximum average use per consumer. This section discusses the fact that due to constraining factors this maximum forecast usage is not expected to be reached for a number of years, if ever.

A reasonably large amount of data on VRS usage and traffic patterns are available for the U.S. market from the FCC and its administrative contractors, and information on other countries' VRS has also been referenced in published reports and in research conducted for this feasibility study's phase 4, *VRS Models in Other Countries*. As the amount of data is most extensive for the U.S. market, that data will be used and adjusted as appropriate to create the basis of Canadian VRS adoption forecasts. The information from other countries is also used to reflect consistency in usage patterns and adjustments to the forecasts as applicable.

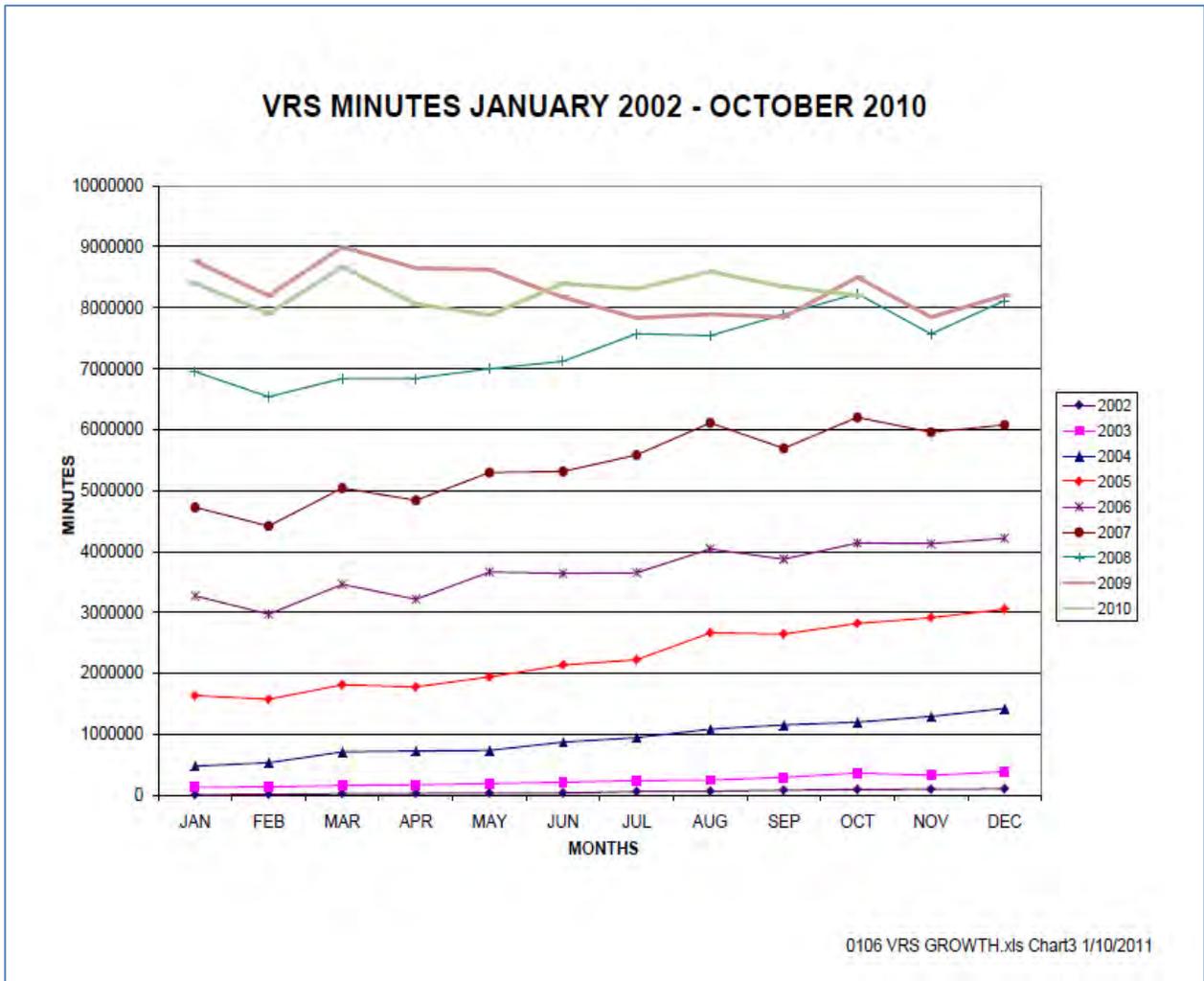
5.1. U.S. VRS Adoption Rate

Technical trials of video relay services began in the United States in the mid 1990's in Texas. However it was not until the FCC approved the service for payment from the TRS Interstate Fund in 2000 that VRS became a national program. In 2002 the FCC reimbursement rate was increased to \$17 USD per service minute, and this encouraged many MRS providers and others to enter into the VRS business. The initially very high FCC reimbursement rates to vendors and a virtually unlimited fund source resulted in aggressive consumer marketing and deployment by U.S. VRS vendors, and a high rate of consumer adoption of the service. As stated in this study's phase 4, *VRS Models in Other Countries*, the high level of the FCC's funding helped create a highly competitive market with providers promoting their individual services as users transitioned from text-based TTY and IP relay.

In 2005 VRS volumes jumped dramatically and continued to have exponential growth until mid-2009. For example, the FCC reported 869,003 minutes of VRS use for June 2004, and a year later it reported 2,136,657 minutes of use in June 2005, a one year increase of 246%.⁵⁹ This spike in traffic is attributed by the FCC to be in part due to fraudulent activities, which then became highly publicized as the FCC sought to tighten controls over the regulations governing VRS. Figure 7 on the next page reflects the initial adoption rate and the annual growth of VRS in the U.S.

⁵⁹ FCC, "Reminder That Video Relay services (VRS) Provides Access to Telephone System Only and Cannot Be Used as a Substitute for In-Person Interpreting Services or Video Remote Interpreting (VRI); Summary of Commission's document DA 05-2417, in CG Docket No. 03-123; Notice dated 10/12/2005

Figure 7: Adoption rate of VRS minutes of use 2002 – 2010, U.S.⁶⁰



Comments on Figure 7, above:

- VRS minutes expanded steadily for the first six years of service.
- Monthly totals each year exceeded the same month in the previous year by 1 to 2 million minutes.
- In 2009 and 2010 VRS traffic appears to plateau at approximately 8 million minutes per month.
- The December 2008 level for VRS is similar to December 2009 and 2010.

⁶⁰ NECA, TRS Fund, VRS terminating call/minute summary 2010

5.2. Application of the U.S. Adoption Rate to Canada's VRS Forecast

Discounting the first year (2002), it took approximately six years for the U.S. market to achieve a stable full saturation in a 24/7 service. After reaching market maturity around 2008, additional increase in U.S. VRS minutes of use were largely due to fraudulent activities of certain VRS providers that the FCC has identified in its recent rulings. As indicated in section 3.3, some additional portion of the growth of VRS in the U.S. can be attributed to fraud and abuse. Unfortunately it is not possible to confirm the actual amount of fraud that impacted the minutes of use reported by NECA from 2000 to 2010.⁶¹

The primary factors that delayed the growth of VRS in the U.S. over this time period were:

- Lack of universal access to sufficiently fast broadband services
- Insufficient development of appropriate user technologies (video phones, software, etc)
- Insufficient numbers of qualified interpreters

All three of these issues improved over time to the degree that after six years, these restraints were effectively non-existent. Note that VRS program funding was not a restrictive factor in the deployment of VRS in the United States. In fact, the initially very high FCC reimbursement rates to vendors and a virtually unlimited fund source resulted in aggressive consumer marketing and deployment by U.S. VRS vendors.

In Canada today, only the last of the three U.S. restrictive factors exists:

- Insufficient numbers of qualified interpreters

Additionally funding may also be a factor that may constrain the availability of the service. At the point of this study, CRTC authorized funding of VRS in Canada has not yet been determined.

Nevertheless, the lack of interpreters is a significant constraint. Since it takes a minimum of five years to develop an ASL or LSQ interpreter, and since the Canadian college and university programs currently graduate only a small number of interpreters, and since almost all such programs have indicated that they are presently not able to increase the size of their programs (expand to graduate more students), it is therefore assumed that it will take at least ten years to develop the number of interpreters required for full VRS adoption, (i.e., to serve all forecast VRS users).⁶² For Canada to reach this maturity of VRS users, an annual growth factor of 50% (applied and compounded monthly) is applied to the first month of service beginning with an estimated 500 users.

Using the U.S. Ratio (high forecast) data of an average of 635 minutes of use per user, the average number of 11,600 VRS minutes per part-time (15 hours per week) Video Interpreter, and the application

⁶¹ The National Exchange Carriers Association (NECA), the U.S. interstate relay fund administrator at that time.

⁶² Ten years was established as the most reasonable expectation with the advice and unanimous concurrence of this study's VRS Advisory Committee members.

of a 50% growth rate up to the maximum forecasted number of 17,050 VRS users, the total annual minutes of use, and the number of part-time interpreters required for a 24/7 VRS in Canada are shown in the table below.⁶³

Table 13: U.S. Ratio – VRS minutes and number of part-time interpreters over 11+ years

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	403,437	310,646	92,790	35	27	8
2	1,127	606,055	466,662	139,393	52	40	12
3	1,691	909,532	700,339	209,192	78	60	18
4	2,537	1,364,668	1,050,794	313,874	118	91	27
5	3,806	2,047,346	1,576,456	470,890	176	136	41
6	5,709	3,071,389	2,364,970	706,420	265	204	61
7	8,564	4,607,137	3,547,495	1,059,641	397	306	91
8	12,846	6,911,128	5,321,569	1,589,560	596	459	137
9	17,051	10,063,004	7,748,513	2,314,491	868	668	200
10	17,051	10,827,385	8,337,086	2,490,299	933	719	215
11+	17,051	10,827,385	8,337,086	2,490,299	933	719	215

Using the Canadian Forecast (probable forecast) data of an average of 444.5 minutes of use per user, the average number of 11,600 VRS minutes per part-time (15 hours per week) Video Interpreter, and the application of a 50% growth rate up to the maximum forecasted number of 15,345 VRS users, the total annual minutes of use, and the number of part-time interpreters required for a 24/7 VRS in Canada are shown in the table below.

Table 14: Canadian Forecast – VRS minutes and number of part-time interpreters over 11+ years

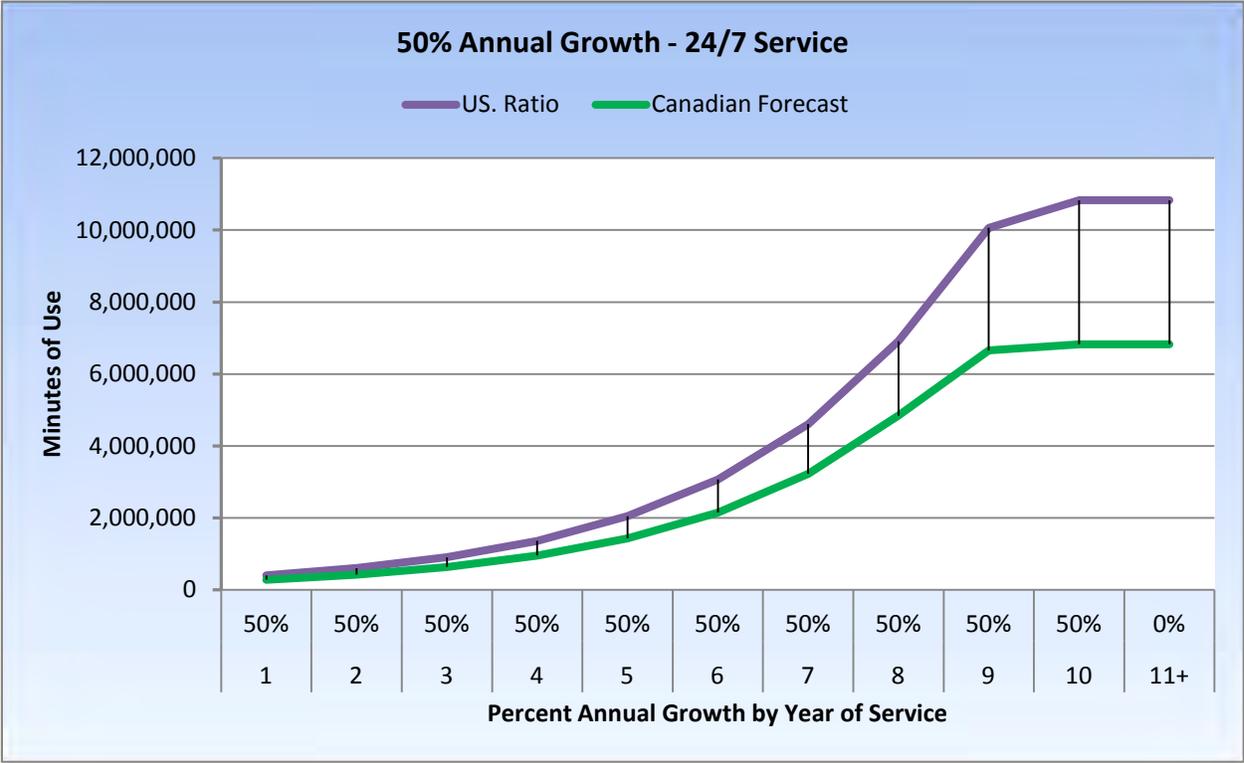
Year	Number of users (at 50% annual growth)	Annual minutes (ASL & LSQ)	Annual ASL minutes (at 77%)	Annual LSQ minutes (at 23%)	Total VRS interpreters required (ASL & LSQ)	ASL VRS interpreters required (at 77%)	LSQ VRS interpreters required (at 23%)
1	751	282,723	217,697	65,026	24	19	6
2	1,127	424,715	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

⁶³ For simplicity of presentation, the tables and figures in this study's phase 9 and 10 reports 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 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.

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%)
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

The rates of usage (total annual minutes) in the above two tables are depicted graphically as follows:

Figure 8: 24/7, 50% annual VRS growth



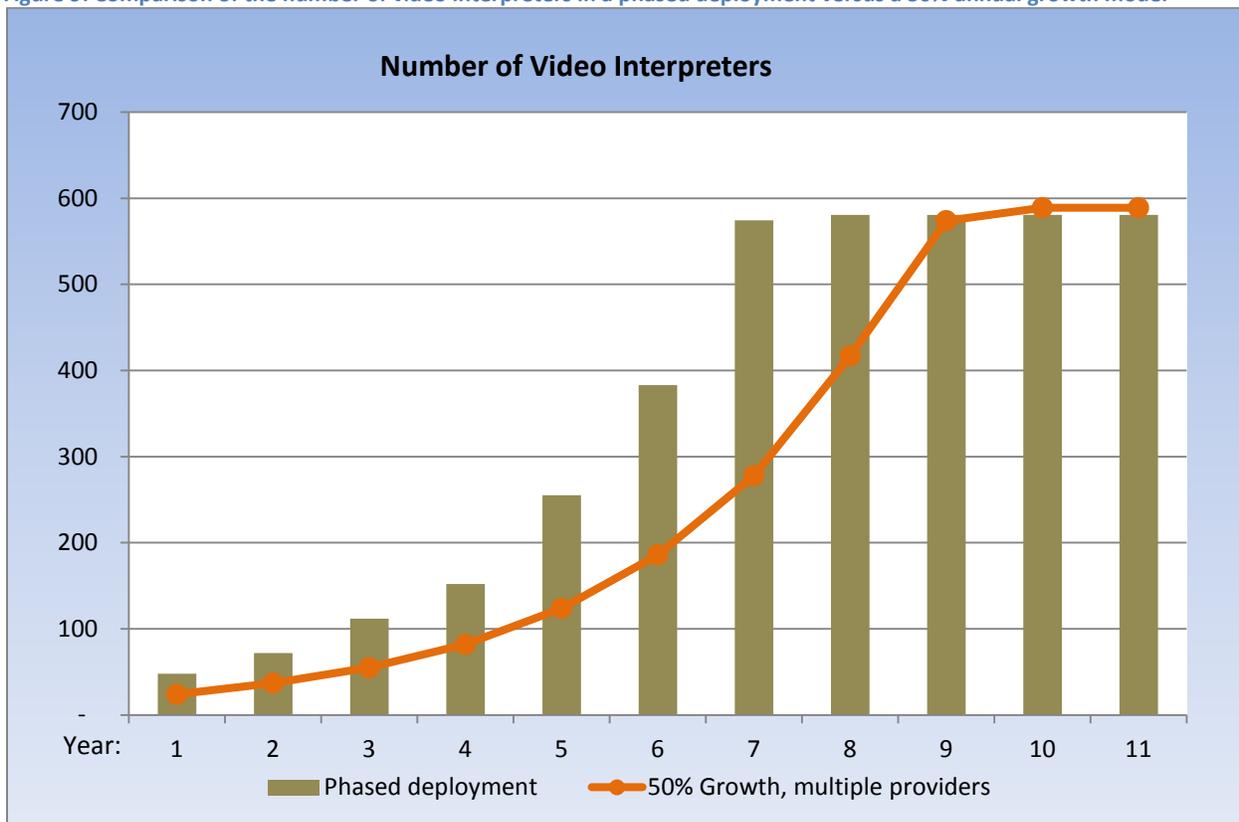
Once the service becomes established a regular review of the actual traffic versus forecasted traffic levels is recommended to ensure that adjustments can be made that reflect actual usage patterns and current actual restrictions.

5.3. Effect of the Selection of a VRS Model

The above forecasts of VRS adoption over time may be significantly influenced by the various VRS model components actually selected for implementation, as discussed in this study’s phase 11, *Potential Canadian VRS Models*. For example, an adequately funded initially controlled phase of implementation may result in more interpreters being available for VRS at the beginning of the service (and therefore more allowed users and minutes) than is depicted in the above tables and charts.

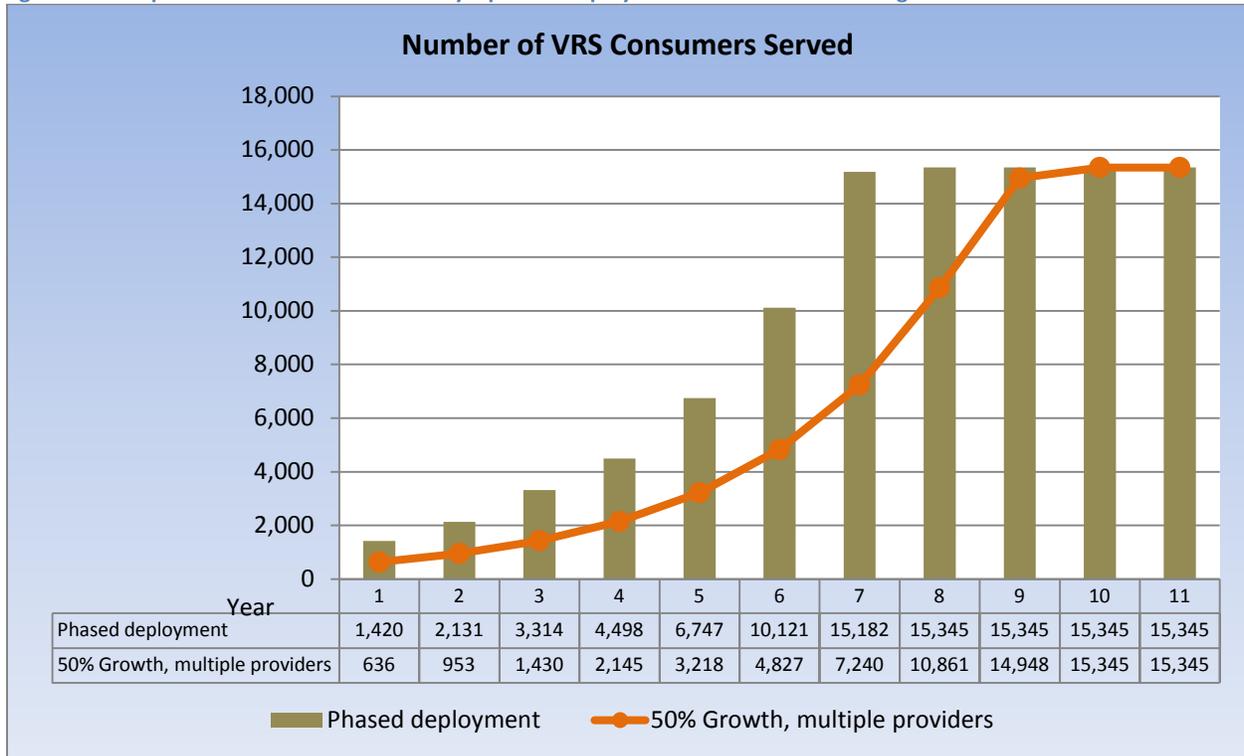
In phase 11⁶⁴ such analyses and recommendations are provided that state that after an initial set up period, this type of two-phased deployment centering on interpreter training programs and interpreter agencies will increase the availability of interpreters and VRS. Based on the detailed assumptions of this approach in phase 12, sections 7.2 and 7.3.3, the two graphs below contrast the number of interpreters or number of consumers served by the recommended two-phased approach compared to the equivalent numbers of the 50% growth scenario.

Figure 9: Comparison of the number of video interpreters in a phased deployment versus a 50% annual growth model



⁶⁴ Phase 11, sections 4.2.1, 4.3, 16.2.3 and 16.3.

Figure 10: Comparison of consumers served by a phased deployment versus a 50% annual growth model

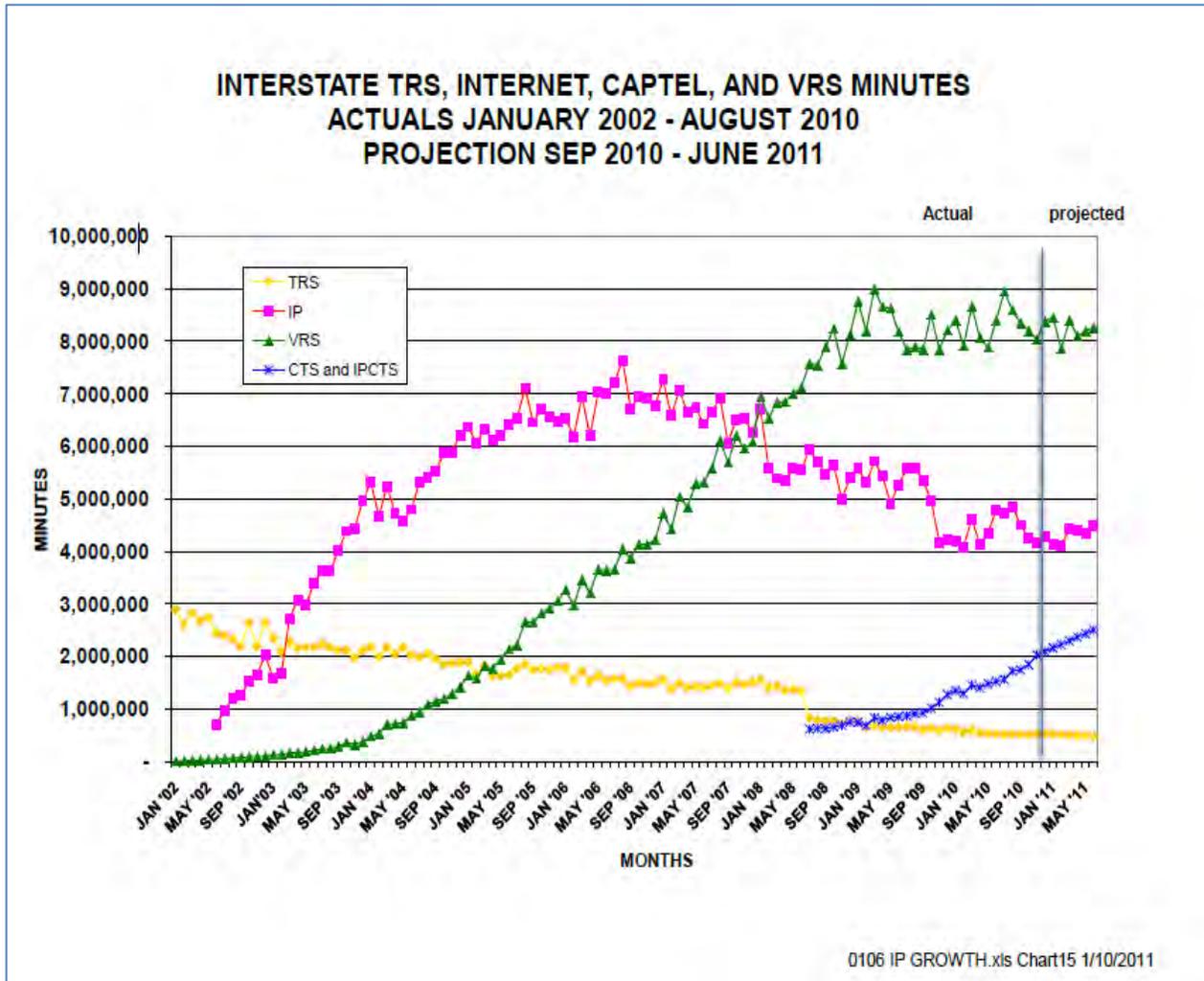


6. Effect of VRS Adoption on Other MRS Modalities

6.1. Effect of VRS on Other MRS Traffic in the U.S.

In the U.S. the dramatic growth of VRS, as well as the introduction of IP-relay and Captioned Telephone Service, effectively reduced the user demand for traditional TTY MRS (TRS) usage, as reflected in Figure 11 and Figure 12 below:

Figure 11: Comparison of different modes of relay, U.S.⁶⁵

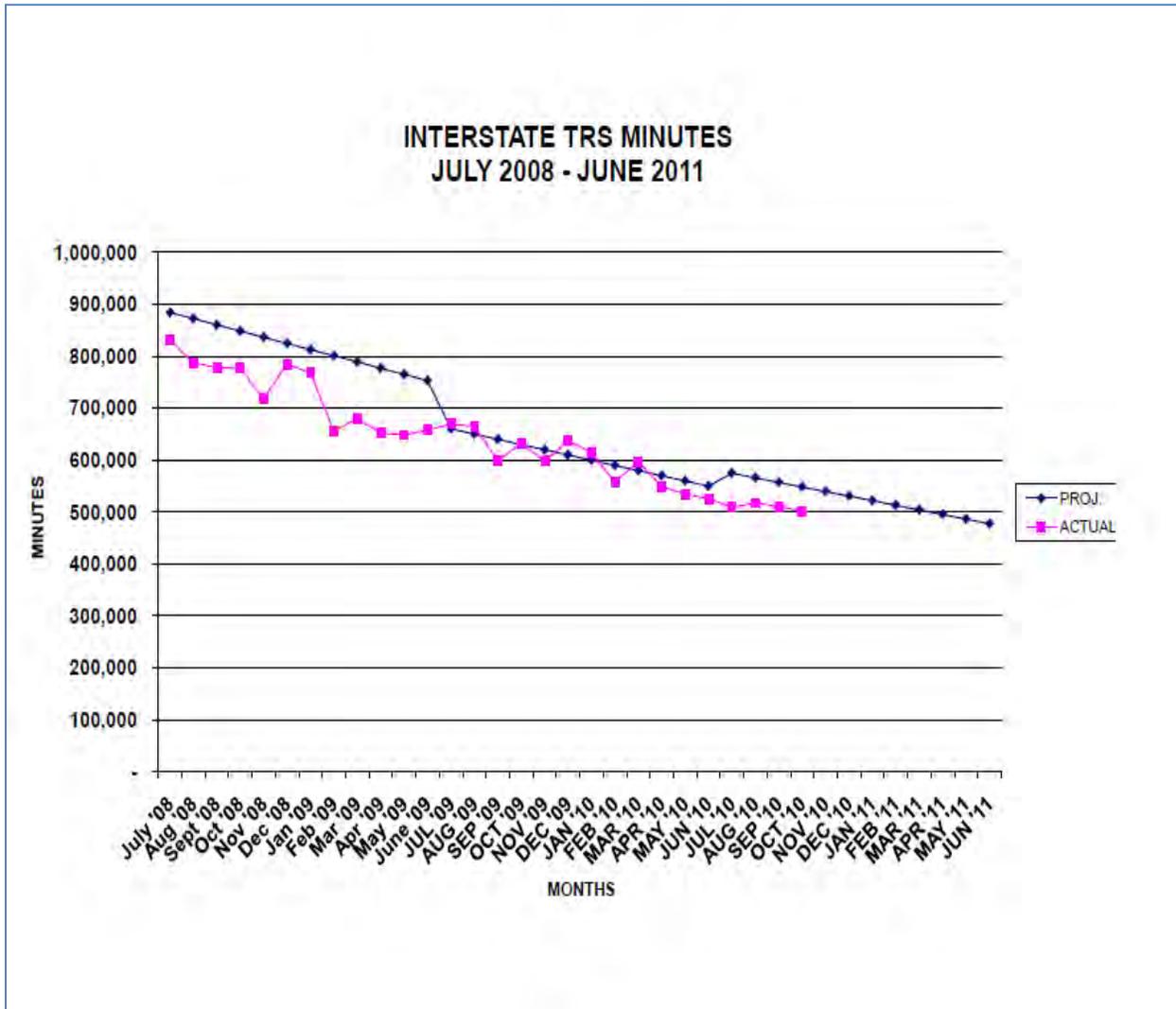


Comments on Figure 11, above:

- Different technologies have affected the volumes in other sectors as they progress from introduction to maturity.
- Traditional TRS volume declines as users migrate to new technologies.
- Growth of VRS and IP-Relay far exceed the previous TRS usage or its relative decline.
- Both IP relay and VRS use had steep increases in the first few years after introduction and then appeared to level off or decline.
- Total TTY traffic declined from 2002 to 2011 by 83 percent due to the combined adoption of IP-relay, VRS, captioned telephone relay; and other non-relay forms of communication between Deaf and hearing people (email, texting, etcetera.)

⁶⁵ NECA TRS Fund Interstate TRS, Internet, CapTel, and VRS minutes 2010

Figure 12: Decline in interstate TTY-relay minutes⁶⁶



Comments on Figure 12, above:

- The chart shows the continued decline of TTY-relay that is depicted in Figure 11, but at a more readable scale.
- Although the chart only shows inter-state traffic (not intra-state traffic), it clearly depicts the trend of declining traditional TTY-relay TRS traffic volumes.
- July 2008 demand ≈ 840,000 minutes. July 2011 projection ≈ 450,000 minutes. This represents a 46% decline in only three years.

⁶⁶ NECA TRS Fund Interstate TRS minutes 2010

6.2. Projected Effect of VRS on Other MRS Traffic in Canada

Although a reduction in TTY-relay and IP-relay usage in Canada is expected as VRS is adopted, this reduction is not forecast to be proportionate to the expansion of the new VRS services. TTY-relay usage may eventually decrease to about a quarter of current levels.⁶⁷ As a new service, IP-relay will continue to grow, but should not grow at as high a rate or reach as high a total usage, due to VRS usage supplanting IP-relay usage. Using the data from the U.S. decrease in MRS traffic, a forecast is provided reflecting compounding reductions in traditional TTY MRS traffic of approximately 18% per year. See this study's phase 10, *Cost Variables and Forecasts*, for an expanded discussion of the effect of VRS on traditional TTY-relay costs.

7. Potential Effect of Limited Hours of Availability

In order to understand the implications of a potentially partial or limited service schedule for Canadian VRS, examination of the daily and weekly traffic cycles is useful. In the United States, where the service is available at all times, very clear traffic patterns emerge.

7.1. U.S. Call Volume Detail

Figure 13 reflects typical U.S. VRS traffic by time of day. Figure 14 shows typical U.S. VRS call traffic by day of the week. The ebb and flow of VRS traffic generally mirrors the patterns documented for MRS.

⁶⁷ This decline in TTY-relay usage will also be due to the adoption of IP-relay, as well as VRS.

Figure 13: VRS hourly call volume, U.S.⁶⁸

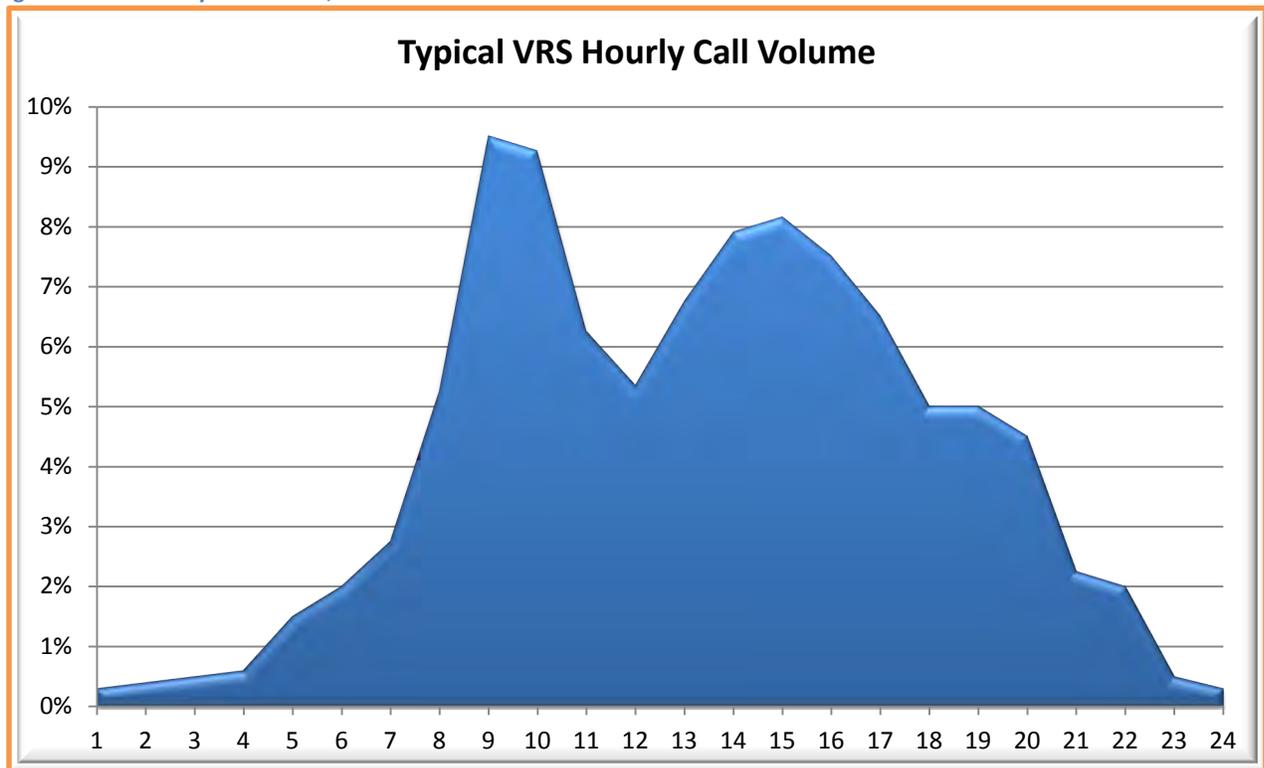
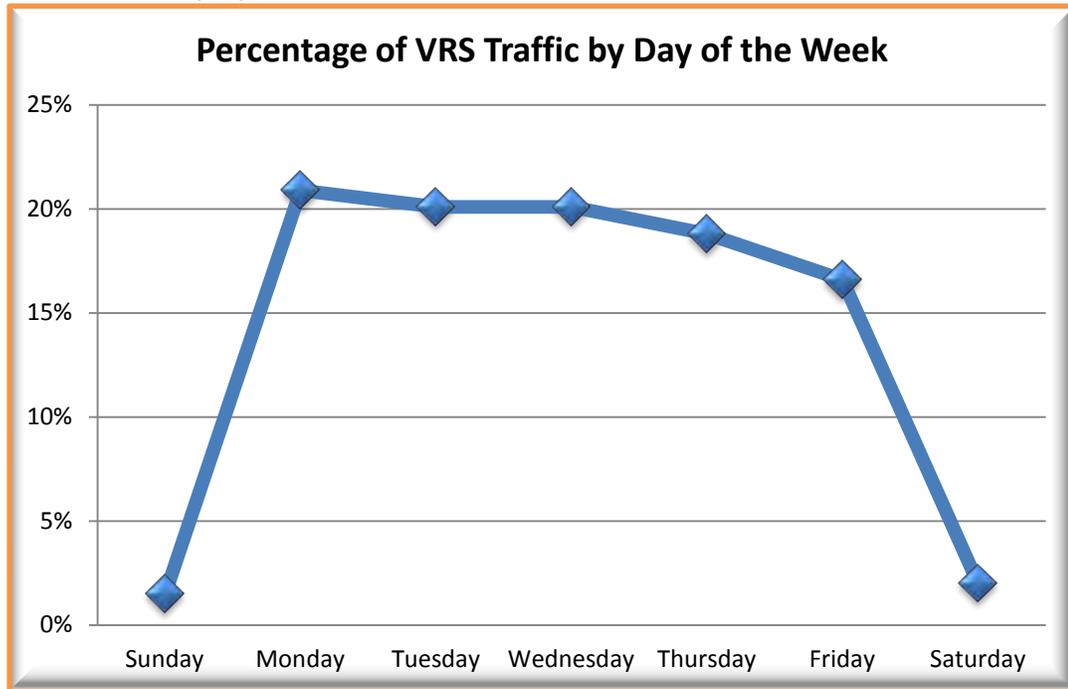


Figure 13 shows the VRS call distribution pattern throughout the day using actual data recently obtained from one of the main VRS providers in the United States. The daily usage for VRS in the United States is comparable to VRS usage in other countries. To confirm this constancy, similar charts were produced for a 2010 VRS study for France, which show similar usage patterns for VRS in Germany, Sweden and France.⁶⁹

⁶⁸ Compiled from actual VRS traffic from a confidential U.S. provider during other project work; further validated from similar traffic charts from ARCEP, Autorité de Régulation des Communications Électroniques et des Postes; “Évaluation des besoins des personnes sourdes ou malentendantes en matière d’accessibilité des services téléphoniques”; Final Report; March 1, 2010

⁶⁹ ARCEP, Final Report, March 1, 2010

Figure 14: VRS traffic volumes by day of the week, U.S.⁷⁰



This VRS call distribution pattern throughout the week again uses actual data obtained from a VRS provider in the United States. Like the time of day report, weekly usage for VRS in the United States is comparable to that of other countries.

VRS call traffic peaks on Mondays and gradually tapers off through Friday. This calling pattern reflects the usage concentration for work and commerce-related calls (banks, medical, retail, etc.) during the week. The traffic is reduced significantly over the weekend. Again, the charts produced for France's VRS study show similar usage patterns for VRS in Germany, Sweden and France.⁷¹ The primary difference between Figure 14 and those for the French report is that the French report does not reflect any Sunday call traffic, even though Germany and Sweden both offer VRS service on Sunday.

⁷⁰ Compiled from actual VRS traffic from a confidential U.S. provider during other project work; further validated from similar traffic charts from the ARCEP Final Report, March 1, 2010

⁷¹ ARCEP, Final Report, March 1, 2010

7.2. Application of Traffic Variations to a 12 Hour, 5 Day Schedule

A consideration under discussion has been the possibility of an initial Canadian VRS schedule that might provide service for less than 24 hours a day. Approximately 79% of VRS call traffic is generated between 8 AM to 8 PM, Monday through Friday. A significant portion of the potential 21% of VRS traffic that occurs outside of these hours may be satisfied by point-to-point video, text messaging, IP relay and TTY MRS. For example if 20% of the evening and weekend traffic was redirected by users to occur during VRS operational hours of 8 AM to 8 PM Monday through Friday, and 80% of the evening and weekend traffic used alternative forms of communication, then the overall amount of VRS traffic occurring during the 8 AM to 8 PM Monday through Friday operational hours would be 83% of total unrestricted 24 x 7 demand.

VRS providers, like MRS providers, are also correct in their observations that there is a lack of staffing efficiency in off-peak hours. However, as they have a significantly reduced staff in slow periods, the overall inefficiency is relatively minor compared to their total cost for provisioning a relay service.

Nevertheless, for a comparative analysis, the implications for interpreter demand due to a 17% reduction in overall minutes of use for a 12-hour service 5 days a week is estimated over 11+ years at a 50% growth rate, and using a 28% interpreter efficiency factor, the forecast of minutes of use and the demand for interpreters is depicted in Table 15 and Table 16, below:

Table 15: U.S. Ratio – Reduction in minutes and numbers of part-time interpreters for a 12 hour 5 day a week service

Year	Annual minutes (ASL & LSQ at 83%)	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	334,852	257,836	77,016	26	20	6
2	503,025	387,329	115,696	38	30	9
3	754,911	581,282	173,630	58	44	13
4	1,132,674	872,159	260,515	86	67	20
5	1,699,297	1,308,459	390,838	130	100	30
6	2,549,253	1,962,925	586,328	195	150	45
7	3,823,923	2,944,421	879,502	292	225	67
8	5,736,237	4,416,902	1,319,334	438	337	101
9	8,352,293	6,431,266	1,921,027	638	491	147
10	8,986,730	6,919,782	2,066,948	686	528	158
11+	8,986,730	6,919,782	2,066,948	686	528	158

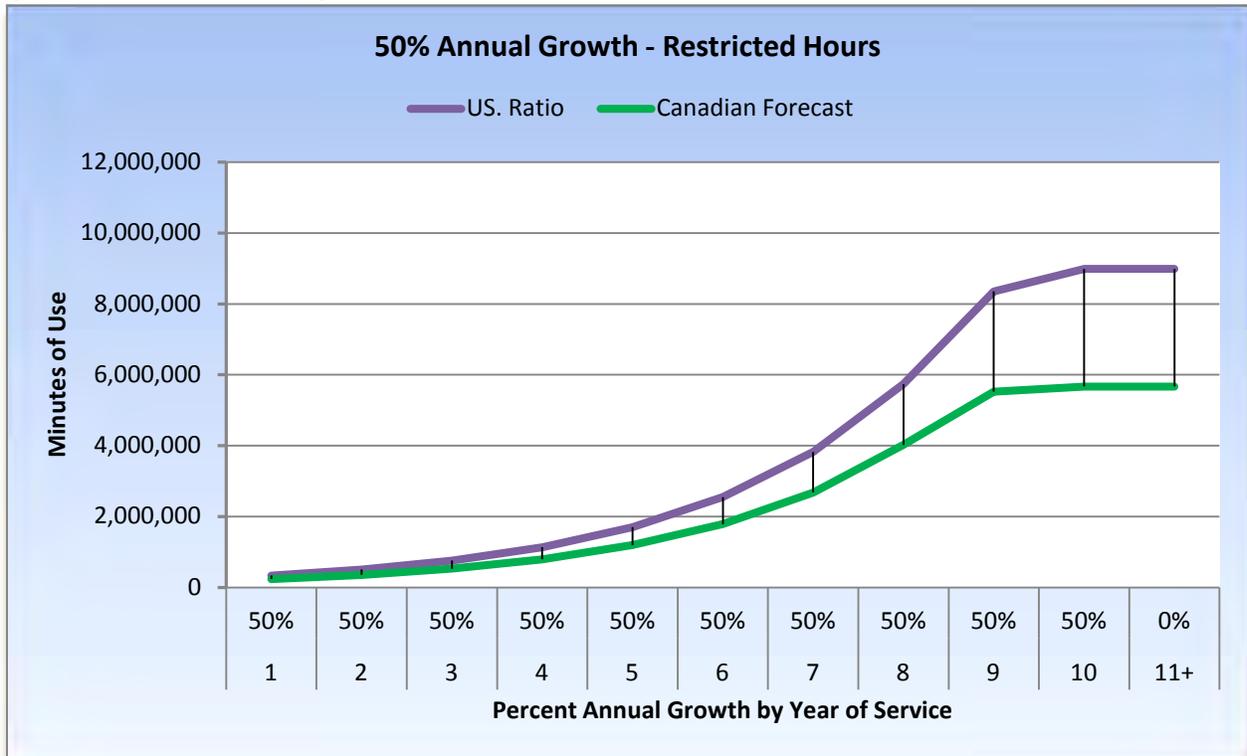
A similar table for the Canadian Forecast is shown below:

Table 16: Canadian Forecast – Reduction in minutes and numbers of part-time interpreters for a 12 hour 5 day a week service

Year	Annual minutes (ASL & LSQ at 83%)	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	234,660	180,688	53,972	18	14	4
2	352,514	271,436	81,078	27	21	6
3	529,032	407,355	121,677	40	31	9
4	793,764	611,198	182,566	61	47	14
5	1,190,846	916,951	273,895	91	70	21
6	1,786,484	1,375,593	410,891	136	105	31
7	2,679,757	2,063,413	616,344	205	158	47
8	4,019,882	3,095,309	924,573	307	236	71
9	5,524,799	4,254,095	1,270,704	422	325	97
10	5,667,676	4,364,110	1,303,565	433	333	100
11+	5,667,676	4,364,110	1,303,565	433	333	100

The rate of usage (total annual minutes) in the above two tables are depicted graphically as follows:

Figure 15: Restricted access VRS growth



8. Factors That May Affect User Demand

From the Canadian *full deployment* projection, the phased ten year adoption projections are postulated for the gradual introduction of VRS in Canada. The ability to achieve such this schedule is dependent on many variables. In part, these include:

- Availability of qualified interpreters.
- The consumers' preexisting experience with point-to-point video and broadband services.
- The consumers' ability to afford hardware, software and broadband services, as well as possible fees or charges associated with the service.
- The consumers' technical competence, as well as the age and ability of the consumer to adapt to new technologies.
- Preparation of consumers' hardware, software and network to ensure adequate video quality and ease of use.
- The successful introduction of the VRS experience to consumers on both sides of the conversation so that they have a positive experience with VRS.
- Communication preferences of the consumers and whether those preferences are offered.
- Attractiveness and availability of ancillary services like Video Remote Interpreting (VRI) and Video Mail.
- Education and outreach to inform users of reasonable expectations from the service.
- The model of VRS selected for Canada.⁷²
- The availability of program funding.
- Potentially restricted hours of VRS availability.

Also, as perhaps may have been experienced during the current Telus VRS trial, the initial volume of traffic and perceived consumer adoption rate can be greatly impacted by the number of users that are accepted into the program, by issues such as limitations in equipment distribution/installation or registration procedures.

This section of the report will briefly review some of the more significant factors that can alter the forecast of user demand for VRS in Canada. These factors are all common to the deployment of video relay service and not necessarily unique to Canada.

Detailed discussions of these topics are found in this VRS Feasibility Study's phases 3, 4, 5, 6, 7 and 8; and are only referenced herein in summary as they pertain to potential effects on user demand.

⁷² Potential models are discussed in this VRS Feasibility Study's phase 11, *Potential Canadian VRS Models*.

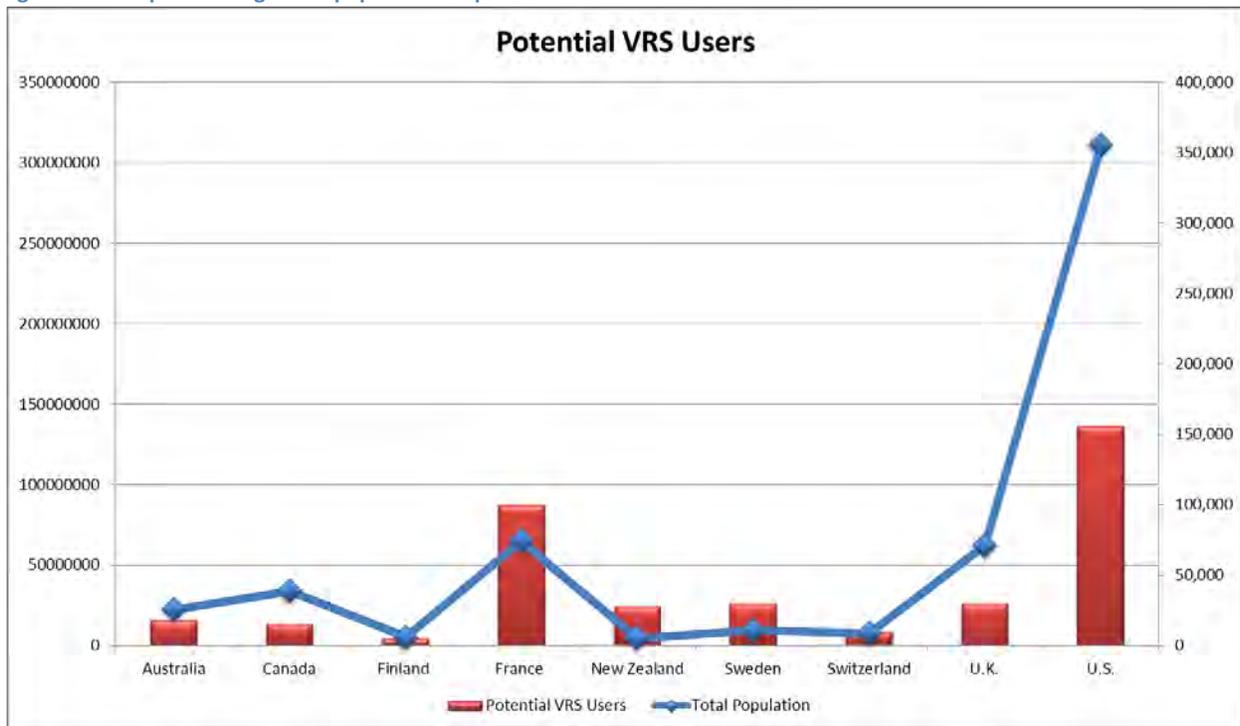
8.1. Potential VRS Consumer Populations/Demographics

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 ASL users and one for LSQ users. These numbers become even more complex as one tries to account for subsets (such as which 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).

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 this study's phase 3, *Consumer Interests and Perspectives*. Comparative population and VRS user data is also found in this study's phase 4, *VRS Models in Other Countries*.

Figure 16 compares total population numbers and potential VRS users of various countries as reported in this study's phase 3 for Canada and phase 4 for other countries. This figure illustrates that the numbers of potential Canadian VRS users identified in this study is consistent with ratios in other countries. Variances in ratios are due in part to dissimilar methods of measurement used in different countries.

Figure 16: Comparison of general population to potential VRS users in other countries



8.2. Availability of Broadband to the Consumer

The availability of broadband services is another factor that could impact the accuracy of forecasted demand volumes. Broadband technology is necessary for the sign language VRS consumer to access the VRS provider's call center interpreters. It is important that a majority of the user population have the ability to connect to video relay services through some form of high-speed Internet (DSL, cable, Wi-Fi, 3G or 4G wireless, or satellite). Although virtually 100 percent of Canada's population has access to broadband at speeds that support VRS, as stated in this study's phase 5, *Technologies and Their Forecasts*, approximately 80% of the general population are presently subscribed to VRS compatible broadband services.⁷³ The broadband subscription rates of the Deaf are however unknown. Regardless of the current Deaf subscription rate, it should increase when VRS becomes available. Consumer access to VRS should only be a problem from a cost perspective; if some Deaf consumers cannot afford broadband, then broadband subscription and usage costs will represent a barrier to VRS usage. At present there is no valid data available to estimate the degree of this potential barrier.

8.3. Availability and Ease of Use of End User Equipment

VRS compatible end user equipment is widely available in various forms: stand-alone videophones, computers with web cams, and mobile devices. Equipment costs vary from about \$150 to a few hundred dollars. Client software, either downloaded on a consumer's existing computer or as a website function, is usually provided by VRS vendors at no charge. In some countries' VRS models equipment costs are subsidized in whole or in part, either by the VRS vendors or by a government agency. However, most VRS models cannot provide end-users with a computer or laptop on which to install the VRS software. Similarly, smartphone devices or mobile tablets and their associated cellular and data service plans are usually the financial responsibility of the Deaf user. At present there is no valid data available to estimate the degree that this potential consumer cost barrier may affect VRS user access and therefore demand.

Many potential VRS users may require individual assistance in setting up their equipment to access VRS and additional instruction in how to use the VRS interface software application. Therefore user equipment could also be artificially unavailable by insufficient end user support installation and customer service support. Again, no data is available regarding this potential barrier, except that as demonstrated by its converse, Sorenson has acquired about 80 to 85 percent of the U.S. VRS consumer market in principal part by providing the VRS equipment at no charge, installing it in Deaf consumers' homes for free, and simultaneously providing instruction by a trained Deaf installer.⁷⁴ As noted in this

⁷³ See this study's phase 5, *Technologies and their Forecasts*.

⁷⁴ Sorenson also achieved this high rate by installing most of its consumer equipment in a proprietary mode that only allowed consumers to use the equipment with Sorenson, and with other VRS consumers who were customers of Sorenson.

study's phase 5, *Technologies and Their Forecasts*, many Deaf consumers will require technical assistance with their end user equipment.

8.4. Availability of Interpreters

The availability of qualified sign language interpreters is perhaps the most significant factor that may limit VRS adoption and usage volumes in Canada. Without interpreters available to handle the volume of incoming calls, the overall VRS program service is affected. Every VRS user that initiates a "call" into the service is routed through a queue to the "next available interpreter". When all interpreters are busy and the queue starts adding up, the queue time extends and wait times become unacceptable. This is the point where a frustrated consumer may end the call and look for alternative options. This would represent a change in the forecast as user behavior is altered when there are not enough interpreters.

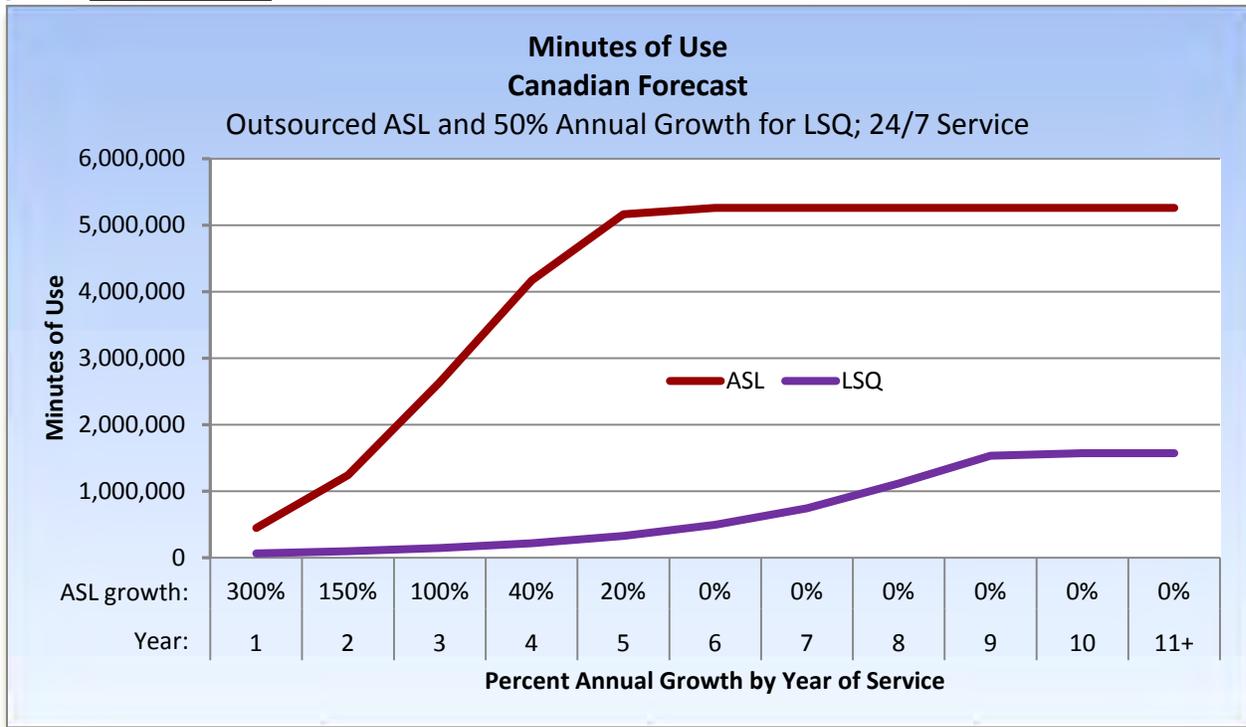
Although estimates of how the change is quantified are too difficult to ascertain, there are some general factors that can help understand the impact. To begin with, an initial ramp-up does not represent a full traffic load on the program during the early phases of deployment. As detailed in this study's phase 6, *Interpreter Considerations*, it typically takes at least five years of university study and practice for an ASL or LSQ interpreter to achieve qualified proficiency, the Canadian interpreter teaching programs provide only a small number of annual graduates, and most programs are not in a position to easily expand. The ten year adoption rate presented in section 5.2 is predicated on the current unavailability of VRS interpreters in Canada, and the time that may be required to develop interpreters through expanded Canadian university or college training programs.

The VRS model that is chosen for Canada can also impact the availability of interpreters. If a 24/7 model is chosen the demand for interpreters will be greater than in a limited schedule. A model that uses ASL interpreters located in the United States also deflects much of this constraint for ASL consumers, but not for LSQ consumers.

8.5. Outsourcing ASL VRS to the U.S.

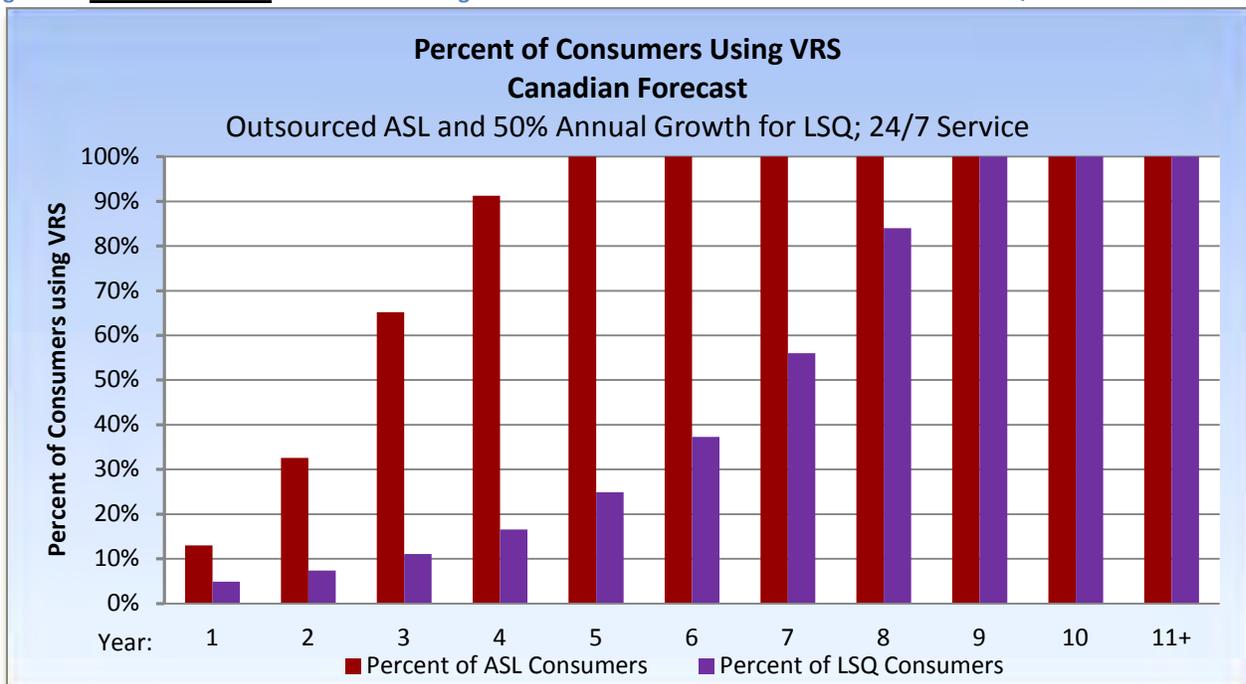
If Canadian ASL VRS were outsourced to a VRS provider located in the United States, the primary factor limiting Canadian ASL VRS usage, the shortage of interpreters, would be removed. In this case a more aggressive adoption rate for ASL VRS would be expected, particularly in response to the pent up demand from Canadian Deaf who have been waiting for a long time for VRS. A suggested resulting ASL VRS adoption shown over eleven years is provided below.

Figure 17: Canadian Forecast – VRS forecast minutes of use for U.S. outsourced ASL, contrasted with Canadian LSQ



The same adoption model for outsourced ASL again contrasted with a 50% annual growth rate for LSQ is shown in the following figure as the forecast percentage of the estimated total number of ASL consumers (11,816), and the forecast percentage of the estimated total number of LSQ consumers (3,529) that would use VRS, by year.

Figure 18: Canadian Forecast – VRS forecast usage for U.S. outsourced ASL contrasted with Canadian LSQ



The above two charts are based on Table 17, below.

Table 17: Canadian Forecast – Outsourced ASL forecast adoption rates

Year	ASL Annual Growth Rate	ASL Number of Users	Percent of ASL Consumers	ASL Minutes of Use	LSQ Annual Growth Rate	LSQ Number of Users	Percent of LSQ Consumers	LSQ Minutes of Use
1	300%	1,540	13%	449,784	50%	173	5%	65,081
2	150%	3,850	33%	1,242,218	50%	260	7%	97,826
3	100%	7,700	65%	2,641,298	50%	390	11%	147,073
4	40%	10,780	91%	4,168,908	50%	585	17%	220,609
5	20%	11,816	100%	5,165,968	50%	878	25%	330,858
6	0%	11,816	100%	5,258,120	50%	1,317	37%	496,546
7	0%	11,816	100%	5,258,120	50%	1,976	56%	744,856
8	0%	11,816	100%	5,258,120	50%	2,964	84%	1,117,469
9	0%	11,816	100%	5,258,120	50%	3,529	100%	1,532,432
10	0%	11,816	100%	5,258,120	0%	3,529	100%	1,570,405
11+	0%	11,816	100%	5,258,120	0%	3,529	100%	1,570,405

8.6. Interpreter Quality of Service

The quality of the VRS interpreters' skills and knowledge will affect the consumers' experiences and may therefore affect forecasted usage. If the quality of the VRS communication is lacking, some consumers may prefer other communication methods.

In Canada, only 9 percent of ASL AVLIC members have passed a standardized certification test. No other Canadian national proficiency tests exist for ASL or LSQ interpreters. See this study's phase 6, *Interpreter Considerations*, for details of this issue, and the current adaptation to this problem undertaken by the interpreter agencies and training programs. However, in general VRS interpreting is more demanding than in-person community interpreting. Some training can be expected to be provided by VRS provider firms, but only as a supplement to a solid interpreter training program from a university and associated community interpreting experience.

The degree that this issue may potentially impact VRS usage in Canada is unknown.

8.7. Security and Fraud Prevention Measures

Fraud or misuse of VRS impacts the overall program traffic levels. It can affect the availability of network and interpreter resources, as well as result in lost funds for the VRS program. The United States VRS environment has had a high incidence of fraudulent call volumes and costs; other countries have not reported any VRS fraud or misuse. This does not necessarily mean that other countries are exempt from this type of activity; the nature and volume of fraud may be such that they are not being reported or are not triggering changes in regulatory oversight. However, it is likely that the for-profit

nature of VRS in the United States, the very high reimbursement rates, the initial relaxed regulatory environment, and the government's effort to protect the rights of the consumers all combined to create a market conducive to fraud.

The United States model is an example of why this category can be so important to the overall forecast of services. As evidenced in the recent declarations and rulings by the FCC, this can be a complex issue that does not necessarily have one simple solution. However, the effect of fraud in the U.S. has been significantly increased VRS use (making services correspondingly unavailable for normal consumer VRS use), and higher program costs, wasting millions of dollars of program funds.

Steps to prevent VRS fraud should be implemented within the regulations and contracts for VRS in Canada or increased VRS usage and costs may result.

8.8. The Impact of Speech-Reading on VRS Usage

VRS is used for many different visual languages around the world. As identified in this study's phase 3, *Consumer Interests and Perspectives*, and phase 8, *Potential Related Services*, VRS also has the potential to provide telecommunications access to people who use other forms of visual communication besides ASL and LSQ. The primary additional form is "speech reading" (also called "lip reading") used mainly by people who are hard of hearing or who became deaf after learning to speak and do not sign, typically later in life.

While there are no known reliable statistics on the number of speech reading individuals in Canada, the online survey conducted as part of the phase 3 research, indicate a very low prevalence of speech reading individuals, even through a generally accepted estimate is that one-tenth of the general population is hard of hearing. Out of 1,299 respondents, only 2.8 percent (n=37 people) used speech reading without the support of a visual language (e.g., ASL). Of these 37 speech readers, 13 percent (n=5 people) stated they would use VRS less than ten times per month, and only 9 percent (n=3 people) stated they would use VRS more than ten times per month. Thus forecast usage for speech reading is negligible, with no apparent measurable impact upon VRS usage. Furthermore, as indicated in this study's phase 6, *Interpreter Considerations*, no extra skills are needed by interpreters to provide speech reading VRS functionality.

8.9. The Impact of Video Remote Interpreting on VRS Usage

Video Remote Interpreting (VRI) is similar to VRS except that it provides interpreting services between two or more individuals who are together in the same room or venue.⁷⁵ VRI is generally not considered a telecommunications or message relay service and therefore is outside the jurisdiction of the CRTC. The inclusion of VRI within VRS (that is, as an allowed service reimbursed as VRS minutes) is therefore unlikely. As discussed in the phase 8 report, VRI can operationally be offered within VRS, but it is also

⁷⁵ VRI is discussed in this study's phase 8, *Potential Related Services*.

dependent upon the availability and training of VRS Interpreters. VRI is only offered in a couple other countries as part of VRS. There is little available VRI usage data from these few constrained examples.⁷⁶ At this time it is not possible to determine what the impact of including VRI in VRS would be on minutes of use and interpreter resources. The potential increase of usage of VRS, if VRI was included within the definition of VRS, could potentially be very high.⁷⁷ The only way to effectively determine its potential impact would be through an initial implementation research phase in which VRI was measured.

8.10. Public Education and Outreach

While outreach to potential VRS Deaf users may affect the adoption rate, education of Deaf users of the equipment requirements and set up, service access, and communication protocols will affect adoption and traffic more. Correspondingly it will be important to educate the hearing public about the new VRS program, and to not hang up on a VRS interpreter calling on behalf of a sign language user.

Both of these types of public education and outreach are important for a smooth roll out and satisfactory adoption of the service. Poor education and outreach may potentially negatively impact VRS usage. The degree of negative impact may not be noticed however if the access to the service is significantly less than consumer demand; for example in a multi-year rollout constrained by lack of interpreters or program funding.

Different models of service accomplish or neglect public education and outreach differently. Of the countries researched for this study's phase 4, *VRS Models in Other Countries*, Sweden has clearly demonstrated an outstanding VRS education and outreach program. Other countries, such as the U.S., let outreach to potential Deaf users be managed by the VRS providers with few mandated requirements, while essentially neglecting all outreach to the hearing population. While some outreach budget information is available from some countries, e.g., Australia, no cost or other data exists that can be used to meaningfully forecast the potential impact of public education and outreach on VRS usage. Potentially this information may be available if public education and outreach is incorporated within an initial implementation research phase.

⁷⁶ VRI is offered in France, but not as a free service. Norway reports that 25% of its VRS calls (not minutes) are VRI.

⁷⁷ Although VRI may be presently funded in part by some provincial governments, for the purpose of this study the usage and cost of VRI is only being considered as potentially part of the allowed services that are approved for reimbursement as VRS.

9. Summary of Variables, Risks, Impacts and Outcomes

9.1. Variables

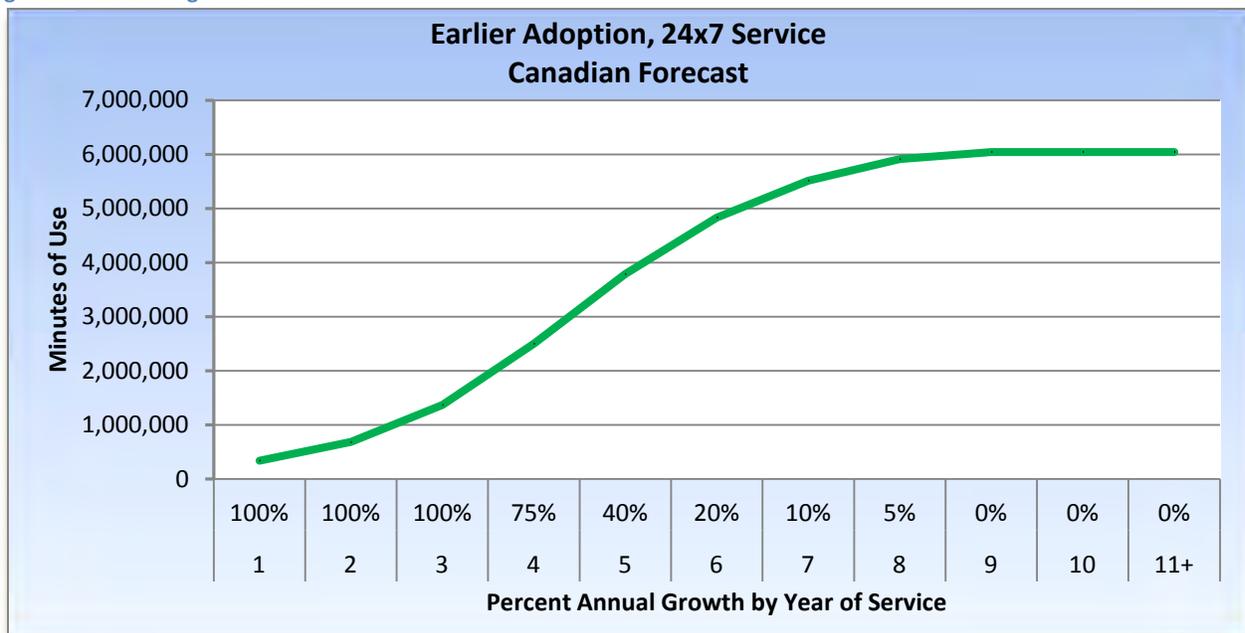
There are many variables that will potentially affect VRS usage rates. Some of these variables are the assumptions described in this phase 9 study, others cannot be quantified at this time. Some variables pose significant impact to potentially changing usage, while others represent less impact. The outcomes of each variable will affect overall realized usage. Some of these variables could be quantified through a carefully planned initial implementation research phase that is specifically designed to measure these and other factors. However the effect of some variables will be unknown, even with such initial research, until regular service is experienced over time.

In this study, VRS usage rates have been presented in four scenarios:

- 1) A fully subscribed 24/7 service (maximum expected usage)
- 2) A 24/7 service in which maximum usage is achieved over ten years of 50% annual growth
- 3) The ten year projection diminished by 17% due to restricted hours of availability (8 AM to 8 PM, Monday through Friday)
- 4) A 24/7 service in which the ASL portion is outsourced to the U.S., and the LSQ portion is retained within Canada

How the variables are actually applied will determine what the adoption/usage rates will look like over time. For example, another possible growth scenario where the adoption rate is higher in the earlier years of service may look like that shown below.

Figure 19: Modified growth curve



9.2. Potential Risks, Impacts and Outcomes

Table 19 summarizes a number of significant variables that may affect adoption or usage of VRS, their potential level of impact, the likelihood of occurrence, and the potential effect or outcome. Most of these variables have been discussed elsewhere in this VRS Feasibility Study and are therefore listed in an abbreviated format.

Usage variables that have the following combinations of potential impact and likelihood are color coded for risk value as follows:

Table 18: Color codes for risk values

RISK VALUE	Potential Impact on Usage	Likelihood of Occurrence
LOW	Low	Low
LOW	Low	Medium
LOW	Low	High
LOW	Medium	Low
MEDIUM	Medium	Medium
MEDIUM	Medium	High
MEDIUM	High	Low
HIGH	High	Medium
HIGH	High	High

The final adoption/usage rate of VRS will be determined by how all of the variables actually combine.

Table 19: Table of VRS usage variables

Principal VRS Usage Variables	Potential Impact on Usage	Likelihood of Occurrence	Potential Effect on VRS Usage (Outcome)
Legal (study phase 2)			
The CRTC may elect to not require VRS interoperability and may restrict consumers to only access VRS provided by their telephone company.	Medium	Low	Consumer demand for VRS will remain high, although the adoption rate may be somewhat slowed
Relayed access to 9-1-1 through VRS may be mandated 24/7	High	Low	The requirement to staff and operate a 24/7 call center will increase the need for interpreters in a VRS that is otherwise restricted by time of day.
Consumers (study phase 3)			
The ASL and LSQ populations may be different than estimated.	High	Medium	May increase or decrease overall demand
The ratio of ASL to LSQ populations may be different than estimated.	Medium	Low	May increase or decrease demand in one group

Principal VRS Usage Variables	Potential Impact on Usage	Likelihood of Occurrence	Potential Effect on VRS Usage (Outcome)
The adoption rate of (actual demand for) VRS by the ASL or LSQ populations may differ (one group may adopt at a higher rate than the other).	Low	Low	May increase or decrease demand in one group
Canadian consumers may be more knowledgeable about VRS and ready for the service than initial U.S. consumers were.	High	Medium	The adoption rate may be higher than forecast if other constraints do not prevail
Canadian consumers may have a more pent up demand for VRS than initial U.S. consumers were.	High	High	The adoption rate may be higher than forecast if other constraints do not prevail
Technical (study phase 5)			
Technical assistance to VRS consumers may be insufficient or not in an accessible format.	Medium	Medium	May reduce the adoption rate but only minimally impact the eventual total adoption
Automated digital interpreters (avatars) of sufficient quality for VRS may be used in place of live video interpreters	High	Low	Because this technology is not anticipated to be available in the near term, it will have no impact on VRS for the foreseeable future
Interpreters (study phase 6)			
The overall number of available and qualified interpreters may be less than estimated.	High	Medium	Will decrease the ability of VRS to meet the demand for service; hence usage will be reduced
The number of available and qualified ASL or LSQ interpreters willing to work in VRS may be different than estimated.	Medium	Medium	The availability of VRS will be disproportionate for the ASL and LSQ communities. Usage will be related to VI availability
Availability of ASL interpreters may be greater than LSQ interpreters, in the beginning and over time.	Medium	Medium	Usage of LSQ VRS will lag behind ASL VRS
The number of interpreters will not support the VRS adoption or demand forecasts	High	High	VRS traffic will be restricted to the availability of VIs. VRS usage will be less than forecast.
Interpreter training programs (colleges) may not be able to develop interpreters fast enough to meet the consumer demand for VRS.	High	High	Availability will need to be artificially restricted or there will be excessively long wait times
There is negative public reaction to too many interpreters being removed from community interpreting for employment with VRS.	High	High	CRTC may decide to restrict VRS usage in order to balance interpreter availability between VRS and the community
Interpreter quality may not be sufficient to meet the needs of the consumers.	Medium	Medium	Usage demand may be lessened. Call durations may be lengthened resulting in fewer calls handled
Quality of Service (study phase 7)			
Consumers may experience long answer times (they may be forced to wait a long time before they reach a video interpreter).	High	Medium	The number of calls serviced may be fewer, depending on how long it takes to reach a video interpreter

Principal VRS Usage Variables	Potential Impact on Usage	Likelihood of Occurrence	Potential Effect on VRS Usage (Outcome)
Consumer education (particularly to hearing users) may be insufficient.	Low	High	Usage may be somewhat lessened if consumers' VRS calls are frequently hung up on by the hearing party
VRS fraud and misuse may be a significant occurrence	Low ⁷⁸	Low	High levels of fraud and misuse will take away interpreter and funding resources that should be available for legitimate VRS calls
VRS interpreter work schedules (length of shift, amount of call time, etc) may be different than estimated. (The number of minutes per hour VIs are expected to relay varies by provider.)	Medium	Medium	The amount of VRS traffic (minutes of use) that can be relayed will increase or decrease depending upon work schedules
Quality of Service feedback mechanisms may be insufficient or there may be a lack of administrative and consumer oversight of QoS.	Low	Medium	If ongoing QoS is not addressed, the consumers' experience and usage will be diminished.
Potential Related Services (study phase 8)			
Video Remote Interpreting (VRI) may be made a part of VRS services. (This is unlikely because VRI is not considered a telecommunications relay service and therefore is outside the jurisdiction of the CRTC.)	High	Low	VRI demand is unknown, but potentially could be quite high; thereby significantly increasing VRS usage, the need for VRS interpreters, and program costs ⁷⁹
The VRS platform could be made available to VRS providers for VRI use, but paid for by the VRS providers and VRI consumers	Low	High	Would lessen the demand for VRI and its outcomes described above ⁸⁰
Other potential services, such as video mail, other modes of visual communications (e.g., speech-reading), availability of specialized interpreters, French-ASL and English-LSQ translations, and interfacing with 9-1-1, may not be included within VRS.	Low	Medium ⁸¹	The unavailability of these services will not lessen the demand for VRS, but will make VRS less complete
Forecasts of VRS User Demand (study phase 9)			
Canadian VRS users may average more or less than the forecast 444.5 VRS minutes per user per year.	Medium	Low	Usage will increase or decrease relative to changes in demand

⁷⁸ The impact and likelihood of fraud and misuse in Canadian VRS is dependent upon the controls put in place by the CRTC and the contracting authority. If few controls are implemented, then the potential impact and the probability of fraud and misuse will both be "High".

⁷⁹ VRI could potentially relieve demands for community interpreters, while simultaneously providing more on-site (virtual) interpreting.

⁸⁰ Same as previous footnote except to a lesser degree.

⁸¹ Some of these other services are likely to be included, while others are not. This "Medium" rating represents a blend of probabilities. See this study's phase 8 for more information.

Principal VRS Usage Variables	Potential Impact on Usage	Likelihood of Occurrence	Potential Effect on VRS Usage (Outcome)
The number of actual Canadian VRS users may be different than forecast.	Low	Low	Since potential differences are not expected to be significant, impact on costs should be minimal
Cost Variables and Forecasts (study phase 10)			
The CRTC may not authorize enough funds to pay for a full-service 24/7 VRS. If enough funds are not available, either VRS will not be approved, its availability will need to be constrained, or it will need to be paid for in part by consumers	Medium	Low	Reduced availability of funds will likely result in reduced VRS hours rather than non-approval of VRS or the requirement that consumers pay its costs
Usage costs may be partially paid for by the consumers instead of by VRS program funding	Medium	Low	May significantly reduce the demand for VRS, depending on how much of the cost is borne by consumers
End user VRS equipment may cost the consumer, instead of subsidized or paid for by others	Low	High	May slightly reduce the adoption rate but only minimally impact the eventual total adoption
End user broadband service may cost the consumer, instead of subsidized or paid for by others	Low	High	May slightly reduce the adoption rate but only minimally impact the eventual total adoption
VRS Models (study phase 11)			
The adopted Canadian model may initially be less than a full 24/7 service.	Medium	High	Approximately 17% fewer calls will be made
Canadian ASL VRS may be provided by companies located in the U.S.	High	High	If other constraints do not prevail, the availability of ASL VRS to Canadian consumers and their adoption rate could be very high
Consumers may be required to register before they can use VRS. (Registration may be used as a means to regulate usage – restrict who is approved to use VRS, limit minutes of use per consumer, and/or share costs by consumers). ⁸²	Low	Medium	May restrict usage to the degree that registration is used as a tool to limit consumer access to VRS or modify consumer behaviour
The CRTC may not approve an open market for providers (multiple providers competing for customers)	Low	Low	Adoption rates may be less than those experienced in the U.S.
VRS providers may be precluded from offering point-to-point video calling for free (since point-to-point is not relay). ⁸³	High	Low	Consumer demand for VRS may be lessened, significantly reducing the adoption rate
The CRTC may elect to begin offering VRS through a well planned multi-year initial implementation research phase. ⁸⁴	High	Medium	May decrease or regulate usage during the research, but may facilitate the ability to thereafter accommodate higher demand

⁸² May also be used as one means to respond to potential fraud or misuse.

⁸³ Point-to-point video calling without the use of an interpreter is estimated to represent about 80 percent of the call traffic carried by the VRS provider's systems, but without significant cost to the provider or the VRS program.

10. Conclusion

By applying reliable traffic data from the U.S. and reports from various sources, this research summary estimates the number of likely Canadian VRS consumers and their usage at full VRS saturation. It also estimates the number of video interpreters needed for both ASL and LSQ to respond to the VRS traffic at various stages and at full saturation. These estimates are presented as a ratio of current U.S. data (the U.S. Ratio), and adjusted to accommodate conditions in Canada (the Canadian Forecast). The Canadian Forecast data portrays VRS in Canada at significantly less usage than the U.S. Ratio's equivalents. The Canadian Forecast data assumptions are presented in sections 3.3, 4.0, 5.2, 5.3, 7.2 and 8, and are conservatively estimated, especially when compared to the VRS experiences of non-U.S. countries or the unique Canadian environment. Therefore the Canadian Forecast estimates might still be considered to be higher than may be actually experienced.

Although forecasts for users, traffic and interpreters are provided, achieving the realization of a VRS program will be dependent on its greatest restriction, the availability and quality of ASL and LSQ video interpreters. Other factors, including funding and the consumer experience will also influence user demand.

Nevertheless, consumer interest in VRS is very strong, as demonstrated in this VRS Feasibility Study Report's phase 3, *Consumer Interests and Perspectives*, and usage is expected to be strong if consumers are given the opportunity to access the service.

⁸⁴ All countries except the U.S. have entered into VRS via a measured trial period. While the CRTC has authorized a VRS trial currently conducted by Telus/Sorenson, an initial VRS implementation research phase could address issues pertinent to how VRS may best be implemented on a full scale, rather than to answer the question whether or not VRS is technically feasible.

Phase 10

Cost Variables and Forecasts

VRS Feasibility Study

Mission Consulting

February 24, 2012

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COST VARIABLES AND FORECASTS

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the tenth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 10 research summary, *VRS Cost Variables and Forecasts*, provides an analysis of the potential costs of providing VRS in Canada, including but not limited to:

- Estimated VRS annual costs
- Cost basis considerations and their variables
- Factors that may delay full implementation, and related cost forecasts
- Cost estimates for separate ASL and LSQ service providers
- Cost variables
- Factors that may be used to limit or control costs
- Cost risk factors

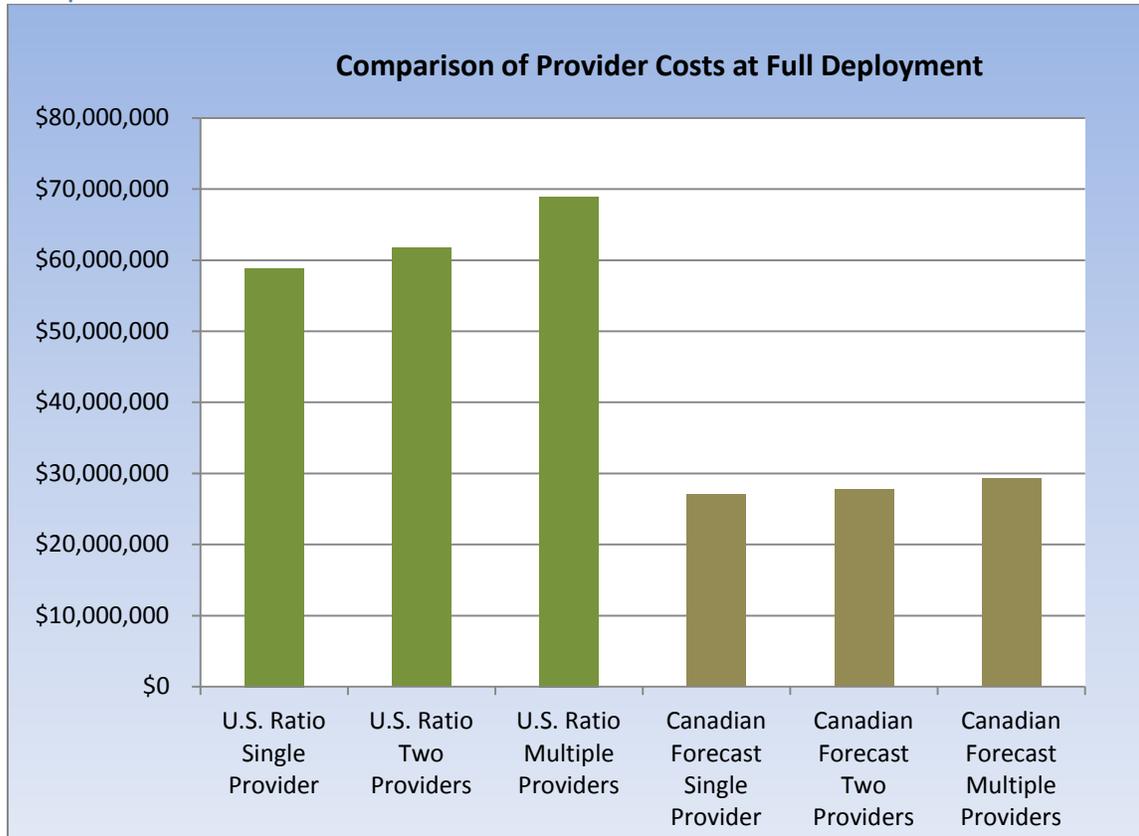
2. Summary Findings

Salient points of this analysis include the following:

Canadian VRS Cost 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.
- The forecast of Canadian VRS provider costs are significantly less than U.S. VRS provider costs applied to Canada:

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



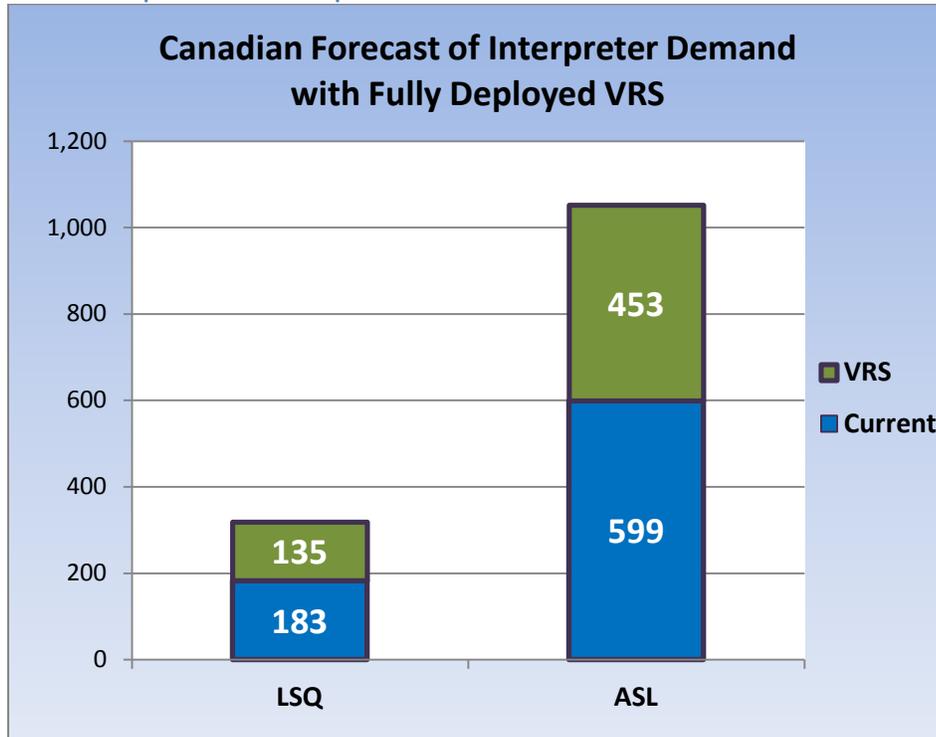
Cost Basis Considerations

- U.S. VRS vendor reimbursement costs are too flawed to be used without a separate Canadian cost analysis. The costs forecast for Canada are based on modified U.S. usage rates and estimated Canadian cost reimbursement rates.
- Canadian VRS costs are based on estimates of the sizes of the ASL and LSQ populations. The ratio of ASL to LSQ users is estimated at 3.3 to 1. Neither the population size nor the ratio has been validated.
- The Canadian Forecast VRS provider reimbursement rates are used in this document to forecast VRS program cost. The actual 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 Canadian Forecast rates used herein.

Constraints of Service

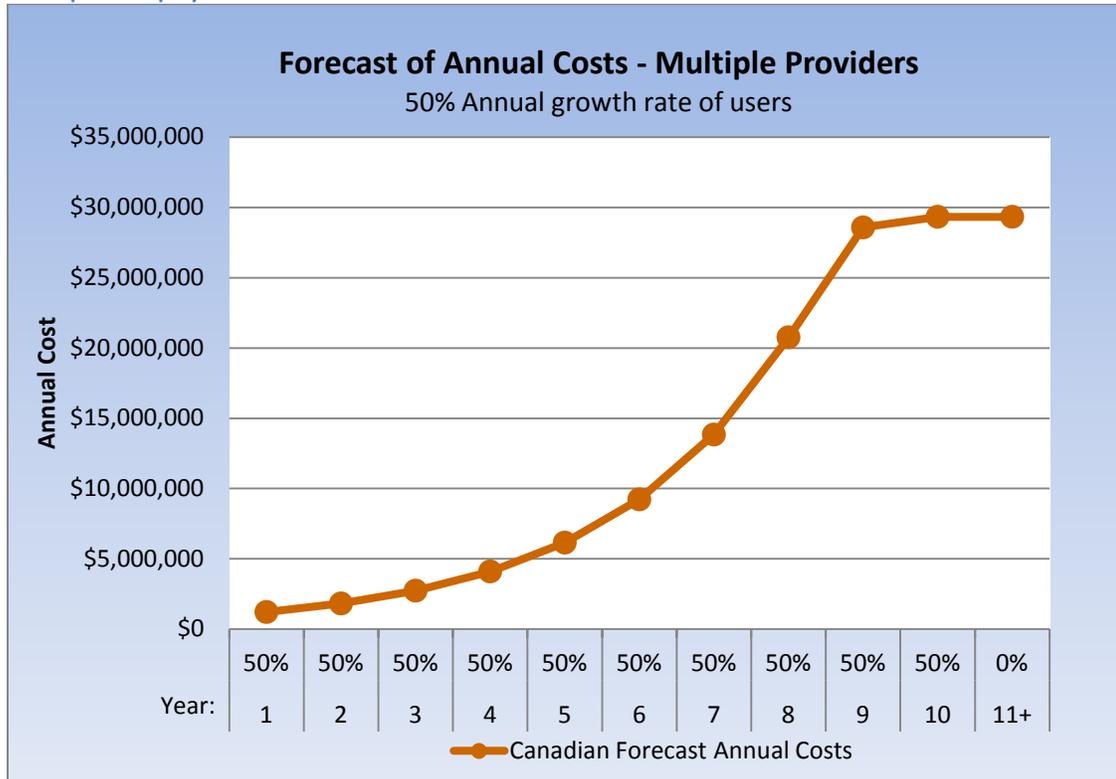
- There are number of potential constraints that may limit the deployment of VRS. The most significant constraint is the lack of Canadian interpreters to work in VRS centers.
- A fully operational VRS will need to employ approximately 75% more interpreters, part-time, than are currently present in Canada:

Figure 2: Demand for part-time VRS interpreters at full service



- One third of the current ASL Canadian interpreters are working at U.S. owned VRS centers in Canada, servicing U.S. consumers. All other current ASL and LSQ interpreters are providing community interpreting to Canadian sign language users.
- The lack of available interpreters for VRS will cause VRS deployment to occur over time while additional interpreters are trained. An aggressive expansion of existing interpreter training programs will be required in order to fully deploy VRS over ten years, as depicted below:

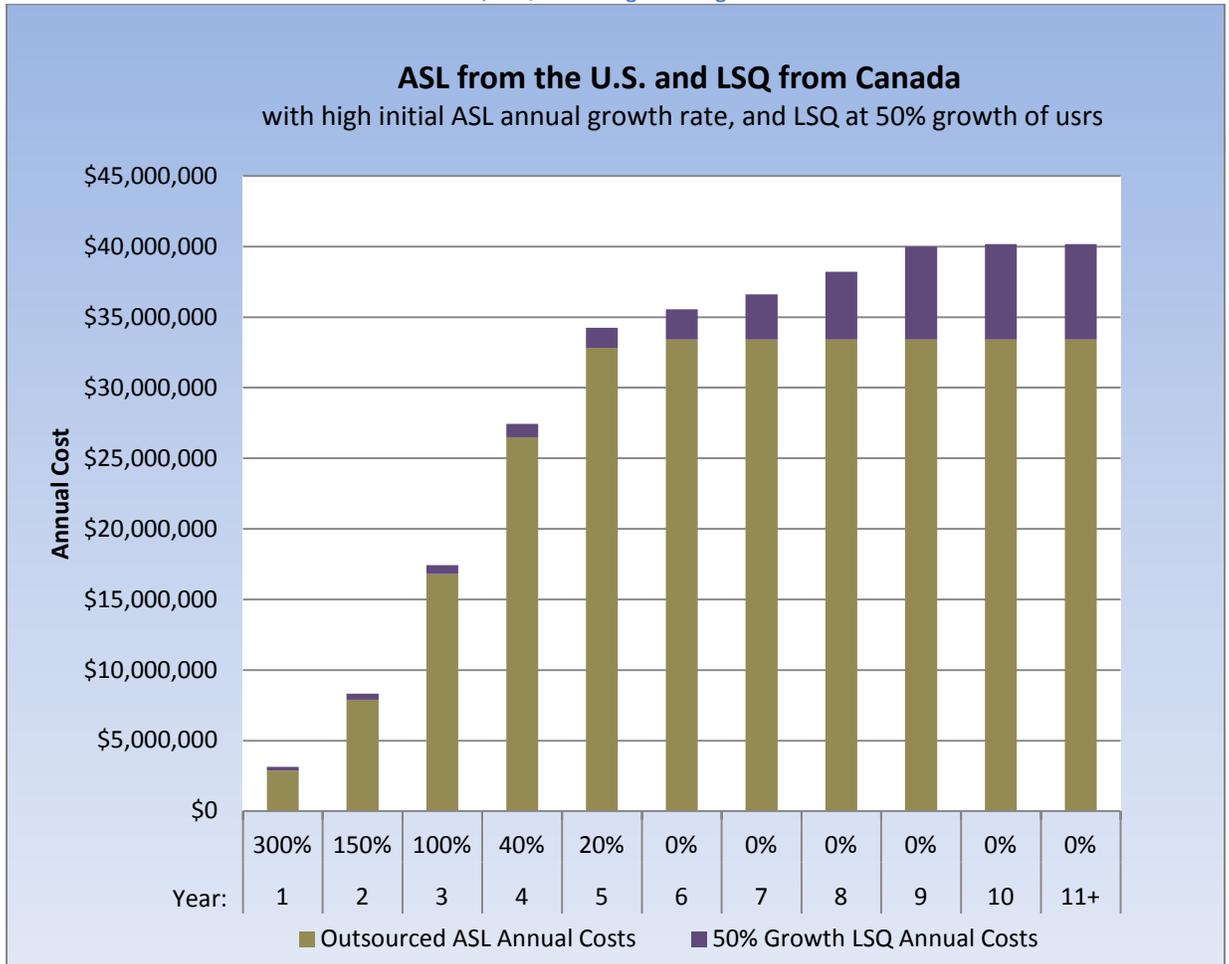
Figure 3: Anticipated deployment of VRS over time



- Canada’s college and university interpreter training programs generally report that they do not have the resources to readily expand their training beyond the levels required to maintain the current labour pool.¹
- By separately contracting for ASL VRS and LSQ VRS, ASL VRS could be outsourced to ASL VRS providers located in the United States, where sufficient ASL interpreters exist.
- Canadian LSQ VRS cannot be outsourced as LSQ interpreters are generally not available outside of Quebec.
- An outsourced ASL VRS would be expected to have a higher adoption rate by Canadian ASL users since the availability of the service would not be constrained by a lack of interpreters (note that the costs in the following chart do not include administrative costs):

¹ See this VRS Feasibility Study’s phase 6, *Interpreter Considerations*, for details.

Figure 4: ASL outsourced to the United States at U.S. rates; LSQ remaining at 50% growth



- Outsourcing ASL to the United States would result in significantly higher initial and ongoing VRS program costs as U.S. providers operate at higher reimbursement rates than are forecast for Canadian based VRS. Fully deployed outsourced ASL VRS paired with Canadian served LSQ VRS is expected to cost approximately \$42.5 million annually, including administrative costs.

Available Limitations or Controls on Costs

- Cost controls must primarily limit consumer availability to VRS, limit the consumers’ minutes of use, or reduce demand for the service.
- Restricting VRS hours of operation may decrease demand and associated costs. Limiting VRS availability to 8:00 AM to 8:00 PM, Monday through Friday, may decrease program costs by approximately 17 percent.
- Another potential restriction can be limiting the number of minutes allowed per consumer. This type of restriction will likely face greater consumer opposition.
- Consumer demand for the service (thereby affecting minutes of use and cost) can be lessened by requiring consumers to pay for a portion of the VRS service (e.g., cost per minute or cost per call), the consumers’ VRS equipment, or the consumers’ broadband service.

Other Cost Considerations

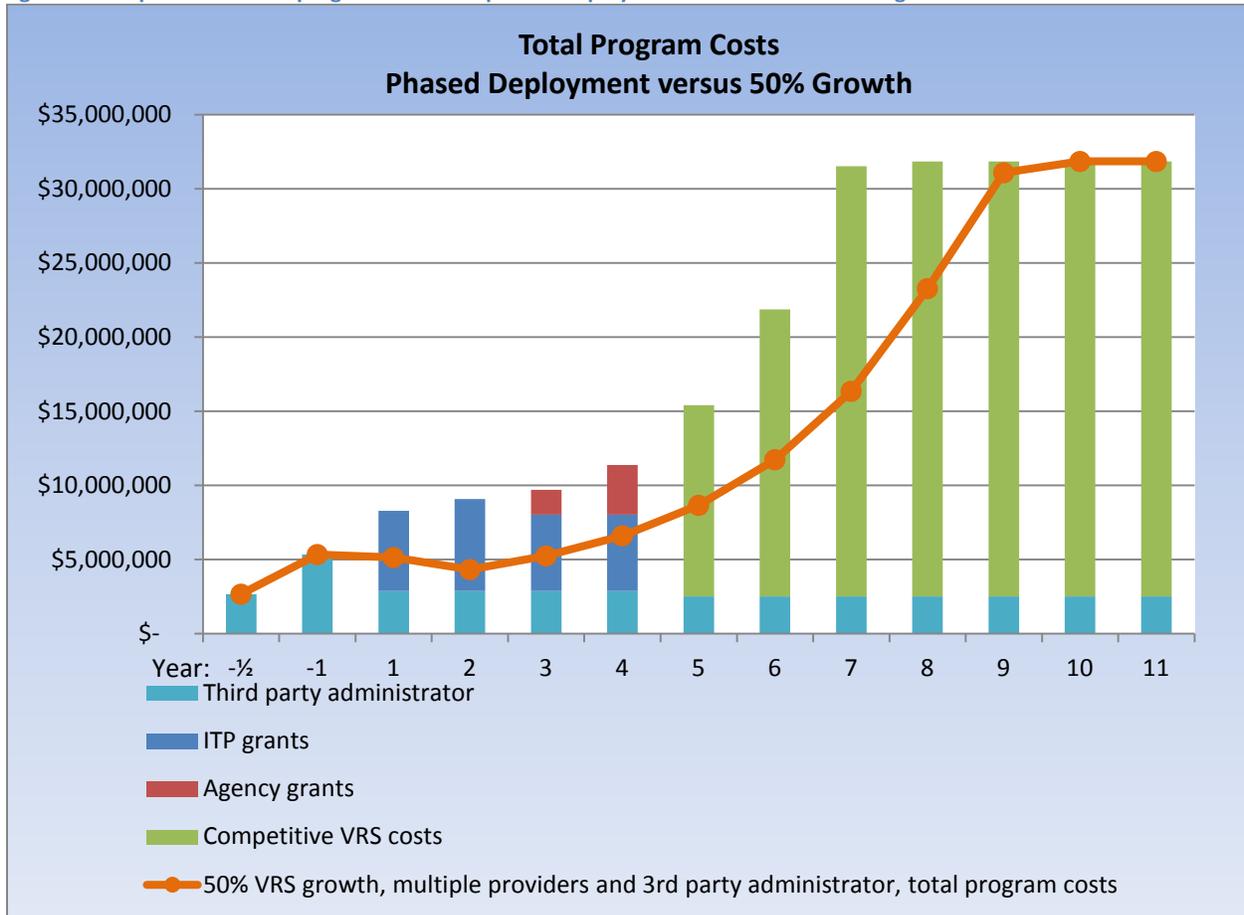
- If VRS is deployed with clear guidelines and regulations to limit fraudulent use of the service, and if VRS is competitively bid or is otherwise kept at reasonably low provider reimbursement rates, Canada should not experience the fraudulent use and billing practices experienced in the United States.
- If U.S. VRS rates remain high, they will create market pressure within Canada to have Canadian VRS reimbursement rates somewhat on par with the U.S. rates so that Canadian VRS can compete for available interpreters. Likewise, local future Canadian VRS providers may put emphasis on providing ASL VRS on behalf of U.S. consumers if the U.S. reimbursement rates remain high.²
- Video Remote Interpreting (VRI) is not expected to be included as a reimbursable function of VRS, since it is generally not considered a form of telecommunications or message relay service, and is therefore considered to be outside the jurisdiction of the CRTC. However if VRI were included and funded by the VRS fund, its potential cost impact may be high. If necessary, the potential cost of VRI and its effect upon community interpreting may best be measured in a VRI trial.
- Consumer use of TTY MRS will continue to decline as VRS is adopted, but not significantly as a result of VRS adoption.
- Potential third party administrative costs, public education and outreach costs, and consumer equipment and broadband costs are considered.
- The selection of different model choices from phase 11, Potential Canadian VRS Models, and their application in phase 12, Final Report, can result in changes to the cost forecasts.³

² The FCC has indicated that it intends to significantly reduce VRS reimbursement costs, and these issues may become moot by the time Canada establishes its actual VRS rates and begins offering VRS.

³ See this phase's section 5.6, *VRS Model Cost Considerations*.

For example the recommended two-phased deployment model results in increased interpreter availability for VRS, initially more minutes of relayed conversation, and therefore also higher initial costs. A comparison of these costs to the 50% annual growth cost model is depicted in the following graph:

Figure 5: Comparison of total program costs of a phased deployment versus a 50% annual growth model



- A concise summary of cost risks, assumptions, impacts and outcomes is also presented.

3. Conclusion

Many of the variables that will influence the final cost to implement VRS in Canada remain undecided or uncertain at this time. These include dependence on other factors such as the availability of interpreters and the cost of labor when the service is deployed. A few variables may be used to potentially control or limit total costs. Cost limits are generally accomplished by limiting consumer use of the service or by financially limiting the providers' ability to offer the service. Limits on consumer use experienced in other countries (but not the U.S.) are restricting user access via time of day, by minutes of use, and/or by requiring consumers to pay for all or part of the service. Financially limiting providers' ability to offer the service without effective controls on consumer demand can lead to significant quality of service issues.

While U.S. VRS data can be informative for forecasting Canadian VRS usage and costs, there are significant discrepancies within the U.S. data that make its application to Canada problematic. Additionally the Canadian environment (numbers of available interpreters, etc) is significantly different from the U.S. to warrant significant modification of any application of U.S. data to Canada. In fact, suggested Canadian VRS provider reimbursement rates are best derived from new analysis of Canadian cost factors.

In the past estimates have been offered to the CRTC that VRS in Canada may cost between \$50 to 100 million CAD. Using the forecasting methods in this analysis, the cost of a full 24/7 deployment of VRS is significantly less as shown in the table below. Also estimated are the costs of a 12-hour 5-day schedule for VRS.

Table 1: Annual VRS provider and administrative forecast costs, at full subscription

Forecast ongoing VRS annual program costs	24 x 7 VRS	Restricted Hours VRS
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

These are forecast costs. Actual costs are expected to represent market conditions, and may be higher or lower than the cost forecasts.

During an anticipated multi-year implementation, the maximum forecasted usage and cost may not be reached until the tenth or eleventh year, depending upon the consumers’ rate of VRS adoption and/or depending upon possible usage restraints to mitigate costs. These costs do not include potential consumers’ costs or the potential costs of education and outreach.

COST VARIABLES AND FORECASTS

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the tenth of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

This Phase 10 research summary, *VRS Cost Variables and Forecasts*, provides an analysis of the potential costs of providing VRS in Canada, including but not limited to:

- Estimated VRS annual costs
- Cost basis considerations and their variables
- Factors that may delay full implementation, and related cost forecasts
- Cost estimates for separate ASL and LSQ service providers
- Cost variables
- Factors that may be used to limit or control costs
- Cost risk factors

2. Background

This phase 10 research summary will provide an overall annual cost estimate of a fully operational (24 x 7, ASL and LSQ), fully subscribed Video Relay Service in Canada. The overall cost estimate will, for reasons discussed herein, be informed by VRS cost and usage data from the United States but modified significantly for the Canadian environment. Therefore a presentation of U.S. cost methodology, usage and cost components precedes the Canadian forecasts. The Canadian forecasts are followed by a presentation of variables that can affect the total annual cost. Some of these variables can be modified by policy, while others may be difficult to influence or even to estimate. Examples of the effect of some variables will be illustrated in forecasts which may be useful in guiding policy decisions to the extent that services may be constrained by available funds or by other factors such availability of interpreters. The actual final annual cost will be a combination of many factors that may often influence each other. Therefore predicting a final program cost with accuracy is problematic, since many key data elements are unknown or difficult to gauge with certainty including actual market rates, and since many are dependent upon policy decisions that have yet to be made.

Some broad forecasts of Canadian VRS costs have been reported at the hearing leading to CRTC Decision 2009-430, in which a provider estimated \$50 to \$100 million annually for a full service VRS,⁴ and another estimate was in the order of \$66 million annually.⁵ All forecasts derived from the best data available for this study project an eventual annual cost of approximately \$32 million for a fully deployed service. This \$32 million could be subject to further adjustments that, depending upon the VRS model chosen, could very reasonably reduce the total forecast to be about \$27 million. Additional potential cost or usage policy restrictions may also be applied to reduce these estimates if necessary to meet available funding limitations.

Not all of the identified cost elements may end up being components of the selected Canadian VRS model. Some costs attributed to one category may be eventually represented in another category, when the specific service model and related regulations are adopted.

These cost forecasts frequently refer to information and data presented in the research summaries of earlier phases of this VRS feasibility study project. All costs depicted in this report are in Canadian dollars except where specifically stated as U.S. dollars (USD).⁶

⁴ GoAmerica/Purple communications; “Response to the CRTC’s Request for Further Information Following GoAmerica’s November 21, 2008 Presentation at CRTC Public Hearing”; Telecom Public Notice CRTC 2008-8; December 23, 2008.

⁵ Bell Canada; “Information requested by Canadian Radio-television and Telecommunications Commission (CRTC)”; Response to Undertaking; The Companies (CRTC)26Nov08-11 PN 2008-8; Transcript Ref: Vol. 6, Paragraphs 11011 - 11021

⁶ Present U.S. dollars throughout this document are 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/>.

2.1. General VRS Cost Forecasting Methodology

This phase of the study assesses potential VRS program costs, based on estimates for the number of potential Canadian VRS users, their initial and long-term traffic estimates, provider charges, and other program related expenses.⁷

The United States is presently the only country where fairly unrestricted use of VRS is available on a 24-hour a day, seven days a week basis. With a significant volume of related VRS data, traffic patterns, and costs, the U.S. VRS environment provides a significant source of information useful for forecasting potential VRS usage and costs of VRS in Canada. Being informed by the U.S. data is also supported by the Canadian Association for the Deaf:

“CAD submits that it is never going to be able to arrive at a precise estimate [of VRS usage] because the information necessary just does not exist and never will. There is, for example, no accepted data as to how many sign language users there are in Canada and no accepted means to collect such data. There is years of experience in the USA that can be looked at. There is no reason that the Canadian experience will vary greatly from that in the USA once the catching up process has been completed.”⁸

3. Cost Forecasts of a Mature Canadian VRS Program

In this study’s phase 9, *Forecasts of VRS User Demand*, two scenarios were presented for a fully mature Canadian VRS program. Both depicted the total number of VRS users, their average annual minutes of use, and the total number of annual minutes. However, the first scenario applied the current U.S. VRS usage rates to Canadian demographics, resulting in Canadian usage projections that were referred to as “U.S. Ratio” forecasts. The second scenario applied significant adjustments to the U.S. data, modifying it to the characteristics of the Canadian environment as distinct from the U.S. VRS environment. This second scenario was referred to as the “Canadian Forecast” and was considered to represent the most probable forecast for Canada for a fully deployed 24 x 7 VRS at an eventual maximum usage rate.⁹ The “U.S. Ratio” numbers were shown for comparative purposes only.

This cost analysis continues to use this dual approach. The projected costs of a Canadian VRS will be presented in section 3.1 based on the U.S. Ratio forecast usage for Canada, at current U.S. FCC VRS reimbursement rates. These costs will continue to be termed “U.S. Ratio” costs. After these costs are portrayed an analysis of the U.S. reimbursement formulas will be presented in section 3.2 resulting in

⁷ See this study’s phase 9, *Forecasts of VRS User Demand*.

⁸ Canadian Association of the Deaf; CAD; CRTC Public Hearing Telecom Public Notice CRTC 2008-8; Unresolved Issues Related to the Accessibility of Telecommunications and Broadcasting Services to Persons with Disabilities; October 6, 2008

⁹ See section 3.3, *Canadian VRS Forecast Using Adjusted U.S. Data*, of phase 9, *Forecasts of VRS User Demand*.

potential adjustments to the rates as applicable to Canada. These potential adjusted rates are then contrasted to Canadian cost estimates resulting in a new Canadian Forecast for VRS provider reimbursement rates. The Canadian Forecast rates are then applied to the Canadian Forecast of usage from phase 9, to generate a “Canadian Forecast” of VRS provider costs. Again, the Canadian Forecast is offered as the probable Canadian VRS cost paid to a VRS provider serving Canada for VRS at full maturity. The U.S. Ratio costs are presented only for comparison.

3.1. U.S. Ratio Costs

3.1.1. VRS provider rates in the United States

As this analysis considers the United States VRS program costs for the introduction of VRS into Canada, it is useful to understand the methodology of how the VRS vendor rates in the U.S. have been established. Historically, the Interstate Telecommunications Relay Services (TRS) Fund Administrator submits proposed compensation rates, demand projections, projected fund size and proposed carrier contribution factors in accordance with FCC regulations. These would then be reviewed and subsequently approved or modified by the FCC.

As will be presented below, the reimbursement rates approved by the FCC to VRS providers are historically based on provider generated forecasts of their costs. As the VRS services are not competitively bid, there is no basis for an accurate and market correct estimate of what providers might propose as a competitive rate, if they were required to follow a different procurement model. Also, currently U.S. providers are fairly secure that their government VRS reimbursements will continue, year after year, for the foreseeable future. However, since the rates approved by the FCC may directly affect the Canadian VRS market, including competitively bid services, the FCC policies are provided with the understanding that the FCC is presently reexamining the VRS rate structure and may significantly revise it before or soon after this VRS feasibility study project is concluded.

The FCC’s *Cost Recovery Order* is the regulatory declaration that provides the rules and guidelines to submit proposed compensation rates for relay services. Currently, the relay services are separated into three different groups and three different rate methodologies.

1. Interstate traditional TTY TRS/MRS, interstate Speech-to-Speech (STS), interstate captioned telephone service and interstate and intrastate Internet Protocol captioned telephone service (IP CTS) compensation rates are all calculated using the Multi-state Average Rate Structure (MARS) Plan. This methodology uses a weighted average of competitively bid state rates for determining the national rate.
2. According to the *Cost Recovery Order*, IP Relay call compensation rates are based on price caps for a three year period. *“The price cap methodology applies three factors to a base rate – an Inflation Factor, an Efficiency (or “X”) Factor, and Exogenous Costs. The basic formula takes a*

base rate and multiplies it by a factor that reflects an increase due to inflation, offset by a decrease due to efficiencies.”¹⁰

3. The FCC *TRS Rate Methodology Order* also established a separate methodology for calculating VRS compensation rates. According to the regulation, the VRS providers would submit to the Administrator their own projected costs and anticipated minutes of future use, along with actual cost and demand data for the previous year. The TRS Fund Administrator would then use this information to propose the next reporting period’s compensation rates. This methodology created an inconsistent pricing structure that fluctuated from a low of \$7.84 (\$5.14 USD) per VRS minute the first year to a high of \$25.58 (\$17.04 USD) per VRS minute in 2002/2003, and currently back down to an average of \$5.97 (\$5.85 USD) per VRS minute.¹¹

Table 2 below, shows the history of U.S. VRS reimbursement rates (in USD per conversation minute) and the VRS fund values (in millions of USD).¹²

¹⁰ Federal Communications Commission (FCC); Interstate Telecommunications Relay Services Fund Payment Formula and Fund Size estimate; CC Docket 03-123; May 2009. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-09-39A1.doc.

¹¹ National Exchange Carriers Association (NECA); 2010-2011 TRS Filing at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6520215580>; Relay Services’ Reimbursement Rate, Contribution Factor & Fund Size History revised 07/06/10.xls; 7/13/2010. Conversion from USD to CAD at a 1.5263 exchange rate at 11/1/2000 at <http://www.x-rates.com/cgi-bin/hlookup.cgia>, and an average 1.5101 exchange for the 2002/2003 date range at <http://www.bankofcanada.ca/rates/exchange/10-year-converter/>. Neither the USD or the CAD of these two historical rates have been adjusted to present value.

¹² Although the FCC reimburses VRS providers based on conversation minutes, there is a discrepancy in how a “conversation minute” is defined in regulation versus how it is billed. Generally providers bill “conversation minutes” when both the calling and called parties are connected through the relay provider’s video interpreter.

Table 2: U.S. historic VRS rates and fund size in USD

		VRS Tier 1	VRS Tier 2	VRS Tier 3		FUND	SIZE		CONTRIBUTION
DATE	VRS***	0-50,000 min	50,001-500,000	>500,000		MIN (M)	MAX (M)	CUM. (M)	BASE (B)**
1993	N/A	N/A	N/A	N/A		\$25.50	\$30.80	\$30.80	
1994	N/A	N/A	N/A	N/A		REQT	NET		
1995	N/A	N/A	N/A	N/A		\$24.80	\$14.70	\$45.50	
1996	N/A	N/A	N/A	N/A		\$29.40	\$28.50	\$74.00	\$86.40
1997	N/A	N/A	N/A	N/A		\$44.20	\$53.20	\$127.20	\$92.20
1998	N/A	N/A	N/A	N/A		\$48.70	\$40.20	\$167.40	\$103.50
1999	N/A	N/A	N/A	N/A		\$43.00	\$38.00	\$205.40	\$100.00
1/00-6/00	N/A	N/A	N/A	N/A					
7/00-12/00	N/A	N/A	N/A	N/A		\$62.00	\$58.60	\$264.00	\$80.50
10/00-12/00	\$5.14	N/A	N/A	N/A					
1/01-6/01	\$5.54	N/A	N/A	N/A					
3/01-6/01	\$5.54	N/A	N/A	N/A					
7/1	\$7.45	N/A	N/A	N/A		\$70.00	\$59.00	\$323.00	\$81.30
8/01-6/02	\$9.61	N/A	N/A	N/A					
4/22/02-6/02	\$9.61	N/A	N/A	N/A					
7/02-6/03	\$17.04	N/A	N/A	N/A		\$90.00	\$64.00	\$387.00	\$79.90
7/03-6/04	\$7.75	N/A	N/A	N/A		\$115.50	\$115.50	\$502.50	\$77.50
7/03-6/04 (2/04)	\$7.75	N/A	N/A	N/A		\$170.50	\$170.50	\$557.50	\$77.50
7/03-6/04 (7/06)	\$8.85	N/A	N/A	N/A					
9/03-6/04 (6/04)	\$8.85	N/A	N/A	N/A		\$170.50	\$170.50	\$557.50	\$77.50
7/04-6/05	\$7.29	N/A	N/A	N/A		\$289.40	\$289.40	\$846.90	\$81.20
7/04-6/05 (12/04)	\$7.60	N/A	N/A	N/A		\$289.40	\$289.40	\$846.90	\$81.20
7/05-6/06	\$6.64	N/A	N/A	N/A		\$441.50	\$441.50	\$1,288.40	\$78.20
07/06-06/07	\$6.64	N/A	N/A	N/A		\$419.70	\$419.70	\$1,708.10	\$78.50
07/07-06/08	\$6.64	N/A	N/A	N/A		\$553.40	\$553.40	\$2,261.50	\$76.80
***07/07-06/08	N/A	\$6.77	\$6.50	\$6.30		\$636.70	\$636.70	\$2,898.20	\$77.70
07/08-06/09	N/A	\$6.74	\$6.47	\$6.27		\$805.50	\$805.50	\$3,703.70	\$79.60
07/09-06/10	N/A	\$6.70	\$6.44	\$6.24		\$891.00	\$891.00	\$4,594.70	\$78.30
07/10-06/11		\$6.24	\$6.23	\$5.07		\$433.90	\$433.90	\$5,028.60	\$74.10

The FCC 2007 *Cost Recovery Order* adopted a tiered rate methodology for VRS based on call volume. The tiered rate approach allows smaller VRS providers, those that have fewer monthly VRS minutes billed to the fund, to be compensated at an average rate that is higher than the average rate for high volume providers. It is believed that the higher rate encourages new service providers to enter the VRS market. In addition, the FCC set base compensation rates for three tiers to be in effect for a three year period and reduced annually by 0.5 percent to reflect productivity gains.¹³

The Cost Recovery Order required VRS providers to continue to submit actual and projected cost and demand data to the Fund Administrator. The actual historical costs were requested to be categorized into five expense categories so that the information would be useful in reviewing the reasonableness of rates adopted for each tier from the different VRS providers. The Administrator would then present the actual weighted average costs for all providers as it recommended the next tiered rate schedule.

¹³ Federal Communications Commission (FCC); Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, CG Docket No. 03-123, Cost Recovery Order at ¶ 47.

The following chart provides a five year view of the VRS weighted cost composition projections as provided by vendors in U.S dollars:

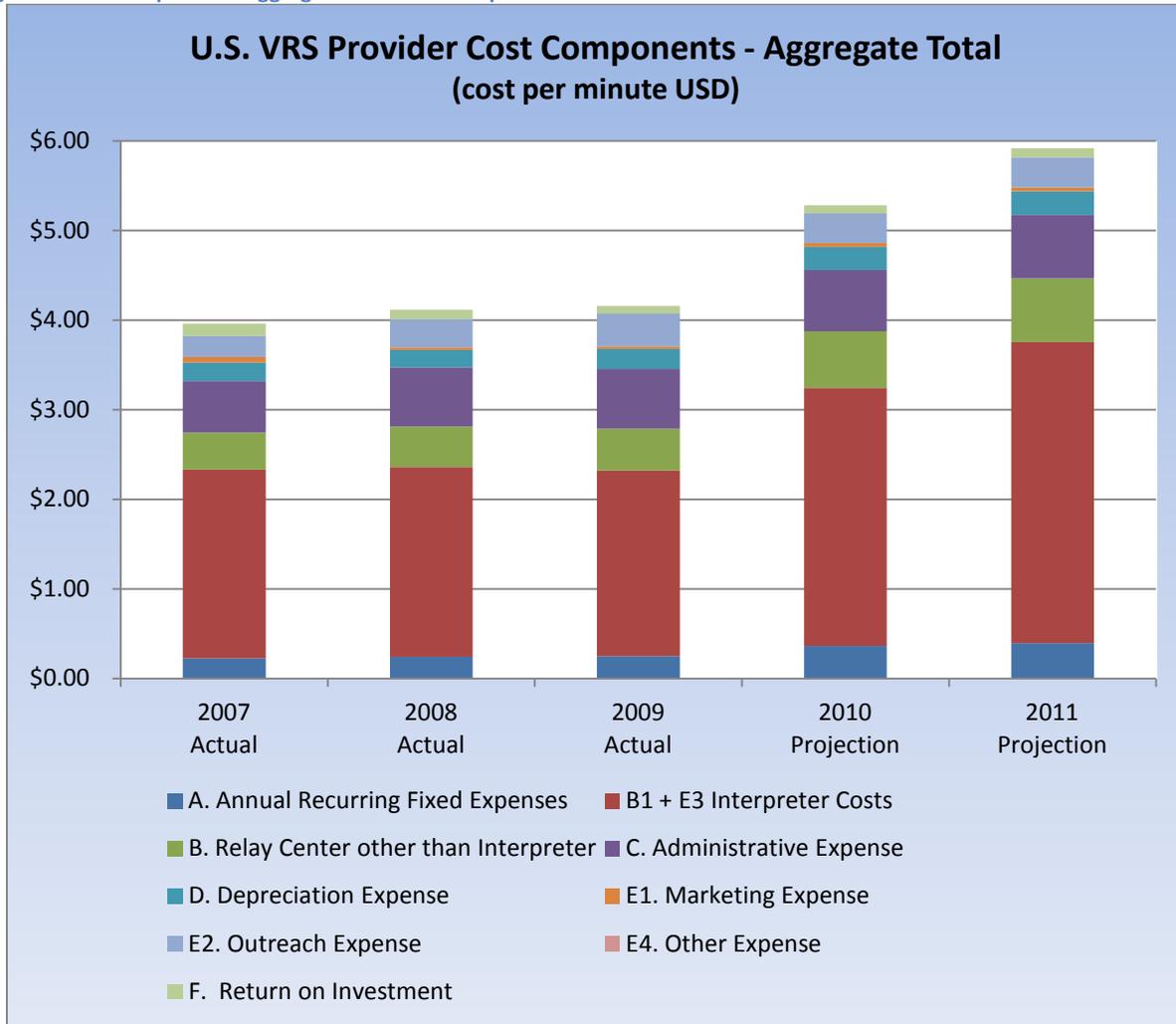
Table 3: US VRS Provider Cost Components (USD) ¹⁴

Cost Category	2007 Actual	2008 Actual	2009 Actual	2010 Projection	2011 Projection
Annual Recurring Fixed Expenses	\$0.2260	\$0.2427	\$0.2487	\$0.3649	\$0.3936
Interpreter Costs	\$2.1070	\$2.1175	\$2.0742	\$2.8782	\$3.3625
Relay Center other than Interpreter	\$0.4118	\$0.4514	\$0.4649	\$0.6334	\$0.7110
Administrative Expense	\$0.5774	\$0.6601	\$0.6688	\$0.6866	\$0.7113
Depreciation Expense	\$0.2054	\$0.1971	\$0.2210	\$0.2531	\$0.2582
Marketing Expense	\$0.0639	\$0.0283	\$0.0302	\$0.0415	\$0.0426
Outreach Expense	\$0.2321	\$0.3122	\$0.3662	\$0.3317	\$0.3383
Other Expense	\$0.0000	\$0.0000	\$0.0000	\$0.0000	\$0.0000
Return on Investment	\$0.1369	\$0.1087	\$0.0855	\$0.0932	\$0.1004
TOTAL COST PER MINUTE (USD)	\$3.9605	\$4.1180	\$4.1595	\$5.2826	\$5.9179

Because of the relatively high cost of interpreter labor and the limited number of interpreters available for VRS employment, cost efficiencies realized in most service businesses may not apply to VRS. As the volume of VRS traffic overall increases, there is expected to be a greater competition between providers for interpreters, thereby driving the cost of labor higher. Figure 6 below provides visual representation of the U.S. VRS cost composition. The costs depicted for 2010 and 2011 are shown to increase because those years' costs are based on provider forecasts, not on actual costs; and based on historical provider forecasts are highly suspect.

¹⁴ Federal Communications Commission (FCC); Interstate Telecommunications Relay Services Fund Payment Formula and Fund Size Estimate; Interstate Telecommunications Relay Services (TRS) Fund For July 2010 through June 2011; CC Docket 03-123; CG Docket No. 10-51; April 30, 2010.

Figure 6: U.S. VRS provider aggregate total cost component



The cost categories in the above chart include all of the providers' costs for delivery of the service including: land and buildings expense, interpreter expense (including subcontractor expense), non-interpreter relay center expense, indirect expense, depreciation expense, marketing expense, outreach expense, other expense, and a return on capital investment (at 11.25%).¹⁵

In addition, the TRS Fund Administrator also includes additional cost components in the proposed rate recovery mechanisms. The Administrator proposes additional compensation of \$0.0083 USD per minute for 10 digit numbering and E9-1-1 reimbursement. The Administrator also added a 1.6 percent Cash

¹⁵ National Exchange Carrier Association's (NECA) annual submission to the Federal Communications Commission (FCC) of the Interstate Telecommunications Relay Services (TRS) Fund Payment Formula and Fund Size Estimate for July 2010 through June 2011; CC Docket 03-123; CG Docket No. 10-51; April 30, 2010, at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020443086>. NECA's annual TRS submittal for July 2011 through June 2012 did not contain any analysis of VRS rate costs or rate cost projections: page 14 at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021341474>.

Working Capital Adjustment to the providers' cost structure prior to determining a reimbursement per minute rate for the VRS Fund.

After reviewing the NECA submittal and receiving industry and consumer complaints that lower rates would jeopardize quality of service or provider viability, the FCC declined to change the VRS reimbursement rates, stating:

"However, in light of concerns expressed by the providers and users, and to ensure sufficient, quality service for users while the Commission considers broad reform, we decline to reduce the VRS rates to that level at this time."¹⁶

Therefore the current U.S. reimbursement rates for the three tiers of annual minutes of use for VRS are:¹⁷

Table 4: VRS tiered rate structure and rates, U.S.

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

The establishment of three rate tiers may by itself give the impression that VRS traffic is equally distributed between the tiers. For example, although the threshold of Tier 1 minutes is comparatively low (50,000 minutes) there are far more VRS providers that operate only within that tier, as compared to the number of VRS providers that reach Tier 3. However, the actual distribution of total annual U.S. VRS minutes by tier is highly skewed. The following table and chart depict the distribution by tier of the U.S. annual VRS minutes reported for July 2009 to through June 2010:

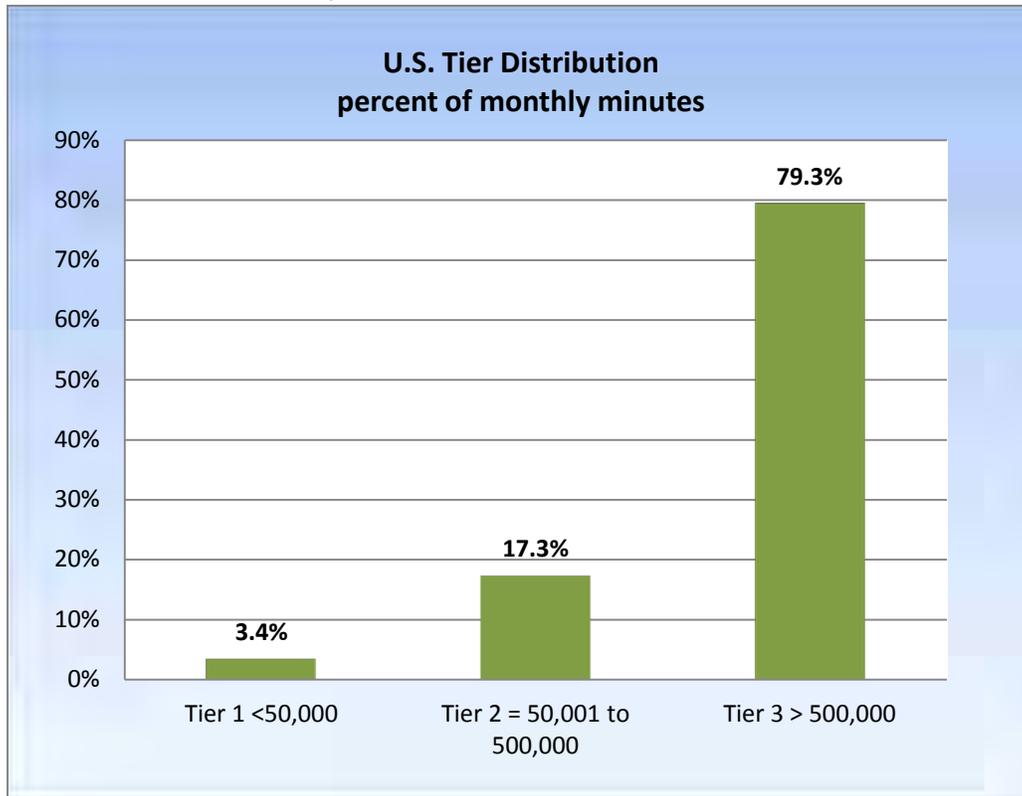
¹⁶ Ibid; page 5

¹⁷ The FCC is intending to again address VRS reimbursement rates in late 2011 or early 2012 in an effort to reduce rates to be more in line with what the FCC may estimate as reasonable and actual costs. Thus the U.S. VRS rates may change from those shown in Table 4.

Table 5: Distribution of U.S. VRS minutes by provider

Provider	Percent of Minutes	Monthly Minutes	Tier 1 <50,000 minutes	Tier 2 50,001 to 500,000	Tier 3 > 500,000 minutes
Number 1	83.7000%	6,893,841	50,000	449,999	6,393,841
Number 2	7.7400%	637,495	50,000	449,999	137,495
Number 3	5.9600%	490,888	50,000	440,888	
Number 4	1.6000%	131,782	50,000	81,782	
Number 5	0.5100%	42,005	42,005		
Number 6	0.2100%	17,296	17,296		
Number 7	0.0900%	7,413	7,413		
Number 8	0.0400%	3,295	3,295		
Number 9	0.0300%	2,471	2,471		
Number 10	0.0200%	1,647	1,647		
Number 11	0.0100%	824	824		
Number 12	0.0100%	824	824		
Number 13	0.0100%	824	824		
Number 14	0.0100%	824	824		
Number 15	0.0090%	741	741		
Number 16	0.0080%	659	659		
Number 17	0.0075%	618	618		
Number 18	0.0060%	494	494		
Number 19	0.0050%	412	412		
Number 20	0.0050%	412	412		
Number 21	0.0040%	329	329		
Number 22	0.0030%	247	247		
Number 23	0.0030%	247	247		
Number 24	0.0025%	206	206		
Number 25	0.0025%	206	206		
Number 26	0.0025%	206	206		
Number 27	0.0020%	165	165		
Total Monthly Minutes:		8,236,369	282,364	1,422,667	6,531,336
Total Annual Minutes:		98,836,426	3,388,365	17,072,010	78,376,027

Figure 7: Distribution of U.S. VRS minutes by tier



U.S. VRS rates per tier are set by averaging the self-reported cost of the providers. For example Tier 1 rates are comprised only of costs of providers that relay less than 50,000 conversation minutes per month. In actuality all of these minutes used for Tier 1 rate setting are relayed by companies (provider numbers 5 through 27 in the above table) that are subcontracted to prime VRS contractors. In the Tier 1 rate calculation the costs of the subcontractor are accounted as “interpreter costs” even though they may include the subcontractor’s overhead and other costs as well as profit. Tier 2 rates are composed of all VRS providers except Sorenson. Tier 3 is comprised only of costs for VRS conversation minutes that are relayed by companies that exceed 500,000 minutes per month, which are only Sorenson and Purple. The dominance of the market by one provider, Sorenson at 83.7%, (or the top three providers at 97.4% of the market) is striking.¹⁸ Because these companies handle almost all of the minutes it is their self-reported cost data that effectively determines the program costs of VRS in the U.S., regardless of the Tier 1 rates offered to smaller providers. U.S. VRS companies are paid for minutes by tier, so that a company’s first 50,000 minutes per month are paid at the Tier 1 rate, its next 450,000 minutes are paid at the Tier 2 rate, and all additional minutes are paid at the Tier 3 rate even though a Tier 3 provider like Sorenson has apparently claimed that the cost of its minutes are mostly equivalent to the Tier 3 cost per minute.

¹⁸ The third ranked provider is generally considered to be either CSDVRS (Z) or Sprint. The fifth ranked provider has identified itself as Convo.

3.1.2. Canadian VRS provider costs using U.S. Ratios

To apply the U.S. cost model to Canada, the current published FCC rates are applied to an estimate of Canadian VRS traffic volumes for a fully deployed VRS operating 24 hours a day 365 days of the year serving all anticipated Canadian VRS users without restrictions.

Forecasts provided in the phase 9 report stated the numbers of estimated users and annual minutes using current U.S. Ratios as follows:

Table 6: U.S. Ratio – forecasts for Canada at VRS usage saturation¹⁹

Canada Forecasts at VRS Usage Saturation using U.S. Ratios	
Forecast ASL & LSQ VRS users (at 0.050% of population)	17,050
Forecast number of ASL VRS users (at 77% of users)	13,128
Forecast number of LSQ VRS users (at 23% of users)	3,922
Estimated average annual VRS minutes per user	635
Forecast of Canadian VRS annual minutes	10,826,750

To apply the U.S. VRS three tier methodology, an adjustment in tier level thresholds was applied to tiers II and III to accommodate the comparatively lower overall forecast of Canadian traffic, and potentially a fewer number of providers serving the Canadian consumers.

Table 7: Suggested VRS tiered minutes for Canada compared to U.S. tiers

US Traffic Rate Monthly Thresholds	Suggested Canadian Monthly Thresholds
Tier I = < 50,000 minutes	Tier I = < 50,000 minutes
Tier II = 50,001 to 500,000 minutes	Tier II = 100,001 to 200,000 minutes
Tier III = > 500,000 minutes	Tier III = > 200,000 minutes

A combined view of the suggested Canadian thresholds and Canadian equivalent rates is shown below.

Table 8: U.S. Ratio – VRS tiered rate structure and per minute reimbursement rates

Tier	Monthly Minutes of Use	Rate (CAD)
Tier I	< 50,000	\$6.3688
Tier II	100,001 – 200,000	\$6.3632
Tier III	> 200,000	\$5.1722

¹⁹ See section 3.2.1, *Initial Application of U.S. Full Saturation and Usage Statistics*, of phase 9, *Forecasts of VRS User Demand*.

By applying the above tiered rates to the estimated total minutes of Table 6 above, a forecast for a 24/7 VRS, (serving 17,050 users who average 635 annual minutes per consumer) a forecasted U.S. Ratio cost for Canadian VRS at maturity provided by a single provider is \$58,863,061.²⁰

Table 9: U.S. Ratio – Forecast of Canadian VRS costs at maturity

Canadian VRS Forecast at Maturity	
VRS consumers:	17,050
Average annual minutes per user:	635
Total annual minutes of use:	10,826,750
Forecast annual cost:	\$58,863,061
Average cost per minute:	\$5.4368

3.2. Canadian Forecast Costs

There are two reasons why the Canadian equivalent of the U.S. VRS reimbursement rates (the “U.S. Ratio” forecast) should be considered to be too high for use in Canada. The first is that the U.S. rates are based on a five year average, including three years of vendor reported actual costs plus two years of vendor reported forecast costs. The second is that the vendor reported costs are considered by many to be excessive. These two reasons and their suggested outcomes for an “Canadian Forecast” of rates and costs are presented below.

3.2.1. Incongruities of U.S. rate averaging

As noted by the FCC, its methodology of averaging historic and future cost projections is flawed, and vendor projections of future costs have consistently been overstated:

“The projected costs for VRS for a given Fund year have consistently proven to be higher than actual costs for that Fund year, and there is currently no “true up” mechanism for reconciling, after the Fund year, the rates at which providers are reimbursed from the Fund and their actual costs for the Fund year.”²¹

“A comparative analysis by NECA of providers’ projected and actual cost and demand over the past several years reveals that there is a substantial disparity between providers’ reported projected costs and demand, and what turns out to be their actual costs and demand.”²²

²⁰ This cost does not include general administrative and other program costs discussed in section 5.

²¹ FCC 10-115, Order, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 03-123, released June 28, 2010, paragraph 6, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-115A1.doc.

²² Ibid, paragraph 9.

The FCC process of rate setting does not provide any incentive for VRS providers to submit accurate estimates of future costs. There is no penalty for inaccuracy, no effective auditing of provider costs, and there is no reconciliation adjustment of rates or payments resulting from over inflated projections of future costs. Providers are financially incented to submit estimates of unrealistically high future costs since high projections will result in higher reimbursement rates.

This is borne out by the most recent TRS Fund Administrator's public submission to the FCC regarding VRS provider data in which NECA pointed out significant anomalies and cost overages:²³

*"One provider has proposed an increase in its interpreter staff of approximately 57 percent for 2010 and over 62 percent for 2011 when compared to 2009 staffing levels despite consistently meeting speed of answer requirements and submitting a demand projection that remains virtually constant (+2.8%) with the demand reported for compensation in 2009. These projections are the primary cause of the increases in 2010 and 2011. ...While one provider's projected costs contain unreasonable and unsubstantiated growth in headcount, the projected rate proposals contained herein utilize this questionable data as it was submitted."*²⁴

*"There are also wide variations in projected costs among providers. One provider submitted projected costs for 2010 that were below \$2.00 [USD] per minute on one extreme while another submitted costs in excess of \$80 [USD] per minute on the other extreme."*²⁵

*"With the benefit of four years' data showing that providers' projections consistently overstate their costs, we can no longer justify basing VRS compensation rates only on projected costs."*²⁶

According to the report, providers were given the opportunity to revise their cost projections, however none were received. Therefore, the U.S. TRS Fund Administrator (NECA) submitted per minute rate

²³ National Exchange Carrier Association's (NECA) annual submission to the Federal Communications Commission (FCC) of the Interstate Telecommunications Relay Services (TRS) Fund Payment Formula and Fund Size Estimate for July 2010 through June 2011; CC Docket 03-123; CG Docket No. 10-51; April 30, 2010, at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020443086>. NECA's annual TRS submittal for July 2011 through June 2012 did not contain any analysis of VRS rate costs or rate cost projections: page 14 at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021341474>.

²⁴ NECA TRS submittal for 2010/2011; pages 18 and 20. Numerically the data suggest that this provider is Sorenson.

²⁵ Ibid. It is assumed that these two providers have comparatively very few annual minutes of VRS traffic.

²⁶ FCC 10-115, Order, In the Matter of Structure and Practices of the Video Relay Service Program, CG Docket 03-123, released June 28, 2010, paragraph 10, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-115A1.doc.

alternatives to the FCC that included the unsubstantiated projected costs for 2010 and 2011 identified above but excluded the costs submitted by the two providers at the extremes (highest and lowest cost).

Since the U.S. VRS rate formula includes unsubstantiated future cost estimates that are consistently higher than actual costs, why should a Canadian VRS reimbursement rate include these unrealistic high estimates? In fact, in its filing NECA also suggested that the FCC should consider only using the historic costs submitted by the VRS providers; that is, those costs that the providers claim are their actual costs for past years, not their projected costs for future years. NECA offered two ways to use the historic costs:

A three year average of actual costs

NECA noted that the average historical costs (weighted across all tiers) for each year, in U.S. dollars was:

Table 10: U.S. historical VRS cost summary, USD²⁷

U.S. Historical Cost Summary	2006	2007	2008	2009
Weighted Average, USD:	\$4.4603	\$3.9604	\$4.1180	\$4.1596

These represent the actual cost to provide VRS as submitted by the VRS providers as described above in section 3.1.1. Based on the provider’s submitted 2009 cost data, NECA offered the following tiered pricing shown below in both U.S. and Canadian dollars:

Table 11: First alternative – NECA suggested U.S. rates based on historical costs

U.S. Historical Costs	Tier 1	Tier 2	Tier 3
U.S. dollars: ²⁸	\$5.7754	\$6.0318	\$3.8963
Canadian dollars:	\$5.8955	\$6.1573	\$3.9773
Decrease from current rates: ²⁹	7.4%	3.2%	23.1%

Historic costs – differential between tiers

NECA then suggested another alternative also based on the 2009 historical costs for the three tiers, but based on the differential between the tiers. NECA offered the pricing “based on the application of the percentages to a composite cost” (the weighted average with a 3.2% growth factor, the additional amount for 9-1-1/10-digit numbering, plus 1.6% of cost of working capital), resulting in the following pricing:

²⁷ NECA TRS submittal for 2010/2011, page 17, Table 2.

²⁸ Ibid, page 25, Table 3.

²⁹ Current rates as shown in sections 3.1.1 and 3.1.2.

Table 12: Second alternative – NECA suggested U.S. rates based on differential of historical costs³⁰

U.S. Historical Costs Differential Basis	Tier 1	Tier 2	Tier 3
U.S. dollars:	\$4.1447	\$3.9797	\$3.8575
Canadian dollars:	\$4.2309	\$4.0625	\$3.9378
Decrease from current rates: ³¹	33.6%	36.2%	23.9%

3.2.2. Excessive expenses reported in U.S. costs

Additionally, there is significant documentation suggesting that the “actual historical costs” reported by the VRS providers contain significantly inflated or excessive amounts, as well as costs that according to regulations should not be reimbursed.³² The subject is actually complex in that it involves differences of understanding between what is allowed as determined by the intent of U.S. law compared to what is allowed as determined by knowledgeable management practice; both contrasted to what is represented and claimed by the providers. For example, U.S. law stipulates that TRS (including VRS) is a service provided by (or funded by) the telecommunication carriers for which the carriers are to be compensated for their costs. The service is not supposed to be compensated at high margins as a profit making enterprise. Yet the high reimbursement rates established by the FCC have established a private VRS for-profit industry completely dependent upon the FCC’s payments at levels far beyond the cost of the service. For a significant description of the issue see the U.S. Congress Committee on Energy and Commerce’s December 9, 2008 Majority Staff Report on its findings of an investigation of the FCC.³³

The issue remains current. In June of 2010 the FCC issued a Notice of Inquiry, which continued to quote the Majority Staff report:

...the House Committee on Energy and Commerce concluded that “[t]here is substantial evidence that the FCC has failed to set reasonable rates for the compensation of TRS

³⁰ NECA TRS submittal for 2010/2011, page 25.

³¹ Current rates as shown in sections 3.1.1 and 3.1.2.

³² Confidential research by Mission Consulting validate this perspective. Examples are cost to provide and install consumers’ VRS equipment, and other inflated or inappropriate costs.

³³ Although the link to the report from the Committee’s news release at <http://democrats.energycommerce.house.gov/index.php?q=archive/110th-congress/committee-releases-staff-report-on-findings-of-fcc-investigation> is not functioning, the report itself is available at <http://www.voiptechchat.com/wp-content/uploads/2008/12/fcc-distrust-report.pdf>. In particular see section 1 and exhibits 3 through 7. For another summary of the issues, see the article, “A Failure of Communication”, The Deal Magazine, Oct. 1, 2010 at <http://www.thedeal.com/magazine/ID/036729/insights/a-failure-of-communication.php>.

providers. As a result, consumers are being significantly overcharged to finance the TRS Fund and TRS providers are being significantly overcompensated.”³⁴

Mr. Thomas Chandler, the past Chief of the FCC’s Disability Right’s Office has often stated that the FCC’s VRS rates are unjustified. When he resigned in March of 2010 he stated:

But the fact is, the “fleecing of America” that resulted from the setting of the VRS rates in 2007 for three years dwarfs the stealing from the Fund through fraud and outright criminal conduct.³⁵

Even today, FCC staff affirms that significant “waste” exists within the current reimbursement rates that surpass the cost estimates attributed to fraud and abuse concerning the reported number of minutes compensated, and that actual costs are unofficially estimated in the range of \$3.50 USD per minute.³⁶ While the overstatement and inappropriateness of costs may be strongly denied by the VRS industry, it is surreptitiously allowed by the combination of vendor self-reporting and lack of effective government oversight.³⁷ In any case a differential of current tiered USD rates (\$6.34/\$6.23/\$5.07) to \$3.50 USD represents a 45% to 31% reduction from current rates.

³⁴ 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, paragraph 30, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-111A1.doc.

³⁵ <http://www.edsalert.com/wp-content/uploads/2010/03/farewell-Tom-Chandler-032510.doc>. Note that the rates established in the three-year term continue to be the current U.S. VRS rates with only insignificant modification at the time of this report.

³⁶ See <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021739255>. Also, in private correspondence with Mr. Chandler for this feasibility study, he suggested that average U.S. VRS rates based on costs might more appropriately be around \$3.00 USD per minute.

³⁷ FCC and TRS Fund Administrator audits have proved unable to independently verify provider cost accounting. For example see Exhibit 7 of the December 9, 2008 Majority Staff Report wherein on April 10, 2008 KPMG identified its inability to audit Sorenson due to denied access and redacted records, and on July 30, 2008 depicted significant missing data and inadequate accounting systems of seven other VRS providers; available at <http://www.voiptechchat.com/wp-content/uploads/2008/12/fcc-distrust-report.pdf>.

3.2.3. U.S. rate alternatives

As documented above, the current U.S. VRS rates are inappropriately high due to two independent factors:

1. The current rates include unsupported high forecasted costs self-reported by the providers.
2. Both the historic and forecasted costs reported by the providers are suggested by qualified experts and FCC representative to include significant excessive and disallowed expenses.

Various revised U.S. VRS reimbursement rates have been put forward:

1. NECA officially suggested that tiered rates based only on historical costs would be appropriate (however still based on unaudited costs as represented by the providers) at either \$5.7754/\$6.0318/\$3.8963 USD or \$4.1447/\$3.9797/\$3.8575 USD, per conversation minute.
2. Costs ranging from \$3.50 to \$3.00 USD per conversation minute have been unofficially suggested by current and past FCC staff.

Based on the record presented it is reasonable to conclude that the current U.S. VRS rates are not supportable and should not be applied to Canada for cost forecasting purposes. While the various alternative rates suggested by NECA and the FCC staff are instructive and are offered by knowledgeable subject matter experts, by themselves these alternative rates are also deeply flawed by missing, inaccurate or inappropriate source data. Therefore while these U.S. rate alternatives may be useful for comparative purposes, another analysis based on average Canadian interpreter costs, reasonable call center overhead and profit margins is warranted.

3.2.4. Canadian cost estimates

Interpreter costs

Phase 6 of this feasibility study indicated a range of hourly rates paid to Canadian interpreters of community interpreting. The variances in these pay rates are influenced by the skill level of the interpreter, availability of interpreters (i.e., competitiveness), and by location (general regional and local cost of living factors) – with skill level being the primary factor. These data, supplemented by additional research for this phase 10, indicate that community interpreters are paid from a low of \$15 per hour to a high of \$60 per hour by interpreting agencies, with most paid about \$25 per hour, and up to \$40 or \$45 per hour for highly qualified individuals. Quebec rates (and non-major metropolitan area) pay rates are often at the lower range of this spectrum. For example rates may be \$15 per hour for a junior skilled person, \$20 per hour for an intermediate skilled person, and \$24 to \$30 per hour for a senior level person.³⁸ Highly qualified freelance interpreters with their own clientele (that is, who work directly for the client, and not through an agency) typically receive \$50 to \$60 per hour.

³⁸ Quebec pay rates may tend to be lower due to lack of standards for hiring LSQ interpreters, and the prevalence of LSQ interpreters performing community interpreting without formal interpreter training program certification.

These pay rates are reflective of rates charged by agencies for their services, which are typically \$40 to \$60 per hour for private parties, and \$50 to \$75 per hour for government and some businesses (e.g., \$75/hour for court interpreting).³⁹

In the United States interpreter pay rates for community interpreting are often similar to the Canadian \$25 to \$40/\$45 range, but are lower for VRS interpreting. This is because community interpreting involves travel time to and from the client that is usually not compensated, involves irregular hours (time of day and day of week), irregular frequency (unpredictable requests), and unpredictable duration of assignments (often short, e.g. 20 – 40 minutes). Highly active community interpreters are also often required to market themselves via personal outreach to the Deaf community through community events and networking. The interpreter is not compensated for their marketing time. Thus an active community interpreter spends a significant amount of time in non-compensated activities and in waiting (while keeping available) for assignments.⁴⁰

This is contrasted to VRS employment which, while also part-time, is nevertheless scheduled in advance with regular hours, involves no client travel, no need for personal outreach, no time spent waiting to be employed, and can provide more working hours. Therefore, as occurs in the United States, interpreters are usually paid less per hour for VRS interpreting than for community interpreting. For example U.S. interpreters are typically paid in the range of \$20 to \$35 per hour to work in VRS, depending upon skills (with most averaging about \$25). For VRS in Canada, a high skill level for interpreters is desired. Assuming a community interpreting pay range of \$40 to \$45 per hour for the higher skilled interpreters, this skill level would be expected to receive approximately \$28 to \$35 per hour when working for VRS as part-time employees.⁴¹ This estimated range is considered conservatively high; actual pay rates could be lower depending upon location, availability of skilled interpreters, and market competitiveness.

With an anticipated VRS interpreter pay range of \$28 to \$35 per hour, an average pay rate of \$31.50 per hour may be used for estimating purposes.⁴² To estimate the labor cost to the VRS provider, a load of 33.33% is added for employment taxes, associated benefits, etcetera. Thus an average \$31.50 VRS pay rate will equate to a loaded cost of \$42.00.⁴³ This loaded labor cost of \$42.00 per hour will be used for Canadian VRS cost estimating purposes.

³⁹ Agencies and freelance typically charge a two hour minimum.

⁴⁰ Community interpreters are also often paid by agencies as contractors instead of as part-time employees, thereby requiring the interpreter to pay their own expenses and benefits, and to account for and file their contractor taxes, licenses, etcetera.

⁴¹ This higher Canadian VRS pay rate (compared to the U.S.) also anticipates the potentially greater competition for skilled interpreters than is experienced in the United States.

⁴² While most VRS interpreters will be part-time, a few (e.g., interpreter/supervisors, interpreter/mentors, etc) will be full time. For illustrative purposes the \$28 to \$35 / hour (\$31.50 average) equates to full time equivalent salaries (rate x 2080 annual hours) of \$58,240 to \$73,000 annually (\$65,520 average).

⁴³ $\$31.50 \times 1.3333 = \42.00

Productivity, overhead and profit

Additional considerations for productivity, overhead and profit are necessary in order to develop a VRS reimbursement rate based on labor, overhead and profit. As detailed in this study's phase 9, section 4.2, based on U.S. and other countries' VRS experience this study has recognized an average 25% interpreter efficiency rate for call handling and billing. That is, for every hour worked the VRS interpreter will relay 15 billable conversation minutes. This efficiency average includes the absorption of the overnight hours, which due to low call volumes produces an interpreter efficiency rate of less than 10%.⁴⁴

Overhead costs can vary depending upon the model of VRS service selected. For example, overhead costs will be higher for companies that are required to form in Canada in order to provide VRS, especially when these firms do not have working relationships with either the Deaf community or the interpreter community. Costs to establish facilities, outreach and marketing, recruitment, and so on will be significantly higher than existing firms already involved with ASL or LSQ interpreting. This is noted because the recommendation for the type of provider in this study's phase 11, *Potential Canadian VRS Models*, is that existing organizations involved with ASL and LSQ interpreting as their primary business/function should be primarily considered as potential VRS provider organizations. Additionally, a significant overhead cost for small providers is the VRS platform hardware and software. The phase 11 recommendation is that the platform be acquired by a third party VRS administrator and licensed at a discount to all Canadian VRS providers, thereby further reducing their overhead costs and making entry into the VRS market more affordable.

For these reasons a combined overhead and profit factor is suggested at 35% of revenue. Depending upon an individual organizations' efficiency, an average overhead is expected to be in the range of 20% of revenue, and profit in the range of 15% of revenue. Loaded labor costs of \$42 per hour at 25% billing efficiency should result in a loaded labor cost at 65% of revenue. All these ratios are considered conservative (costs can be lower and profits can be higher).

3.2.5. Canadian Forecast rates

Based on the above percentage estimates of labor, efficiency, overhead and profit, the recommended Canadian VRS provider reimbursement rate for Tier 1 for VRS provider cost forecasting purposes only is \$4.30 per conversation minute.

⁴⁴ In assessing the interpreter efficiency of VRS without service at night, the British Ofcom report cited in this study's phase 9 suggested an improved efficiency rate of 28% which was used in the phase 9 report for non-night and weekend services. However, since the Ofcom efficiency rate was based on "the American experience" and was provided by Sorenson, and since Table 5 indicates the dominance of Sorenson minutes, night coverage by a large provider can be efficiently handled by routing all night calls to one VRS call center. Small independent VRS call centers do not have that option if they are required to provide night service, and therefore they incur significantly lower interpreter efficiencies for low volume night service. The routing and handling of night service should be a topic of an eventual Canadian VRS design, including appropriate cost offsets in provider reimbursements.

At 25% interpreter efficiency, this \$4.30 VRS reimbursement rate generates \$64.50 in revenue per hour worked per interpreter (\$4.30 x 15 minutes = \$64.50). Labor, overhead and profit shown as a percentage of this hour’s revenue are as follows:

Table 13: Breakdown of an hour's VRS revenue at 25% interpreter efficiency, at \$4.30/billable minute

Percentage of revenue	
Loaded labor cost at 65% of \$64.50:	\$41.925
Overhead cost at 20% of \$64.50:	\$12.900
Profit at 15% of \$64.50:	\$9.675
Total hour’s revenue:	\$64.500

The recommended Tier 1 rate is reduced to account for additional efficiencies gained by potential providers that reach Tier 2 and 3 thresholds. The recommended long term provider reimbursement rates for Canadian VRS for cost forecasting purposes only are:

Table 14: Recommended Canadian tiered VRS provider rates, CAD

Recommended per conversation minute VRS rates	Tier 1 less than 100,000 minutes/month	Tier 2 100,000-200,000 minutes/month	Tier 3 more than 200,000 minutes/month
Canadian dollars:	\$4.300	\$4.1000	\$3.8500

While the above Canadian Forecast rates may be appropriate for estimating the long term forecasts of provider costs (fully deployed and over eleven years), actual rates will be affected by the procurement or rate setting methodology selected. These actual rates may be lower since the above Canadian Forecast rates are still more than the self-reported historic costs of the U.S. providers.⁴⁵ How the model selections may influence actual costs will be referenced in section 5.6, *VRS Model Cost Considerations*, and the cost implications of those selections presented in this study’s phase 12, *Final Report*.

The above recommended Canadian tiered VRS provider rates and associated forecast costs will be referred to in this document as the “Canadian Forecast”, and used for both the fully deployed Canadian VRS (operating 24/7/365 with unrestricted access by 100% of consumers who wish to use the service), and for provider costs depicted over time, e.g., eleven years.

The forecasts in the remainder of this cost analysis will depict:

1. Numbers (shown as “U.S. Ratio”) that are based on the U.S. equivalent cost forecasts from section 3.1, U.S. Ratio Costs, above; and the U.S. equivalent forecast number of minutes of VRS from section 3.2, Canadian VRS Forecast Using United States Data, from this study’s phase 9, Forecasts of VRS User Demand.

⁴⁵ Figure 4 and Table 10.

2. Numbers (shown as “**Canadian Forecast**”) that are based on the adjustments to the U.S. rates as recommended in this section 3.2.5, *Canadian Forecast rates*; and the Canadian Forecast number of minutes of VRS from section 3.3, *Canadian VRS Forecast Using Adjusted U.S. Data*, from this study’s phase 9, *Forecasts of VRS User Demand*.

The “**Canadian Forecast**” represents the most probable forecast for Canada for a fully deployed 24 x 7 VRS at an eventual maximum usage rate. The “U.S. Ratio” numbers are shown for comparative purposes only.

3.2.6. Canadian Forecast single VRS provider costs

The results of using the U.S. Ratio and Canadian Forecast numbers for forecasting the VRS provider costs in a single provider Canadian VRS environment are shown below.⁴⁶

Table 15: **U.S. Ratio** - Forecast of single VRS provider costs, at maturity, 24x7⁴⁷

Number of VRS users	Total Annual Minutes	Tier 1 Costs at \$6.3688 per minute	Tier 2 Costs at \$6.3632 per minute	Tier 3 Costs at \$5.1722 per minute	Total Costs (at average of \$5.4362 per minute)
17,050	10,826,750	\$7,642,525	\$7,635,788	\$43,584,747	\$58,863,061

Table 16: **Canadian Forecast** - Forecast of single VRS provider costs, at maturity, 24x7

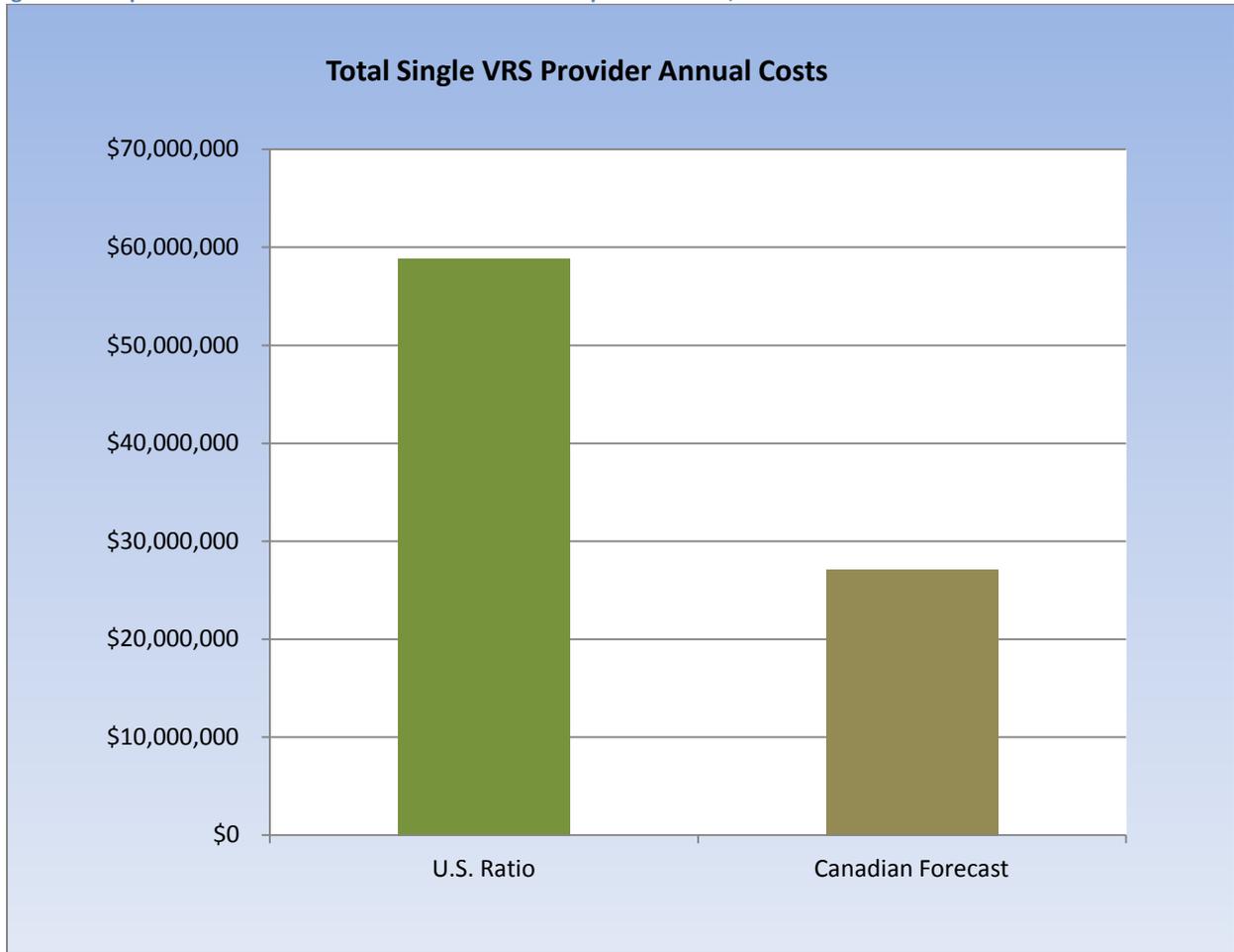
Number of VRS users	Total Annual Minutes	Tier 1 Costs at \$4.3000 per minute	Tier 2 Costs at \$4.1000 per minute	Tier 3 Costs at \$3.8500 per minute	Total Costs (at average of \$3.9732 per minute)
15,345	6,820,853	\$5,160,000	\$4,920,000	\$17,020,282	\$27,100,282

A graphic relationship of the U.S. Ratio provider costs (using U.S. equivalent minutes of use and the current U.S. reimbursement rates) and the Canadian Forecast provider costs (using the reduced minutes of use and the reduced reimbursement rates) is presented in Figure 8, below. The Canadian Forecast is the probable long term annual single VRS provider cost for Canada for a fully deployed and subscribed VRS operating 24x7.

⁴⁶ The forecasts of provider costs for an environment of multiple VRS providers are discussed in section 4.4.

⁴⁷ Refer to section 3.1.2 for details.

Figure 8: Comparison of U.S. Ratio to Canadian Forecast VRS provider costs, 24x7



4. Cost Variables

There are many different factors that may impact the above cost forecasts. The principal VRS cost variables will be discussed below. Some can be reasonably estimated, while others are difficult to predict. Whether or not to accept these factors, or to consider their implications, will in many instances be a matter of policy.

4.1. Population Demographics

To arrive at reasonably accurate forecasts of VRS costs, fairly precise data on the size of the user population and their VRS usage is required. As noted in the phase 3, *Consumer Interests and Perspectives*, efforts to gather accurate data on the potential VRS consumer population have been limited. Researchers and stakeholders do not necessarily agree on the size of the Canadian population identified as Deaf, hard of hearing, or those who may benefit from a VRS program.

Representative opinions on this issue include:

“... while we have expertise in VRS, nobody can claim to have enough expertise in the Canadian VRS market to make such assertions.”

“We do not know how many Deaf Canadians know ASL/LSQ.”

“We cannot easily predict the number of minutes each Deaf Canadian will use VRS.”⁴⁸

“It is the opinion of the Canadian Association of the Deaf that no fully credible census of Deaf, deafened, and hard of hearing people has ever been conducted in Canada.”⁴⁹

While this study has attempted to define the population of ASL and LSQ users in Canada as accurately as possible, it is probable that these estimates are not as accurate as hoped for. The VRS usage demand analysis of phase 9, *Forecasts of VRS User Demand*, also differentiated the number of expected VRS users from the population of people who sign. The number of expected users and their average annual minutes of use were used to calculate the total annual minutes of use against which the tiered costs were applied. Therefore if the actual number of users is different from the estimate, the costs will be similarly affected. The following tables illustrate the changes to overall annual costs associated with potential changes in the number of users in a single VRS provider environment.

Table 17: U.S. Ratio - Changes in single provider costs for variances in number of VRS users of a 24x7 VRS

Percent change in number of VRS users	Number of VRS users	Total Annual Minutes at 635 min/user	VRS provider Costs
-20%	13,640	8,661,400	\$47,663,461
-10%	15,345	9,744,075	\$53,263,261
0%	17,050	10,826,750	\$58,863,061
+10%	18,755	11,909,425	\$64,462,861
+20%	20,460	12,992,100	\$70,062,661

⁴⁸ Response to the CRTC’s Request for Further Information Following GoAmerica’s November 21, 2008 Presentation at CRTC Public Hearing Telecom Public Notice CRTC 2008-8; Unresolved Issues Related to the Accessibility of Telecommunications and Broadcasting Services to Persons with Disabilities; December 23, 2008; pages 3-5

⁴⁹ Canadian Association of the Deaf, Position Paper on Statistics at www.cad.ca/statistics_on_deaf_canadians.php.

Table 18: Canadian Forecast - Changes in single provider costs for variances in number of VRS users of a 24x7 VRS

Percent change in number of VRS users	Number of VRS users	Total Annual Minutes	VRS Provider Costs
-20%	12,276	5,456,682	\$22,848,226
-10%	13,811	6,138,990	\$24,475,110
0%	15,345	6,820,853	\$27,100,282
+10%	16,880	7,503,160	\$29,727,166
+20%	18,414	8,185,024	\$32,352,339

4.2. Average Minutes of Use per Consumer May Vary

The forecast of a total annual cost based on the U.S. average of 635 (U.S. Ratio) or the Canadian Forecast at 444.5 annual minutes of VRS use per average consumer may be higher or lower than the usage rate that Canadian consumers will employ. Total single provider costs of a fully subscribed 24 x 7 VRS with alternative average minutes per VRS user are shown in the following two tables. The baseline forecast of each is shown in bold.

Table 19: U.S. Ratio – Changes in annual single provider cost for variances in minutes per user, for 17,050 users, 24x7

Average Annual Minutes per User	Average Minutes per Month	Total Annual Minutes	Average Cost per Minute	Total Annual Cost
335	28	5,711,750	\$5.6738	\$32,407,312
435	36	7,416,750	\$5.5585	\$41,225,895
535	45	9,121,750	\$5.4863	\$50,044,478
635	53	10,826,750	\$5.4368	\$58,863,061
735	61	12,531,750	\$5.4008	\$67,681,644

Table 20: Canadian Forecast – Changes in annual single provider cost for variances in minutes per user, for 15,345 users, 24x7

Average Annual Minutes per User	Average Minutes per Month	Total Annual Minutes	Average Cost per Minute	Total Annual Cost
235	20	3,602,075	\$4.0829	\$14,723,389
345	29	5,294,025	\$4.0087	\$21,221,996
444.5	37	6,820,853	\$3.9732	\$27,100,282
545	45	8,363,025	\$3.9504	\$33,037,646
645	54	9,897,525	\$3.9349	\$38,945,471

While the above tables are illustrative of the effect of potential differences in consumer usage, they may also be used to gauge the effect of potential restrictions on consumers' usage that may be imposed by policy in order to limit or control the overall program costs.

4.3. Delays in Adoption of VRS

4.3.1. Factors that may delay full implementation

There are a number of factors that may delay full implementation, and thus reduce initial program costs. These include, in an anticipated descending order of significance:

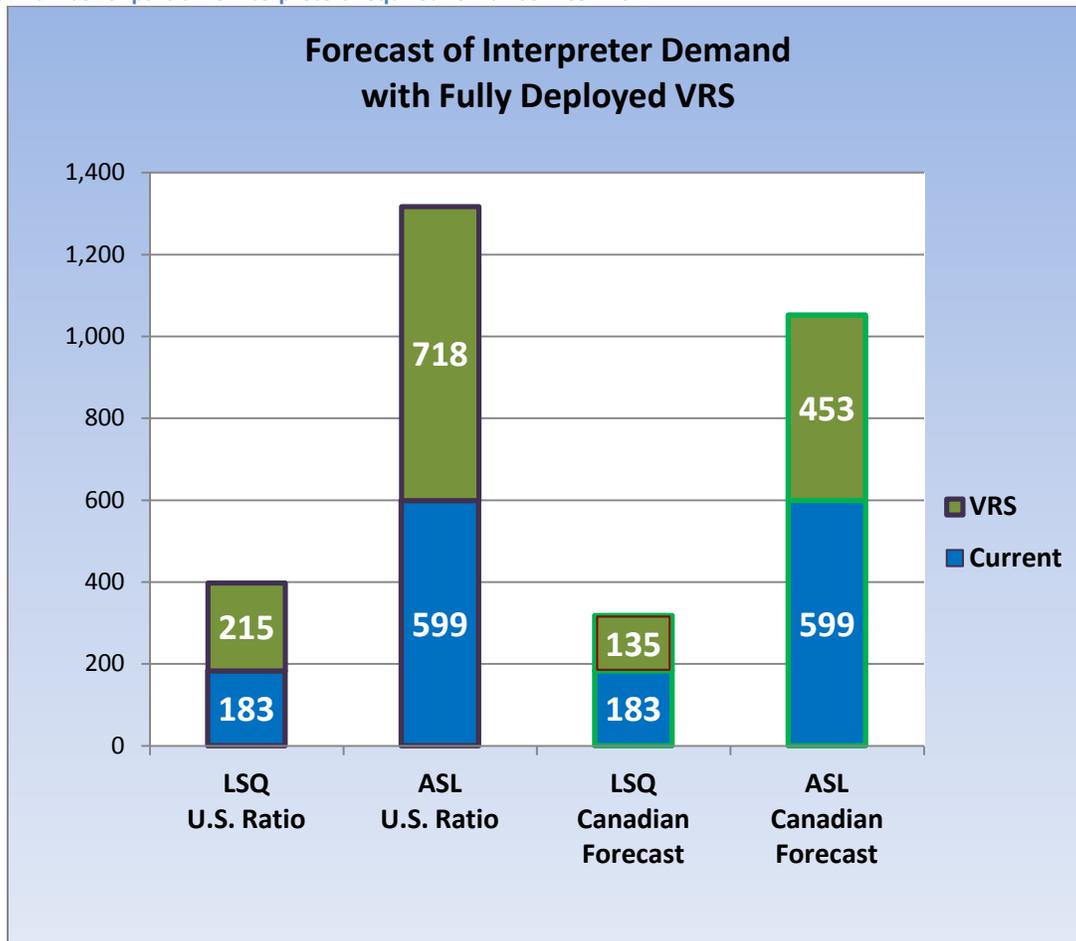
- Not enough interpreters to meet the consumers' demand for service
- Initial lack of funds to pay for full service
- Inability of consumers to acquire hardware and/or broadband services
- Lack of sufficient consumer training or support

Lack of Interpreters

As demonstrated in this study's phase 9, section 4, a fully subscribed VRS will require significant numbers of qualified Video Interpreters. The chart below illustrates the numbers of interpreters required for full implementation of VRS, 24x7, serving 17,050 sign language users, each averaging 635 annual minutes of use (the U.S. Ratio); or serving 15,345 users averaging 444.5 annual minutes (the Canadian Forecast). The forecast of the number of interpreters needed assumes an average of 15 VRS interpreting hours per week per Video Interpreter, with an efficiency rating of 25%.⁵⁰ The Canadian Forecast represents the most probable forecast for Canadian VRS.

⁵⁰ See this study's phase 9, *Forecasts of VRS User Demand*, section 4.2 for a more thorough description of how the number of required VRS interpreters is derived.

Figure 9: Number of part-time interpreters required for full service VRS 24 x 7



If the above number of interpreters are not available for VRS, and if it takes years to develop the necessary pool of interpreters, then the total Canadian Forecast usage (6,820,853 annual minutes of use) will not be realized until there are enough interpreters to handle the traffic. Therefore, the usage or adoption rate of VRS will occur over time. While this should not affect the eventual usage of VRS (assuming that enough interpreters eventually become available), it will cause the costs of VRS to be reduced during the years before the total interpreter resources needed are available.

Lack of Funding

Likewise, lack of approved initial funding may also cause a similar limitation on the degree that the service is made available. Funding constraints can impose limitations on number of interpreters hired or result in other factors that limit access or service. While it is impossible at this point to predict funding outcomes, initially reduced funding is offered as a consideration.

Inability of consumers to acquire hardware and/or broadband services

As stated in this study's phase 5, *Technologies and Their Forecasts*, end user VRS equipment and broadband service represent an expense that may not be affordable by all potential VRS users.⁵¹ To the degree that some consumers cannot afford these items and to the degree that their costs are not borne by the VRS program, by the VRS vendor(s), or by other provincial or local government programs, then delays in VRS consumer adoption of the service will result.

Lack of sufficient consumer training or support

Many VRS consumers will likely need assistance in setting up their VRS hardware or software. Trained vendor personnel will need to be available to provide initial support. If support is not available to meet the demand, then the implementation and adoption rate will be diminished.

4.3.2. The effect of the above factors on initial costs

While it is impossible to predict how the adoption rate will be affected, scenarios can be portrayed that will provide an appreciation for their possible effect on costs. For example, using a delayed ten year implementation, annual costs can be predicted as detailed below.⁵² A ten year growth or adoption timeframe was selected as the shortest time anticipated for the most significant constraint (the interpreter shortage) to be met. Since it takes a minimum of five years to develop an ASL or LSQ interpreter, and since the Canadian college and university programs currently graduate only a small number of interpreters, and since almost all such programs have indicated that they are presently not able to increase the size of their programs (expand to graduate more students), it is therefore assumed that it will take at least ten years to develop the number of interpreters required for full VRS adoption, (i.e., to serve all forecast VRS users).⁵³ Even the assumption that the required increase in interpreters can be met within ten years is based on a rapid and sustained increase in the training capabilities of current Canadian interpreter training programs. Therefore while ten years is offered as a target, some experts in the interpreter training field may suggest that ten years is optimistic.

In any case, ten years is offered as a model against which numerous variables will compete for influence. If a constraining variable such as funding or interpreter availability is never totally resolved, the total VRS program costs will continue at a reduced amount without reaching the higher cost levels depicted in the ten year growth tables and charts or as estimated for a fully mature service. In fact some variables may

⁵¹ See the phase 5 research summary for details on types of equipment and broadband services, and their costs.

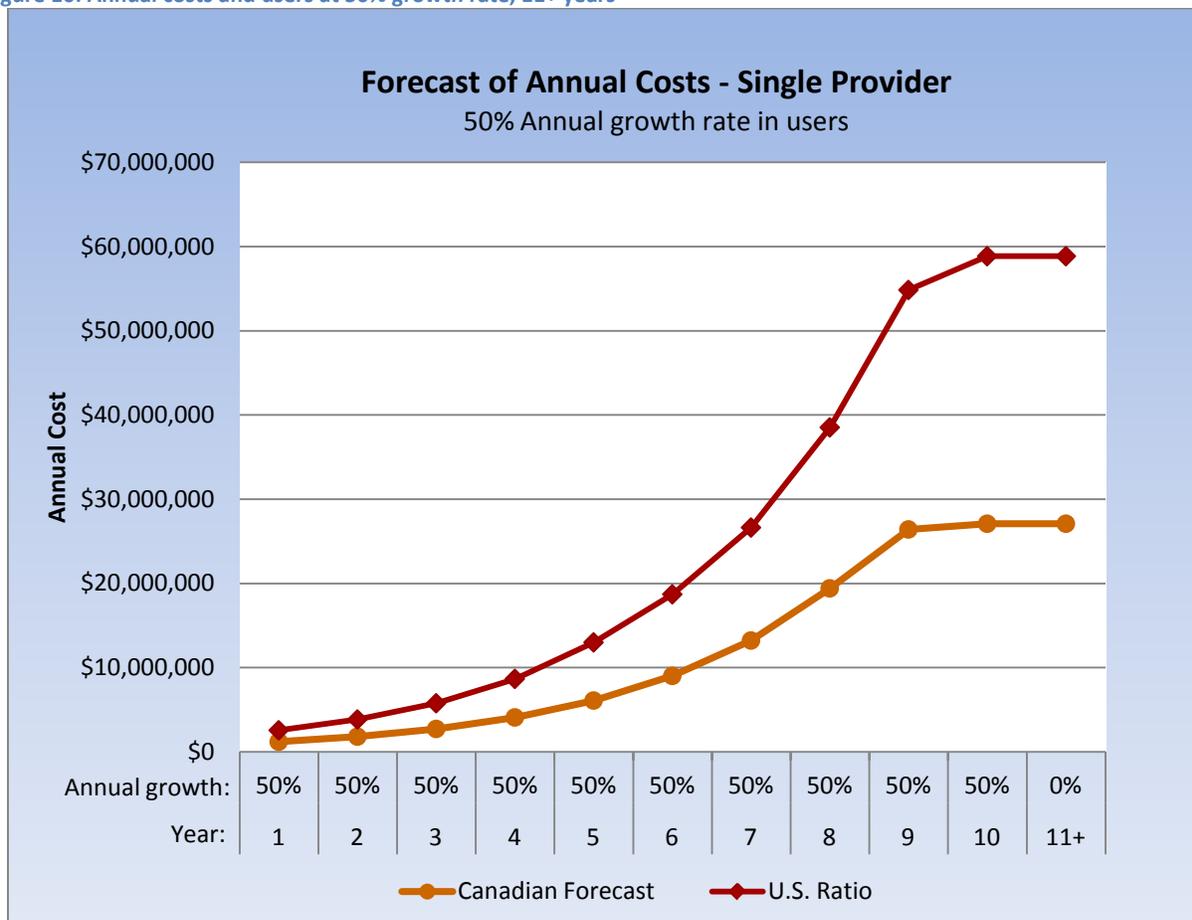
⁵² Ten years is reference here because full consumer subscription to VRS (and the resulting need for the maximum number of interpreters identified in section 4.3.1.) is forecast during the tenth year, even though the charts and tables in this section present eleven years of data.

⁵³ Ten years was established as the most reasonable expectation with the advice and unanimous concurrence of this study's VRS Advisory Committee members.

be manipulated by policy to cause usage and costs to match funding limits or other considerations. Again, in these instances total program costs may remain constant at a significantly reduced level.⁵⁴

By applying the 24/7 forecasted VRS traffic volumes from the phase 9, *Forecasts of User Demand*, which use *monthly* growth patterns that reflect projected growth based on a month-to-month compounded increase of users with approximately 500 users the first month, the per month U.S. Ratio and Canadian Forecast traffic volumes were determined and were then applied to the earlier forecast to achieve the average VRS cost estimate. This means that as the services expand, and volume exceeds either the Tier I or Tier II service thresholds, the applied rates would represent a lower average cost per minute. These monthly costs were then applied to the yearly forecast and a yearly average cost, and total cost projection was established. The results are shown in Figure 10 and Table 21 showing the U.S. Ratio data and Table 22 showing the Canadian Forecast data, below.⁵⁵

Figure 10: Annual costs and users at 50% growth rate, 11+ years



⁵⁴ See this study’s phases 6 and 9 for additional discussion on this topic.

⁵⁵ Note that in this and similar tables the costs shown may vary slightly due to rounding and other minor compounded calculation differences. The average costs per minute are based on the suggested tiers, and are rounded to two decimal places for viewing in the table but not in the calculations.

The above chart is derived from the “Total Annual Cost” column presented in the following two tables.

Table 21: U.S. Ratio – 50% annual growth rate over 11+ years, single provider

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	750	279,620	\$ 2,570,070	\$6.37
2	50%	1,125	419,430	\$ 3,855,105	\$6.37
3	50%	1,688	629,127	\$ 5,782,489	\$6.37
4	50%	2,532	943,873	\$ 8,674,450	\$6.37
5	50%	3,798	1,415,920	\$ 13,008,239	\$6.37
6	50%	5,697	2,123,770	\$ 18,717,748	\$6.11
7	50%	8,546	3,185,600	\$ 26,643,683	\$5.80
8	50%	12,819	4,778,657	\$ 38,534,910	\$5.59
9	50%	17,050	6,896,470	\$ 54,850,418	\$5.46
10	50%	17,050	10,826,750	\$ 58,863,061	\$5.44
11+	0%	17,050	10,826,750	\$ 58,863,061	\$5.44

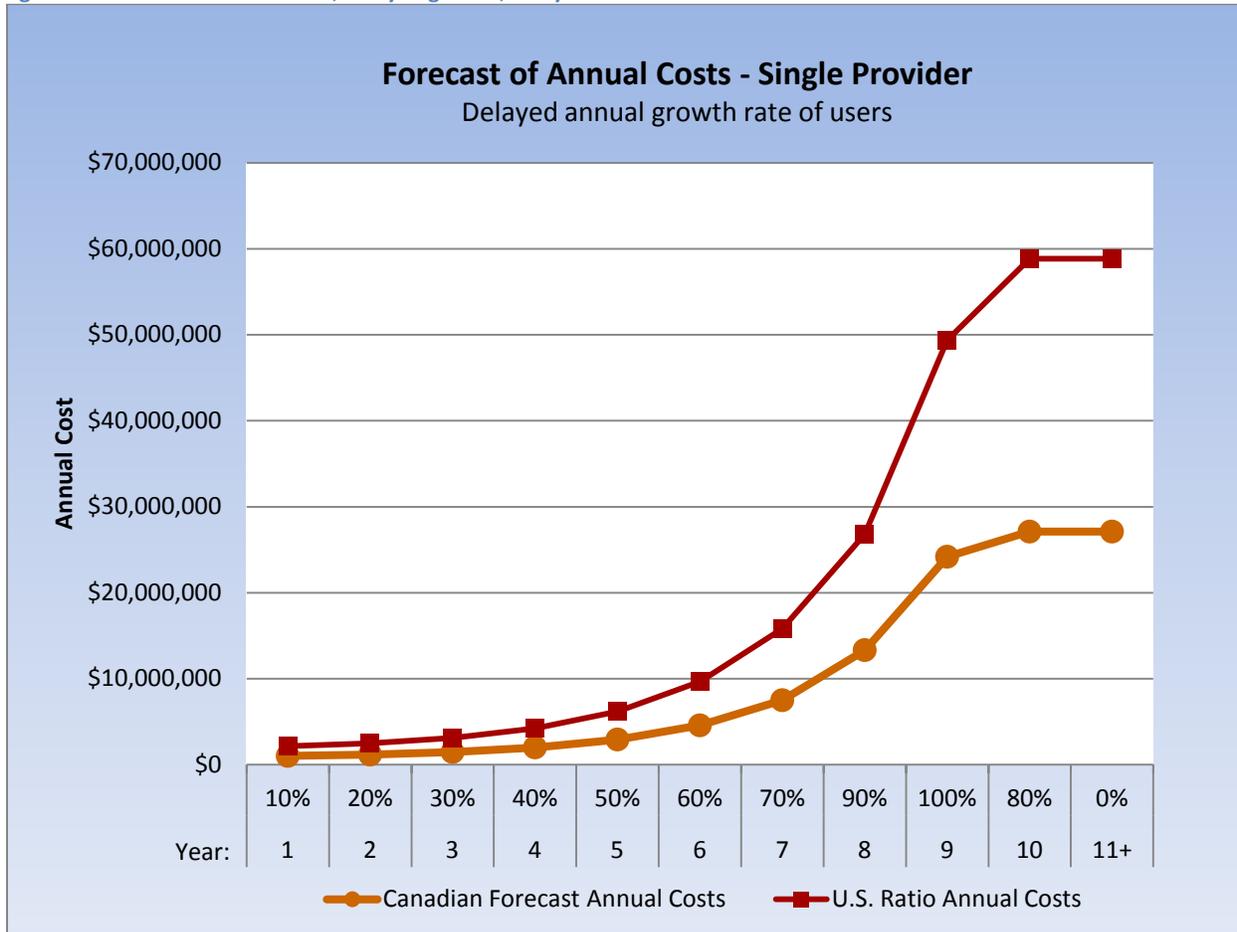
Table 22: Canadian Forecast – 50% annual growth rate over 11+ years, single provider

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	750	282,480	\$ 1,214,663	\$4.30
2	50%	1,125	423,720	\$ 1,821,994	\$4.30
3	50%	1,688	635,561	\$ 2,732,912	\$4.30
4	50%	2,532	953,527	\$ 4,100,164	\$4.30
5	50%	3,798	1,430,401	\$ 6,104,187	\$4.27
6	50%	5,697	2,145,490	\$ 9,032,460	\$4.21
7	50%	8,546	3,218,180	\$ 13,229,993	\$4.11
8	50%	12,819	4,827,529	\$ 19,425,988	\$4.02
9	50%	15,345	6,644,423	\$ 26,421,029	\$3.98
10	50%	15,345	6,820,853	\$ 27,100,282	\$3.97
11+	0%	15,345	6,820,853	\$ 27,100,282	\$3.97

Note that in all of the tables that show costs over ten or more years, the total annual cost for the first year in which the maximum number of users is reached is less than the estimated total cost of the subsequent years because the first year of achieving maximum users includes some months with fewer than the maximum total VRS users. It is important to realize that the “Number of VRS Users” is simply used to generate the total minutes as a function of an average of minutes per user only for computation purposes.

The same concept of growth over a ten year period may in fact result in something other than a constant 50% annual growth. For example the development of interpreters (or impact of another constraint) may take longer, i.e., fewer interpreters the first six years, followed by higher rates of availability in subsequent years. The potential effect of delayed interpreter availability on the ability to handle consumers’ VRS demand (minutes of use) and resulting annual costs are depicted in Figure 11 and Table 23 and Table 24, below.

Figure 11: Annual costs and users, delayed growth, 11+ years



The above chart is derived from the “Total Annual Cost” column presented in the following two tables.

Table 23: U.S Ratio – Initially delayed growth followed by increased rate, 11+ years, single provider

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	10%	550	334,751	\$ 2,131,951	\$6.37
2	20%	660	387,138	\$ 2,465,595	\$6.37
3	30%	858	487,363	\$ 3,103,900	\$6.37
4	40%	1,201	662,887	\$ 4,221,776	\$6.37
5	50%	1,802	969,063	\$ 6,171,740	\$6.37
6	60%	2,883	1,516,168	\$ 9,654,354	\$6.37
7	70%	4,901	2,524,866	\$ 15,800,643	\$6.26
8	90%	9,312	4,629,309	\$ 26,808,721	\$5.79
9	100%	17,050	8,989,378	\$ 49,359,822	\$5.49
10	80%	17,050	10,826,750	\$ 58,863,061	\$5.44
11+	0%	17,050	10,826,750	\$ 58,863,061	\$5.44

Table 24: Canadian Forecast – Initially delayed growth followed by increased rate, 11+ years, single provider

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	10%	550	234,326	\$ 1,007,600	\$4.30
2	20%	660	270,997	\$ 1,165,286	\$4.30
3	30%	858	341,154	\$ 1,466,961	\$4.30
4	40%	1,201	464,021	\$ 1,995,290	\$4.30
5	50%	1,802	678,344	\$ 2,916,879	\$4.30
6	60%	2,883	1,061,318	\$ 4,561,592	\$4.30
7	70%	4,901	1,767,406	\$ 7,486,365	\$4.24
8	90%	9,312	3,240,516	\$ 13,314,780	\$4.11
9	100%	15,345	6,061,387	\$ 24,176,341	\$3.99
10	80%	15,345	6,820,853	\$ 27,100,282	\$3.97
11+	0%	15,345	6,820,853	\$ 27,100,282	\$3.97

4.4. Dividing the Service Among Two or More Providers

4.4.1. Cost and expense considerations

The requirement to provide video relay services in more than one language increases the complexity of the overall program, but does not materially increase costs. The language environment in Canada requires that VRS is provisioned in four languages: English, ASL, French and LSQ. Therefore, a schedule of interpreters for any given time of day needs to be able to address the traffic associated with two distinct calling queues. Since the VRS consumers and sign language interpreters typically communicate in either ASL/English or LSQ/French, the scheduling requirement must anticipate the use of two different interpreter pools to provide coverage of anticipated call flows.

Scheduling of interpreter resources is based on anticipated call patterns that may or may not be duplicated or precisely predictable. While previous trends in traffic volume may provide a forecast for the number of interpreters required for any given day, peak period or hours of the day, the moment-by-moment pairing of calls to available interpreters to achieve short *average speed of answer* times is challenging. Any excess that occurs in the availability of interpreters versus the calls that are presented creates inefficiency and higher labor costs.

An additional factor that can decrease provider efficiencies may be the VRS model Canada elects to implement. If the model anticipates many VRS providers instead of one, each provider will have a fewer number of interpreters to offset their expenses.

For example, in the United States, all providers that offer VRS in Spanish have an equal requirement to meet the call volume and ASA parameters in either language 24 hours a day. The VRS traffic overnight is extremely low compared to day time traffic. Nonetheless, a provider typically should have at least two

interpreters scheduled at any hour of the night to cover the calls that may be presented.⁵⁶ If the Canadian model is for multiple providers to divide the available evening traffic, the number of potentially idle interpreters scheduled for any calls during the night multiplies.

This issue focuses on the negative implications of covering two languages and multiple providers, and also identifies the inefficiency of overnight coverage necessary to provide equitable service. In reality, the provision of multiple languages in the United States is still profitable based on the daily traffic and per/minute reimbursement rates currently offered by the FCC and TRS Fund Administrator. It should be noted that normal call center economies of scale are also constrained in that VRS call centers are typically limited in size by the availability of interpreters in the local vicinity of the call center. Physical VRS call centers can often be limited to ten seats or less. Economies of scale are only realized when these multiple VRS call centers are networked together as one large virtual call center, which may or may not be possible, depending upon the VRS model selected for Canada

In Canada other visual languages that may be considered for VRS, such as Speech-Reading, may be considered based on the need of additional interpreter skills.⁵⁷ If they can be professionally satisfied by an existing interpreter pool, then the cost of training and the provision of the service would be low. In the case of Speech-Reading, it is anticipated that the demand would be low and that interpreters who were employed to handle Canadian VRS would not require significant training.

4.4.2. The effect of two providers on forecast costs

For comparative purposes and using the same methodology, a variation was created that attributed 23% of the traffic volume each month to a second vendor, specializing in LSQ. As the per month volume for each was reduced from a single vendor model, the average cost per minute for each increased using the tiered rate structure, but with an overall cost difference of only 2.3% for the Canadian Forecast. The forecast usage and costs of two providers operating 24 x 7, serving a total of 15,345 Canadian Forecast consumers (or 17,050 U.S. Ratio) with 77% ASL/English and 23% LSQ/French, that average 444.5 minutes each (or 635 minutes U.S. Ratio) is presented in the following two tables. These combined totals of the ASL and LSQ services then contrasted to the total forecast for a single provider serving the same consumer population and with the same usage rates.

⁵⁶ There are no time limits for VRS calls in the United States. It is conceivable that a VRS call may last more than an hour or two. If there is only one interpreter scheduled, any other callers to VRS during that two hour period would be placed 'on hold' in the queue. Furthermore, that interpreter would physically not be able to interpret with quality for that amount of time without switching with another interpreter to take a break. ASA is not the only factor in scheduling.

⁵⁷ See this study's phases 3, 8 and 9 for additional information on this topic.

Table 25: U.S. Ratio – Comparison of single provider costs versus two provider costs⁵⁸

Provider	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
Provider # 1 – ASL at 77%:	13,128	8,336,915	\$45,985,163	\$5.52
Provider # 2 – LSQ at 23%:	3,922	2,490,470	\$15,746,242	\$6.32
Total of both providers	17,050	10,827,385	\$61,731,404	\$5.70
Single provider estimates:	17,050	10,826,750	\$58,863,061	\$5.44
Differences:			\$2,868,343	\$0.26

Table 26: Canadian Forecast – Comparison of single provider costs versus two provider costs

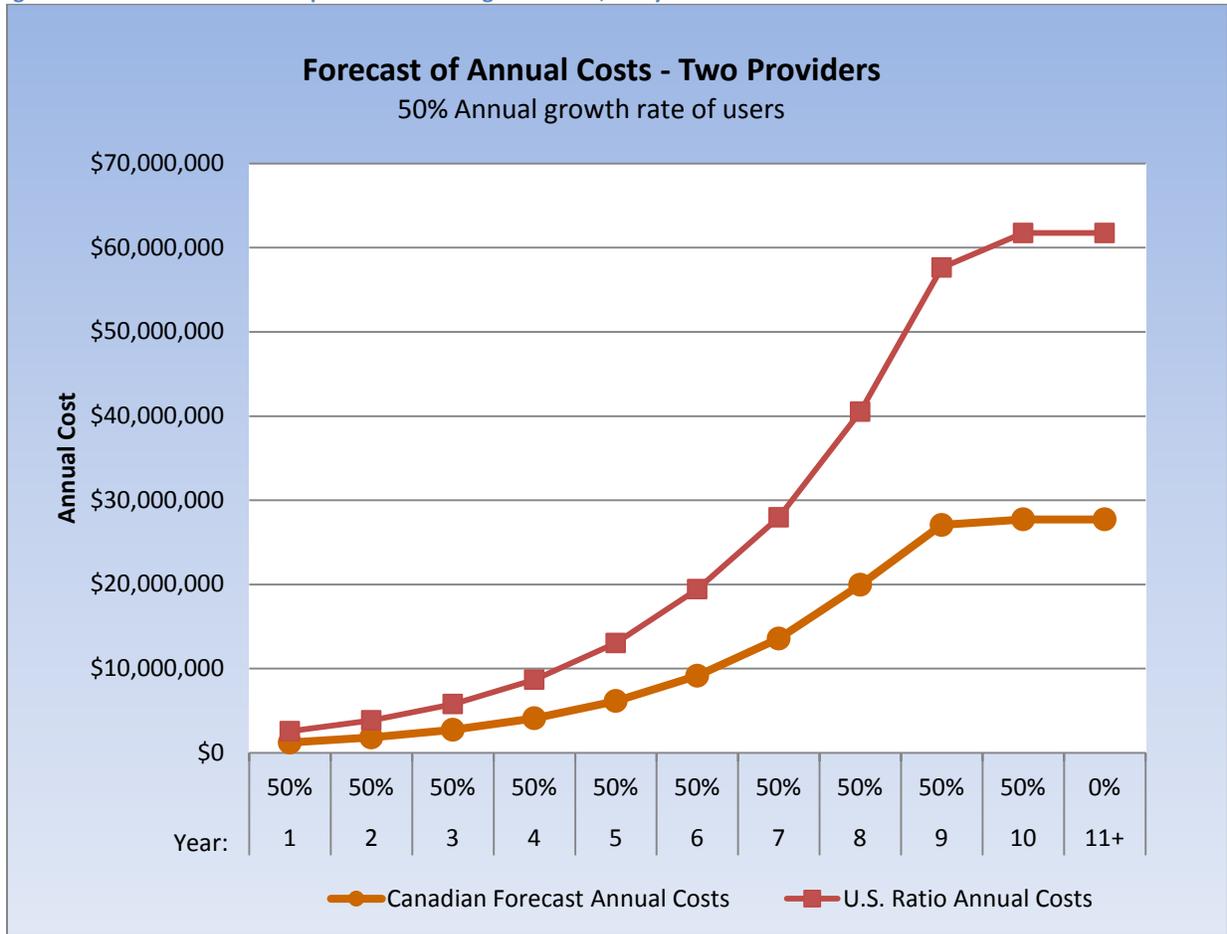
Provider	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
Provider # 1 – ASL at 77%:	11,816	5,252,212	\$21,061,016	\$4.01
Provider # 2 – LSQ at 23%:	3,529	1,568,641	\$6,671,426	\$4.25
Total of both providers	15,345	6,820,853	\$27,732,442	\$4.07
Single provider estimates:	15,345	6,820,853	\$27,100,282	\$3.97
Differences:			\$632,160	\$0.10

Applying the initially delayed implementation presented in section 4.3 to each provider results in the first ten year costs shown below, prior to the full implementation costs depicted above for years eleven and beyond. Two delayed scenarios are presented, a 50% annual growth rate, and a further initially delayed growth that uses the same growth rates presented above in section 4.3.2: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 90%, 100%, 80%, and 0% for years 11 and beyond.

The costs per year for two VRS providers (ASL and LSQ), based on a 50% annual growth rate is shown in Figure 12, below.

⁵⁸ Differences in some numbers in this and the following table are due to rounding. Original numbers were derived on a spreadsheet.

Figure 12: Annual costs for two providers at 50% growth rate, 11+ years



In all charts and tables “Year 11” represents fully deployed and subscribed ongoing service costs for year 11 and annually thereafter, while the maximum number of users is reached during year 10 or earlier. ASL and LSQ portions are 77% and 23% respectively.

The above chart is derived from the “Total Annual Cost” column presented in the next two tables.

Table 27: U.S. Ratio – Two providers’ combined costs; 50% annual growth rate, 11+ years

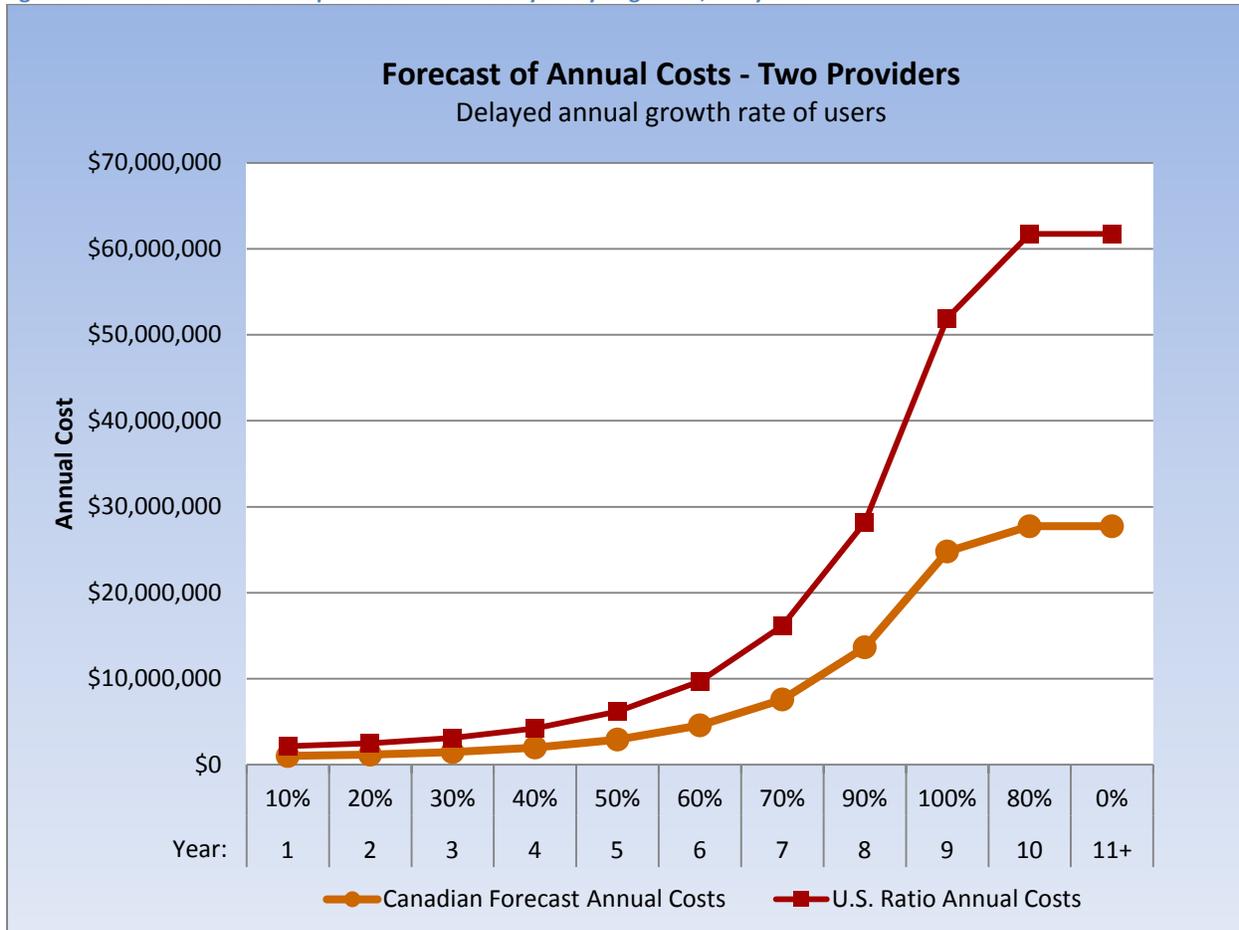
Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	751	403,437	\$ 2,569,396	\$6.37
2	50%	1,127	606,055	\$ 3,859,823	\$6.37
3	50%	1,691	909,532	\$ 5,792,599	\$6.37
4	50%	2,537	1,364,668	\$ 8,691,237	\$6.37
5	50%	3,806	2,047,346	\$ 13,036,971	\$6.37
6	50%	5,709	3,071,389	\$ 19,438,181	\$6.33
7	50%	8,564	4,607,137	\$ 27,965,835	\$6.07
8	50%	12,846	6,911,128	\$ 40,516,567	\$5.86
9	50%	17,051	10,063,004	\$ 57,633,045	\$5.73
10	50%	17,051	10,827,385	\$ 61,731,404	\$5.70
11+	0%	17,051	10,827,385	\$ 61,731,404	\$5.70

Table 28: Canadian Forecast – Two providers’ combined costs; 50% annual growth rate, 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	751	282,406	\$ 1,214,344	\$4.30
2	50%	1,127	424,238	\$ 1,824,224	\$4.30
3	50%	1,691	636,672	\$ 2,737,690	\$4.30
4	50%	2,537	955,268	\$ 4,107,650	\$4.30
5	50%	3,806	1,433,142	\$ 6,159,244	\$4.30
6	50%	5,709	2,149,972	\$ 9,154,084	\$4.26
7	50%	8,564	3,224,996	\$ 13,569,820	\$4.21
8	50%	12,846	4,837,790	\$ 19,963,613	\$4.13
9	50%	15,345	6,648,905	\$ 27,060,962	\$4.07
10	50%	15,345	6,820,853	\$ 27,732,442	\$4.07
11+	0%	15,345	6,820,853	\$ 27,732,442	\$4.07

Applying the delayed annual growth rates of 10%, 20%, 30%, 40%, 50%, 60%, 70%, 90%, 100%, 80%, and 0% for years 11 and beyond to two VRS providers (ASL and LSQ) results in the following costs per year:

Figure 13: Annual costs for two providers with initially delayed growth, 11+ years



The above chart is derived from the “Total Annual Cost” column presented in the next two tables.

Table 29: U.S. Ratio – Two providers’ combined costs; initially delayed growth rate, 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	10%	551	334,857	\$ 2,132,625	\$6.37
2	20%	661	387,720	\$ 2,469,303	\$6.37
3	30%	860	487,998	\$ 3,107,944	\$6.37
4	40%	1,204	664,422	\$ 4,231,550	\$6.37
5	50%	1,807	971,709	\$ 6,188,591	\$6.37
6	60%	2,892	1,520,455	\$ 9,683,135	\$6.37
7	70%	4,916	2,532,803	\$ 16,126,355	\$6.37
8	90%	9,341	4,643,543	\$ 28,161,675	\$6.06
9	100%	17,051	9,009,168	\$ 51,911,944	\$5.76
10	80%	17,051	10,827,385	\$ 61,731,404	\$5.70
11+	0%	17,051	10,827,385	\$ 61,731,404	\$5.70

Table 30: Canadian Forecast – Two providers’ combined costs; initially delayed growth rate, 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	10%	551	234,400	\$ 1,007,919	\$4.30
2	20%	661	271,404	\$ 1,167,038	\$4.30
3	30%	860	341,598	\$ 1,468,872	\$4.30
4	40%	1,204	465,095	\$ 1,999,909	\$4.30
5	50%	1,807	680,196	\$ 2,924,843	\$4.30
6	60%	2,892	1,064,318	\$ 4,576,568	\$4.30
7	70%	4,916	1,772,962	\$ 7,586,059	\$4.28
8	90%	9,341	3,250,480	\$ 13,655,803	\$4.20
9	100%	15,345	6,071,463	\$ 24,800,230	\$4.08
10	80%	15,345	6,820,853	\$ 27,732,442	\$4.07
11+	0%	15,345	6,820,853	\$ 27,732,442	\$4.07

The above calculations are examples from many different possible provider and growth scenarios, as well as possible application of other variables.

4.4.3. The effect of multiple providers on forecast costs

In this study’s phase 11, *Potential Canadian VRS Models*, section 5 also offers the possibility that instead of one or two providers, there may be multiple small providers; for example, 10 to 20 VRS providers. All such providers would be billing within the Tier 1 threshold (less than 100,000 minutes per month) for fully deployed 24x7 VRS.⁵⁹ In this scenario a fully deployed VRS operating 24x7 would incur the following provider costs at maturity (100% of anticipated users).

⁵⁹ The Canadian Forecast 6,820,853 annual minutes divided by 12 months = 568,404 minutes per month. 568,404 divided by 100,000 = 5.7. Therefore six or more providers equally sharing traffic will each relay less than 100,000 monthly minutes, which is the Tier 1 threshold. The same formula for the U.S. Ratio data results in all Tier 1 minutes for nine or more providers equally sharing the traffic.

Table 31: U.S. Ratio – Comparison of multiple provider costs versus one and two provider costs, at full maturity

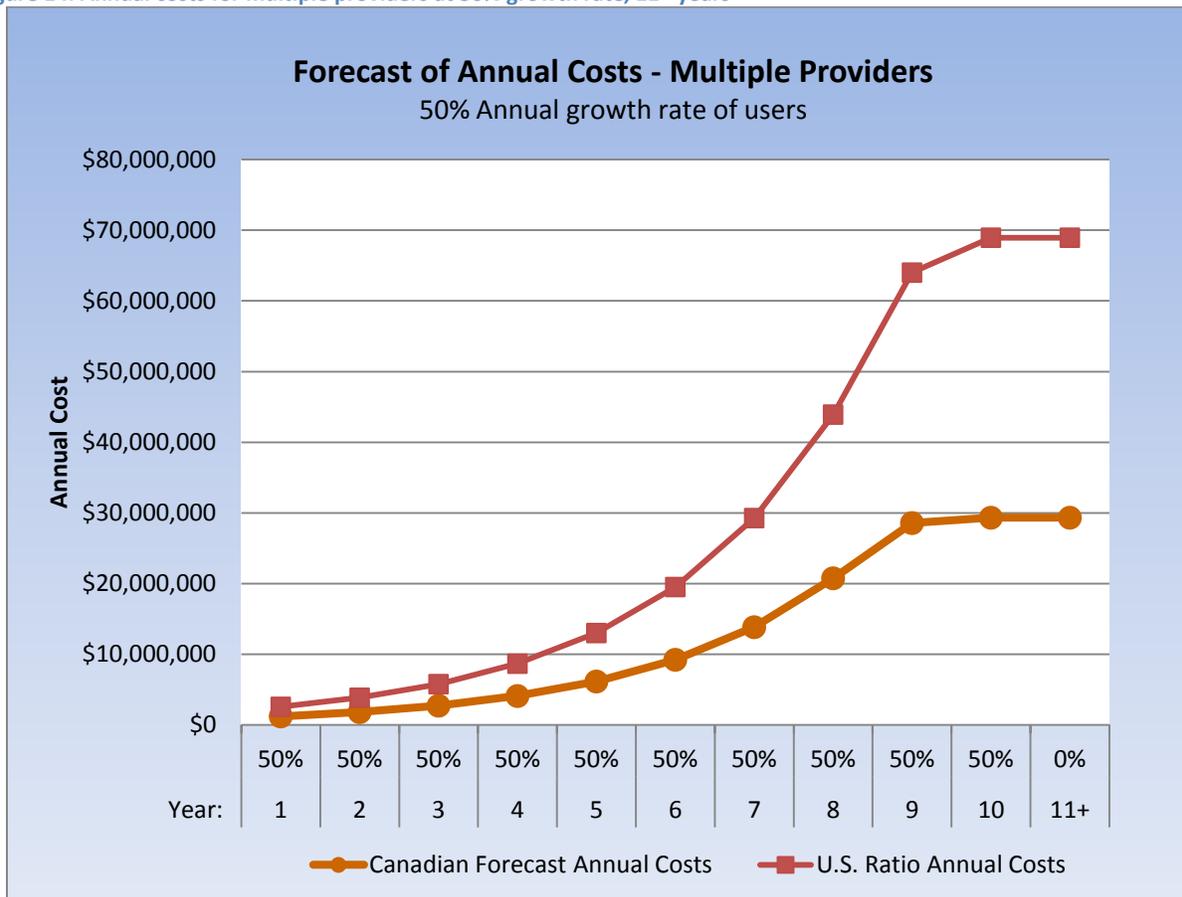
Provider	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
Multiple provider estimates:	17,050	10,826,750	\$68,953,094	\$6.37
Two provider estimates:	17,050	10,826,750	\$61,731,404	\$5.70
Single provider estimates:	17,050	10,826,750	\$58,863,061	\$5.44

Table 32: Canadian Forecast – Comparison of multiple provider costs versus one and two provider costs, at full maturity

Provider	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
Multiple provider estimates:	15,345	6,820,853	\$29,329,666	\$4.30
Two provider estimates:	15,345	6,820,853	\$27,732,442	\$4.07
Single provider estimates:	15,345	6,820,853	\$27,100,282	\$3.97

Applying the initially delayed implementation presented in section 4.3 to the scenario with multiple providers results in the first ten year costs shown below, prior to the full implementation costs depicted above for years eleven and beyond. Two delayed scenarios are presented, a 50% annual growth rate, and a further initially delayed growth that uses the same growth rates presented above in section 4.3.2: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 90%, 100%, 80%, and 0% for years 11 and beyond.

Figure 14: Annual costs for multiple providers at 50% growth rate, 11+ years



In all charts and tables “Year 11” represents fully deployed and subscribed ongoing service costs for year 11 and annually thereafter, while the maximum number of users is reached during year 10 or earlier. ASL and LSQ portions are 77% and 23% respectively.

The above chart is derived from the “Total Annual Cost” column presented in the next two tables.

Table 33: U.S. Ratio – Multiple providers’ combined costs; 50% annual growth rate, 11+ years

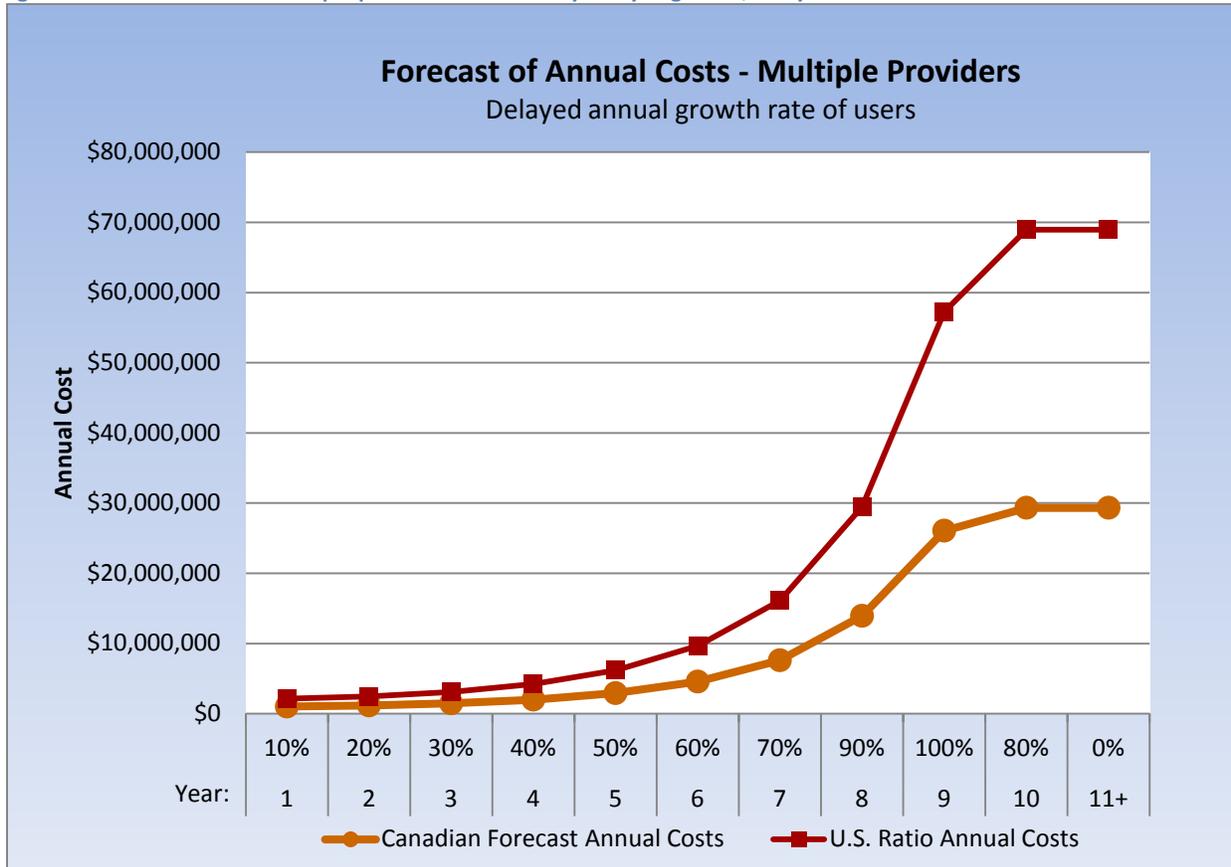
Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	750	403,543	\$ 2,570,070	\$6.37
2	50%	1,125	605,314	\$ 3,855,105	\$6.37
3	50%	1,688	907,944	\$ 5,782,489	\$6.37
4	50%	2,532	1,362,181	\$ 8,675,418	\$6.37
5	50%	3,798	2,043,430	\$ 13,014,138	\$6.37
6	50%	5,697	3,064,986	\$ 19,520,196	\$6.37
7	50%	8,546	4,597,400	\$ 29,279,789	\$6.37
8	50%	12,819	6,896,470	\$ 43,922,042	\$6.37
9	50%	17,050	10,050,939	\$ 64,012,129	\$6.37
10	50%	17,050	10,826,750	\$ 68,953,094	\$6.37
11+	0%	17,051	10,826,750	\$ 68,953,094	\$6.37

Table 34: Canadian Forecast – Multiple providers’ combined costs; 50% annual growth rate, 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	750	282,480	\$ 1,214,663	\$4.30
2	50%	1,125	423,720	\$ 1,821,994	\$4.30
3	50%	1,688	635,561	\$ 2,732,912	\$4.30
4	50%	2,532	953,527	\$ 4,100,164	\$4.30
5	50%	3,798	1,430,401	\$ 6,150,724	\$4.30
6	50%	5,697	2,145,490	\$ 9,225,609	\$4.30
7	50%	8,546	3,218,180	\$ 13,838,174	\$4.30
8	50%	12,819	4,827,529	\$ 20,758,376	\$4.30
9	50%	15,345	6,644,423	\$ 28,571,019	\$4.30
10	50%	15,345	6,820,853	\$ 29,329,666	\$4.30
11+	0%	15,345	6,820,853	\$ 29,329,666	\$4.30

Applying the delayed annual growth rates of 10%, 20%, 30%, 40%, 50%, 60%, 70%, 90%, 100%, 80%, and 0% for years 11 and beyond to two VRS providers (ASL and LSQ) results in the following costs per year:

Figure 15: Annual costs for multiple providers with initially delayed growth, 11+ years



The above chart is derived from the “Total Annual Cost” column presented in the next two tables.

Table 35: U.S. Ratio – Multiple providers’ combined costs; initially delayed growth rate, 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	10%	550	334,751	\$ 2,131,951	\$6.37
2	20%	660	387,138	\$ 2,465,595	\$6.37
3	30%	858	487,363	\$ 3,103,900	\$6.37
4	40%	1,201	662,887	\$ 4,221,776	\$6.37
5	50%	1,802	969,063	\$ 6,171,740	\$6.37
6	60%	2,883	1,516,168	\$ 9,656,129	\$6.37
7	70%	4,901	2,524,866	\$ 16,080,293	\$6.37
8	90%	9,312	4,629,309	\$ 29,483,008	\$6.37
9	100%	17,050	8,989,378	\$ 57,251,289	\$6.37
10	80%	17,050	10,826,750	\$ 68,953,094	\$6.37
11+	0%	17,050	10,826,750	\$ 68,953,094	\$6.37

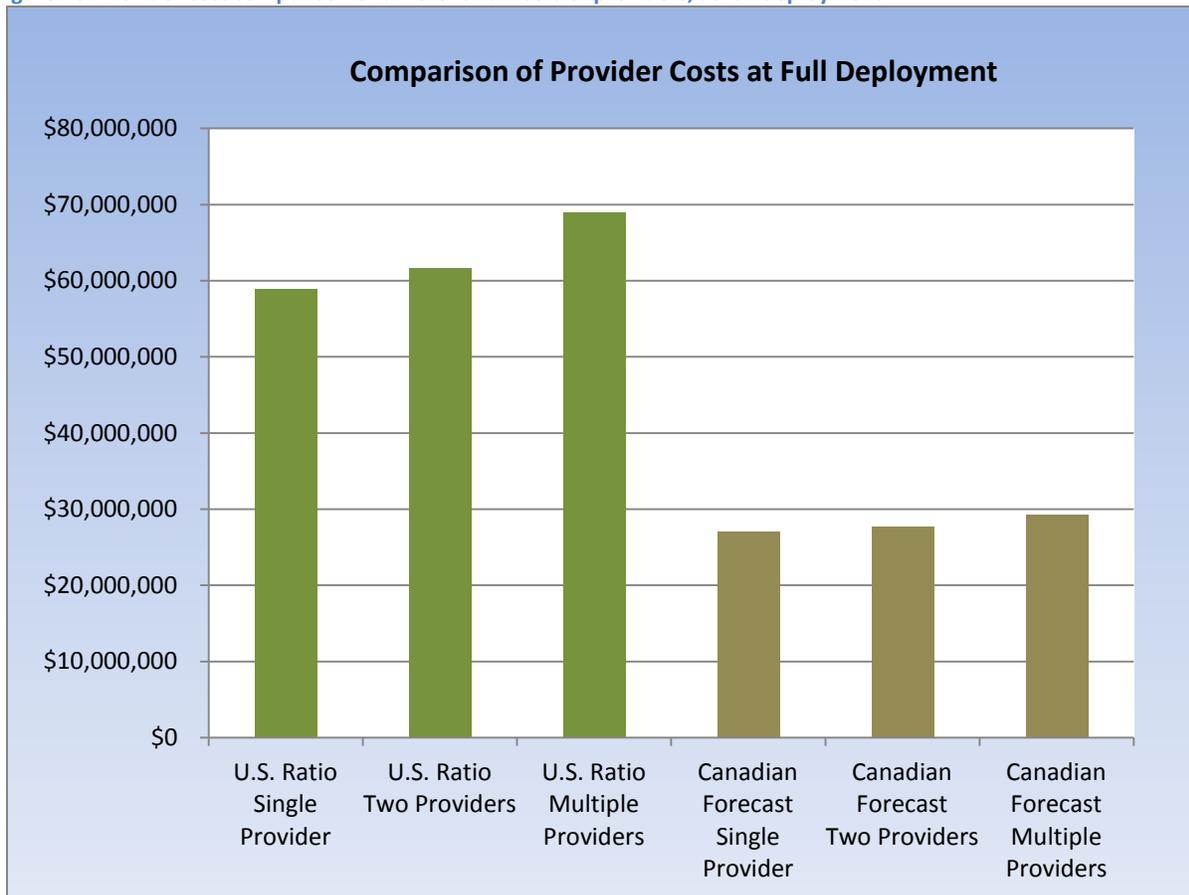
Table 36: Canadian Forecast – Multiple providers’ combined costs; initially delayed growth rate, 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	10%	550	234,326	\$ 1,007,600	\$4.30
2	20%	660	270,997	\$ 1,165,286	\$4.30
3	30%	858	341,154	\$ 1,466,961	\$4.30
4	40%	1,201	464,021	\$ 1,995,290	\$4.30
5	50%	1,802	678,344	\$ 2,916,879	\$4.30
6	60%	2,883	1,061,318	\$ 4,563,667	\$4.30
7	70%	4,901	1,767,406	\$ 7,599,846	\$4.30
8	90%	9,312	3,240,516	\$ 13,934,219	\$4.30
9	100%	15,345	6,061,387	\$ 26,063,965	\$4.30
10	80%	15,345	6,820,853	\$ 29,329,666	\$4.30
11+	0%	15,345	6,820,853	\$ 29,329,666	\$4.30

4.4.4. Cost comparisons of one, two and multiple provider solutions

A comparison of the costs of a single-provider, two-provider, and multiple provider VRS at full maturity and for delayed implementations are shown below.

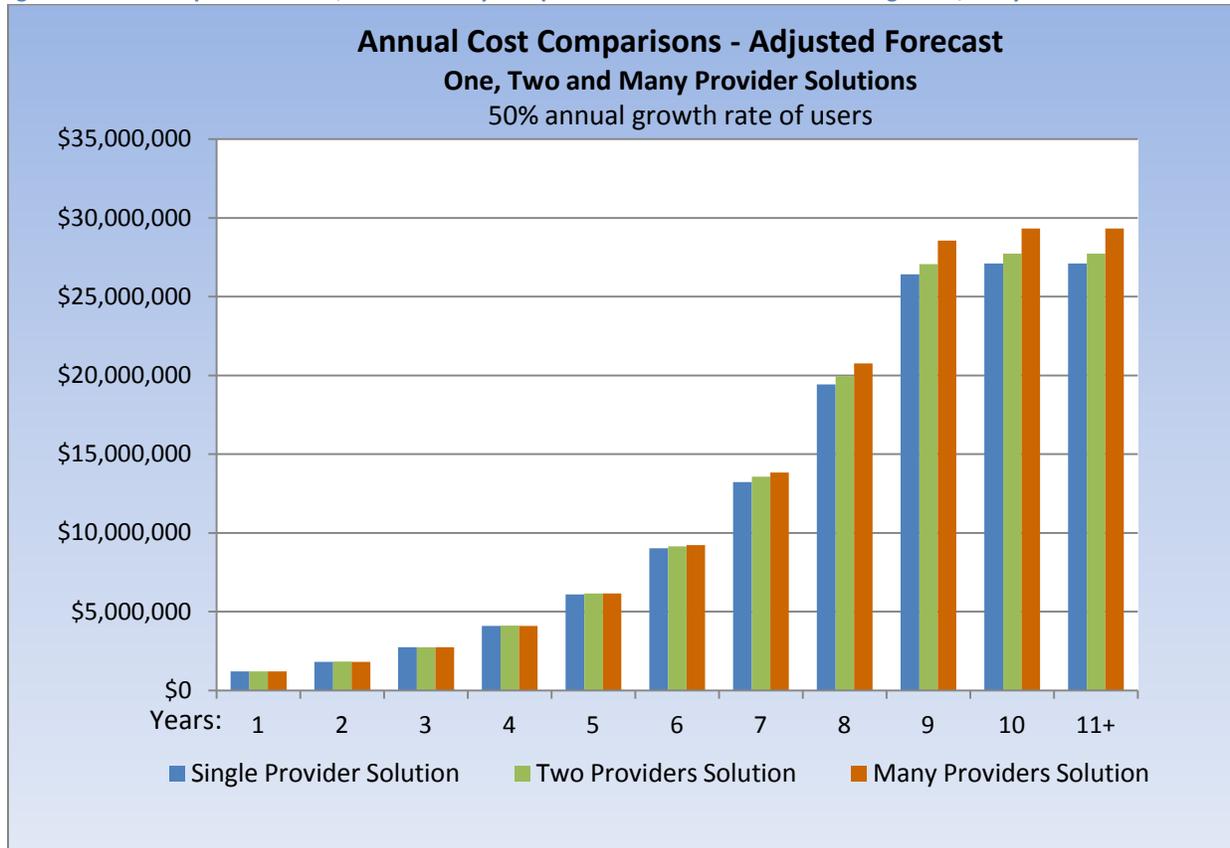
Figure 16: Provider cost comparison of different numbers of providers, at full deployment



The above chart is derived from the total costs shown in Table 31 and Table 32. It is significant to note that there is very little difference in costs between one, two or many providers for a fully deployed 24x7 service, with 100% of anticipated users, for the Canadian Forecast – which represents the probable Canadian VRS provider costs.

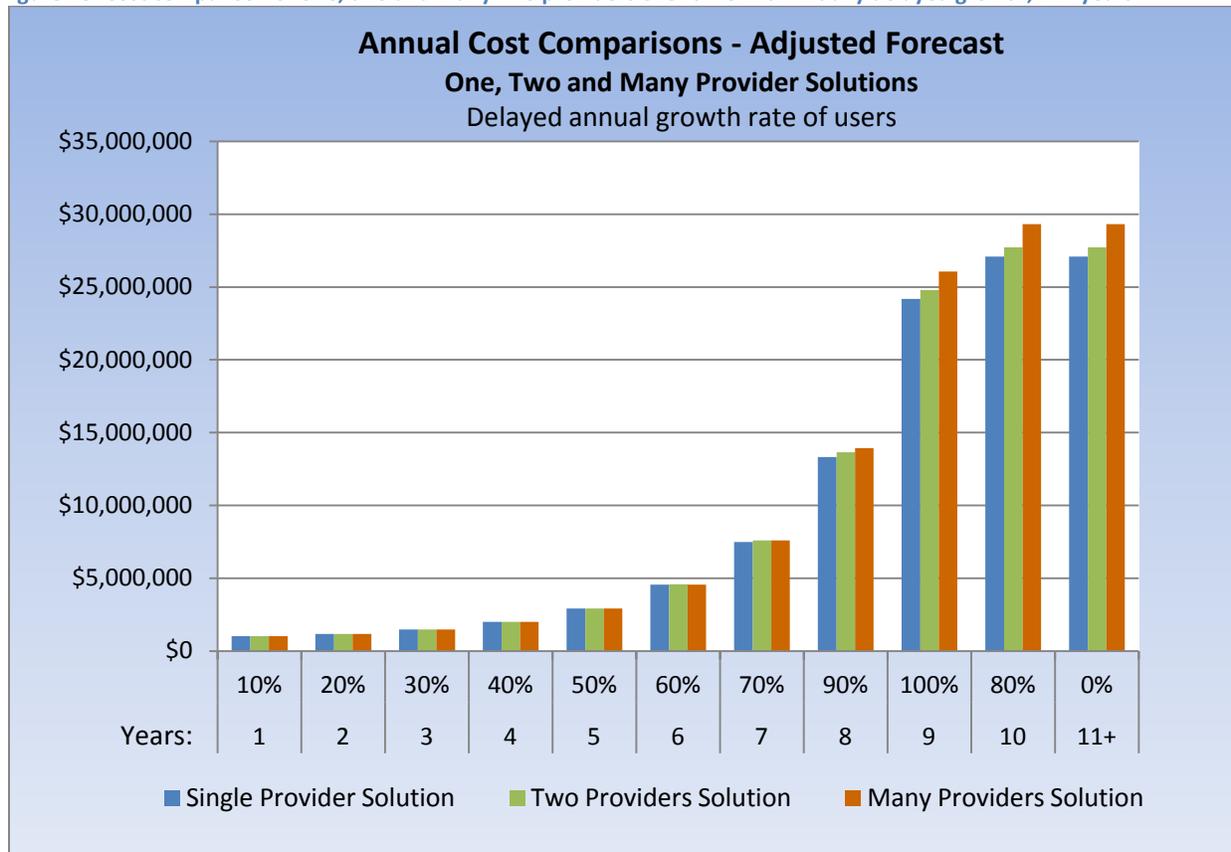
The Canadian Forecast VRS provider costs over time shown in Figure 17 below represent the 50% annual growth rates of Table 22, Table 28, and Table 34.

Figure 17: Cost comparison of one, two and many VRS providers over time at 50% annual growth, 11+ years



The Canadian Forecast VRS provider costs over time shown in Figure 18 below represent the initially delayed growth rate of Table 24, Table 30, and Table 36.

Figure 18: Cost comparison of one, two and many VRS providers over time with initially delayed growth, 11+ years

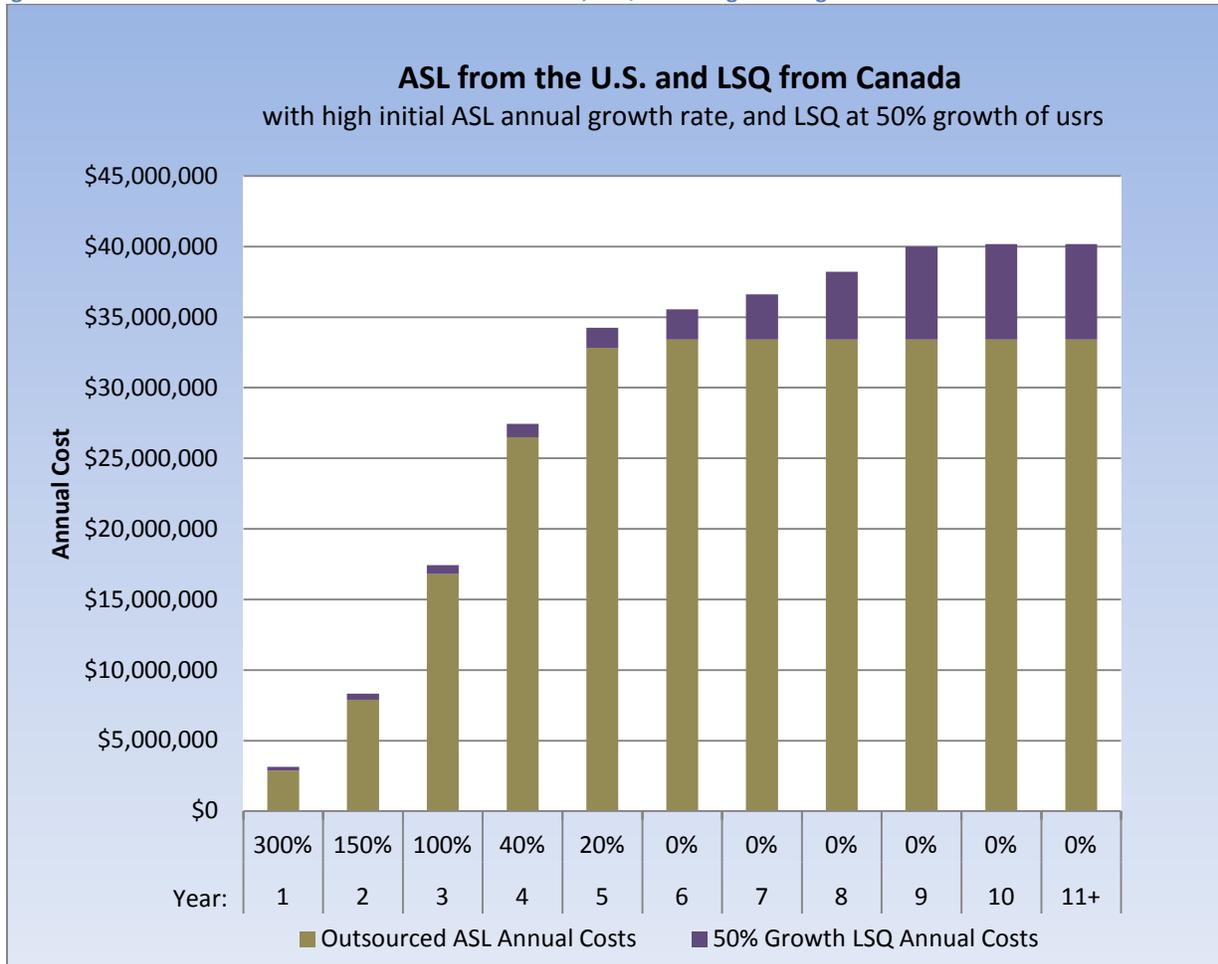


4.5. The Potential to Outsource VRS

Dividing VRS into two separate services, an ASL VRS provider and a LSQ VRS provider, creates an opportunity to outsource the ASL VRS to the U.S.. In the U.S. there are many available qualified ASL interpreters, and the U.S. VRS providers should be able to easily accommodate the slight increase in traffic that Canadian ASL will represent.

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, particularly in response to the pent up demand from Canadians who are Deaf and have been waiting for a long time for VRS. A suggested resulting ASL VRS adoption shown over eleven years is provided below in Figure 19, 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). The LSQ VRS traffic, however, cannot be outsourced because there is no existing VRS anywhere in the world that supports LSQ (LSQ interpreters and LSQ interpreter training are only in Canada). Therefore 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).

Figure 19: ASL outsourced to the United States at U.S. rates; LSQ remaining at 50% growth



The above chart is derived from the “Total Annual Cost” columns presented in the following two tables.

Table 37: ASL only; outsourced to a single provider the U.S. (in CAD), 11+ years

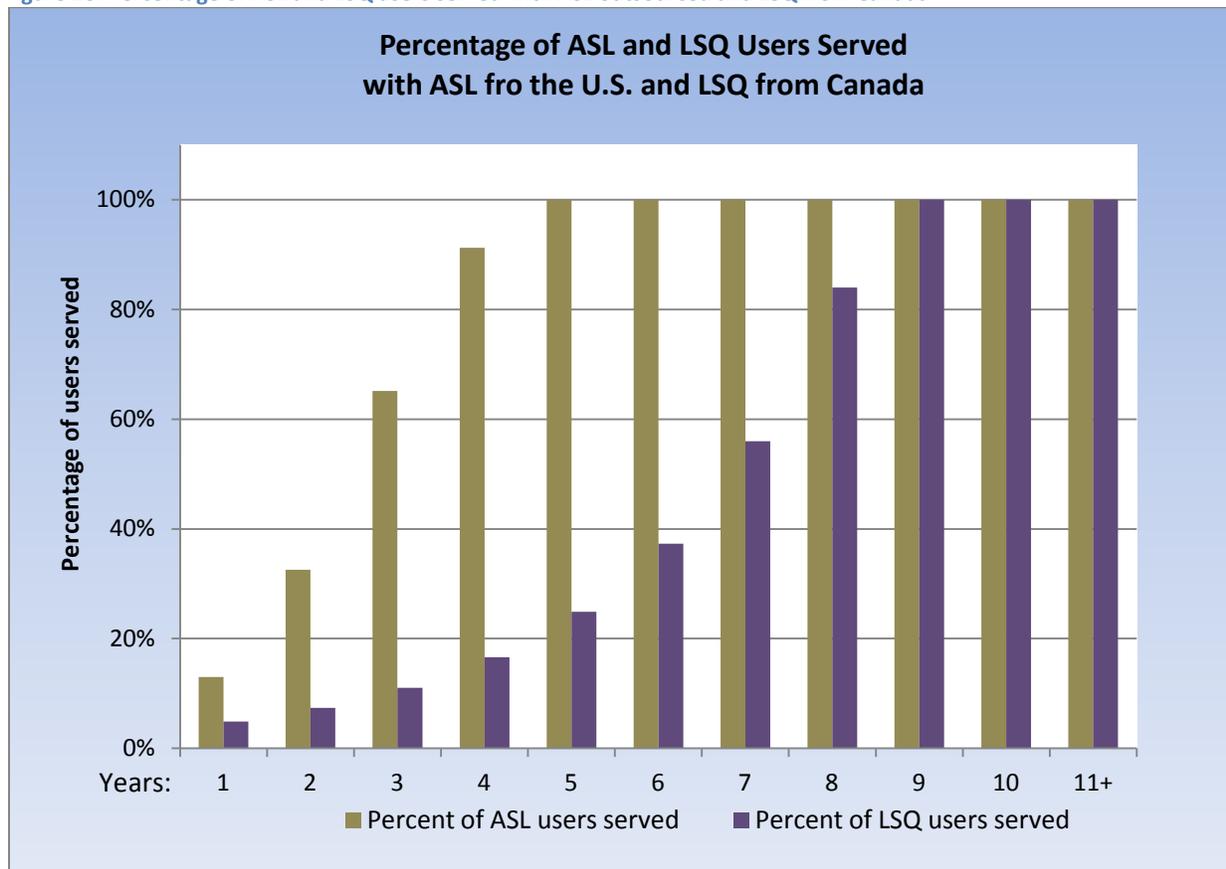
Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	300%	1,540	449,278	\$ 2,861,292	\$6.37
2	150%	3,850	1,240,822	\$ 7,898,912	\$6.37
3	100%	7,700	2,638,330	\$ 16,791,475	\$6.36
4	40%	10,780	4,164,224	\$ 26,500,980	\$6.36
5	20%	11,816	5,160,163	\$ 32,838,298	\$6.36
6	0%	11,816	5,252,212	\$ 33,424,017	\$6.36
7	0%	11,816	5,252,212	\$ 33,424,017	\$6.36
8	0%	11,816	5,252,212	\$ 33,424,017	\$6.36
9	0%	11,816	5,252,212	\$ 33,424,017	\$6.36
10	0%	11,816	5,252,212	\$ 33,424,017	\$6.36
11+	0%	11,816	5,252,212	\$ 33,424,017	\$6.36

Table 38: LSQ only; from multiple providers in Canada (in CAD), 11+ years

Year	Annual Growth Rate	Number of VRS Users	Total Annual Minutes of Use	Total Annual Cost	Average Cost Per Minute
1	50%	173	65,008	\$ 279,535	\$4.30
2	50%	260	97,716	\$ 420,178	\$4.30
3	50%	390	146,907	\$ 631,701	\$4.30
4	50%	585	220,361	\$ 947,552	\$4.30
5	50%	878	330,486	\$ 1,421,089	\$4.30
6	50%	1,317	495,988	\$ 2,132,748	\$4.30
7	50%	1,976	744,019	\$ 3,199,281	\$4.30
8	50%	2,964	1,116,214	\$ 4,799,718	\$4.30
9	50%	3,529	1,530,710	\$ 6,582,052	\$4.30
10	50%	3,529	1,568,641	\$ 6,745,154	\$4.30
11+	0%	3,529	1,568,641	\$ 6,745,154	\$4.30

The outsourced ASL scenario would allow Canadian ASL users to achieve maximum use of VRS earlier than would be achieved by Canadian LSQ users, thereby creating significant initial disparity of the percentage of potential users served, as illustrated in the following chart.

Figure 20: Percentage of ASL and LSQ users served with ASL outsourced and LSQ from Canada



4.6. The Effect of Limiting Available VRS Hours

All countries that provide VRS, except the United States, limit consumer or business access to the service by time of day and sometimes by day of the week. Restricted access is usually due to lack of funding for 24 hour service, including cost considerations for significantly higher operational expenses per minute of usage during the non-busy evening and weekend times.

In this study's phase 9, *Forecasts of User Demand*, the analysis of U.S. traffic by time-of-day and day-of-the-week indicated that the great majority of VRS usage occurs between 8 AM and 8 PM, Monday through Friday. Usage forecasts in phase 9 for a Canadian VRS limited to these time periods (at the local time in each time zone) suggest that minutes of use for this time period may be approximated at 83% of a 24 hour a day, 365 day a year service.⁶⁰ The reduced minutes at 83% usage, and corresponding reduced costs, at service maturity (15,345 consumers) using the Canadian Forecast data are shown in the following table:

Table 39: Canadian Forecast – Costs at maturity, 15,345 users, with restricted hours

	Total Annual Minutes of Use	Average Minutes per User Annually	Average Minutes per User Monthly	Total Annual Cost	Average Cost per Minute
One provider:	5,661,308	369	30.7	\$22,636,034	\$4.00
Two providers:	5,661,308	369	30.7	\$23,201,527	\$4.10
Many providers:	5,661,308	369	30.7	\$24,343,624	\$4.30

Restricted hours could be combined with other restrictions, such as further actively restricting the minutes of use per consumer to further decrease costs, both initially as well as permanently. However such additional restrictions would likely be considered by many consumers to be unjustifiable.

4.7. The Cost Impact of Including Video Remote Interpreting

Video Remote Interpreting (VRI) is a service in which a remote interpreter is used to provide interpreting services between two or more individuals who are together in the same room or venue. VRI is generally not considered a form of telecommunications or message relay service, and is usually not included within countries' VRS programs.⁶¹ VRI is probably outside of the jurisdiction of the CRTC to order, and would likely be opposed by TSPs who would otherwise be required to fund it as MRS. The effect of including VRI within VRS upon community interpreting and other considerations is discussed in this study's phase 8, *Potential Related Services*.

Nevertheless, if VRI is approved for reimbursement from VRS funds, the total number of VRS/VRI minutes of use will increase because of the convenience of VRI. Furthermore, unlike relatively brief VRS

⁶⁰ See this study's phase 9 for more information on typical call distribution by time-of-day and day-of-the-week. To invoke time-of-day restriction in the consumer's time zone will require user registration.

⁶¹ As VRI is not considered a telecommunications relay transaction, this service is not approved for reimbursement by the FCC in the U.S.

calls from users, VRI sessions may be lengthy and used by businesses to more fully engage Deaf consumers (such as participating in a business meeting). Very little usage data on VRS from other countries has been successfully acquired for this study. However if VRI were reimbursed at the same rates as standard VRS, additional costs for a fully operational unrestricted VRS (24 x 7, 15,345 consumers) at the Canadian Forecast levels can be projected for VRI minutes of use as an additional percentage of the 6,820,853 standard VRS minutes:

Table 40: Canadian Forecast – Cost projections for VRI usage, with fully deployed VRS

Number of VRS Providers	VRI as a Percent of VRS traffic	Annual VRI Minutes	Annual Cost of VRI	Annual Cost of VRI+VRS	Average Cost Per Minute
One provider:	10%	682,085	\$2,626,028	\$29,726,310	\$3.96
One provider:	20%	1,364,171	\$5,252,057	\$32,352,339	\$3.95
One provider:	30%	2,046,256	\$7,878,085	\$34,978,367	\$3.94
One provider:	40%	2,728,341	\$10,504,113	\$37,604,395	\$3.94
Two providers:	10%	682,085	\$2,662,244	\$30,394,686	\$4.05
Two providers:	20%	1,364,171	\$5,330,489	\$33,062,931	\$4.04
Two providers:	30%	2,046,256	\$7,995,733	\$35,728,175	\$4.03
Two providers:	40%	2,728,341	\$10,660,977	\$38,393,419	\$4.02
Many providers:	10%	682,085	\$2,932,966	\$32,262,632	\$4.30
Many providers:	20%	1,364,171	\$5,865,933	\$35,195,599	\$4.30
Many providers:	30%	2,046,256	\$8,798,899	\$38,128,565	\$4.30
Many providers:	40%	2,728,341	\$11,731,866	\$41,061,532	\$4.30

Because of the lack of VRI usage data, the cost implications of VRI would best be identified in a VRI trial.

5. Additional Cost Considerations

In addition to the direct VRS program costs and their variables discussed above in section 4, there are other areas of consideration that may impact overall program costs. These areas should be considered because, by policy or process, they may impact the overall VRS program or they may become a direct cost responsibility of the program. Five significant areas of consideration are presented below:

- VRS fraud
- Public education and outreach
- MRS cost offsets
- Third party administrative costs, including VRS platform and database
- Consumer VRS costs
- VRS model cost considerations

5.1. Fraudulent VRS Costs

Fraud or misuse of VRS can affect the availability of network and interpreter resources, as well as result in lost funds for the VRS program. The United States VRS environment has had a high incidence of fraudulent call volumes and costs. Other countries have not reported any VRS fraud or misuse.

VRS fraud perpetrated by VRS providers in the U.S. has been in two areas: 1) billing for improper types of calls, and 2) inflating the declaration of expenses on which reimbursement rates are set, and including expenses that should not be reimbursable.

The first type of fraud results in increased billed and reported minutes of use. The FCC and the U.S. Department of Justice (DOJ) has addressed this first type of fraud by clarifying its rules, conducting investigations and arrests, and levying significant penalties. See this study's phase 4, VRS Models in Other Countries, for more information about the unique situation in the U.S. The FCC and DOJ actions have resulted in high profile and awareness of these crimes. Although much of this type of fraudulent calling activity has been reduced, FCC staff indicates that there may still be significant fraudulent call activity.⁶² However, the decline in U.S. VRS call minutes in the last couple of years is assumed to be due to the decline in fraudulent call activity on the part of the U.S. VRS providers. Therefore, in this study's phase 9 and phase 10 analyses, the application of U.S. estimates of minutes of use and minutes per consumer in the U.S. Ratio figures used on behalf of Canada have used the U.S. annual minutes of use data after the decline.

The second type of fraud has not been verified but has been reported.⁶³ This is the inflation of expense reporting, the inclusion of ineligible expenses, and the inflation of projections of future costs within the U.S. providers' cost submissions to the FCC.⁶⁴ Because the U.S. providers' cost accounting records are largely unauditiable, and because the providers submit their own cost estimates, it is very easy to knowingly submit false costs. Since U.S. VRS rates are based on "cost plus" formula of past and future costs, this causes the FCC to inadvertently calculate rates at a significantly inflated rate.

Canada can protect itself against VRS provider fraud by:

- 1) Establishing clear rules regarding what types of calls will be reimbursed and what types will not be reimbursed.
- 2) Not adopting a "cost plus" rate setting methodology.
- 3) Ensuring that the profits from VRS are not excessive, and therefore do not make the risk of abuse or fraud attractive.
- 4) Ensuring that the regulatory and administrative agencies have the authority and means to conduct effective audits appropriate to the rate basis employed.

⁶² See <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021739255>.

⁶³ See section 3.2.2, *Excessive expenses reported in U.S. costs*.

⁶⁴ Also see section 3.2.1, *Incongruities of U.S. rate averaging*.

- 5) Establishing and enforcing accountability, including significant penalties for fraud and abuse.

However, even if it were possible to accurately identify the percentage of the U.S. rates that are over inflated due to fraud, that does not mean that Canada will be able to acquire its own rates without the influence of the existing U.S. rates. As long as the FCC continues to offer very high reimbursement rates, U.S. vendors who may wish to bid Canadian VRS may or may not be willing to reduce their rates for a Canadian bid. Even if U.S. or Canadian firms bid significantly lower rates, they will have to compete for available interpreters with U.S. VRS firms operating in Canada that are being reimbursed by the U.S. at higher rates. Likewise, local future Canadian VRS providers may put emphasis on providing ASL VRS on behalf of U.S. consumers if the U.S. reimbursement rates remain high. However, the FCC has indicated that it intends to significantly reduce VRS reimbursement costs, and these issues may become moot by the time Canada establishes its actual VRS rates and begins offering VRS.⁶⁵

5.2. Public Education and Outreach

The likelihood of a successful VRS program introduction will be significantly improved if efforts are made to provide public education, marketing, and outreach to the targeted users, as well as the general population about relay and how to use the services.

In the United States much of the marketing and outreach is generated by the relay service providers as they try to differentiate themselves from other providers, and vie for customers (almost exclusively ASL users). Much of their marketing leverages the Internet to target the specific demographics that would utilize the service. VRS providers in the United States are also very active in the user association gatherings (e.g. Deaf Expo, Deaf Awareness Day Events, etc.). They will usually attend an event by participating in presentations, hosting a booth, and often have terminals where the public can make “test calls” through their VRS call center. In other instances they may supply a group of volunteer interpreters to support the event, providing an example of their services and dedication to the community, while helping offset some of the event promoter’s logistical costs. Almost all U.S. VRS provider marketing is oriented to the potential sign language user; with almost no marketing to the hearing population.

The FCC has stated that relay providers must conduct outreach activities to ensure that “callers in their service area are aware of the availability and use of all forms of TRS.”⁶⁶ As such, they are also including outreach expenses in provider cost submissions that are reimbursable from the TRS Fund.

Unfortunately, the definitions put forth in the TRS Fund Administrator forms and instructions are

⁶⁵ Section 16, Implementation, of this study’s phase 11, Potential Canadian VRS Models, recommends an initial three-year research phase before competitively bidding VRS. This initial low traffic volume period will provide time for the U.S. to reduce its rates prior to completely relying upon market rates for a more fully deployed VRS.

⁶⁶ Federal Communications Commission (FCC); Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, CG Docket No. 03-123, Cost Recovery Order at ¶ 47.

general and vague, leaving much room for interpretation. This confusion also causes a wide range of costs between the providers. The current definitions from the latest FCC fund payment formula state:

- **Marketing Expense:** “The projected costs of advertising the provider’s service”
- **Outreach Expense:** “The projected costs of notifying consumers of service availability”⁶⁷

The FCC stated that the aggregated marketing and outreach costs that were reported by the VRS providers in 2008 amounted to \$30 million USD. This was an increase from the \$20 million USD reportedly spent the previous year.⁶⁸ For purposes of comparison, the increase in provider reported costs spent on outreach and marketing in 2008 was 4.7% of the Total Fund requirement; a 30 percent increase over the 2007 cost of 3.6%.

Table 41 below represents the cost of outreach and marketing reported by the U.S. VRS providers compared to the reported per/minute costs. It shows the cost contribution for outreach and marketing over the years to be between 6% and 10% of per/minute provider reported costs:

Table 41: VRS provider cost of outreach and marketing, U.S. (USD)⁶⁹

	2007 (actual)	2008 (actual)	2009 (actual)	2010 (projected)	2011 (projected)
Marketing Expense/min	\$0.0639	\$0.0283	\$0.0302	\$0.0415	\$0.0426
Outreach Expense/min	\$0.2321	\$0.3122	\$0.3662	\$0.3317	\$0.3383
M. & O. cost/minute	\$0.2950	\$0.3305	\$0.3964	\$0.3732	\$0.3709
Total Cost per Minute	\$3.9604	\$4.1180	\$4.1596	\$5.2826	\$5.9179
M. & O. as % of Total	7.4487%	8.0257%	9.5298%	7.0647%	6.2674%

As with other provider generated self-reporting of “actual” expenses, there is a degree of uncertainty about the accuracy and effectiveness of these charges. (See also the table and charts in Section 3.1 – *Vendor VRS Rates* regarding the various categories of expense average.) Also, in providers’ promotional efforts and materials there is usually a self-serving purpose and focus between their *marketing and outreach* campaigns, versus the need to inform consumers in more neutral public *outreach and education* efforts, especially with respect to the hearing public.

In the United States, the individual states are directly responsible for the intrastate and non-IP relay services. Many states have an active effort to perform *outreach and education* related to their relay services. Often these expenses are applied to both the state’s relay program and its equipment distribution program. Although the states may not be responsible for the IP-based relay, including VRS,

⁶⁷ Federal Communications Commission (FCC); Interstate Telecommunications Relay Services Fund Payment Formula and Fund Size Estimate; Interstate Telecommunications Relay Services (TRS) Fund For July 2010 through June 2011; CC Docket 03-123; CG Docket No. 10-51; April 30, 2010

⁶⁸ Ibid

⁶⁹ Ibid

they usually do help promote the VRS services for their MRS contractors. All outreach and education expenses paid by the individual states are not included in the Interstate TRS cost filings, detailed above.

If, in the selected Canadian model, the contracted VRS providers are not responsible for marketing and outreach, the expenses may arguably be removed from the U.S. Ratio per minute rates used for cost forecasting. In that instance, those costs, currently in the U.S. Ratio forecasted per minute provider rates, may be spent by the CRTC directly, or through its VRS administrator for public education and outreach. Thus these cost elements should not be eliminated but should be shifted to a different, non-VRS vendor, program cost. For the considerations of the various marketing and outreach options and recommendations for Canadian VRS, see section 12 of this study's phase 11, *Potential Canadian VRS Models*.

5.3. MRS Cost Offsets Resulting From VRS Usage

In this study's phase 9, *Forecasts of VRS User Demand*, the growth and impact of U.S. VRS usage on the volume of traditional text relay, IP relay, and potentially other forms of relay was presented. That report's data related to federally funded relay programs and did not include an analysis of the intrastate traditional relay traffic paid by the individual states. While those charts did not fully represent the decline in total *minutes-of-use* nationally, it did provide a percentage of TTY MRS decline which may be applied to the Canadian forecasts.

During the decline of TTY MRS usage in the U.S., several relay technologies were introduced. However, as both IP-relay and VRS had been introduced as a competitor of TTY MRS, it is difficult to attribute the initial decline in U.S. TTY MRS use to VRS or IP-Relay exclusively. The decline in U.S. TTY MRS may also be due in large part to the simultaneous increase of availability of text-to-text communication (e.g., email and SMS) between Deaf, hard of hearing, and hearing users.

The later introduction of captioned telephone service after September 2008 is easier to correlate to the decline in U.S. TTY MRS since by that date VRS and IP-relay growth had begun to stabilize, or subside.

In the U.S. the total TTY relay traffic declined from 2002 to 2011 by 83 percent due to the combined adoption of IP-relay, VRS, captioned telephone relay; and other non-relay forms of communication between Deaf and hearing people (email, texting, etcetera.)

The accelerated growth of VRS traffic in the United States lasted for approximately six years until the market reached maturity. Other data presented in the phase 9 report confirmed that in the three year period from 2008 to 2011 TTY relay traffic was reduced by 46%, as VRS was still growing, IP-relay had peaked, and captioned telephone service growth began its impact on TTY relay.⁷⁰

⁷⁰ NECA TRS Fund Interstate TRS minutes 2010

However in Canada, TTY-Relay has already been declining at a rate of approximately 10 to 11 percent annually⁷¹ as a result of the prevalence among Deaf, deaf, hard of hearing, and hearing users of alternative and ubiquitous means of text communication, such as email, Internet chat, Facebook, texting (SMS), etcetera. Although Canadian IP-Relay has recently been initiated, it has not realized any significant growth, and therefore is considered to not yet have had any significant impact on the reduction of TTY-Relay use.

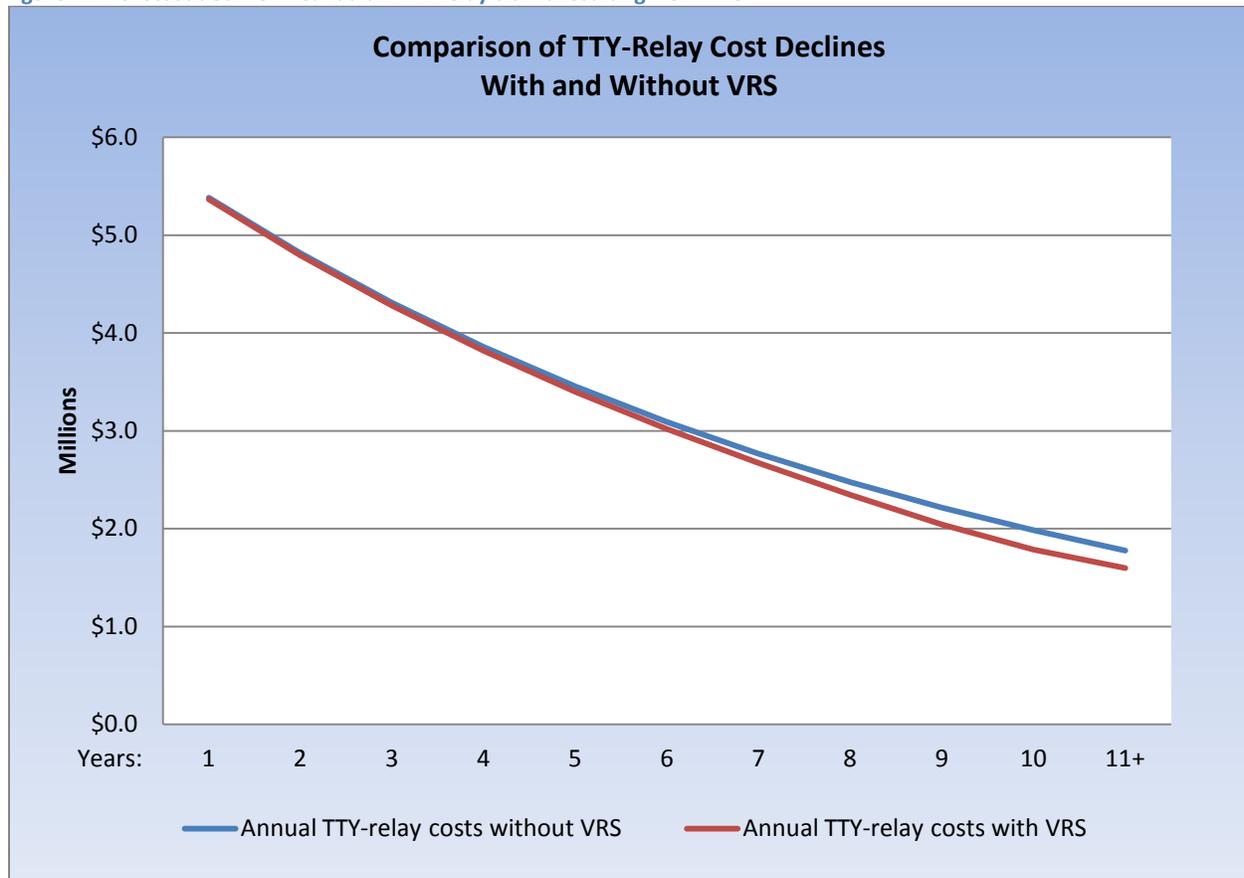
Since VRS offers more natural and fluid conversation in the language of the sign user, it is expected to replace TTY-Relay for people who sign. It is not known what percentage of TTY-Relay calls are presently made by ASL and LSQ users, but their population is usually considered to be about one-tenth of the non-signing combined deaf and hard of hearing populations.⁷² Therefore, the impact of VRS on the reduction of TTY-Relay beyond what is already being experienced due to the availability of modern text communications can be forecast to be very slight. In this context, the experience of the U.S. portrayed above may appear to have a similar decline of TTY-Relay use, but unlike the U.S. the timing and the resulting effect of the availability and adoption of VRS is not expected to have a significant effect upon the decline of TTY-Relay. This is especially true if VRS is only slowly adopted over an eleven year period as suggested in this study's VRS usage and cost analysis.⁷³ Assuming VRS deployment begins in 2013 with a 50% annual adoption rate, a general graphic representation of the decline in TTY-relay costs with VRS and without VRS is shown below. This representation should not be considered an accurate forecast.

⁷¹ Personal communication with Bell Canada.

⁷² See this study's phase 3, *Consumer Interests and Perspectives*

⁷³ This study's phase 9 and 10 deliverables.

Figure 21: Forecast decline in Canadian TTY-relay traffic resulting from VRS



5.4. Third Party Administrative Costs

5.4.1. U.S. Administrative Costs

Although the initial VRS Feasibility Study project phase 1, *Confirmation Report*, states that regulatory administrative costs (e.g. CRTC and telephone company administration expenses) would not be estimated as part of this study, it may be useful to consider some potential cost implications for third party administration, should that be a consideration for Canadian VRS. Once again, the United States may be used for comparison as they have published data on this subject.

While the FCC is involved in many of the regulations and orders dictating the provision of relay services, some of the administration activities for VRS and other relay services are supported by the TRS Fund Administrative Contractor.⁷⁴ As the TRS Fund administrator, their expenses are charged directly to the

⁷⁴ Formerly the National Exchange Carriers Association (NECA); currently Rolka Loubé Salzer Associates, LLC.

TRS Fund. Their annual expenditures for administrative expenses related to relay services are in the range of 0.17% (or rounded up to 2/10ths of 1%) of the Total TRS Fund annual requirements.

*"NECA administrative expenses charged to the TRS Fund are allocated in accordance with NECA's Cost Accounting and Procedures Manual ("CAM") filed with and approved by the FCC annually. NECA annually submits a Statement of Cost Allocation System Compliance to the FCC for which a schedule of costs incurred by category (including the TRS Fund) is attached. Costs for NECA personnel specifically assigned to the TRS Fund such as salaries, benefits and travel are directly charged to the TRS Fund. Common costs are accumulated in defined cost pools and allocated on a monthly basis to the TRS Fund using activity based cost drivers as further described in NECA's CAM. These costs include legal, auditing, finance, information systems, facilities and general overheads."*⁷⁵

These U.S. administrative costs are not identified by and assigned to the various relay services being managed. Also, the administrative costs for intrastate non-IP relay services are the responsibility of the individual states, which have varying degrees of administrative involvement and costs. Nevertheless, as a program administrator may be a consideration in Canada, the U.S. federal TRS Fund administrator data is being provided for reference only (not as a forecast for Canada). For example, the following chart states the NECA administrative expenses for years ended 2009 and 2008:⁷⁶

Table 42: TRS Fund third party administrative costs, U.S. (USD)

	2009	2008
Direct labor	437,000	307,000
NECA allocated common costs	752,000	588,000
Miscellaneous	103,000	87,000
Consultants	42,000	42,000
Data collection agent	51,000	68,000
Travel	5,000	5,000
Total Administrative Costs	\$ 1,390,000	\$ 1,097,000

⁷⁵ NECA; Interstate Telecommunications Relay Services Fund; Notes to Financial Statements; September 30, 2009 and 2008 (in thousands); Withum, Smith + Brown; *Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on Audit of Financial Statements Performed in Accordance with Government Accounting Standards*

⁷⁶ Ibid

5.4.2. Estimated Canadian Administrative Costs

Depending upon the model selected for Canada and the role of a Canadian third party VRS administrator, the above U.S. third party administrative costs will likely not be sufficient for a more engaged management of VRS. For example, the third party administrative role represented in sections 13.2.3 and 13.3 of this study’s phase 11, *Potential Canadian VRS Models*, anticipates a significant administrative and management role for all of VRS in Canada. Representative potential initial and annual reoccurring administrative costs might include:⁷⁷

Table 43: Potential Canadian Third Party Administrator costs

Cost Category	Initial Annual Costs	Ongoing Annual Costs
Board member reimbursements	\$250,000	\$250,000
Staff costs (6 people), loaded	\$640,000	\$640,000
Facilities and furniture	\$350,000	\$200,000
Legal, CPA, interpreters and consultants	\$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 suggested administrator costs are examples only. Note that general VRS education and outreach expenses are not included. Similarly consumers’ VRS costs are not included.

5.4.3. Combined Canadian Administrative and Provider Costs

For reference, combining the suggested Canadian annual administrative costs with the annual Canadian Forecast of VRS provider costs, results in the following estimates of VRS program costs for a fully deployed VRS serving all Canadians who wish to use it (estimated at 15,345 people). Table 44 shows VRS as provided by multiple providers operating 24 x 7 as well as with restricted hours. Note that the table below does not include consumers’ costs or the cost of public education and outreach.

⁷⁷ The cost estimates of Table 43 are suggestions only. While a detailed cost analysis of potential Administrator costs are outside the scope of this study, it is assumed that a cost forecast, even based on estimates, will be useful. Initial annual costs are for the period before relay services actually begin. Ongoing annual costs are after VRS has begun. See phase 12, *Final Report*, section 7.1.1 for a potential one-and-a-half year timeline of initial administrator tasks.

Table 44: Annual VRS provider and administrative costs⁷⁸

Forecast ongoing VRS annual program costs	24 x 7 VRS	Restricted Hours VRS
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

As forecast above in Table 44, estimated annual administrative costs represent only eight to nine percent of the total VRS program costs (even less if consumer and education costs are included).

5.5. Consumers' VRS Costs

Potential consumer cost factors are presented in two categories: terminal equipment related costs and network related costs. Consumer terminal equipment considerations include end-point equipment, hardware and software installation, and training. Network costs include broadband access and usage costs.

5.5.1. Terminal equipment considerations

The VRS user can connect to the relay center VI through any of several end-point or terminal devices at the consumer's location:

- a videophone;
- a computer with a web camera running video chat or a proprietary video relay software program (also called a "client") which is downloaded and installed on the end user's computer;
- a computer with web camera running a browser-based chat or video relay software program (i.e. no software installation required on the end-user's computer); or
- a mobile or tablet device with wireless or cellular Internet connectivity.

Examples of these devices, their current applications, and costs are detailed in this study's phase 5 Report, *Technologies and Their Forecasts*.⁷⁹

VRS hardware technologies and software costs vary. Client VRS software, either downloaded on a consumer's existing computer or as a website function, is usually provided by VRS vendors at no charge.

⁷⁸ Annual multiple provider costs for 24 x 7 service are from section 4.4.3, and restricted service costs are from section 4.6.

⁷⁹ VRS Feasibility Study, phase 5, *Technologies and Their Forecasts*; section 6.

When considering a standalone videophone, costs typically vary from a \$150-\$500, and can escalate to more than a thousand dollars for professional (non-consumer) models.

As stated in phase 4 of this study, *VRS Models in Other Countries*, in some countries the VRS consumer equipment costs may be subsidized in whole or in part, either by the VRS vendors to promote business, or by a government agency. However, in most VRS models desktop or laptop computers are not provided to consumers. Similarly, smartphone devices or mobile tablets, and their associated cellular and data service plans, are usually the financial responsibility of the consumer.

In the United States, where a competitive VRS model encourages providers to differentiate themselves, providers have adopted different strategies of technical support to the consumer. While some offer comparatively minimal consumer support, others offer more complete personalized services. These include the delivery of equipment, as well as the set-up and testing by Deaf installers who then explain the equipment and demonstrate its use in sign language. This latter approach was successfully employed by Sorenson during the initial U.S. deployment of VRS and it enabled them to acquire more than 80% of the U.S. VRS market. This is the current deployment process in the current Telus VRS trial.

For this study, there are no estimates of how many potential Canadian VRS consumers lack suitable equipment. Order of magnitude equipment cost forecasts can be made, but without foundation. For example the following table lists potential costs based on an average of \$300 per device being required, by different percentages of the forecast 15,345 eventual VRS users:

Table 45: Estimates of potential VRS program consumer equipment costs

Percent of 15,345 users needing equipment	Number of pieces of equipment needed	Average cost of each unit	Estimated total cost of needed equipment
10%	1,535	\$300	\$460,500
20%	3,069	\$300	\$920,700
30%	4,603	\$300	\$1,380,900

The above table only identifies potential consumer costs of equipment without any sharing or subsidizing of those costs.

The policy questions are: Who will pay for these devices and their technical support: the VRS vendors, the provincial or local government agencies, the VRS program, the consumers themselves, or some combination of these? Should equipment subsidies, if any, be based on disability, personal income, or both?

5.5.2. Broadband access and usage costs

As presented in this study’s phase 5, *Technologies and their Forecast*, an adequately fast broadband requirement is of critical importance to the quality of a VRS experience. Canada has one of the highest levels of availability of fast broadband service among the countries with established VRS.⁸⁰ As reported in this study’s phase 5:

“Approximately 98% of Canadian households are located within a 1.5 Mbps broadband footprint, consisting of either landline or mobile (i.e., HSPA+) facilities. On a provincial basis the footprint encompasses all households in the following 5 provinces: Alberta, Ontario, New Brunswick, Nova Scotia, and Prince Edward Island. For the remaining provinces it encompasses at least 89% of the households. With respect to Canada’s mobile network, 97% of Canadians are within the mobile broadband footprint.”⁸¹

Table 46: 2010 Internet and Broadband Availability at a Glance⁸²

Broadband availability (excluding satellite)	
National	96%
Urban	100%
Rural	85%
National wireless (HSPA+)	98%

As depicted in tables 47 and 48 below, *subscription rates* are however lower than *availability rates*, as shown in both the 2011 CRTC Communications Monitoring Report statistics as well as the 2010 Canadian Internet Use Survey, which reports that 8 out of 10 Canadian households (79%) have subscribed to Internet services.⁸³

Table 47: Broadband penetration rates, 2010

Penetration (actually signed up for service)	
All speeds	77%
High-speed	74%
Broadband (1.5 Mbps and higher)	70%
Broadband (5 Mbps and higher)	52%

⁸⁰ See this study’s phase 4, *VRS Models in Other Countries*, for details.

⁸¹ CRTC 2011 Communications Monitoring Report, Executive Summary, page i; at www.crtc.gc.ca/eng/publications/reports/policymonitoring/2011/cmr2011.pdf (English) or www.crtc.gc.ca/fra/publications/reports/policymonitoring/2011/cmr2011.pdf (French). Also see VRS Feasibility Study phase 5, *Technologies and their Forecast*, sections 4 and 5, Mission Consulting, 2/24/2012.

⁸² CRTC 2011 Communications Monitoring Report, from data on page 137

⁸³ 2010 Canadian Internet use Survey, available at Statistics Canada at <http://www.statcan.gc.ca/daily-quotidien/110525/dq110525b-eng.htm>. This report has additional useful information about subscription rates per household income and other factors.

Table 48: CRTC report of households by province with Internet subscriptions, 2010⁸⁴

Canadian Households with Subscribed Internet Access (2010)	
Canada	79%
<i>Newfoundland and Labrador</i>	74%
<i>Prince Edward Island</i>	73%
<i>Nova Scotia</i>	77%
<i>New Brunswick</i>	70%
<i>Quebec</i>	73%
<i>Ontario</i>	81%
<i>Manitoba</i>	73%
<i>Saskatchewan</i>	76%
<i>Alberta</i>	83%
<i>British Columbia</i>	84%

In 2010 the average monthly fee for broadband services in Canada was \$38.96.⁸⁵ A breakdown of average rates by speed tier is shown below:

Table 49: Average monthly cost per broadband subscriber (2010)⁸⁶

Download Speeds	Average Subscriber Rate
300 to 1,400 Kbps	\$28.87
1.5 to 4 Mbps	\$33.57
5 to 9 Mbps	\$42.23
10 to 15 Mbps	\$39.67
16 to 100 Mbps	\$53.71

For a more detailed breakdown of the above rates by wireline, wireless, broadband, and mobile Internet service plan average monthly prices, see this study's phase 5 report.

Demographics of average subscription rates for Deaf users, however, are not available.⁸⁷ Since no estimates for the Deaf population are available, cost projections can be forecast using a similar methodology to that used for estimating equipment costs:

⁸⁴ 2010 Canadian Internet use Survey, <http://www.statcan.gc.ca/daily-quotidien/110525/dq110525b-eng.htm>

⁸⁵ Ibid, data from table 5.3.3, page 141.

⁸⁶ Ibid, data from 5.3.3, page 141. Excludes terminal rental costs

⁸⁷ Some can be extrapolated from the Bell Consumer statistics, although these surveys only represent current Bell subscribers, and therefore are not an accurate representation of the entire Deaf population.

Table 50: Estimates of potential VRS program consumer broadband costs

Percent of 15,345 users needing broadband	Number of users needing broadband	Average annual cost of broadband ⁸⁸	Estimated total annual cost of needed broadband
10%	1,535	\$403	\$618,605
20%	3,069	\$403	\$1,236,807
30%	4,603	\$403	\$1,855,009

The above table only identifies potential consumer costs of equipment without any sharing or subsidizing of those costs.

However the question is the same as that for VRS equipment: To what extent should VRS consumers be subsidized for subscribing to Internet services at speeds necessary for VRS?

The policy questions are the same as that for VRS equipment: Who will pay for the necessary broadband services: the VRS vendors, the provincial or local government agencies, the VRS program, the consumers themselves, or some combination of these? Should broadband subsidies, if any, be based on disability, personal income, or both?

Although these questions for both consumer equipment and consumer broadband service are beyond the scope of this study, they are pertinent policy considerations of VRS program design that may directly impact program costs via equipment and network expenditures or subsidies, or may indirectly affect program costs by influencing the consumers' VRS adoption rates and minutes of use.

5.6. VRS Model Cost Considerations

There are many considerations in the selection of the VRS model components that may affect total VRS program costs. Some of these choices have been presented in this document for cost forecasting purposes only, such as: using tiered per minute rates that are sensitive to monthly volume of minutes, the method and amount of VRS provider reimbursement, the number of providers, the anticipated population of VRS users, the average minutes of use per person, the anticipated level of VRS interpreter efficiency, the rate of VRS deployment over time (annual growth rates), the potential costs of outsourcing, limiting hours and access, potential VRI costs, administrative costs (including VRS platform and database), and consumer costs.

However, there are additional model choices that can affect costs. These potentially include:

- Establishing VRS provider reimbursement rates based on an offered set rate or via competitive bid. For example, the tiers and per minute rates used in this document are provided only for cost forecasting purposes. Competitively derived market rates may be higher or lower than the suggested rates used for cost forecasts. Reimbursement to VRS providers may be based on

⁸⁸ Based on \$33.57 per month for 1.5 to 4 Mbps download speed.

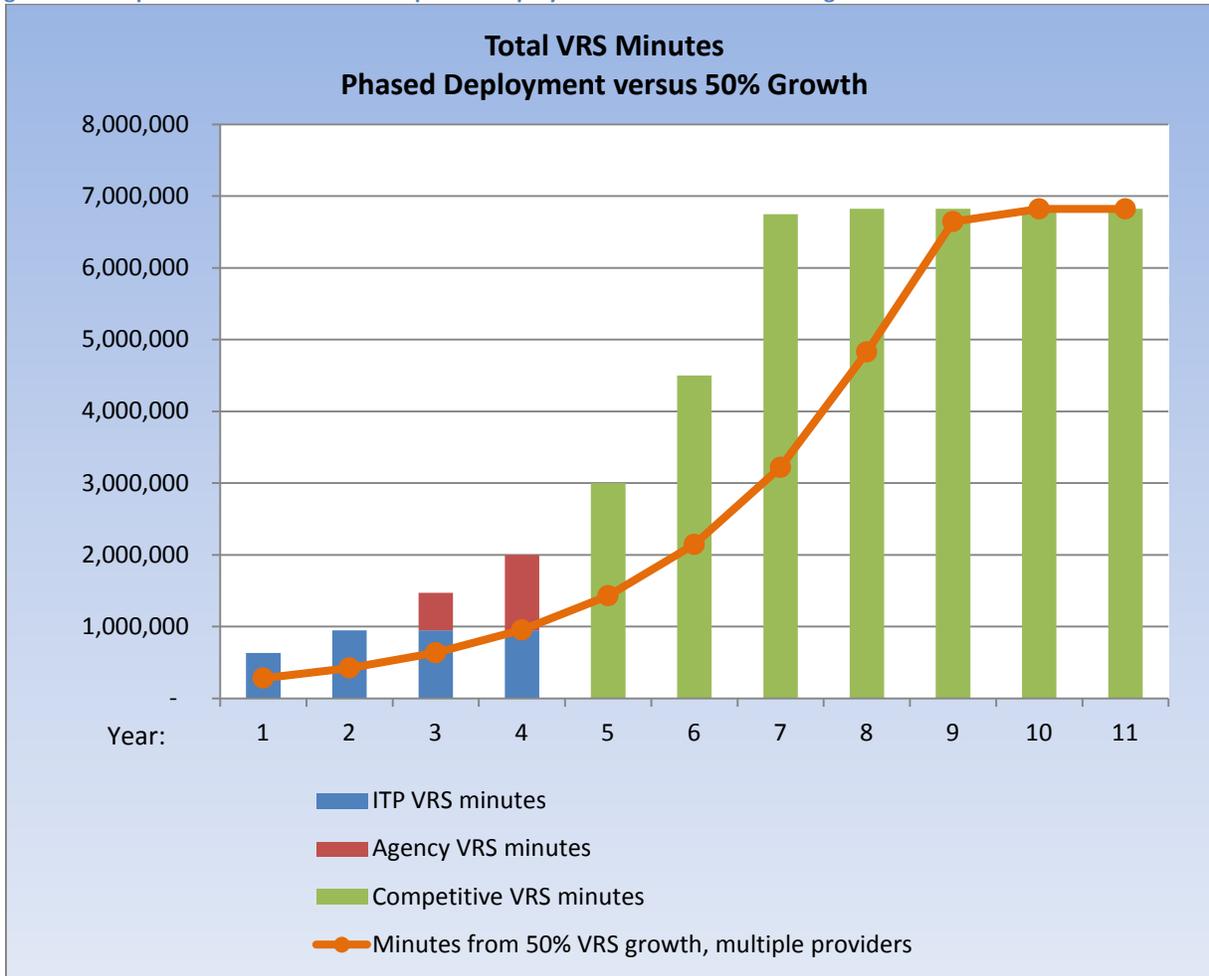
minutes of conversation relayed, or based on video interpreter hours contracted. If fixed rates are used, the rate setting methodology may result in higher or lower rates.

- Different actual provider rates (e.g., tiers) may be established for different regions of the country, for different languages (ASL vs. LSQ), for different times of the day (e.g., higher rates for weekend and nights), for different volumes of minutes (as in this cost forecast), and for different years (initial rates may be different than rates for later years)
- Public education and outreach costs may or may not be included, and may be funded as VRS program costs or may be funded by national or regional social programs outside of the VRS program budget.
- Implementation costs may be fixed at a relatively high amount during a slow growth initial period that includes additional research, and then competitively bid at potentially lower rates for subsequent years.

The many prime options of VRS models and recommendations are addressed in this study's phase 11, *Potential Canadian VRS Models*. Not all choices affect total VRS program costs, but those that will have significant cost impact will be reviewed as appropriate in this study's phase 12, *Final Report*. For example, phases 11 and 12 recommend a two-phased VRS deployment in which interpreter training programs and interpreter agencies are initially awarded grants for VRS research and service. This approach facilitates greater use of existing interpreters as well as increases the capacity of the interpreter training programs to graduate more interpreters. The result is that more interpreters are initially available for VRS in this phased deployment model than in the 50% annual growth model. More VRS minutes are therefore initially relayed, as depicted in the following graph:⁸⁹

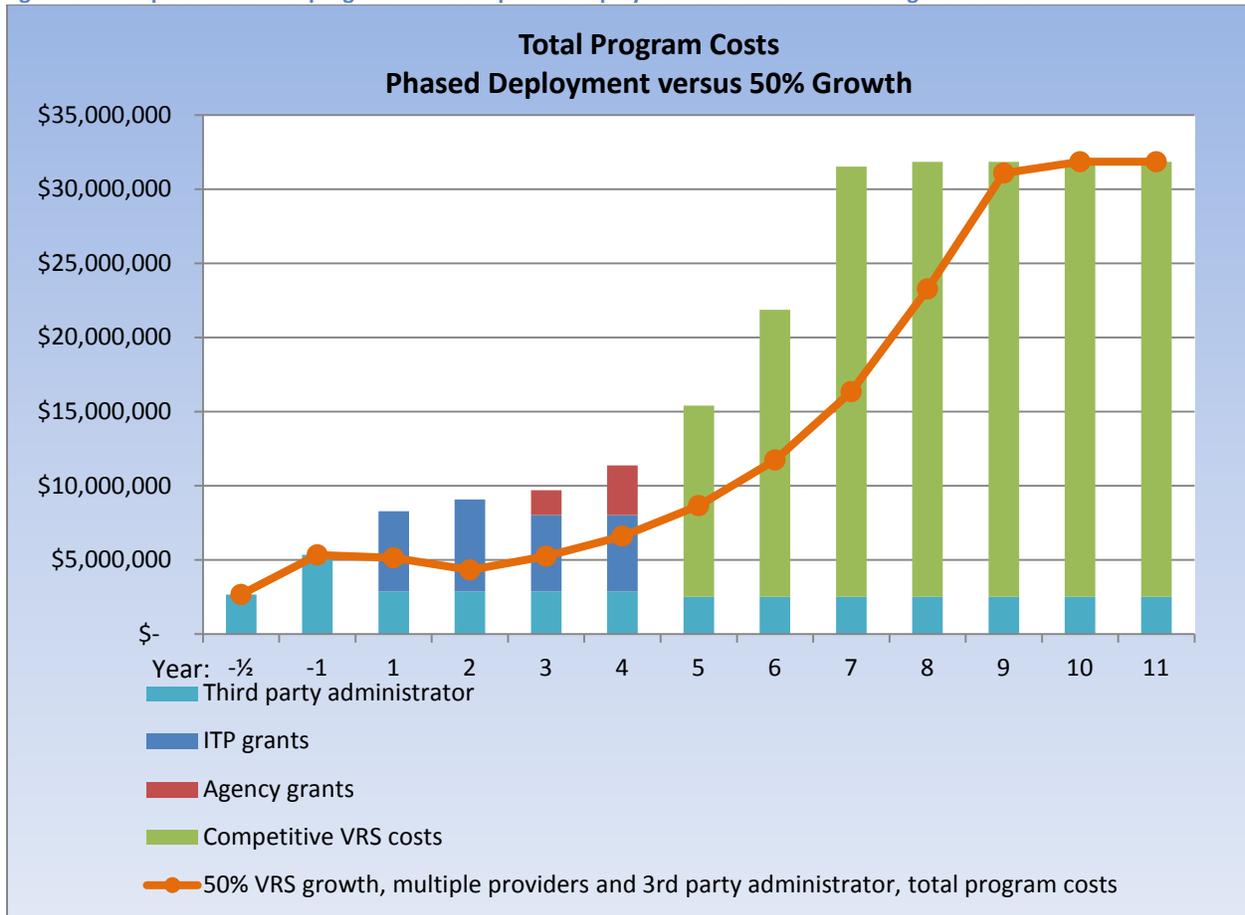
⁸⁹ For additional information about the phased deployed model see this study's phase 9 section 5.3, phase 11 sections 4.2.1, 4.3, 16.2.3 and 16.3, and phase 12 section 7.

Figure 22: Comparison of VRS minutes of a phased deployment versus a 50% annual growth model



The initial increase in minutes of relay from a phased deployment naturally results in initially higher costs associated with paying for more service. The following chart contrasts the total program costs of the phased deployment against the costs of the 50% annual growth model. Note that the costs include a year-and-a-half of third party administrator costs (including VRS platform and database) prior to the start of VRS service to the public.

Figure 23: Comparison of total program costs of a phased deployment versus a 50% annual growth model



6. Summary of Assumptions, Impacts and Outcomes

The assumptions and variables related to VRS service, the size of the Canadian VRS user community, their individual needs, and the costs to provide this service, are referenced throughout earlier phases of this VRS feasibility study. Additionally the most significant assumptions and variables pertaining to costs have been presented in prior sections of this phase 10, *Cost Variables and Forecasts*.

Table 52 beginning on the next page summarizes a number of variables that may affect the cost of VRS, their potential level of impact on costs, the likelihood of occurrence, and the potential cost affect or outcome. Because these variables have been discussed elsewhere in this VRS Feasibility Study, they are listed here in an abbreviated format.

Cost variables that have the following combinations of potential impact and likelihood are color coded for risk value as follows:

Table 51: Color codes for risk values

RISK VALUE	Potential Impact on Costs	Likelihood of Occurrence
LOW	Low	Low
LOW	Low	Medium
LOW	Low	High
LOW	Medium	Low
MEDIUM	Medium	Medium
MEDIUM	Medium	High
MEDIUM	High	Low
HIGH	High	Medium
HIGH	High	High

The final costs for VRS will be determined by how all of the variables actually combine.

Table 52: Table of VRS cost variables

Principal VRS Cost Variables	Potential Impact on Costs	Likelihood of Occurrence	Potential Effect on VRS Costs (Outcome)
Legal (study phase 2)			
The CRTC may not mandate or otherwise approve a requirement for VRS interoperability.	Medium	Low	While initial usage may be reduced, costs may be increased if a provider uses proprietary services or equipment to control market share and costs.
Relayed access to 9-1-1 through VRS may be mandated 24/7	High	Low	The requirement to staff and operate a 24/7 call center will increase provider costs in a VRS that is otherwise restricted by time of day.
Consumers (study phase 3)			
The ASL and LSQ populations may be different than estimated.	High	Medium	May increase or decrease overall cost
The ratio of ASL to LSQ populations may be different than estimated.	Medium	Low	May increase or decrease cost to serve one group
The adoption rate of (actual demand for) VRS by the ASL or LSQ populations may differ (one group may adopt at a higher rate than the other).	Low	Low	May increase or decrease cost to serve one group compared to the other
Canadian consumers may be more knowledgeable about VRS and ready for the service than initial U.S. consumers were.	High	Medium	Adoption <i>rate</i> and related costs may be higher than forecast if other constraints do not prevail
Canadian consumers may have a more pent up demand for VRS than initial U.S. consumers were.	High	High	Adoption <i>rate</i> and related costs may be higher than forecast if other constraints do not prevail

Principal VRS Cost Variables	Potential Impact on Costs	Likelihood of Occurrence	Potential Effect on VRS Costs (Outcome)
Technical (study phase 5)			
Technical assistance to VRS consumers may be insufficient or not in an accessible format.	Medium	Medium	May reduce the adoption <i>rate</i> and related costs but only minimally impact the eventual total adoption
Interpreters (study phase 6)			
The overall number of available and qualified interpreters may be less than estimated.	High	Medium	Will decrease the ability of VRS to meet the demand for service; hence usage and cost will be reduced
The number of available and qualified ASL or LSQ interpreters willing to work in VRS may be different than estimated.	Medium	Medium	The availability of VRS will be disproportionate for the ASL and LSQ communities. Usage and related costs will be related to VI availability
Availability of ASL interpreters may be greater than LSQ interpreters, in the beginning and over time.	Medium	Medium	Usage and costs of LSQ VRS will lag behind ASL VRS
The number of interpreters will not support the VRS adoption or demand forecasts	High	High	VRS traffic and related costs will be restricted to the availability of Vis. VRS usage and costs will be less than forecast.
Interpreter training programs (colleges) may not be able to develop interpreters fast enough to meet the consumer demand for VRS.	High	High	Availability will need to be artificially restricted or there will be excessively long wait times. Restricted service will reduce cost estimates.
There is negative public reaction to too many interpreters being removed from community interpreting for employment with VRS.	High	High	CRTC may decide to restrict VRS usage in order to balance interpreter availability between VRS and the community. Restricted service will reduce cost estimates.

Principal VRS Cost Variables	Potential Impact on Costs	Likelihood of Occurrence	Potential Effect on VRS Costs (Outcome)
Quality of Service (study phase 7)			
Consumer education (particularly to hearing users) may be insufficient.	Low	High	Usage and related costs may be somewhat lessened if consumers' VRS calls are frequently hung up on by the hearing party
VRS fraud and misuse may be a significant occurrence	Low ⁹⁰	Low	High levels of fraud and misuse will take away interpreter and funding resources that should be available for legitimate VRS calls
VRS interpreter work schedules (length of shift, amount of call time, etc) may be different than estimated. (The number of minutes per hour VIs are expected to relay varies by provider.)	Medium	Medium	The amount of VRS traffic (minutes of use) that can be relayed and their related costs will increase or decrease depending upon work schedules
Quality of Service feedback mechanisms may be insufficient or there may be a lack of administrative and consumer oversight of QoS.	Low	Medium	If ongoing QoS is not addressed, the consumers' experience and usage and related costs will be diminished.
Potential Related Services (study phase 8)			
Video Remote Interpreting (VRI) may be made a part of VRS services. (This is unlikely because VRI is not considered a telecommunications relay service and therefore is outside the jurisdiction of the CRTC.)	High	Low	VRI demand is unknown, but potentially could be quite high; thereby significantly increasing VRS usage and related costs
The VRS platform could be made available to VRS providers for VRI use, but paid for by the VRS providers and VRI consumers	Low	High	No effect: costs borne by the VRS program would not be affected by VRI
Other potential services, such as video mail, other modes of visual communications (e.g., speech-reading), availability of specialized interpreters, French-ASL and English-LSQ translations, and interfacing with 9-1-1, may not be included within VRS.	Low	Medium ⁹¹	The unavailability of these services will generally not lessen the demand and related costs for VRS
Forecasts of VRS User Demand (study phase 9)			
Canadian VRS users may average more or less than the 444.5 VRS minutes per user per year used in the Canadian forecasts.	Medium	Low	Costs will increase or decrease relative to changes in demand

⁹⁰ The impact and likelihood of fraud and misuse in Canadian VRS is dependent upon the controls put in place by the CRTC and the contracting authority. If few controls are implemented, then the potential impact and the probability of fraud and misuse will both be "High".

⁹¹ Some of these other services are likely to be included, while others are not. This "Medium" rating represents a blend of probabilities. See this study's phase 8 for more information.

Principal VRS Cost Variables	Potential Impact on Costs	Likelihood of Occurrence	Potential Effect on VRS Costs (Outcome)
The number of actual Canadian VRS users may be different than forecast.	Low	Low	Since potential differences are not expected to be significant, impact on costs should be minimal
Cost Variables and Forecasts (study phase 10)			
Actual market rates for VRS provider reimbursement may be higher or lower than the rates used for cost forecasting purposes.	Medium	Medium	Contracted rates and resulting program costs would be lower or higher than forecasted
The CRTC may not authorize enough funds to pay for a full-service 24/7 VRS. If enough funds are not available, either VRS will not be approved, its availability and related costs will need to be constrained, or it will need to be paid for in part by consumers	Medium	Low	Reduced availability of funds will likely result in reduced VRS hours rather than non-approval of VRS or the requirement that consumers pay its costs
U.S. provider rates have Outreach and Marketing cost elements that may not apply to Canada.	Low	High	The need for outreach and marketing to users and the general public will remain and would still be an additional cost of the Canadian program.
The cost of VRS interpreters in Canada may be higher than estimated, in part because of the more limited number of qualified interpreters.	Medium	Low	If VRS demand creates an escalating cost for interpreters, overall costs may increase, both for the program and for community interpreting
Usage costs may be partially paid for by the consumers instead of by VRS program funding	Medium	Low	May significantly reduce the demand for VRS and therefore the cost to the program, depending on how much of the cost is borne by consumers
End user VRS equipment may cost the consumer, instead of subsidized or paid for by others	Low	High	May slightly reduce the adoption rate and related costs but only minimally impact the eventual total adoption
End user broadband service may cost the consumer, instead of subsidized or paid for by others	Low	High	May slightly reduce the adoption rate and related costs but only minimally impact the eventual total adoption
VRS Models (study phase 11)			
The adopted Canadian model may initially be less than a full 24/7 service.	Medium	High	Providers may slightly reduce their proposed per minute cost, as they would not need to staff for low volume (less profitable) traffic periods. If they already provide interpreters during these low volume times, no reduction in cost may be realized.

Principal VRS Cost Variables	Potential Impact on Costs	Likelihood of Occurrence	Potential Effect on VRS Costs (Outcome)
Canadian ASL VRS may be provided by companies located in the U.S.	High	Medium	If other constraints do not prevail, the availability of ASL VRS to Canadian consumers and their adoption rate and related cost could be very high
Consumers may be required to register before they can use VRS. (Registration may be used as a means to regulate usage – restrict who is approved to use VRS, limit minutes of use per consumer, and/or share costs by consumers). ⁹²	Low	Medium	May restrict usage and related costs to the degree that registration is used as a tool to limit consumer access to VRS or modify consumer behaviour
The CRTC may not approve an open market for providers (multiple providers competing for customers)	Low	Low	Adoption rates and related costs may be less than those experienced in the U.S.
VRS providers may be precluded from offering point-to-point video calling for free (since point-to-point is not relay). ⁹³	High	Low	Consumer demand for VRS may be lessened, significantly reducing the adoption rate
The CRTC may elect to begin offering VRS through a well planned multi-year initial implementation research phase. ⁹⁴	High	Medium	May decrease or regulate usage during the research phase, but may facilitate the ability to accommodate higher demand after the initial phase

7. Conclusion

Many of the variables that will influence the final cost to implement VRS in Canada remain undecided or uncertain at this time. These include dependence on other factors such as the availability of interpreters and the cost of labor when the service is deployed. A few variables may be used to potentially control or limit total costs. Cost limits are generally accomplished by limiting consumer use of the service or by financially limiting the providers’ ability to offer the service. Limits on consumer use experienced in other countries (but not the U.S.) are restricting user access via time of day, by minutes of use, and/or by requiring consumers to pay for all or part of the service. Financially limiting providers’ ability to offer the service without effective controls on consumer demand can lead to significant quality of service issues.

⁹² May also be used as one means to respond to potential fraud or misuse.

⁹³ Point-to-point video calling without the use of an interpreter is estimated to represent about 80 percent of the call traffic carried by the VRS provider’s systems, but without significant cost to the provider or the VRS program.

⁹⁴ All countries except the U.S. have entered into VRS via a trial period. While the CRTC has authorized a VRS trial currently conducted by Telus/Sorenson, a new research phase could address issues pertinent to how VRS may best be implemented on a full scale, rather than to answer the question whether or not VRS is technically feasible.

While U.S. VRS data can be informative for forecasting Canadian VRS usage and costs, there are significant discrepancies within the U.S. data that make its application to Canada problematic. Additionally the Canadian environment (numbers of available interpreters, etc) is significantly different from the U.S. to warrant significant modification of any application of U.S. data to Canada. In fact, suggested Canadian VRS provider reimbursement rates are best derived from new analysis of Canadian cost factors.

In the past estimates have been offered to the CRTC that VRS in Canada may cost between \$50 to 100 million CAD. Using the forecasting methods in this analysis, the cost of a full 24/7 deployment of VRS is significantly less as shown in the table below. Also estimated are the costs of a 12-hour 5-day schedule for VRS.

Table 53: Annual VRS provider and administrative forecast costs, at full subscription

Forecast ongoing VRS annual program costs	24 x 7 VRS	Restricted Hours VRS
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

These are forecast costs. Actual costs are expected to represent market conditions, and may be higher or lower than the cost forecasts.

During an anticipated multi-year implementation, the maximum forecasted may not be reached until the tenth or eleventh year, depending upon the consumers’ rate of VRS adoption and/or depending upon possible usage restraints to mitigate costs. These costs do not include potential consumers’ costs or the potential costs of education and outreach.

Phase 11:

Potential Canadian VRS Models

VRS Feasibility Study

Mission Consulting

February 24, 2012

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POTENTIAL CANADIAN VRS MODELS

EXECUTIVE SUMMARY

1. Overview

This research summary represents the findings of the eleventh of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

This Phase 11 research summary, *Potential Canadian VRS Models*, provides a synopsis of potential considerations and options for different ways that VRS may be best offered and managed in Canada. This synopsis includes an analysis of:

- VRS goals
- Challenges and issues
- 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
- Summary of recommendations

2. Summary Findings

The recommended VRS model for Canada includes the following recommended elements:

Types of providers

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

Number of providers

- Begin in a research phase with multiple interpreter training programs only, then expand the research phase to include multiple interpreter agencies, and then after the research phase when regular VRS is deployed, allow multiple interpreter training programs, interpreter agencies, and experienced VRS providers to contribute to VRS in Canada.

Location of providers

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

VRS platform and interoperability

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

Provider reimbursement

- Adopt a payment methodology that initially uses a fixed amount for a specific time period, such as an initial research phase. For a full deployment phase, consider paying vendors for each hour of contracted VRS interpreter's time, or paying vendors based on relayed conversation minutes.

Consumer costs

- Consumers are responsible to obtain their own VRS equipment or software, and pay for their broadband access to VRS. There is no additional cost to consumers to use VRS, i.e., outbound calls are free.
- Non-relayed VRS calls are free to consumers.

Consumer technical support

- The providers of each part of the service are responsible to offer their own consumer technical support.

Education and outreach

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

Other related services

- Do not allow VRI except to extend the VRS platform licensing for VRI use by authorized VRS providers in a cost neutral way.
- 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.
- All of the specialized interpreter functions should be allowed.
- 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.

Program governance and management

- Manage the VRS program by a third party administrator.

Funding

- No special CRTC mandated funding or subsidies for consumer network services.
- No special CRTC mandated funding or subsidies for consumer video devices.
- Provide funds as a percent of the telecommunications operations revenues of all telecommunications service providers, wireless service providers, and Internet service providers (collectively referred to herein as “TSPs”) as mandated by the CRTC, for VRS provider services, VRS platform, VRS consumer technical support, and VRS program administration.
- As an initial stimulus to increase the capacity and capability of the college and university ITPs, provide a VRS grant program that requires both program expansion and offering of VRS as a service to consumers. After a predefined term, such as three to six years, when the ITPs are self sustaining and robust enough to meet the training needs for interpreters, discontinue the grant program.

Acquisition

- 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 fully deployed VRS services would best be competitively acquired through an adjusted fixed rate, multi-vendor RFP, or by a multi-vendor flexible rate RFP.

Implementation

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

3. Conclusion

VRS is highly feasible. The recommendations presented provide the optimum VRS model for Canada, given the variety of circumstances and issues affecting any potential video relay service. Not every recommended choice of VRS model element will be the choice of every stakeholder. With thoughtful planning it will be possible to establish an affordable and sustainable VRS that offers all Canadians a flexible and quality video relay service.

Potential Canadian VRS Models

RESEARCH SUMMARY

1. The VRS Feasibility Study

This research summary represents the findings of the eleventh of twelve phases of a study commissioned by Bell Canada (Bell). The feasibility study was commissioned by 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. The final feasibility report will draw, in part, on information contained in this research summary.

The twelve phases of the study are as follows:

- 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
- Phase 12 VRS Feasibility Study Report

This phase 11 research summary, *Potential Canadian VRS Models*, provides a synopsis of potential considerations for different ways that VRS may be best offered and managed in Canada. This synopsis will begin with a brief review of VRS goals and challenges, followed by an analysis of thirteen principal areas for consideration that are associated with any VRS solution. Each area is broken down into three areas of discussion: desired outcomes, primary options, and recommendation. The principal areas for consideration are:

- 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.¹

The analysis of these thirteen areas will be followed by a summary of the recommendations for VRS in Canada.

2. VRS Goals

This section will review five primary goals of a Canadian VRS, and will also list three secondary goals. In addition to these goals, many additional desired outcomes are discussed in this study's phases 1 through 10.

2.1. Primary Goals

A Canadian VRS should be:

- Acceptable quality
- Affordable
- Ubiquitous
- Manageable
- Legal

¹ See section 16, *Implementation*, for a recommended process for the development of a VRS program design and service requirements.

2.1.1. Acceptable quality

VRS Quality of Service (QoS) is made up of many components, which are discussed in phase 7 of this study, *Quality of Service*. 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 considerable interpreter skills, the 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.

2.1.2. Affordable

VRS must be affordable to the communication 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, as demonstrated in this study's phase 10, *VRS Cost Variables and Forecasts*, very expensive. 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. This phase 11 will assess how the models may affect cost, and will endeavor to achieve the goal of an affordable and sustainable VRS for Canada.

2.1.3. Ubiquitous

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. Just like a telephone call between two parties who both hear and speak, a VRS call should not be limited by boundaries. 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.

2.1.4. 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 and ISPs 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 that of the providers and other stakeholders (e.g., interpreter training programs, etc.) And finally it must be easy for the consumers to manage their accounts and to use the service.

2.1.5. Legal

Lastly, 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.

2.2. Secondary Goals

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.

2.2.1. 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.² 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 fulfillment 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.

2.2.2. 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

² 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 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.³ 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.

2.2.3. 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.⁴ Learning from the U.S. can possibly result in a VRS that is more cost efficient and affordable.

3. Challenges and Issues

Numerous challenges and issues have been discussed in this study's prior ten phases of research. Only those that stand out as the most significant are presented below for review while assessing the potential models of Canadian VRS:

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

3.1. Not enough interpreters for VRS

As demonstrated in this study's 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

³ In the U.S. this VRS provider staff role is referred to as a "certified Deaf interpreter".

⁴ *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.⁵ Projections detailed in this study's phase 9, *Forecasts of VRS User Demand*, indicate that a fully subscribed VRS will require about twice as many ASL and LSQ interpreters than presently exist.

In Canada there are five ASL-English training programs and one LSQ-French training program. As identified in this study's 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 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.

3.2. 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 Quebec. Therefore in Quebec 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 Quebec not only is there an interpreter shortage, but many LSQ interpreters that work in the field do not adhere to any 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.

3.3. 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

⁵ The term "community interpreting" is used herein for all in-person interpreting assignments, including personal, social, legal, medical, religious, educational, workplace, and all others.

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? If this is not possible, can a VRS model achieve a balanced approach or some other controlled outcome? These challenges should be addressed in any proposed VRS model for Canada.

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

VRS policies in the United States are established by the Federal Communications Commission (FCC) via regulations. These regulations presently allow multiple VRS vendors to be reimbursed at relatively high per minute rates for allowable VRS traffic.⁶ 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 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.⁷ 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. 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.

4. Type 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, 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.

⁶ See this study's phase 10, *VRS Cost Variables and Forecasts*, for details.

⁷ See this study's phase 9, *Forecasts of VRS User Demand*, for details.

The consideration for Canada is: What type of organizations should be qualified to provide VRS?

4.1. Desired Outcomes

The desired outcome when considering what type(s) of provider(s) should be allowed to offer VRS in Canada and be paid from a CRTC mandated VRS fund, should include:

- Subject to oversight – that is, the type(s) of provider(s) will be responsive to CRTC regulatory oversight, either directly or indirectly
- From the perspective of third party administration by the CRTC or others, the type(s) of provider(s) will be easy to manage
- From the perspective of the VRS consumers, the type(s) of provider(s) will offer quality VRS
- From the perspective of the VRS consumers, the type(s) of provider(s) will not create disorder or confusion of who is providing what
- That the type(s) of provider(s) will contribute to meeting the challenges and issues associated with the potential for VRS in Canada

4.2. Options

The primary options offered for consideration are:

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

4.2.1. Companies with VRS experience

This option assumes that the best type of VRS provider will be an organization that is already providing VRS elsewhere, e.g., in the United States or other country. This assumption is primary based on the view that VRS is so complex a service that only experienced firms will know how to do a good job.

Advantages of this option

1. Companies with VRS experience will know how to establish effective VRS with few challenges, while organizations without VRS experience may face many first unknowns and initial challenges.

2. Companies with VRS experience do exist in the United States and have expressed an interest in providing services in Canada.⁸

Disadvantages of this option

1. This option does not address the problem of an insufficient number of interpreters in Canada, and may result in a depletion of interpreter resources for community interpreting.
2. Some U.S. companies may hire interpreters with competence that might be below the standards that may be desired by consumers or other stakeholders.⁹
3. Provider costs will likely be based on the U.S. per minute rates, and as such may cost the program more than necessary, and may make VRS vulnerable to fraudulent practices.
4. No existing VRS company has experience in LSQ interpreting.

4.2.2. Organizations with contact center experience

VRS operations are run in small contact centers, often networked together to form a larger virtual contact center. There are many professional firms with proven expertise in efficient contact center staffing, training and operations experience. Today's contact centers typically offer voice, email, chat, and sometimes video. They also work with internal and external databases and networks, providing client organizations with complex call center and data center functions. Theoretically these firms may be suited to provide VRS with the addition of some staff expertise in ASL and LSQ interpreting and relay.

Advantages of this option

1. Professional contact center firms exist throughout Canada, and some should have the expertise and resources to competitively set up multiple networked VRS call centers throughout Canada.
2. Contact center firms can leverage their existing technical and organizational knowledge and resources, as well as their facilities and systems.

Disadvantages of this option

1. No Canadian contact center companies have experience with relay, or with ASL, LSQ, or interpreting.
2. Existing contact center companies will have no knowledge or appreciation for the Deaf consumers, their culture, or their communication needs. Many complexities and nuances will not be understood and the service may suffer as a result.

4.2.3. Organizations with ASL or LSQ interpreter experience

The heart of VRS is the interpreters. It is their skill and experience that is the primary resource that VRS consumers depend upon for satisfactory service. Therefore an argument can be made that VRS should

⁸ Both Sorenson Communications and Purple have presented their interests to the CRTC. Sorenson is presently providing a CRTC sponsored ASL VRS trial with Telus in British Columbia and Alberta.

⁹ This was initially the case with the Sorenson/Telus trial.

be limited to organizations that have professional experience with ASL or LSQ interpreting. These organizations include established VRS providers, interpreting agencies (companies that fulfill community interpreting assignment requests), and college and university interpreter training programs (ITPs).

Advantages of this option

1. These organizations understand and appreciate the Deaf consumers, their culture, and their communication needs.
2. These are the only organizations that already have the ASL and LSQ interpreting skills and experience necessary to be able to provide effective VRS.
3. By balancing the resource demands for community interpreting with VRS, interpreter agencies could partially mitigate the negative effect that VRS may have in removing interpreters from community interpreting.¹⁰
4. Interpreter agencies are the only organizations presently capable of providing VRS to people who use alternative or dialect sign languages, such as Inuit Sign Language in the north or Maritime Sign Language in the Maritime Provinces.
5. The use of college and university interpreter training programs for VRS would help solve the problem of insufficient numbers of qualified interpreters by expanding their program resources and curricula, by attracting more students, by establishing standards for VRS interpreting, and by providing mentoring and employment for qualified students or graduates.
6. College and university ITPs could also use the resources of their information technology departments or support staff to provide IT support to their VRS operations.
7. Many Canadian college and university ITPs already employ Deaf interpreters, Deaf teachers and Deaf mentors. This could be expanded with the addition of VRS. Deaf employment could also be provided within the IT staff and IT help desk staff, especially if technical support is provided to VRS consumers.
8. Interpreter agencies and ITPs already have established relationships with the Deaf community and advocacy organizations, especially at the local level. These relationships could facilitate local education and outreach.

Disadvantages of this option

1. Interpreter agencies and ITPs typically do not have experience operating call centers or contact centers, or operating VRS.

4.2.4. A new national non-profit organization

This option would create a single new non-profit organization (or two organizations, one for ASL-English and one for LSQ-French) specifically to operate VRS nationwide.

¹⁰ This is the model successfully used in Sweden and France. For example, in France the interpreting agencies that provide VRS are prohibited from having any interpreter work more than 30% of their time in VRS.

Advantages of this option

1. The organization would be focused exclusively on VRS without any distractions.
2. The not-for-profit nature of the organization may assist in deterring the types of VRS provider fraud experienced in the United States.

Disadvantages of this option

1. While individual staff members may have various experience with contact centers, technologies, VRS, or ASL or LSQ interpreting, the organization as a whole would be new and thus have no corporate experience.
2. The organization would have no proven ability to accomplish any goals, no proven ability for staff to work together, and no established administrative, program or technical operations.
3. Conflicts may arise over who is to be involved in the new entity, which may delay implementation.
4. This places all expectations for success on a new organization, which represents a high risk situation.

4.3. Recommendation

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

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

Qualified interpreters are the most crucial part 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.

5. 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. Only the United States has a VRS model in which any firm that meets certain FCC minimum standards can be authorized for VRS reimbursement by the FCC. The result is that the U.S. has over twenty VRS provider companies that qualify for reimbursement.¹¹ The question is: What is the optimum number of VRS providers for Canadian VRS?

¹¹ See this study's phase 4, *VRS Models in Other Countries*, for information about VRS models in other countries.

5.1. Desired Outcomes

The number of VRS providers serving Canada should be the optimum that:

- Provides the best video relay interpreting services to the consumers
- Is easiest to manage
- Is the least costly to acquire
- Does the least harm to community interpreting

5.2. Options

The primary options for consideration are:

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.

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.

5.2.1. One national provider (ASL & LSQ)

The first option for consideration is one VRS provider for the country, serving all consumers. This provider would staff both ASL and LSQ interpreters. In order to attract qualified interpreters, VRS call centers would be located in multiple cities where interpreters live.

Advantages of this option

1. It will be easier to administratively manage one provider than multiple providers, especially if quality of service and other requirements are clearly defined and the provider is cooperative.
2. A provider can be selected based on best value offered (quality, cost, promises, etc) from all bidding vendors, optimizing the chances that the provider selected will provide the best service for the best price to all consumers.

3. All consumers have the same VRS user interface, with ASL, English, LSQ, and French options. No confusion about multiple providers, such as can occur with multiple providers: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etc.
4. This option offers the most efficient use of interpreter resources for overnight coverage. (In a multiple non-networked provider environment, interpreters sitting idle waiting for a call reduce interpreter availability overall.)

Disadvantages of this option

1. If the provider is not performing satisfactorily, there is limited punitive leverage that can be applied (payments can be reduced but traffic cannot be given to another provider, and the contract cannot be terminated).
2. Since 77% of the traffic is estimated to be ASL in a fully subscribed service, and since it may take longer to achieve LSQ services due to the lack of qualified LSQ interpreters, the finances of VRS will strongly favor ASL services. The provider will likely be an English/ASL company that will place its resources and attention on ASL and English, while putting relatively little effort on LSQ and French. The LSQ community may receive poor services, or may receive only a minimal effort from the provider to make the extra effort that will be required to develop a LSQ VRS.
3. No competition between providers for consumers, i.e., no competitive outreach by the provider to the Deaf who make most of the VRS calls. The provider may however still be incented to provide outreach to the Deaf in order to obtain more users and more reimbursable VRS traffic.
4. Consumers will not have a choice of providers.

5.2.2. Two national providers (both ASL & LSQ)

This option results in two VRS providers, each serving all languages.

Advantages of this option

1. If one of the providers is not performing satisfactorily, there is more leverage that can be applied (payments can be reduced, traffic can be given to the other vendor, and the contract can even be terminated).
2. There will be competition between vendors for consumers, i.e., competitive outreach by the providers to the Deaf who make most of the VRS calls.
3. This option similarly offers efficient use of interpreter resources for overnight coverage. (In a multiple non-networked provider environment, interpreters sitting idle waiting for a call reduce interpreter availability overall.)
4. Consumers will have a choice of providers.

Disadvantages of this option

1. Selection of the two providers can be more complex, since there will be differences between the two selected (one will be judged to have the better proposed service than the other). For example: How is traffic allocated between the two providers (consumer choice or award formula)? Are the two providers reimbursed at different bid rates? Etcetera.

2. Since 77% of the traffic is estimated to be ASL in a fully subscribed service, and since it may take longer to achieve LSQ services due to the lack of qualified LSQ interpreters, the finances of VRS will strongly favor ASL services. The providers may likely both be English/ASL companies that will place their resources and attention on ASL and English, while putting relatively little effort on LSQ and French. The LSQ community may receive poor services, or may receive only a minimal effort from the providers to make the extra effort that will be required to develop LSQ VRS.
3. Consumers will see different VRS user interfaces from each provider. There may be confusion about multiple providers: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etc.
4. It will be more work to administratively manage two contractors instead of only one.

5.2.3. Two national providers (ASL only & LSQ only)

In this option there are two providers, one for ASL-English only, and one for LSQ-French only.

Advantages of this option

1. A single ASL provider and a single LSQ provider can each be selected based on best value offered (quality, cost, promises, etc) from all bidding vendors of each type of service, optimizing the chances that the providers selected will provide the best service for the best price to each language group.
2. All consumers of each language will have the same VRS user interface, either ASL-English or LSQ-French. Consumers will have no confusion about multiple providers, (such as may occur with multiple providers serving the same consumer: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etcetera.)
3. Each provider will focus on either ASL only or LSQ only depending on which service they are awarded. Each language will receive the undivided maximum attention and resources of its assigned VRS provider.
4. This option similarly offers efficient use of interpreter resources for overnight coverage. (In a multiple non-networked provider environment, interpreters sitting idle waiting for a call reduce interpreter availability overall.)

Disadvantages of this option

1. If a provider is not performing satisfactorily, there is limited punitive leverage that can be applied (payments can be reduced but traffic cannot be given to another provider, and the contract cannot be terminated).
2. No competition between providers for the same consumers, i.e., no competitive outreach by the provider to the ASL or LSQ consumers. The providers may however still be incented to provide outreach to either the ASL or LSQ consumer groups in order to obtain more users and more reimbursable VRS traffic.
3. Consumers will not have a choice of providers.
4. It will be more work to administratively manage two contractors instead of only one.

5.2.4. Multiple experienced national providers (ASL or LSQ)

In this option, multiple experienced VRS vendors (companies with experience providing VRS) would be awarded contracts or are otherwise qualified and authorized to be reimbursed for services. The number of providers would be dependent upon the award or qualification criteria, or would be set at a specific maximum. Each VRS provider can elect to provide only ASL, or only LSQ, or both.

Advantages of this option

1. This option allows multiple, smaller, specialized providers (which make up most of the VRS providers in the U.S.) to contribute to Canada's VRS.
2. If a provider is not performing satisfactorily, there is more leverage that can be applied (payments can be reduced, traffic can be given to the other vendor, or the contract can even be terminated).
3. There will be competition between vendors for consumers, i.e., competitive outreach by the providers to the Deaf who make most of the VRS calls.
4. Consumers will have a choice of providers.

Disadvantages of this option

1. It may be administratively very difficult or time consuming to manage multiple vendors.
2. With multiple vendors there is a higher probability that at least one vendor will have significant challenges that will have to be administratively managed.
3. There may be significant consumer confusion about the different vendors. For example: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etcetera.
4. The deployment of interpreter resources for overnight coverage is inefficient. Interpreters sitting idle waiting for a call reduce interpreter availability overall.
5. There is a reasonable possibility that no provider will offer LSQ VRS.

5.2.5. Multiple interpreter agency and/or university providers (ASL or LSQ)

In this option, multiple interpreter agencies and/or universities with interpreter training programs (without VRS experience) would be awarded contracts or are otherwise qualified and authorized to receive reimbursement for services. The number of providers would be dependent upon the award or qualification criteria, or would be set at a specific maximum. Each VRS provider can elect to provide only ASL, or only LSQ, or both. This model has proved successful in Sweden, Finland and France using interpreter agencies.

Advantages of this option

1. If a provider is not performing satisfactorily, there is more leverage that can be applied (payments can be reduced, traffic can be given to the other vendor, or the contract can even be terminated).

2. There can be competition between vendors for consumers, i.e., competitive outreach by the providers to the Deaf who make most of the VRS calls.
3. There is a high probability that at least one provider will offer LSQ VRS.
4. Consumers will have a choice of providers.

Disadvantages of this option

1. It may be administratively very difficult or time consuming to manage multiple vendors.
2. With multiple vendors with little or no VRS experience there is a higher probability that a number of vendors may have challenges that will have to be administratively managed.
3. The deployment of interpreter resources for overnight coverage is inefficient. Interpreters sitting idle waiting for a call reduce interpreter availability overall.
4. There may be significant consumer confusion about the different vendors. For example: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etcetera.

5.2.6. A combination of VRS providers, interpreter agencies, and university ITPs

In this option, multiple interpreter agencies and interpreter training programs (both without VRS experience) and experienced VRS providers would be awarded contracts or are otherwise qualified and authorized to be reimbursed for services. The number of providers would be dependent upon the award or qualification criteria, or would be set at a specific maximum. Each VRS provider can elect to provide only ASL, or only LSQ, or both.

Advantages of this option

1. This option has the advantages of both the experienced VRS providers (see section 5.2.4 above) and the advantages of the interpreter agencies and ITPs (see section 5.2.5 above).

Disadvantages of this option

1. It may be administratively very difficult or time consuming to manage multiple vendors.
2. With multiple vendors with little or no VRS experience there is a higher probability that a number of vendors may have challenges that will have to be administratively managed.
3. The deployment of interpreter resources for overnight coverage is inefficient. Interpreters sitting idle waiting for a call reduce interpreter availability overall.
4. There may be significant consumer confusion about the different vendors. For example: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etcetera.

5.3. Recommendation

The recommendation for the number of VRS providers is:

- Begin with an initial research phase with multiple interpreter training programs only, then expand the research phase to include multiple interpreter agencies, and then after the research

phase when fully deployed VRS is implemented, allow multiple interpreter training programs, interpreter agencies, and experienced VRS providers to contribute to VRS in Canada.

This option makes maximum use of the entities with pre-established relationships with 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.

6. 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, there are presently not enough interpreters in Canada to supply both community interpreting and VRS. The question then is: Should VRS be serviced by call centers located in Canada and staffed by Canadian interpreters, or should they be outsourced to call centers located in the United States staffed by U.S. interpreters?

6.1. Desired Outcomes

The best outcome of this issue will:

- Provide the fastest ability to service the consumer's demand for VRS
- Build up a robust professional interpreter pool for the long term, serving both VRS and community interpreting
- Not be administratively burdensome to manage
- Not be financially burdensome
- Do the least harm to community interpreting

6.2. Options

The primary options for consideration are:

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

6.2.1. Source all VRS from within Canada

In this option all VRS call centers are located within Canada. The providers may be Canadian or U.S. companies (or companies from other countries).

Advantages of this option

1. This option provides a need and incentive to develop, over time, a large pool of professional ASL and LSQ interpreters that will serve both VRS and community interpreting needs.
2. Interpreters will be Canadian and therefore familiar with the culture and regional dialects unique to Canada.
3. A solution developed by Canadians for Canadians.
4. It will be easier to monitor and manage vendors located in Canada, rather than in another country.
5. Acquiring VRS from within Canada may be less expensive than outsourcing to the U.S. where costs are set by the FCC at a very high rate.

Disadvantages of this option

1. It will take time to develop the Canadian VRS interpreter labour pool, and consumer demand for VRS may be delayed or restricted by the unavailability of local interpreters.
2. Interpreters would be expected to work part time for VRS, creating a potential shortage of community interpreting during the period when there are not enough interpreters to satisfy the needs of both VRS and community interpreting.
3. The Canadian government affirms that VRS is a service that under the North American Free Trade Agreement (NAFTA) must be allowed to be provided across the border (as applied to this option, from the U.S.) This will necessitate provider selection criteria that favor Canadian locales without contravening NAFTA.

6.2.2. Outsource to the U.S.

In this option ASL is outsourced to the United States where there are plenty of ASL interpreters. LSQ however must remain in Canada because LSQ interpreters only exist in Canada.

Advantages of this option

1. Canadian ASL consumers will have plenty of professional VRS interpreters to relay their calls. Deployment of ASL VRS need not be delayed due to lack of interpreters.
2. There may be minimal VRS competition for Canadian ASL interpreters, and therefore less impact to ASL community interpreting within Canada.

Disadvantages of this option

1. It will be difficult to monitor and administratively manage vendors located in another country.
2. This option will create a disparity of service availability between Canadian VRS ASL and LSQ consumers, which may be politically unacceptable.
3. This option creates no incentive to develop a robust ASL interpreter labour pool to serve VRS and community interpreting. ASL community interpreting shortages will prevail over the long term, and Canadian ASL VRS will always be required to be provided from the United States.

4. Outsourcing ASL to U.S. providers with their call centers located in the U.S. will likely result in pricing equivalent to what U.S. providers are receiving from the FCC, which may be more expensive than what may be available via a competitive bid for services located in Canada.
5. U.S. interpreters would 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).

6.2.3. Combination

In this option, LSQ VRS is served from within Canada, while ASL VRS is served from both the U.S. and Canada. Potentially ASL VRS might be initially provided more from the U.S. than Canada, with Canadian based ASL VRS increasing over time. At this point it is unclear how ASL VRS would be acquired in a manner that would ensure its provisioning from both countries.

Advantages of this option

1. Canadian ASL consumers will initially have sufficient VRS interpreters to relay their calls. Full deployment of ASL VRS need not be delayed or deployed gradually due to lack of interpreters.
2. The impact to ASL community interpreting would be not as great as a Canadian only solution.
3. ASL VRS interpreters in Canada would still be needed, thereby providing a long-term incentive to develop a larger ASL interpreter labour pool in Canada.

Disadvantages of this option

1. It will be difficult to monitor and administratively manage vendors located in another country.
2. This option will create a disparity of service availability between Canadian VRS ASL consumers and LSQ consumers, which may be politically unacceptable.
3. Outsourcing ASL to U.S. providers with their call centers located in the U.S. will likely result in pricing equivalent to what U.S. providers are receiving from the FCC, which may be more expensive than what may be available via a competitive bid for services located in Canada.
4. ASL consumers will see different VRS user interfaces from different providers. There may be confusion about multiple providers: Who is my provider? What are the differences? I thought I was signed up with one but I got the other. Etcetera.
5. It may be difficult to transition services from U.S. vendors' proprietary VRS platforms to Canadian provider platforms. Management of traffic between vendors may also be a challenge (is traffic allocated by award formula, by consumer choice, by first available interpreter or wait times, etc....?)
6. It may be difficult to create ASL VRS provider selection criteria or contract language that will ensure the migration of services from the U.S. to Canadian locales without contravening NAFTA.

6.3. Recommendation

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

This solution may initially involve some augmentation of ASL VRS from the United States, but this should be carefully defined, managed and its outsourced traffic or costs limited to ensure that VRS is provided in large part from within Canada by a set timeframe. This solution also endeavors to place ASL VRS and LSQ VRS on parity, with specific goals and timelines understood at the outset.

7. 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 scalability, flexibility and 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.
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 text, and relaying of emergency calls to 9-1-1 centers.

7.1. Desired Outcomes

As much as possible VRS should use platform(s) that:

- Allows consumers to use a variety of video devices (including wireless) to connect to the VRS provider
- Allows consumers to change VRS providers without having to change their video devices
- Allows consumers to visually communicate point-to-point (without a relay interpreter) with consumers who use a different type of device
- Facilitates the use of other related services such as emergency calls, text with video, network call distribution and distribution by skill level or other factors, etcetera.¹²
- Facilitates management reporting and auditing¹³

7.2. Options

The following options are considered for VRS platform and interoperability.

1. Allow all VRS providers to use any VRS platform they desire.

¹² See section 12 of this paper, *Other Related Services*.

¹³ See section 13 of this paper, *Program Governance and Management*.

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.

7.2.1. Allow all VRS providers to use whatever VRS platform they desire

This option allows each VRS provider to select whatever VRS platform they feel will best meet their business goals, regardless of the level of interoperability supported by the platform.

Advantages of this option

1. Different VRS platforms may offer different features or functions. A VRS model with multiple VRS platforms may allow different providers to distinguish themselves from each other by functionality as well as graphically.
2. This option will not require any experienced VRS vendors to change their platforms in order to offer their services in Canada.

Disadvantages of this option

1. If Canada has multiple VRS providers, or when a provider is replaced at the end of its contract, consumers may be required to change their VRS end user devices or software, depending upon the level of interoperability (or lack of) supported by the platform.
2. Depending upon the non-open or non-standard design of a provider's platform, it may significantly limit the consumers' choices of the types of video devices that may be operable with the providers VRS platform. For example, some platforms may support Apple iPhones or mobile devices using Android while other platforms might not.
3. Depending upon the capabilities or settings of the provider's platform, direct peer-to-peer video calling may be blocked between consumers who use different VRS providers, or between consumers who use end user equipment or software distributed by different VRS providers.¹⁴ This is not equivalent to the ability of hearing persons to call each other on any telephone network.
4. Different platforms may contribute to different user experiences among consumers, and confusion as to why some consumers can do some things (for example, have a speed dial list or have video mail, or have real-time text along with video, or have audio for VCO) while others cannot. Some consumers may think that VRS is not working or is broken for them, or they may wonder why some people get a function while they do not. To the extent that these differences are between groups, such as between ASL and LSQ users, there may be feelings of discrimination with political ramifications.
5. In a multiple VRS provider environment, distribution of incoming VRS calls will most likely be restricted to within each vendor's networked sites.

¹⁴ This was the case in the United States with Sorenson's platform and their "free" consumer devices for many years until the FCC ordered interoperability.

6. In a multiple VRS provider environment, the reporting and monitoring of different VRS provider's traffic quality measurements (average speed of answer, call abandoned rate, etc) will be problematic, as different platforms will provide different data in different formats.

7.2.2. Require all VRS platforms to meet an interoperability standard

Because new consumer equipment comes to the market monthly, it can be a challenge to establish an interoperability standard. Nevertheless, some basic standards and requirements can be identified. For example, a platform should be able to support both H.323 and SIP protocols. Platform providers can be selected for their general approaches to exclusivity and openness, and commitments for ongoing compatibility and openness can be requested. This option allows different vendors to use different VRS platforms (and potentially to distribute different end user devices and software), as long as those platforms, end user devices and software meet a set standard for interoperability and functionality.¹⁵

Advantages of this option

1. Different VRS platforms may offer different features or functions. A VRS model with multiple VRS platforms may allow different providers to distinguish themselves from each other by functionality as well as graphically.
2. This option will not require many experienced VRS vendors to change their platforms in order to offer their services in Canada.
3. Consumers will be promised interoperability, dependent upon the definition of the interoperability standard.

Disadvantages of this option

1. Different platforms may contribute to different user experiences among consumers, and confusion as to why some consumers can do some things (for example, have a speed dial list or have video mail, or have text along with video) while others cannot. Some consumers may think that VRS is not working or is broken for them, or they may wonder why some people get a function while they do not. To the extent that these differences are between groups, such as between ASL and LSQ users, there may be feelings of unfairness with political ramifications.
2. In a multiple VRS provider environment, distribution of incoming VRS calls will most likely be restricted to within each vendor's networked sites.
3. In a multiple VRS provider environment, the reporting and monitoring of different VRS provider's traffic quality measurements (average speed of answer, call abandoned rate, etc) will be problematic, as different platforms will provide different data in different formats.

¹⁵ For example, the "Total Conversation Standard" adopted by the International Telecommunications Union (ITU-T). See <http://www.itu.int/en/ITU-T/studygroups/com16/accessibility/Pages/conversation.aspx>.

7.2.3. Require all VRS providers to use the same interoperable platform

This option selects a VRS platform for its interoperability and other features, and requires all VRS providers to use it. This platform could include a user registration data base for peer-to-peer routing, emergency call routing to 9-1-1, and 10 digit numbering.

Advantages of this option

1. The same level of interoperability and features is offered to all consumers.
2. Updates to accommodate new consumer devices entering the market need only be done by one firm, simplifying testing (verification) and the consumers' experience.
3. There is no confusion or upset feelings resulting from different functionality offered by different VRS providers.
4. Consumer education and outreach, and technical support, can be mainstreamed with only one platform to explain and install.
5. As individual VRS providers come and go (are awarded contracts, are authorized to provide services, or cease services), the consumers will not necessarily experience changes to their VRS interface.¹⁶
6. There may be cost efficiencies and savings for one platform versus many.
7. Depending upon the overall network configuration, incoming VRS call distribution could be shared among providers to balance wait times or route to consumer chosen skills or providers.
8. In a multiple VRS provider environment, the reporting and monitoring of different VRS provider's traffic quality measurements (average speed of answer, call abandoned rate, etc) will be greatly simplified and directly comparable.

Disadvantages of this option

1. Experienced VRS vendors have developed their technical operations, interpreter training, consumer user interfaces and education, and other significant practices in association with their platform. Many VRS vendors will not be prepared to change platforms for Canada. This option may limit the potential participation or competition of experienced VRS vendors in the Canadian market.

7.3. Recommendation

For VRS platform interoperability and functionality, the recommendation is:

- Require all VRS providers to use the same interoperable, flexible and scalable platform during an initial research phase and monitor results to determine if one platform is suitable for a fully deployed VRS.

¹⁶ This depends on a decision regarding the extent that different VRS providers will be allowed to customize their user interface screens. This will be addressed in section 13, *Program Governance and Management*.

This recommended option greatly simplifies the management of the services, provides equal functionality to all consumers, offers the potential of networked call distribution across different VRS providers, can assure maximum interoperability, and can assure that advanced VRS features such as the ITU's Total Conversation, are available to all consumers.

With this recommendation, the selection of the platform and its ownership will be considerations for a VRS design, and potential acquisition.¹⁷

8. Provider Reimbursement

Different countries have established different ways that they pay their VRS vendors. Some provide a fixed total amount of annual funds, and the vendor provides the services it can afford with the money provided. Other options include reimbursement at a set amount 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. Most countries pay the provider for the minutes of VRS. Some include set up time, while others only pay for the time that the conversation is actually being relayed between the Deaf user and the hearing user. Some countries pay for each hour that a video interpreter is assigned to VRS.¹⁸

The question is: What should be the basis for Canadian VRS provider reimbursement?

8.1. Desired Outcomes

The optimum reimbursement outcome will:

- Be fair but not excessive
- Incent providers to offer quality services
- Be easy to administratively manage; and can be audited
- Will dissuade vendor abuse and fraud
- Will be competitively attractive to multiple VRS vendors who might want to provide VRS

8.2. Options

The primary options for VRS provider payment are:

1. Payment per relayed conversation minute.

¹⁷ See section 16, *Implementation*.

¹⁸ The implementation of the selected basis for reimbursement may be achieved via the acquisition methodology selected, which is discussed in section 15.

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.

8.2.1. Per conversation minute

In this option the VRS provider is paid for each minute of relayed conversation.¹⁹

Advantages of this option

1. This type of billing is a normal practice for call center operators and VRS vendors, and can be measured.
2. Only the actual relay function is being reimbursed. The VRS provider is financially incented to make their relay operations as efficient as possible since all non-relay functions must be paid for out of their conversation minute revenues.

Disadvantages of this option

1. The VRS provider may be financially disinclined to spend significant time on consumer activities that are not directly reimbursable, such as customer service calls and technical support.
2. VRS providers with poorly skilled interpreters will spend more time interpreting on a call than would be spent if the interpreters were more highly skilled. The result is that VRS providers may be financially incented to employ poorly skilled interpreters.
3. Without carefully defined requirements, accountability and monitoring, payment based on minutes can lead to provider abuse and fraud, whereby the VRS provider makes and bills for disallowed calls, pays consumers or others to make VRS calls, or pays consumers to make calls to toll-free numbers known to have unusually long hold times.²⁰

8.2.2. Per session minute

In this option the VRS provider is reimbursed for each minute that the interpreter is engaged on a call; even if the outbound call (such as to the hearing user) is not yet established, or fails (e.g., no answer).

¹⁹ A conversation minute can be the time that the Deaf and hearing users are both connected to the relay center and the interpreter is conversing with either one of them. Or it may be for the time that the Deaf and hearing users are both connected to the relay center and the interpreter is relaying actual conversation between them (for example, as opposed to explaining relay to the hearing user). The details of how a conversation minute is defined, including to what interval of seconds, are usually specified in a Request for Proposal and in the resulting contract, and therefore need not be resolved here.

²⁰ This has been a significant problem in the United States, where VRS providers are reimbursed on a per minute basis.

Session minute billing can optionally also be extended to non-relay calls, such as customer service or technical support.

Advantages of this option

1. The VRS provider is incented to spend as much time as necessary with consumers, regardless of the function (relay, customer service, technical support, etc.)

Disadvantages of this option

1. The VRS provider can abuse the reimbursement design (and annoy the calling party) by spending more interpreter time than is necessary on non-relay functions.
2. The VRS provider may encourage its interpreters to spend non-relay time with callers that are personally known by the interpreters, either before or after the relayed conversation.
3. VRS providers with poorly skilled interpreters will spend more time interpreting on a call than would be spent if the interpreters were more highly skilled. The result is that VRS providers may be financially incented to employ poorly skilled interpreters.
4. Without carefully defined requirements, accountability and monitoring, payment based on minutes can lead to provider abuse and fraud, whereby the VRS provider makes and bills for disallowed calls, pays consumers or others to make VRS calls, or pays for consumers to make calls to toll-free numbers known to have unusually long hold times.²¹

8.2.3. Per completed relay call

In this option the VRS provider is reimbursed a flat amount for each completed relayed call, regardless of the length of the call.

Advantages of this option

5. This type of billing can be easily measured.

Disadvantages of this option

1. Since VRS vendors will not know how long the average call may last, or what the effect might be of unusually long calls,²² this method of payment represents a higher risk to VRS bidders than either conversation minutes or session minutes. The result is that VRS vendors may bid rates that are higher than necessary rates in order to protect themselves against this risk.
2. Unless this payment method is extended to non-relay functions, the VRS provider is financially disinclined to spend significant time on consumer activities that are not directly reimbursable, such as customer service calls, and technical support.
3. VRS providers are incented to try to keep each call as short as possible.

²¹ This has been a significant problem in the United States, where VRS providers are reimbursed on a per minute basis.

²² For example, late night personal calls may occasionally be significantly longer than day time calls.

8.2.4. Per registered VRS consumer

This option assumes that consumer registration is required. The design of a potential registration system is beyond the scope of this feasibility study, but basic options could be a single national registration system or, with multiple VRS providers, each provider having their own registration system and reporting results for reimbursement.²³

Advantages of this option

4. This type of billing can be measured, especially if there is only one registration system.

Disadvantages of this option

1. Since VRS vendors will not know how long the average call may last, or what the effect might be of unusually long calls,²⁴ this method of payment represents a higher risk to VRS bidders than either conversation minutes or session minutes. The result is that VRS vendors may bid rates that are higher than necessary in order to protect themselves against this risk.
2. VRS providers will be financially incented to not make VRS calls, to keep VRS calls short, and to not spend time on customer service or technical support. The financial emphasis will be on signing up consumers and not on providing the service.
3. In any scenario, most VRS consumers will place very few VRS calls, while a minority will make most of the calls. For this option the VRS providers will be incented to sign up the low volume users and dissuaded from signing up the high volume users.
4. This option will be very susceptible to fraud, as hearing and non-signing people may be encouraged or even paid to register even though it may be against the rules. People who sign but who generally have little interest in using the service will also probably be inappropriately encouraged to register, driving up costs. Inappropriate or fraudulent registration will be very difficult to monitor.²⁵

8.2.5. Per video interpreter hour

In this option, a VRS program office contracts with provider(s) to staff for VRS calls, and pays for the staffing level regardless of how many calls are handled or how many minutes are relayed. This model is successfully used in France and other countries where interpreter agencies are also the VRS providers.

²³ A single registration database could include 10 digit numbering matched to local North American Numbering Plan design, could facilitate peer-to-peer video calling to VRS consumers of different providers, and could facilitate the relaying of emergency calls to a consumer's local 9-1-1 call center, could be used for account management or limitations placed on VRS usage, and could be used to deal with suspected fraud. The use of a single registration database is not dependent upon reimbursement of the VRS providers based on user registration.

²⁴ For example, late night personal calls may occasionally be significantly longer than day time calls.

²⁵ For example, a provider may donate money to Deaf advocacy and social organizations with the clearly implied understanding that the organizations will work to get all their members, relatives and friends who sign (including those who would not use VRS) to register with the provider.

Advantages of this option

1. Eliminates revenue versus cost risks to the VRS provider that would otherwise be dependent on the amount of incoming VRS calls and their length, which the provider has no control over.
2. This type of billing can be easily measured by log-on status on a common single VRS platform.
3. Interpreter efficiency can also be measured by minutes of conversation being relayed during each assigned hour.
4. Eliminates almost all potential vendor fraud by removing incentives for inappropriately increasing the number of minutes, number of call, or number of users.

Disadvantages of this option

1. Like all VRS payment options, would require establishment of minimum video interpreter qualifications. Potential fraud could occur if those qualifications are not met, or if calls are not answered.
2. Would cause the administrative contracting entity to be more active in forecasting VRS traffic and in collaboratively contracting for the appropriate VRS staffing levels.

8.2.6. Fixed annual or monthly amount

In this option, each VRS provider is provided a fixed amount to provide services for a fixed length of time, regardless of the number of minutes of use or number of calls.²⁶

Advantages of this option

1. For new services in which there are no accurate forecasts of the amount of calls, minutes of use, or number of consumers, or in which the amount of usage is expected to be initially very low, this type of reimbursement can significantly reduce the VRS provider's financial risk.
2. This type of funding can be more akin to a grant than a reimbursement of usage, and as such can be tied to other service requirements and matrices. Examples are funding for a fixed number of interpreters by time of day, or funding to support a certain number of users per month, as well as the provision of other non-relay functions (testing, customer surveys, customer service, technical support, interpreter training, outreach, reporting, etc.)
3. This option will provide consistently accurate cost forecasting, which is not based on changing minutes of use or other variable cost forecasting methods.
4. Eliminates almost all potential vendor fraud by removing incentives for inappropriately increasing the number of minutes, number of calls, or number of users.

²⁶ This is the reimbursement model for the VRS interpreter centers in France, which also uses interpreter agencies as the VRS providers. The administrative contracting entity essentially purchases a number of hours of video interpreters from each provider on a schedule agreed upon by the administrator and the provider.

Disadvantages of this option

1. May be significantly more expensive on a per minute or per user basis, compared to payment for minutes of relay.
2. May not be appropriate or cost effective for a service with many users and minutes of use.
3. May cause the administrative contracting entity to be more active in forecasting VRS traffic and in contracting for the appropriate VRS staffing levels.

8.3. Recommendation

- Adopt a payment methodology that uses a fixed amount for a specific time period, such as during an initial research phase (see section 16, *Implementation*). For a full deployment phase, consider paying vendors for each hour of contracted VRS interpreter's time (without separate funding for non-relay functions), or paying vendors based on relayed conversation minutes.

This payment methodology offers the most value for services performed. If desired, the VRS provider can also be reimbursed for non-relay functions to the degree required by contract. The decision to continue payment based on the number of contracted interpreter hours, or based on per relayed conversation minutes, can be made by the VRS administrative authority as part of its design and RFP for fully deployed services that follow an initial research phase (see section 16, *Implementation*). This decision can be supported by information gained from the research, including consumer usage rates, average answer times, differences in availability and costs of interpreters in different cities or regions, the effect of the then current U.S. VRS reimbursement rates on Canadian VRS operations, and etcetera.

9. Consumer Costs

As with any telecommunications service, consumers of VRS may be expected to pay for certain parts of their calling experience. However, which parts if at all, to what degree, and how subsidies if any should be paid, are all relevant questions. For example, 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

Regardless of which type of cost is considered, the overall issue is the same: To what degree, if any, should VRS consumers pay for their access and use of VRS? The answer is in part dependent upon one's perspective of MRS. Is it a service whose purpose is to provide equivalency of telephone service to people who need an accommodation? Or is it a social program with the goal of providing a service to persons with disabilities?

Different countries have established VRS based on these different perspectives. For example the Scandinavian countries consider VRS to be a social program for persons with disabilities, and consumer equipment (including video phones and laptops) is provided to Deaf VRS consumers for free, and VRS usage is without cost to the consumer. In the United States, VRS is part of a legal framework built on telecommunications equivalency for persons with disabilities, and the consumer pays for some VRS costs in the same manner that are paid by voice/hearing users of the telecommunications services in general.²⁷

For Canada, the MRS is part of the CRTC's oversight of telecommunications and IP access, and not a social or health service. However, MRS consumer equipment such as TTYs are often provided to consumers for free or subsidized as part of a Provincial government's social or health programs. For VRS the model for consumer costs will most likely be approved if it parallels the consumer cost arrangement for Canadian MRS in general: TTY-Relay and IP-Relay.

Also of significance is the question whether or not non-relay VRS related usage should be charged to the consumer. Examples of this are point-to-point calls, customer service and technical support.

9.1. Desired Outcomes

The optimum reimbursement outcome will:

- Be fair, but will not create a barrier to access or use of VRS
- Be easy to administratively manage; and if necessary can be audited
- Is not overly burdensome or costly for the VRS providers
- Will dissuade vendor or consumer misuse of VRS

9.2. Options

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 are:

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., outbound calls are free.

²⁷ In the U.S. the consumer pays for their own broadband access and usage (wireline, wireless, cable, etc) to reach VRS. The consumers pay for their own VRS equipment or they may accept free equipment from some VRS providers. Unlike U.S. TTY-Relay, there is no per minute or per call cost to the consumer to use VRS.

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

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

9.2.1. All VRS consumer costs are free

In this option consumers are reimbursed for their VRS equipment or it is provided for free by others (the Provincial or local governments, by the VRS provider, or subsidized from a CRTC VRS fund). Payment or reimbursement could be for paid receipts, vouchers to be used by the consumer to obtain VRS hardware and/or software, or free equipment physically supplied to the consumer. Monthly network access costs and per minute network costs to use VRS via the telephone (for voice users), via the Internet (for VoIP or Deaf users), or via wireless (cellular or satellite for voice and Deaf users) would also be reimbursed to the consumer. When an outbound VRS call is made by the interpreter to the called party, the consumer would not pay for using VRS, and would also not pay for any portion of the call to the called party.

This option aligns more closely with MRS as a social or health program, rather than as a telecommunications accommodation or equivalency program.

Advantages of this option

1. Consumers experience no financial barriers to VRS.

Disadvantages of this option

1. Considering the variety of network providers and their different rates and billing plans, as well as the variety of equipment types (videophones, computers, laptops, smart phones, tablets, etc), the payment and reimbursement requirements will be very complex to establish and maintain, and very difficult and expensive to effectively operate and manage.
2. This option would require defining payment and reimbursement details with many different network and equipment provider stakeholders, initially and ongoing. Consensus would be difficult to achieve.
3. The total cost of the consumer payment/reimbursement outlay may also be very expensive, and potentially may put the approval and sustainability of the overall VRS program funding at risk.
4. This totally free approach does not align to current CRTC MRS policy. As a general program, if VRS is paid for by Telecommunication Service Provider's ratepayers (either directly or as a percent of TSP revenue), the ratepayers may question the fairness of their paying for services that voice users typically pay for. Therefore this option may not be politically acceptable.
5. To the extent that VRS providers are required to reimburse, pay for, or administer the program, they will likely see this option as an operational and financial burden that may be a barrier to offering VRS.

9.2.2. Consumers pay for access, and pay to use VRS

In this option consumers are responsible to obtain their own VRS equipment or software. They can purchase their devices, or they may be able to obtain them for free or at a discount from Provincial or local governments or from a VRS provider.

Advantages of this option

1. Many consumers already have VRS compatible equipment (computers, laptops, smart phones, tablets, etc) and will not need to purchase special equipment.
2. Consumers may take advantage of currently existing Provincial or local government programs that provide or subsidize MRS consumer equipment.
3. This option will not be difficult for a VRS administrative body to manage, and will not require significant stakeholder consensus.
4. This option aligns to current CRTC MRS policy.

Disadvantages of this option

1. Some VRS consumers may not be able to afford broadband or wireless access to VRS, or may not be able to obtain the necessary VRS consumer equipment.
2. The expense to the VRS provider to establish, maintain and operate a consumer billing system and practice may be more than the revenue it receives from the billing. This outcome is dependent upon the complexity or simplicity of such billing; such as whether it is designed to be financially equivalent to a non-VRS consumer's outbound calling costs, accommodating all types of wireline, wireless, and VoIP carriers and their different rate plans; or whether a simple fixed per minute charge is applied regardless of destination, carrier or calling plan.²⁸
3. VRS consumers may not want to pay for the equivalent of the outgoing portion of their VRS calls, especially considering that all VRS calls are free in the U.S.
4. Some consumers may question why they are paying for outbound calls when they are also paying (via broadband or wireless access and usage) to call to VRS and to keep their network connection during the relayed conversation. They may view these costs as already equivalent to making a call directly to the other party.

9.2.3. Consumers pay for access, but do not pay to use VRS

This option is the same as the previous one, except that consumers do not pay for the outbound VRS call.

Advantages of this option

1. Many consumers already have VRS compatible equipment (computers, laptops, smart phones, tablets, etc) and will not need to purchase special equipment.

²⁸ An example of a simple approach might be 5¢/minute for local calls, 10¢/min for long distance, and 90¢/min for international calls.

2. Consumers may take advantage of currently existing Provincial or local government programs that provide or subsidize MRS consumer equipment.
3. This option will not be difficult for a VRS administrative body to manage, and will not require significant stakeholder consensus.
4. This option will be easy for the VRS provider to operate and manage.
5. This option aligns to current CRTC MRS policy.

Disadvantages of this option

1. Some VRS consumers may not be able to afford broadband or wireless access to VRS, or may not be able to obtain the necessary VRS consumer equipment.

9.2.4. Non-VRS calls are free to the consumers

For this option, what is being considered are the costs associated with non-relay VRS related calls. For example, consumer calls to a VRS provider's customer service or to a provider's technical support group. Also under consideration is the cost of consumer calls made through the VRS provider's network, but which are point-to-point (between two people who sign, and not involving an interpreter). These types of services and calls are typically a part of most VRS provider's operations, and the provider's expenses are factored into the provider's general VRS program reimbursement rates.

Nevertheless, a program model decision concerning these expenses should be made so that all stakeholders are clear on expectations. For this option, these types of calls are at no additional expense to the consumer.

Advantages of this option

1. Consumers of most services expect that their calls to a company's customer service or technical support are normally free, especially when the call is in regard to using the company's services.
2. Free point-to-point calls are a usual practice in VRS. In fact this type of call is the most prevalent form of VRS platform use, making up 70 to 80 percent of the traffic.²⁹ Point-to-point calls are truly the Deaf consumers' equivalence to voice users' direct voice-to-voice calling through the telecommunications network. The difference is that since point-to-point video calls are made via the Internet, the consumers' access and usage costs are based on their IP network rate plans instead of based on a telecommunication carrier's voice rate plans.
3. Free non-relayed VRS calls will significantly encourage potential VRS consumers to understand and use the service.³⁰

²⁹ Mission Consulting assessment based on proprietary data of U.S. VRS providers. This figure will likely also be confirmed with the Telus VRS trial.

³⁰ Also refer to section 11, *Education and Outreach*.

Disadvantages of this option

1. The VRS provider's costs to handle these types of calls will need to be built into the provider's overall VRS reimbursement.
2. Some minor program or provider revenue may be not realized.

9.2.5. Non-VRS calls are paid for by the consumers

For this option non-relayed VRS calls are charged to the consumer.

Advantages of this option

1. Some revenue will be generated for non-relayed VRS calls.

Disadvantages of this option

1. Easy access to customer service and technical support is crucial for VRS to succeed. Placing a cost on these calls could be a barrier to adoption of VRS, not from a financial point of view as much as from a cultural point of view.
2. Establishing a cost to use point-to-point video calling through the VRS provider's network will likely result in most consumers either electing to use a free point-to-point service such as Skype, or will result in numerous consumer complaints that they did not know they would be charged or that they are being taken advantage of.
3. The cost to set up and maintain a billing program for non-relayed VRS calls may exceed the revenue generated.

9.3. Recommendation

For this area of consideration, the following are recommended:

- Consumers are responsible to obtain their own VRS equipment or software, and pay for their broadband access to VRS.³¹ There is no additional cost to consumers to use VRS, i.e., outbound calls are free.
- 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.

³¹ Consumer representatives request that the CRTC consider discounted usage based broadband fees for VRS users similar to the current 50% discount applied to TTY calls.

10. Consumer Technical Support

VRS customer support will be necessary in order to assist consumers implement VRS to their end-user video devices. In some cases this will be a download of an application through the Internet, or the IP connection and set up of a video phone, or the configuration of a firewall and computer for optimum VRS. In many cases consumers will handle these tasks without difficulty, particularly if they have experience with current consumer computing or communication devices and networks. However, there will be potential VRS consumers who have little or no exposure to technology, and who are not comfortable communicating in English or French. These consumers in particular 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).

Some countries, e.g., Sweden, provide and set up the consumer's VRS equipment at the consumer's location (work or home) at no cost to the consumer. In the U.S. the most popular VRS providers (that have about 85% of the market) do the same. In the case of the U.S. providers who do this, the equipment they provide is set up to work with the provider's service, and installation includes demonstrating how to use the provider's VRS. Typically the equipment is installed and explained to the consumer by a Deaf technician.

The questions for Canadian VRS are: to what extent will field technical support be needed, and who is the best entity to provide it, and who is best equipped to provide remote VRS technical support?

10.1. Desired Outcomes

The desired outcomes for consumer technical support are:

- Easy setup and support experienced by consumers for all technical aspects of VRS (device, network and VRS).
- Cost effective/affordable technical support.
- Technical support provided in the preferred language of the consumer.

10.2. Options

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

1. Offered by the consumer equipment suppliers
2. Offered by the TSPs
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

10.2.1. Offered by the consumer equipment suppliers

This option aligns with the fact that there are many different manufacturers and models of end-user consumer devices that may be compatible with VRS. These devices are always changing in the marketplace, with new models regularly being offered. Many consumers new to technology may need assistance with basic device set up and operations, in addition to setting up the devices for compatibility with VRS. This option assumes that most VRS consumer assistance will be needed at the device level, and suggests that the manufacturers and suppliers of these devices are in the best position to support consumer technical assistance.

Advantages of this option

1. It takes advantage of a robust market driven evolution of consumer technologies, and their existing technical consumer support operations.
2. Many device manufacturers' consumer technical support operations are accessible by email and web chat, as well as through TTY-Relay.
3. Technical support is also available in person at some retail outlets where the devices can be purchased.
4. Device support is market driven, and is available to all consumers.
5. Many devices are relatively simple to set up (e.g., "plug and play" applications, etcetera) and many devices will not need unique configuration for VRS that is beyond the capability of most manufacturer/supplier's technical support capabilities.

Disadvantages of this option

1. Existing device technical support is usually not available in sign language, and therefore may not be accessible to people who are not conversant in written English or French.
2. Although most device manufacturers may have an understanding of general video communication requirements, most will have no understanding of VRS. Consequently very few will be able to assist with any unique setup requirements for VRS that may be different from general video communications.

10.2.2. Offered by the TSPs

This option assumes that because VRS will be accessed through the networks of the TSPs, that they will be in the best position to assist consumers with technical support.³²

Advantages of this option

1. Because VRS is a telecommunications and IP network service (paid for by TSPs, and regulated by the CRTC), therefore the TSPs should be responsible for VRS's technical support to consumers.

³² The acronym "TSP" used herein includes telecommunications service providers, wireless service providers, and Internet service providers.

2. Most TSPs already have technical support available, both via consumer help desk access (web-chat, voice, and TTY or TTY-Relay), as well as established field technical support for installation and repair.
3. TSP technical support is market driven, and is available to all consumers

Disadvantages of this option

1. Existing TSP technical support is generally not available in sign language, and therefore may not be accessible to people who are not conversant in written English or French.
2. Although most TSPs may have an understanding of general video communication requirements, most will have no understanding of VRS. Consequently very few will be able to assist with any unique setup requirements for VRS that may be different from general video communications.
3. TSP technical support will usually only be capable of providing assistance for the setup and use of their networks – this is particularly true for wired IP networks, e.g., DSL and cable. (Wireless providers usually do offer technical support for both their wireless network and wireless devices, both in-store and remotely.)

10.2.3. Offered by the VRS providers

This option suggests that VRS providers are in the best position to offer technical support to consumers of VRS because they best know their software application requirements and network configuration requirements. The viability of this option is influenced in large part by the model of who the VRS providers are. If they are professional VRS companies with technical support staff, this can be a good option. If they are professional interpreting organizations with little technical staff capabilities, this option will probably not be practical.

Advantages of this option

1. VRS professional companies have the strongest motivation to solve all VRS consumers' technical problems so that the consumer will be able to use VRS, and the provider will receive revenue.
2. VRS providers typically have technical staff that can assist consumers with setup and operational questions.
3. VRS providers typically have staff that can communicate with consumers in sign language. Staff can be available at outreach events. Some VRS providers, e.g., Sorenson, provide setup and instruction in the home at no cost to the consumer (under the U.S. compensation model).

Disadvantages of this option

1. If VRS providers are interpreting agencies or similar organizations they will not have technical staff knowledgeable or available to help consumers with their technical questions.
2. It is impractical to assume that all VRS providers will have knowledge of all consumer devices and all network issues. Their primary focus will be on their own devices (if any), and their own user software.
3. Most VRS providers are too small to offer in-home setup, or to attend outreach events in all locations. Most may be too small to assume the responsibility to offer technical support

nationwide for an entire new population of potential users that is significantly larger than their current user base.

10.2.4. Offered by the VRS platform provider

This option assumes that the VRS platform provider is most knowledgeable regarding the specialized VRS software that will be used by consumers, and therefore they are in the best position to provide VRS technical support.

Advantages of this option

1. If the VRS platform provider is the same as the VRS provider (e.g., where the VRS provider uses its own proprietary software as is the case with many U.S. VRS providers – Sorenson, Purple, ZVRS, etcetera), then this solution is operable to the same degree (advantages and disadvantages as the previous option).
2. If the VRS platform provider is not a VRS provider (e.g., iVès, nWise, and AuPix supporting most VRS operations in Europe), these companies are expert in their software and know its technical compatibilities and interoperability better than anyone else.

Disadvantages of this option

1. The independent VRS platform providers, e.g, iVès, nWise, and AuPix, are small companies that are not staffed to handle direct contact with a large consumer base. Their business focus is to support the VRS providers that use their software, not the consumers.
2. The independent VRS platform providers are not in a position to answer all types of technical questions regarding all potential consumer devices or networks.

10.2.5. Offered by a third party or third parties

This option assumes that none of the above options are viable, and that the best option is to establish or contract with a third party to provide technical support for consumers. The contract requirements could specify the level of support required (e.g., in-home or not; device, network and/or VRS software support; support at outreach events; etcetera).

Advantages of this option

1. The design and degree of support can be predefined in a procurement or contracting process.
2. The desired services can be specific to the needs of the signing public.

Disadvantages of this option

1. This could be a very expensive solution for technical support, depending upon the services required.
2. No single entity is likely to have all of the required expertise (device, network, VRS, signing, etc.) and therefore a hybrid or new entity creation would probably be required. (For example, existing third party technical support companies with field service capabilities, such as Geek Squad and others, are focused on the general public PC market, and only have some of the expertise and skills that may be needed.)

3. The new service entity would need to learn much of the information necessary.

10.2.6. Offered by a mixture of entities

This option assumes that different parts of the technical environment are best handled by the organizations that serve those parts, and where there is a service gap, that a new entity might be sought or created to service that gap and to share information with consumers and the providers of the various technologies used by consumers of VRS.

In this technical service model, the first level of consumer technical support for VRS compatible consumer devices is provided by the device manufacturers and suppliers, including field support to the degree that they offer it. The first level of support for the consumer network setup, access and usage is provided to the VRS consumers by the TSPs, including field support to the degree that they offer it. If the VRS providers are established VRS companies with consumer technical support capabilities or if they are using their own proprietary VRS software at the client interface (e.g., downloaded on videophones or computers), then those providers would offer their technical support of the VRS software to the VRS consumers. If the VRS software is provided by a third party company not associated with a VRS provider, then a separate third party entity may be the optimum source for consumer technical support of the VRS software. In this instance the third party entity may optimally also be focused on keeping track of the consumers' significant VRS issues with the device manufacturers/suppliers, the network providers, and the VRS software provider, only as they relate to VRS. The first role of this task would be to identify problems and to try to get the device manufacturers, network providers, and VRS software provider to address the problems and to cooperatively develop solutions. The second role of this task would be to publicize issues, actions and results to the VRS consumer communities in the preferred language of the consumers and through the outreach of the consumer organizations.

Advantages of this option

1. This option makes use of the knowledge and technical support capabilities already in place for each portion of the technologies used by VRS consumers.
2. A third party role is focused on getting these entities to solve consumers' VRS problems instead of trying to have the third party develop the technical solutions.
3. The level of support and funding of the third party can be predefined in a procurement or contract, including reporting of status and findings.

Disadvantages of this option

1. Consumers will be looking to multiple entities instead of a single entity for assistance in setting up and operating their VRS.
2. There will be finger pointing between the different entities (our part is working fine, the problem is the other guy's.)
3. This may require the establishment of a new third party technical support/coordination entity (if this service cannot be offered by an established VRS provider.)

10.3. Recommendation

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. This is the mixed approach described in section 10.2.6.

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.

11. Education and Outreach

As discussed in more detail in this study's phase 7, *Quality of Service*, education and outreach will be key components to a successful VRS implementation. 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.

From a design perspective the issues are:

- Who needs to receive education and outreach?
- Who should carryout it out?
- Who should pay for it?

11.1. Desired Outcomes

Desired outcomes for education and outreach are an understanding

- By potential VRS consumers that the service is available, and what is necessary in order to use it.
- By hearing users that VRS calls may be made or received.
- By the telecommunication service providers, wireless service providers, and Internet service providers (all referred to herein as "TSPs") of their role in providing VRS.

11.2. Options

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 TSPs.
4. By public social service agencies.
5. By a mixture of the above.

11.2.1. Provided by the VRS vendors

This option assumes that the VRS providers are in the best position and are the most motivated to perform education and outreach, and can do so as a normal operating expense of VRS. Minimum requirements for education and outreach could be included within a provider's contract, or an approach could be taken in which requirements are not set, and providers carry out education and outreach to the extent that they believe will benefit their ability to successfully provide the service and at an expense that they determine contributes to their return on investment and profit.

Advantages of this option

1. VRS providers are inherently motivated to take all reasonable steps to maximize consumer use of the service. Therefore they should be willing to perform this function.
2. VRS providers can perform this function as part of their normal operations. Therefore no additional contracts are required for education and outreach.
3. VRS providers should be able to communicate using the preferred sign language of the potential consumers of VRS.
4. Certain functions such as customer service are best provided by the VRS vendor. It can be unclear to what extent customer service may be considered education and outreach. Having the VRS provider responsible for all eliminates any potential concern about who is appropriately performing which function.
5. Having the VRS provider do education and outreach will ensure that the provider develops close relations with the consumers, and knows of their concerns and needs.

Disadvantages of this option

1. VRS providers' primary motivation is to make a profit. Any education and outreach performed by them will be only to that purpose. Education and outreach that does not significantly contribute to the bottom line, will not be done or will not be done effectively.
2. Some types of education, such as general media campaigns to hearing users to let them know about VRS (e.g., do not hang up on VRS calls), are likely not within the VRS provider's normal business skill set, and should not be expected to be performed effectively or efficiently by them.
3. While it may be normal for a few VRS providers to perform education and outreach, their core competency and business focus is running multiple small VRS call centers. They may not have the trained resources to perform the necessary education and outreach.
4. Canada is geographically a very large country. Education and outreach may be too large a task for a medium to small VRS provider.
5. In VRS models where there are multiple VRS providers competing for consumers (such as in the U.S.), the VRS providers are motivated to perform education and outreach in order to try to gain market share. If Canada adopts a VRS model with only one provider for ASL and one provider

for LSQ, those providers will have no competitive motivation to perform education and outreach.

6. Education and outreach performed by the VRS providers tends to emphasize the provider company rather than the service. For example, a provider will try to use media and outreach to “brand” their name and selection of their product/service, rather than promoting a generic service such as “VRS Canada” that might be the general service description for all VRS provided in Canada at the time, and in the future.

11.2.2. Provided by the consumer groups

This option assumes that the consumer advocacy and social groups are the best organizations to provide education and outreach.

Advantages of this option

1. The consumer advocacy groups and social organizations of the Deaf, deaf and hard of hearing know their members’ needs, and are better connected to their members, than any other entities.
2. They already have established two-way communication with their members, and education and outreach are already a normal and significant part of their operations.
3. They can communicate using the preferred sign language of the potential VRS consumers.
4. The consumer groups will be highly motivated to perform some level of VRS education and outreach to their members, as a function that will be highly valued by their members.

Disadvantages of this option

1. Consumer advocacy and social groups are generally not equipped to handle VRS customer service.
2. Except for just a few national or provincial groups, most consumer groups cover a very small geographic area or potential user base. In order to assure that the consumer groups perform education and outreach with consistency of effort and message, some entity will need to coordinate the ongoing engagement of these groups.
3. Most consumer groups are run by volunteers, who may not have the time, skills or financial capabilities to perform VRS education and outreach adequate to the need.

11.2.3. Provided by the communication utilities (TSPs)

This option assumes that because VRS will be funded by the telecommunications and IP providers, and is regulated by the CRTC, then the telecommunications service providers (wireline and wireless and Internet service providers), should be responsible for education and outreach as a normal part of their business.

Advantages of this option

1. All VRS consumers will be customers of a TSP and therefore should be able to be reached by their TSP.

2. Since TSPs need to be aware of VRS anyway, an argument can be made that they should therefore be made responsible for VRS education and outreach.
3. TSPs have existing operations in marketing and education. Therefore they should have the skills and resources to perform the function, especially to the hearing community.

Disadvantages of this option

1. TSPs do not understand the Deaf and would therefore not be effective at education and outreach to the potential VRS user community.
2. TSPs do not have two-way communications already established with potential VRS consumers, and are not equipped to do so.
3. TSPs are not equipped to communicate in the sign language of the potential VRS consumers.
4. The TSPs will view VRS as a cost but not as a revenue generator. Therefore they will never be motivated to perform VRS education and outreach, and will not be motivated to do an excellent job. Education and outreach performed by TSPs will likely be inadequately performed, will not be sensitive to the needs of the Deaf or other VRS consumers, and will not adequately offer two-way communication with the VRS consumers.
5. The customer service and technical support functions of TSPs will likely remain focused on the services that they directly offer, and will likely not be expanded to include VRS functions. Therefore TSPs should not be expected to answer customer service and technical support issues of VRS, except as they may relate to the TSP portion of the call or service set up.

11.2.4. Provided as a public social service

This option assumes that VRS education and outreach can be best performed as a public service of a government run or sponsored social service. In addition to general public education campaigns, this type of approach can also be used to reach specific social or business venues for messages tailored to these organizations. Examples are educational campaigns directed at financial institutions, health care providers or insurers, educational institutions and districts, large business employers, etcetera. Each of these will need to know how to accept and use VRS in light of their own unique concerns for consumer privacy or other considerations. This type of education and outreach can be performed directly by the social service agency or contracted to marketing campaign companies.

Advantages of this option

1. General public education campaigns are a normal part of social service programs (such as stop smoking campaigns, etcetera), and therefore can be most effectively managed by these organizations.
2. Public education campaigns have been proven to be the most effective, consistent and cost efficient way to reach the general population with a simple message, when a large for-profit business is not self-motivated to advertise the message.

Disadvantages of this option

1. Social service programs may not have the knowledge, the expertise, or the close relationships with the Deaf, deaf and hard of hearing communities that are needed in order for education and outreach to these groups to be effective.³³
2. Public education campaigns are only effective for a simple message. They cannot effectively communicate details.
3. Most social agencies cannot communicate using the preferred sign language of potential VRS consumers.
4. Social agencies will have no expertise in the VRS customer service that will be needed by VRS consumers.

11.2.5. Hybrid of the above

This option assumes that the best way to provide the necessary VRS education and outreach will be by a mixture of the above options.

Advantages of this option

1. This approach will ensure that the organizations that are best at what they do, and are motivated to perform education and outreach within their normal business operations, are engaged for those functions.
2. This approach will not try to be a “one-size fits all” solution, but will match specific education and outreach needs to organizational capabilities.

Disadvantages of this option

1. It will take an overall planning, coordination and ongoing management effort, which may need to be significant.
2. Funding will need to be allocated to multiple organizations and through multiple contracts or grants.

11.3. Recommendation

As seen from the review of advantages and disadvantages, 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. This is the hybrid or mixed approach described in section 11.2.5, and is suggested with the following particulars:

³³ They could, however, collaborate with the Deaf advocacy organizations and interpreting agencies to make their messages available in sign language and to develop outreach plans.

- ✓ VRS providers are best suited to offer VRS customer service and VRS technical support.
- ✓ VRS providers should be expected to perform some direct outreach activities to VRS consumers so that they make themselves available to learn directly from consumers what service improvements are desired.
- ✓ Consumer advocacy and social organizations are best suited to provide most outreach to their members who are potential VRS consumers.
- ✓ Government (federal, provincial or local) social agencies are best suited to provide educational campaigns to the general public, especially to the hearing population.
- ✓ TSPs will need to be educated regarding the availability of VRS to their customers and will need to know the technical requirements of how their services work with VRS so that they can be responsive to VRS consumers who need assistance in establishing or troubleshooting their VRS connection. But TSPs should not be expected to perform VRS education and outreach to either the VRS consumers or to the general population.
- ✓ A third party coordinator/administrator will be needed to manage or coordinate some of the above efforts.

12. Other Related Services

In this study's phase 8, *Potential Related Services*, six services that could be associated with VRS were analyzed for potential inclusion or exclusion with Canadian VRS.³⁴ In this section 12, these related services are considered from the perspective of an optimum VRS model.

12.1. Desired Outcomes

The primary desired outcomes for the possibility of including the related services within VRS are:

- The additional services offer functionality that will be desired by consumers
- The additional services do not add any significant cost to the VRS program
- The additional services do not create a significant additional demand for interpreters
- The additional services do not create a significant administrative or management burden on the program
- The additional services do not create a significant technical or administrative challenge for the VRS providers

³⁴ See this study's phase 8, *Potential Related Services*, for descriptions of these services, a discussion of their application to VRS, the potential relative significance of their cost impacts to VRS, their congruity to MRS regulations, and their potential effect on VRS administrative oversight.

- The additional services are not contrary to MRS regulation or policy, and are acceptable by all stakeholder groups

12.2. Options

Although each of the following options should be considered from the point of view of whether or not they should be included within the Canadian VRS model, they are presented here in a positive format, i.e., the related service will be included within VRS, simply as a device that will allow each option to be discussed in the continuing format of “advantages” and “disadvantages” of each option.

1. Include Video Remote Interpreting (VRI) within VRS
2. Include video mail and related message answering services within VRS
3. Include non-ASL and non-LSQ forms of visual communication within VRS
4. Include the ability to select specialized interpreters within VRS
5. Include French-ASL and English-LSQ translation services within VRS
6. Include relaying of emergency calls to 9-1-1 call centers within VRS

12.2.1. Include Video Remote Interpreting (VRI) within VRS

This option assumes that VRS providers will be reimbursed from the VRS fund for VRI.

Advantages of this option

1. VRI will remotely support the need for interpreters at a site (such as at a business visited by people who use sign language) and can be an effective and cost efficient way of providing interpreting, especially for non-scheduled, short duration interpreting needs.

Disadvantages of this option

1. It is unknown what the impact of including free VRI within VRS will have on minutes of use, the need for additional VRS interpreters, the additional costs to the VRS program, and the impact upon community interpreting and interpreting agencies. Without this information it would be very risky to order VRI as a part of VRS.
2. Since VRI is not an equivalent telecommunications function and not relay, it may be outside the authority of the CRTC to: 1) require TSPs to fund, 2) mandate as a part of VRS, and 3) reimburse VRS providers for VRI.
3. Many VRI and community interpreting settings such as government, medical or legal, are currently meant to be accommodated through provincial laws related to accessibility, and should not be conflated with CRTC mandated VRS.

12.2.2. Include video mail and related message answering services within VRS

This option assumes that video mail and related message answering services will be reimbursed from the VRS fund. If the video mail is from a relayed caller, then the interpreter time would be considered reimbursable. If it is a point-to-point call, without involving an interpreter, then reimbursement would not be provided. Retrieval of video mail typically does not involve an interpreter.

Advantages of this option

1. Video mail is equivalent to a hearing user being able to retrieve a message from their answering machine or voice mail service.
2. Most VRS platforms provide video mail capability, and it is a common feature offered by many VRS providers.

Disadvantages of this option

1. There will be some additional minor interpreter time and reimbursement costs involved for video mail.

12.2.3. Include non-ASL and non-LSQ forms of visual communication within VRS

This option assumes that a variety of visual communication is provided as part of VRS. In addition to ASL and LSQ, this includes visual or sign supported speech, signed transliteration, cued speech, lip reading/ speech-reading, oral transliteration, finger spelling, etc. These all are methods of translating spoken speech (e.g., English or French) into a non-ASL or non-LSQ visual form.

VRS can also be supplemented by text (e.g., English or French) provided as real-time text within the VRS screen/session. This can speed up the interpreting and accuracy of some relayed information such as names, addresses and numbers.

Likewise VRS can be designed to support audio along with video for consumers who sign and speak but cannot hear (using a voice carryover or VCO feature), or for consumers who sign and can hear but cannot speak (using a hearing carryover or HCO feature).

This option assumes all of these features will be part of VRS.

Advantages of this option

1. The above ancillary services will make VRS far more useful for a broader range of people who use visual modes of communication.
2. All of the services are technically easy to provide.³⁵
3. Generally the services require only minimal additional interpreter training, which depending upon the type of VRS provider, may be offered by the provider.
4. None of the additional communication modalities will significantly increase the demand for interpreter time or VRS costs.³⁶

³⁵ Especially with VRS platforms that offer “Total Conversation” capabilities.

³⁶ See this study’s phase 9, *Forecasts of VRS Demand*, and phase 10, *VRS Cost Variables and Forecasts*.

Disadvantages of this option

1. Cued speech would require additional interpreter training, is not offered in college and university interpreter training programs, is often not accepted by many consumers and its level of use may be marginal.³⁷
2. Speech reading without sign language support is highly susceptible to fraudulent use.

12.2.4. Include the ability to select specialized interpreters within VRS

This option offers the ability for consumers to request interpreters with special skills or attributes such as:

- Specialized vocabulary or experience (such as medical, legal, etc.)³⁸
- Regional/cultural knowledge including place names, unique nomenclature or dialects (such as the unique signs of Maritime sign users)
- Gender of the interpreter (e.g., a male consumer can select a male interpreter to voice for him)

VRS can be designed to permit consumer requests for preferences within personal registration profiles, and/or can be offered as options each time a VRS call request is made. Intelligent VRS systems could indicate estimated wait times for certain types of requests and allow the consumer to choose to wait or to take the first available video interpreter who may not have the abilities requested.

For VRS it is assumed that the above specialized services would be made available to the extent that they are available within the VRS provider's employed interpreter labour pool. The VRS provider would not be forced to have interpreters on staff to meet every consumer request for these specialized services.

Advantages of this option

1. The above specialized interpreter services or skills will make VRS more useful for relaying in a wider range of situations or assignments.
2. All of the services are technically easy to provide.
3. The services can make use of the additional skills, training and experience of some interpreters, to the degree that they are available.
4. None of the additional specialized interpreter services will materially increase the demand for interpreter time or VRS costs.

³⁷ If interpreter training programs were to offer training in cued speech, it is unclear whether interpreters would elect to take the training as many are opposed to it due to its controversial nature; i.e., it is generally considered to not be a language or a means of communication, but is often considered to be a tool used to teach speech, and therefore viewed by many as audism. See this study's phase 3, *Consumer Interests and Perspectives*, and phase 6, *Interpreter Considerations*.

³⁸ In the context of potential Canadian VRS, the ability to select ASL or LSQ would be considered basic to the service, and would not be considered a "special interpreter offering".

Disadvantages of this option

1. None

12.2.5. Include French-ASL and English-LSQ translation services within VRS

This option assumes that relayed calls between ASL and French, and between LSQ and English, will not be required but will be allowed and reimbursed. Alternatively they could be required; however, there are only a few interpreters that may have the ability to provide this combined interpreting/translation service.

Advantages of this option

1. This option would expand the ability of people who use ASL or LSQ to converse with people who use either English or French, which could be very useful.

Disadvantages of this option

1. It has been reported that only a few interpreters have the ability to provide this combined interpreting/translation service.
2. Translation is not part of other MRS services: TTY-relay and IP-relay, and is not part of existing CRTC MRS policy or orders.
3. Hearing telephone users do not have access to free translation services. Therefore an argument can be made to exclude translation from any MRS including VRS.
4. The demand for combined interpreting/translation services is unknown. In a few other countries where it is provided as part of VRS, it is offered only by appointment during limited hours.³⁹
5. If oral interpreting or speech-reading are provided through VRS or by VRS providers, the addition of translation could potentially invite misuse of VRS or fraudulent VRS calling, impacting interpreter resources and program costs. To the extent that VRS providers might be complicit in such arrangements, this could be difficult to monitor and correct.

12.2.6. Include relaying of emergency calls to 9-1-1 call centers within VRS

This option assumes that consumers' emergency calls to 9-1-1 centers can be placed through VRS. This option assumes that these calls are relayed, not point-to-point.⁴⁰

Advantages of this option

1. This option aligns with the CRTC's requirement for emergency calls from consumers to be relayed to 9-1-1 call centers (Public Safety Answering Points) via TTY-relay and IP-relay.

³⁹ Sweden offers VRS translation services four hours a week.

⁴⁰ See this study's phase 8, *Potential Related Services*, section 7, *Integration or Interface of VRS with Emergency Services* for more information.

2. This option allows consumers to communicate with 9-1-1 call center personnel via relay using the consumers' preferred sign language. Communication will be faster and usually more accurate than with either form of text relay.

Disadvantages of this option

1. It may be complex and time consuming to establish, depending upon the degree of automation required.

12.3. Recommendations

The recommendations for inclusion or exclusion of the related services within VRS are as follows:

Video Remote Interpreting (VRI)

- 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.

However if VRI is approved by the CRTC as part of VRS paid for from the VRS fund, it should only be initiated within a controlled and measured trial because the demand and impact of VRI is unknown. If the trial indicates that the impact of VRI is minimal for VRS interpreter demand and VRS costs, and other considerations are acceptable, only then should VRI be offered in a permanent production mode as a normal part of VRS.

Video mail

- Video mail should be a normal part of VRS.

Video mail is a normal part of most VRS capabilities, incurs minimal costs, and provides a valuable communication service comparable to that enjoyed by hearing users. VRS providers should be allowed to limit a consumer's mail storage in order to not place a stress on the providers.

Non-ASL and non-LSQ forms of visual communication

- 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..

These forms of communication augment VRS and broaden its usefulness to more people, including people who are deaf or hard of hearing that do not use ASL or VRS, but rely upon other modes of visual communication. In particular some of these forms of visual augmentation such as HCO and VCO are widely regarded as basic and integral requirements of relay, and should not be considered as optional. The cost impact of including these forms of visual communication is expected to be negligible.⁴¹ These

⁴¹ See this study's phase 3, *Consumer Interests and Perspectives*, and phase 10, *Cost Variables and their Forecasts*.

forms of communication augmentation should be included within a controlled and measured initial research phase so that information can be gained regarding the usage, procedures, and training that may be necessary in a fully deployed VRS environment.

Select specialized interpreters

- All of the specialized interpreter functions should be allowed.

These specialized services are often offered by experienced VRS providers, and can be made available to the consumers in a way that is congruent with the VRS providers' capabilities. These specialized capabilities should be included within a controlled and measured initial VRS research phase so that information can be gained regarding the usage, procedures, and training that may be necessary in a fully deployed VRS environment.

French-ASL and English-LSQ translation

- French-ASL and English-LSQ translation should not be included within VRS.

It is not practical to mandate translation services since there are only a few interpreters with the capability to provide simultaneous interpreting and translation. If it is allowed, it should first be offered through a controlled and measured trial. If a trial proves translation to be effective, and if it does not place too great a demand upon interpreter resources, and if it is not subject to fraud and misuse, only then it might be considered for limited availability within VRS with CRTC approval.

Relaying of emergency calls to 9-1-1 call centers

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

If the CRTC mandates that VRS only needs to be provided within limited times of day or days of the week, then availability of relaying emergency calls to 9-1-1 should only be required during the hours that the VRS providers offer VRS to consumers.

Because the establishment of VRS to 9-1-1 may be complex (depending upon the functional design), the implementation of VRS to 9-1-1 should take place during an initial controlled and measured research phase of VRS. Serious caveats should be made to all consumers and research phase participants that other already proven ways to contact 9-1-1 (TTY-relay and IP-relay) should be considered and relied upon until 9-1-1 VRS access issues are identified and resolved. The deployment of VRS should not be delayed while these complexities and issues are worked out.

13. 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 question arises; what is the optimum model of governance and management of the VRS program?

13.1. Desired Outcomes

The primary desired outcomes for governance and management are:

- Ease of governance/management
- Responsive to consumer input
- Facilitates cooperation among all parties
- Encourages continuous program improvement
- Responsive and effective in dealing with challenges
- Results in an affordable cost to the ratepayers and the public
- Minimize opportunities for VRS vendor or user fraud, misuse or waste
- Facilitates quality service
- Equity of services and treatment for all parties

13.2. Options

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

13.2.1. CRTC provides total management through regulation

This is the U.S. model, where all detailed rules regarding VRS are provided by the FCC. In this option, the many varieties of issues are constantly worked on by FCC staff, with an almost unbroken string of open proceedings, petitions, and “temporary” waivers since the inception of VRS. Ongoing input is received from stakeholders with vested interests (primarily VRS providers) with fewer comments from advocacy groups and the public, and very few comments from state government organizations. Orders are made directly to the VRS providers in lieu of the telecommunications carriers.

Advantages of this option

1. All authority and decisions are in one organization.

Disadvantages of this option

1. The management of VRS can be a very complex and detailed endeavor, and the regulatory process may not be the best way to handle all the situations and management obligations that may arise.
2. The management of VRS will likely require daily involvement and significant effort. If all of this was the responsibility of the CRTC, it would be very labour intensive for the CRTC.
3. The time required for the regulatory process may prevent issues from being addressed in a timely manner.⁴²
4. The regulatory process is geared to respond to input rather than create its own research. Almost all input received is not neutral; it is biased towards the self interest of the stakeholders.
5. Consumer input can be significantly manipulated by VRS providers.⁴³
6. VRS governance at the public regulatory level is subject to significant political influence wielded by stakeholders. Experienced VRS vendors may resort to political means or the courts when they do not obtain favorable rulings from the CRTC.⁴⁴

13.2.2. TSP managed in response to CRTC orders

Since VRS will be regulated by the CRTC as a telecommunications and Internet service provider service, and paid for by the TSPs, it can be argued that the TSPs should be the ones to perform the detailed day-to-day management of VRS. Such management would be in response to CRTC orders that generally define VRS and provide such management authority to the TSPs. If the VRS model selected assigned the responsibility to provide VRS to each TSP, the governance may be through CRTC approved TSP tariffs. The daily management of the service would be carried out by the TSPs.

Advantages of this option

1. Governance is aligned with who is paying for the service.

Disadvantages of this option

1. TSPs that are not also VRS providers will have little self interest in managing the complexities of VRS for quality service. Their primary focus will be to keep costs low so that they pay a minimum to support the service, and to maintain a low risk of liability.

⁴² The U.S. FCC experience has demonstrated that some issues can take years to reach resolution. Some issues, such as high costs, have never been resolved.

⁴³ In the U.S., consumer input is often manipulated by VRS providers, who frequently get consumers to send in identical complaints or positions by the hundreds or thousands based on minimal or often false information. For example if the FCC is planning on reducing the reimbursement rate by 30 cents based on VRS provider submitted costs, providers will initiate a campaign to consumers asserting that the FCC is going to make the providers go out of business and end their VRS.

⁴⁴ In the U.S. when VRS providers do not get their way they use all available methods to combat the FCC's plans or orders, including political means and the courts.

2. It is unclear how multiple TSPs would manage VRS provided by others. This would be expected to be a problem since few, if any, TSPs are expected to provide VRS from their own call centers.
3. A collaborative management approach between TSPs would be necessary. The outcome could be delays, little interest, and minimal resources applied to issues. Consensus on issues may be difficult to obtain, as most TSPs would not be interested in the details of VRS.

13.2.3. Managed by a third party administrator

This option assumes that the best governance and management approach would be one in which the industry (TSPs), at the direction of the CRTC, creates a third party VRS administrator agency (the Corporation) to which it provides funding, and through its Board, direction. The agency would be an independent, accountable corporation and run accordingly (i.e. in the corporation's best interest and mandate). In order to determine the makeup and structure of the agency, the following five guiding principles for governance are suggested.⁴⁵

Linguistic and Cultural Balance

In order to ensure that all potential users of VRS have meaningful input and all major interests are 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, and board members 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.⁴⁶

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 to the benefit and approval of shareholders.

⁴⁵ Guiding principles were determined through consultation with this study's VRS advisory committee on November 4th, 2011.

⁴⁶ 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.

Consistent with a successful model followed in Canada,⁴⁷ a corporation without share capital (the Corporation) would be established pursuant to Part II of the *Canada Corporations Act*. Legal details of the Corporation's structure would be set out in its By-Laws.

Membership in the agency would be compulsory for all TSPs pursuant to a directive from the CRTC which would also require TSPs to offer VRS. In order to meet the requirements of the Commission's directive, only the services of VRS providers who have been selected by the Corporation can be used. Selected VRS providers are subject to terms and conditions for the delivery of VRS that have received the approval of the Corporation pursuant an RFP or equivalent process. Membership in the agency would permit TSPs to offer VRS to their customers through the agency approved VRS providers.

Rights and obligations of TSP members would be specified in a Membership Agreement which all TSP members would be required to execute as a condition of membership.

The operations of the Corporation would be subject to oversight by a Board of Directors (Board).

Responsibilities of the Board of Directors could include:

- a) Selection of a Chief Executive, secretary and treasurer of the corporation;
- b) Providing the Chief Executive general guidance in carrying out the duties of Chief Executive;
- c) Approval of the annual report, budget and business plan of the Corporation;
- d) Approval of the Chief Executive's recommendation(s) regarding the selection of service providers further to RFP process(es) to be conducted by the Chief Executive;

⁴⁷ For example, the Commissioner for Complaints for Telecommunications Services (CCTS), an agency created by industry subject to CRTC approval which the CRTC granted in 2008 and again in 2011, and the Canadian LNP Consortium Inc. responsible for the operation of certain systems needed to support local as well as wireless number portability. The model suggested is also similar to a successful MRS program under the authority of the California Public Utilities Commission, which has brought valuable innovations to California's Deaf and disabled population. The former chairman of the FCC, William Kennard, called this program design, "a model for the nation."

- e) Approval of contracts with service providers developed by the Chief Executive for the supply of VRS;
- f) Approval of recommendations submitted by the Chief Executive for VRS platform(s), VRS user registration systems and practices, VRS provider services, education and outreach programs, consulting, and administrator facilities, operations and support;
- g) Approve compliance and quality of service standards and procedures developed by the Chief Executive;
- h) Direct the Chief Executive to conduct such audits of the corporation's books as the Board may consider appropriate;
- i) Direct the Chief Executive to provide such information and reports concerning the services, systems and operations of the Corporation as the Board considers appropriate;

The board could be designed similarly to the Commissioner for Complaints for Telecommunications Services (CCTS) board;⁴⁸ for example a nine member board consisting of:

- 4 Consumer representatives (appointed by consumer groups)
- 2 Independent directors with expertise in running corporations/organizations without ties to 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)

The size of the Board should remain manageable in order to simplify the scheduling and organization of meetings. In order to ensure consumer perspectives are included, quorum and majority voting thresholds could be set for decisions in relation to items a), b), d), e) f), g) and i), above. The make-up of the Board should also reflect funding obligations as well as accountability of TSPs to the Commission. Only TSPs are responsible for funding VRS and the obligation to provide VRS resides with TSPs. To further ensure that approvals reflect funding obligations and accountability, unanimous approval by the 3 industry Board members would be required for decisions in relation to items c), f) and g), above.

However, because multiple stakeholders are involved in VRS, the governing Board will need to and should 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

⁴⁸ 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>

- LSQ interpreters and interpreter trainers
- TSP Industry Representative(s)

The advisory committee members would serve for a specific maximum length of time, e.g. four years, before rotating off and being replaced by others, in a staggering fashion. No committee members may have financial conflicts of interest with any of the VRS contractors or TSPs. Committee members would receive a per diem and travel allowance for attending committee meetings.

The Corporation's Board would select and appoint a Chief Executive whose responsibilities would include the conduct of periodic Request for Proposal (RFP) competitive processes to select VRS providers, accountability for the performance of the VRS providers, preparation of an Annual Budget and Business Plan, and for the day-to-day management of the Corporation.

More specifically, the Chief Executive's responsibilities would include the following:

- a) Assess, collect and manage the VRS funds provided by the TSPs.
- b) Define VRS service provider performance requirements in detail, setting standards and minimum requirements as appropriate for a variety of VRS functions, including but not limited to: technical, operational, functional and interpreting for approval by the Board;
- c) Develop outreach and user education requirements for approval by the Board;
- d) Develop RFP(s) for competitively awarded program services;
- e) Select successful VRS service provider proposal(s) in response to the RFP(s) for approval by the Board;
- f) Enter into and manage contracts and grants for delivery of VRS as authorized by the Board, including as appropriate: VRS platform(s), VRS user registration systems and practices, VRS provider services, research, education and outreach programs, consulting, and administrator facilities, operations and support;
- g) Develop and implement VRS provider oversight systems and procedures, develop operations and support systems and procedures, subject to approval by the Board;
- h) Monitor program compliance and quality of service against specific benchmarks and report findings to the Board, as requested by the Board;
- i) Facilitate the resolution of problems with different entities;
- j) Investigate, plan, analyze, evaluate and report to the Board at the request of the Board on new service features, offerings or methods;
- k) Conduct research and trials of new service features, offerings or methods, as directed by the Board;
- l) Produce an annual report, annual budget and annual business plan for Board approval;
- m) Hire and manage staff with consideration for linguistic and cultural balance;
- n) Establish advisory committees and task forces of stakeholders as requested by the Board;
- o) Plan or coordinate public education and outreach programs as requested or approved by the Board;
- p) Conduct and/or commission such audits or reviews of the Corporation's books as the Board may request and further to such directions as the Board may issue;

- q) Provide a point of contact with the CRTC for VRS matters possibly through submission of an annual report and periodic reporting of service performance.

The Chief Executive would be appointed for a fixed term (renewable at the Board's discretion).

Under the contemplated mechanism, an Annual Budget and Business Plan would be developed by the Chief executive and subject to Board approval. The Annual Budget and Business Plan would form the basis upon which TSPs' funding obligations would be set.

TSPs could contribute to costs reflected in the Annual Budget and Business Plan of the Corporation via an allocation of revenues generated by any given TSP in given areas of service as a proportion of overall industry revenues associated with such areas of service, as ordered by the CRTC.⁴⁹ In addition an initial membership fee could be considered to cover the initial costs incurred by the Corporation to accept a member.⁵⁰

Advantages of this option

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 provide VRS.
3. Use of periodic RFP or equivalent 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. This option 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.
5. This option puts in place a long term solution for day-to-day management of the Canadian VRS program.

Disadvantages of this option

1. This option will involve significant work to establish in an operational mode.

⁴⁹ See Section 14, *Funding*, for details on funding options. Specifically Section 14.2.3.2

⁵⁰ A mechanism based on similar considerations was developed by industry to fund a portion of the costs associated with the operations of the Commissioner for Complaints for Communications Services. This mechanism is described in section 5 of the CCTS Amended and Restated Membership Agreement filed with the Commission in the proceeding initiated by Telecom Notice of Consultation 2010-247 (TNC 2010-247) See response to interrogatory CCTS(CRTC)30Apr10-1, Appendix 16(a).

13.3. Recommendation

For VRS program governance and management, the recommendation is:

- Manage the program by a third party administrator as described above.

This option provides the knowledgeable resources necessary for program success.

14. 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 how much funds are needed compared to their availability, and by established MRS or related funding policies.

A basic assumption is made that funds are short; that is, money is politically scarce and not every possible or desired outcome may be achieved. For example, VRS devices and broadband network access and usage may be ubiquitously available, but may not be affordable by all potential VRS consumers. The numbers of qualified ASL and LSQ interpreters needed to support a fully subscribed VRS are presently a scarce resource, and the expansion of the interpreter training programs in Canada will require additional funds. The question then is, what components of VRS should be funded and by whom? The answers can be influenced in large part by the selection of other non-funding elements of the Canadian VRS model presently under consideration. Some of these key variations are presented below in the *Options* section.

14.1. Desired Outcomes

The desired optimum outcomes for VRS funding are:

- All VRS program components are financially available to the extent that quality services can be provided to meet consumer demand
- The funding demands are acceptable to all of the stakeholders, including the CRTC and other government oversight bodies, and to the general public
- Program funds are not wasted, nor spent on fraudulent activities
- VRS program component funding is aligned to fund sources designed to support the component

14.2. Options

The following primary funding options are considered for:

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 customer fees.
7. Provide CRTC mandated funds as a percent of all TSP revenue.
8. Provide CRTC mandated funds as a percent of all TSP 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

14.2.1. VRS consumer device funding options

14.2.1.1. No special CRTC mandated funding or subsidies

In this option consumers would be required to purchase their VRS devices at their own cost, or with subsidies that may be offered by Provincial or other government programs, or as may be voluntarily offered by VRS providers.

Advantages of this option

1. This option matches the current MRS programs for TTY-relay and IP-relay, and should not require CRTC approval.
2. This option avoids the potentially high costs of consumer equipment being paid from limited VRS funds.
3. This option avoids the establishment of a resource intensive administrative program to qualify consumers and equipment.

4. This option allows consumers to select and pay for their communication equipment in the same market driven way that hearing users select and pay for their communications equipment.

Disadvantages of this option

1. Some potential VRS consumers may not be able to afford their own equipment.
2. In a multi vendor environment, large VRS providers that can afford to provide their own proprietary equipment to consumers will have a strong market advantage over other VRS providers for consumers and minutes of use.⁵¹

14.2.1.2. CRTC mandated funds subsidize VRS device purchases.

In this option CRTC mandated funds are used to subsidize VRS devices based on an individual consumer's need, such as demonstration that the consumer does not presently own a VRS compatible device (e.g., computer, laptop, videophone, smart phone, mobile tablet, etc.) and that the consumer's household income is below a certain threshold. VRS devices needed at work would be the responsibility of the employer.

Advantages of this option

1. Potential VRS consumers in need would have all or some of their VRS device costs paid for.

Disadvantages of this option

1. This option would require the establishment of a permanent national administrative program to qualify consumers, and to qualify equipment. Such a program would be complex and very expensive to operate.
2. The equipment qualification part of the program would insert delays from the time a new product comes to market to when it is approved for subsidization.
3. This option would be subject to significant fraud and misuse, as both Deaf and hearing users may attempt to get free or subsidized equipment via qualified friends who do not plan to use VRS, or via fake qualification documents or statements.
4. This option is not congruent with current CRTC MRS policy.
5. This option is potentially very expensive, and would take that money from the available scarce VRS funds.

⁵¹ In the U.S., Sorenson Communications gained about 85% of the VRS market by providing proprietary devices to consumers. Consumers have reported anecdotally that they believe they were encouraged to increase their VRS calls to prevent their equipment from being taken away due to lack of funding from the FCC. Some consumers report confusion over how relay is funded and may feel that if they do not generate enough VRS calls (i.e. revenue for the providers), the FCC will cut the service. Communication from providers to their customers may perpetuate this misinformation. For example, see <http://commerson.blogspot.com/2010/03/open-letter-from-alfred-sonnenstrahl.html>. Also in section 7, *VRS Platform and Interoperability*, regarding the non-interoperability of these Sorenson devices with other non-Sorenson devices and with non-Sorenson VRS platforms.

14.2.1.3. VRS providers are required to offer devices at no cost to the consumers

In this option the VRS providers would be required to offer compatible devices to consumers who do not have a device and who do not exceed the income threshold. Funding would be part of the CRTCC mandated VRS program.

Advantages of this option

1. The VRS provider can offer technical support for both their offered consumer devices and their VRS.

Disadvantages of this option

1. Equipment costs and qualification program expenses paid for by the VRS funds would not be avoided; they would only be shifted to the VRS providers who would include them within their operating costs needing VRS fund reimbursement.
2. The equipment offered may only be those devices which are the least costly to the VRS provider, and may not represent the wide range of types of devices (mobile tablet, 4G smart phone, etc) desired by consumers, or may not offer the range of features (memory, address book, etc) desired by consumers.
3. To the extent that VRS providers might impose proprietary equipment or equipment not compatible with other VRS providers or not compatible with other VRS provider's consumer devices, this option would prevent consumers from selecting a different VRS provider without also changing their equipment. It could also prevent consumers from being able to communicate directly via point-to-point with non-compatible equipment provided to customers of another VRS provider.⁵²
4. In a competitively awarded VRS in which a provider is granted the right to provide VRS for a limited time, e.g., five years, all proprietary VRS consumer equipment would need to be replaced if a new provider is selected that is not compatible with the existing distributed consumer equipment, or if the distributed consumer equipment is only on loan.
5. This option is also subject to significant fraud and misuse, as both Deaf and hearing users may attempt to get free or subsidized equipment via qualified friends who do not plan to use VRS, or via fake qualification documents or statements.

⁵² These issues assume a multi-vendor environment. This incompatibility was the case in the United States for many years for most VRS consumers before the FCC ruled that interoperability was a VRS requirement.

14.2.2. Consumer broadband services

14.2.2.1. No CRTC mandated funding or subsidies for network services

In this option consumers acquire wireline or wireless broadband networks for VRS at their own cost, or with subsidies that may be offered by Provincial or other government programs, or with subsidies that may be voluntarily offered by VRS providers.

Advantages of this option

1. This option matches the current MRS programs for TTY-relay and IP-relay, and should not require CRTC approval.
2. This option avoids the potentially high costs of consumer broadband networks being paid from limited VRS funds.
3. This option avoids the establishment of a resource intensive administrative program to qualify consumers and networks.
4. This option allows consumers to select and pay for their broadband network services in the same market driven way that hearing users select and pay for their broadband network services.

Disadvantages of this option

1. Some potential VRS consumers may not be able to afford their broadband network services.
2. Since broadband is required for video calls, consumers may feel punished based on their need to use video to communicate.

14.2.2.2. CRTC mandated funds subsidize network services

In this option CRTC mandated funds are used to subsidize VRS broadband network access based on individual consumer's need, such as demonstration that the consumer does not presently have a broadband network and that the consumer's household income is below a certain threshold. Broadband network access and usage needed for VRS at the consumer's work would be the responsibility of the employer.

Advantages of this option

1. Potential VRS consumers in need would have all or some of their VRS broadband services paid for.

Disadvantages of this option

1. This option would require the establishment of a permanent national administrative program to qualify consumers, and to qualify broadband network services. Such a program would be complex and very expensive to operate.
2. The network qualification part of the program would insert delays from the time a new network service comes to market to when it is approved for subsidization.

3. This option would be subject to significant fraud and misuse, as both Deaf and hearing users may attempt to get free or subsidized network services via qualified friends who do not plan to use VRS, or via fake qualification documents or statements.

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

For 1) the operation of the VRS providers' services, 2) the VRS platform and related services, 3) the third party or VRS provider offered technical support, and 4) the operation of a necessary VRS program administration, the primary funding options considered are:

14.2.3.1. Provide funds from CRTC mandated TSP customer fees

In this option customer fees would be collected by the TSPs as specifically mandated by the CRTC to support VRS.⁵³ The fees may be a flat amount per user account or a percentage of the customer's bill. The fees would appear on every TSP customer's monthly invoice as a separate line item. The CRTC may try to apply the fees with parity by electing to establish the same fee amount for all, or may order different fee levels for different categories of TSPs, such as: market entrants vs. ILECs, or by size of company, or telecommunications vs. Internet providers, etcetera. Customer invoices for broadcast only (e.g., subscribed accounts for radio, television or movies) would not be assessed since those services do not provide two-way communication.

Advantages of this option

1. The funding is transparent; that is, all TSP customers would clearly see their contribution to VRS.
2. This method of payment has been used by the CRTC for other communication services and is familiar to the TSPs.

Disadvantages of this option

1. This option would require the establishment of a new separate VRS fund that would need to be managed, and to which the TSPs would need to support with revisions to their fiscal and accounting practices.
2. This option would require all TSPs to educate their customers about the fees, and would require all TSPs to modify their customer billing processes. TSPs would prefer not to do these activities, which will take time, resources and money; and will also affect customer relations.
3. This option's fees would be applied equally to all customers. Some customers who can afford only basic TSP services would be paying the same amount as customers who purchase more expensive TSP service plans. The customers who have the minimum services may consider it unfair that they are paying a larger percent of their service costs for VRS.
4. Some TSP customers may consider their VRS fees to be personally challenging or politically offensive, and may dispute the fees with the CRTC directly, through the courts, through the

⁵³ The TSPs currently recover the costs associated with TTY relay and IP relay through a rate collected from their general body of subscribers. The CRTC has set the rate at 13 cents per month per subscriber since the 1990s. The CRTC may elect to increase this amount to allow the provision of VRS through the same cost recovery mechanism.

media, or through their elected representatives. Such actions would at best necessitate a political and managerial response, and at worst would potentially put the VRS program at risk.

14.2.3.2. Provide funds from a CRTC mandated percentage of all TSP revenues

In this option the CRTC would mandate that all TSPs must pay a percentage of their revenues based on market share into a national VRS fund. The percentage would apply only to the TSP portion of a company's total telecommunications operations revenue (i.e. two way communications). The CRTC may try to apply the percentage with parity by electing to establish the same percentage amount for all, or may order different percentages for different categories of TSPs, such as: market entrants vs. ILECs, or by size of company, or telecommunications vs. Internet providers, etcetera. The percentage assessment would not appear on customer invoices. Broadcast revenues would not be assessed since those services do not provide two-way communication.

Advantages of this option

1. This method of VRS program funding would share the costs over a broad spectrum of companies, and as a percentage of total revenues, would be seen as an extremely small amount. Politically this option would be more acceptable to the public and to the TSPs than new customer fees.
2. This method does not necessitate educating the TSP customers.
3. This method of payment has been used by the CRTC for other telecommunication services and is familiar to the TSPs.

Disadvantages of this option

1. This option would require the establishment of a new separate VRS fund that would need to be managed, and to which the TSPs would need to support with revisions to their fiscal and accounting practices.

14.2.3.3. Provide funds from a CRTC mandated percentage of all TSP profits

In this option the CRTC would mandate that all TSPs must pay a very small percentage of their TSP profits into a national VRS fund. The assessment would not appear on customer invoices. Broadcast profits would not be assessed.

Advantages of this option

1. Companies that are not making a profit or are making less of a profit would pay less than those that are making more profit. This may be viewed by some stakeholders as less burdensome on struggling companies.
2. This method of VRS program funding would share the costs over a broad spectrum of companies, and as a percentage of profits, would be seen as an extremely small amount. Politically this option would be more acceptable to the public and to the TSPs than new customer fees.
3. This method does not necessitate educating the TSP customers.

Disadvantages of this option

1. This option would require careful definition of what constitutes “profits”, and potentially would be subject to considerable disagreement of definitions by various TSPs.
2. The more profitable companies may complain that they are proportionately paying more than those which would have had a higher profit but they reinvested their income into facilities, research or development. It may be more difficult to achieve stakeholder consensus for this option.
3. This option could be more difficult to audit.
4. This option would require the establishment of a new separate VRS fund that would need to be managed, and to which the TSPs would need to support with revisions to their fiscal and accounting practices.

14.2.4. Interpreter training program expansion

14.2.4.1. No CRTC funds for interpreter training

In this option, no CRTC mandated funds are used for interpreter training. Canadian ITPs would be required to respond to the need for expanded interpreter training based on their own funding sources, student demand and enrolment. Similarly, interpreting students would be required to fund their education in the same manner as they do presently.

Advantages of this option

1. This option does not require establishing a new VRS interpreter training funding plan and managing its activities.
2. This option costs less by not providing additional VRS funds to colleges and universities.

Disadvantages of this option

1. The ITPs are not financially provided an increase in revenue necessary to support the development of additional interpreters that will be necessary for VRS.
2. Without the necessary interpreters, VRS will not be able to meet the significant demand for service from VRS consumers.

14.2.4.2. Interpreter training programs provide VRS

In this option, the Canadian ITPs would be involved in the delivery of VRS, e.g., as functioning VRS call centers. They would receive payment from the VRS fund for their VRS calls, which they can use to expand their programs and/or to support their students.

Advantages of this option

1. This option will provide VRS to consumers while simultaneously providing funds to ITPs for the development of their programs and students that is needed to support VRS.
2. This option will give ITPs, their directors, instructors, students and graduates with actual experience with VRS, so that all aspects of the ITPs benefit. For example: ITPs will develop firsthand knowledge of what the VRS interpreting challenges are, and how to address them in

their curricula; ITPs will need to develop video interpreter mentoring programs, and other creative facets of their VRS programs/services in order to ensure that video interpreter training is appropriate and the quality of service is sufficient.

3. ITPs can, from their own experience, become key participants in the development of national VRS program interpreter standards of competence for VRS that might be defined in CRTC regulation or contracts. For example, many stakeholders consider that simply graduation from an ITP does not guarantee that an individual may be professionally ready to interpret in a VRS setting.
4. On-campus VRS run by the ITPs will encourage quality students to stay with the program, and to not drop out to take community interpreting employment in the field.
5. The long term benefit of this option will be to expand and develop the ITPs resulting in a permanent and increasing number of interpreter graduates available for both community and VRS interpreting.

Disadvantages of this option

1. VRS calls will initially be handled by organizations that have no professional experience providing VRS.
2. ITPs may have little ability to handle typical non-VRS functions such as customer service or consumer technical support. These functions will need to be augmented by additional resources or will need to be provided by others. For example, the college information technology department or support staff may provide VRS technical support to the ITPs and potentially to VRS consumers.

14.2.4.3. Interpreter training is funded or offered by the VRS providers

In this option the VRS providers would be required to sponsor or offer additional interpreter training. Such training may be either supplementary to interpreters who already have some level of expertise or experience and is in support of the unique requirements of VRS, or it may also offer a more basic level of interpreter training for people with little interpreting skills.⁵⁴

Advantages of this option

1. This option does not require a separate funding mechanism and its consequential administrative overhead to support VRS interpreter training. The additional VRS interpreter training would be the responsibility of the VRS provider, not the VRS program in general or the ITPs.
2. VRS providers would be free to judge the additional level of training that they determine to be necessary in order to offer the VRS quality they deem appropriate for their customers.

⁵⁴ For example, the largest U.S. VRS provider, Sorenson Communications, offers interpreter training to augment the skills of interpreters for use in VRS. It requires participants to sign a contract that obligates the participant to work for Sorenson and no other VRS provider. (As a standard employment practice, Sorenson requires exclusivity of all its interpreter employees with threatened consequences for non-adherence.)

Disadvantages of this option

1. Only the very largest VRS provider(s) would be able to afford to establish interpreter training programs, as they are not part of the current business practice of almost all existing VRS providers.
2. The requirement for VRS providers to offer additional interpreter training would not relieve the VRS program from interpreter training costs. It would only shift the costs to the VRS providers, who would need to include the cost within their VRS per minute or other form of reimbursement.
3. This option places the requirement for interpreter training on the business elements that typically have no, or very limited, expertise in interpreter training. They do not have the professional expertise and in-depth resources of the college and university ITPs.
4. The VRS providers are focused on profit, not interpreter training. They will only offer interpreter training to the extent that it will increase their profits resulting from their provisioning of services. They will not be intrinsically motivated to provide interpreter training at the highest quality standards of competence that many stakeholders may believe should be necessary for effective VRS.
5. VRS providers will not be capable of providing the long term development of interpreter training that is offered by college and university ITPs. At best they may only be able to provide augmentation of training to interpreters who already have attained a high level of competence through formal training and experience.

14.2.4.4. CRTC VRS funds support interpreter training programs

In this option dedicated VRS funds mandated by the CRTC would be provided directly to the Canadian college and university ITPs for their expansion and development. This funding to these ITPs would be separate from funding to VRS providers.

Advantages of this option

1. This option would allow the ITPs to develop and expand their interpreter training programs for the short term and long term benefit of VRS consumers, regardless of whether an ITP may also elect to provide VRS.
2. The long term benefit of this option will be to expand and develop the ITPs resulting in increasing their capacity to graduate more students, who will become available for both community and VRS interpreting.

Disadvantages of this option

1. ITPs will not gain invaluable knowledge and experience as a result of also providing VRS.

14.2.4.5. CRTC VRS funds support students of interpreting

In this option dedicated VRS funds mandated by the CRTC would be provided directly to Canadian students enrolled in Canadian interpreter training programs in the form of grants or student loans.⁵⁵ Funds would not need to be paid back to the extent that they worked for a VRS provider located in Canada providing VRS to Canadians for a specified period.

Advantages of this option

1. Students will be financially supported and encouraged to learn interpreting, and to work in VRS.
2. As a result of the VRS student aid program, more students will enter ITPs, graduate, and work in VRS, thereby increasing the ability of VRS to meet consumer demand for service.

Disadvantages of this option

1. The money provided to students will be spent by the students on all forms of student expenses (housing, general tuition, food, entertainment, etcetera.) Very little of the funds will be used specifically to support the college and university ITPs, which will need funds to hire teachers, expand their facilities, develop curriculum, etcetera.
2. ITPs will not gain invaluable knowledge and experience as a result of also providing VRS.
3. Many interpreting students, who may have received VRS student aid, will never obtain the competency necessary for interpreting regardless of the training, are unsuited to become interpreters, or they leave the program because they realize interpreting is too difficult.
4. Rules for the student aid program would need to be established, including a requirement that the student loans or grants would not need to be paid back if the students graduate and work for a number of years for Canadian VRS organizations. Obtaining repayments for not graduating and working in VRS could be problematic.
5. If this option does not simply allocate a portion of VRS funding to existing student scholarship or loan programs, new similar programs will need to be set up and managed by the college and university ITPs, potentially at a significant administrative expense.
6. The development of this student aid program could generate political interest, either in support of or against the program, which would need to be responded to, and which may potentially put the VRS student aid program at risk. For example, an argument may be made that if there will be plenty of VRS interpreting jobs for graduates, a student aid program specifically for VRS is not necessary; that existing student aid programs can meet interpreting students' financial needs.

⁵⁵ This option has been adopted by New Zealand VRS since 2008.

14.3. Recommendation

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 look for non-CRTC 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 look for non-CRTC 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

- Provide CRTC mandated funds as a percent of all TSP telecommunications operations revenue.

This option will probably be the most acceptable by all stakeholders: TSPs, the public, and politicians. 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, including the grant research recommended in sections 16.2.3 and 16.3.

Interpreter training program expansion

- As an initial stimulus to increase the capacity and capability of the college and university ITPs, provide a VRS grant program that requires both program expansion and offering of VRS as a service to consumers. After a time certain, such as three to six years, when the ITPs are self sustaining and robust enough to meet the training needs for interpreters, discontinue the grant program.

This recommendation is a blend of the two options that provide revenue to the ITPs. It assumes that the strongest way to enhance the ITPs and attract and keep students will be for the ITPs to provide VRS to consumers and for the ITPs to receive funds for instructor and curriculum development, and as deemed appropriate by the ITPs for potential scholarships to their students who demonstrate ability and financial need. Once the programs are developed and student

enrollments and graduations are high, the VRS funds can be reduced or discontinued. Depending upon the VRS model selected, the ITPs may elect to continue to provide VRS as an augmentation to their programs.

15. Acquisition

VRS provider services must be acquired and paid for. The question is: What is the best way to procure or acquire the services?

15.1. Desired Outcomes

The optimum desired outcomes for acquisition of VRS provider services should:

- Result in a combination of lowest costs and best services
- Be a fair acquisition methodology
- Provide contracts and services that are responsive to the needs of all parties

15.2. Options

The options under consideration are:

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

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. For example program grants may have a different RFP process than solicitations for technical services. Many of these additional acquisitions will be dependent upon other aspects of the VRS model that are selected. For example, if it is determined that a single VRS platform is desired, it will probably be best if the platform is not owned by a VRS provider, but is owned or leased by the VRS program (such as by the third party administrator entity) and licensed for use by the VRS providers. Such licensing arrangements would have their own unique assignment and contract process.

15.2.1. CRTC regulated, cost-plus

In this option the CRTC would establish VRS provider reimbursement rates based on the allowed costs submitted by VRS providers. Costs would be a weighted averaging of forecast and actual costs. The CRTC would need to define what costs are allowable and what percentage of profit is allowable. Providers would need to submit auditable cost data, which would remain confidential. Provider services

could be acquired by allowing all vendors who meet minimum CRTC requirements to be certified to offer VRS and to receive CRTC reimbursement. This regulatory cost-plus model is the U.S. FCC approach.

This option would need to be adjusted to comply with CRTC rules and processes, and align to the rest of the selected components of the VRS model. For example, if VRS were to be under the jurisdiction and administration of the individual TSPs, the CRTC may elect to use a tariff rate setting process. In this process the TSPs would submit tariffs for rate reimbursement (which they could pass on to their contracted VRS providers) for CRTC approval through an established CRTC tariff process.

Advantages of this option

1. As a regulatory function, the CRTC would have an established process already in place.

Disadvantages of this option

1. As a “cost plus” process, providers are only incented to increase allowable costs, since the reimbursement rate will be set based on the level of costs.
2. This option could be a labour intensive practice for the CRTC.
3. The process in the U.S. has resulted in very high rates, an inability to audit costs, and excessive fraud and waste.

15.2.2. Competitively bid, single vendor fixed rate service

In this option, an entity such as the third party VRS administrative program manager would develop a Request for Proposal (RFP) and solicit services and reimbursement rates from VRS vendors.⁵⁶ The award and rate would be made based on “best value” – a combination of best proposed services and costs. The award would be to either a single national provider or to one ASL-English provider and one LSQ-French provider.⁵⁷

Advantages of this option

1. This option will award to the bidder with the blend of highest capabilities and lowest costs. Therefore consumers are theoretically assured that they will receive the best possible service at the best program cost.
2. This acquisition methodology can result in excellent competitive proposals when there are multiple bidders qualified and capable of providing the requested services.

Disadvantages of this option

1. Canada is a large and diverse country. There may be only three or fewer entities with the resources necessary to serve the country. Not all may choose to bid, and the results could be more expensive than desired, particularly if the bidders rely upon their U.S. cost models as their fiscal basis for bidding rates for Canada.

⁵⁶ See section 4, *Type of Providers*, for a discussion of the possible different types of VRS providers.

⁵⁷ See section 5, *Number of Providers*, for a discussion of the possible different numbers of VRS providers.

2. This option also has the disadvantages listed for single providers in section 5, *Number of Providers.*, subsections 5.2.1 and 5.2.3.

15.2.3. Competitively bid, multi-vendor flexible rate service

In this option, an entity such as the third party VRS administrative program manager would develop an RFP and solicit services and reimbursement rates from VRS vendors. Awards would be to multiple vendors. In a single platform, networked vendor design, the award of VRS rates and traffic might be tied to the best value determination of each awarded provider and their ongoing quality of service. In a non-networked design the allowed reimbursement rates for all awarded providers might be the lowest rate bid that meets minimum technical and operational requirements.⁵⁸

Advantages of this option

1. This option will allow more competition by awarding to smaller multiple vendors that will share the load of VRS calls.⁵⁹
2. Depending upon the procurement details, it may be possible to award different reimbursement rates for different providers with this type of acquisition.
3. This option also includes the advantages of multiple vendors identified in section 5, *Number of Providers*, subsections 5.2.4, 5.2.5, and 5.2.6.

Disadvantages of this option

1. It may be difficult for most smaller bidders to successfully compete against the potentially lower costs of large established VRS vendors. The result may be that few awards are made.
2. The establishment of awarded rates may be complicated. It can be done, but the outcome of this type of bid is not easy to predict. Bidders may not accept their intended awards if the awarded rates are too divergent from their bid rate.
3. This option also includes the disadvantages of multiple vendors identified in section 5, *Number of Providers*, subsections 5.2.4, 5.2.5, and 5.2.6.

15.2.4. Competitively bid, multi-vendor service at a pre-established rate

In this option, the CRTC (with possible support from a third party VRS program administrator) would establish a reimbursement rate based on its best analysis of expected VRS provider costs for the services required. This rate could be either a per minute rate or a fixed annual or monthly amounts.⁶⁰ The third party VRS program administrator would develop and issue an RFP and award services to vendors that are then certified for reimbursement. The awards would be based on an evaluation of competitive

⁵⁸ These kinds of detailed choices are typically worked out in an operational design and RFP process.

⁵⁹ The method of sharing, either networked or standalone, would be defined in an operational design and RFP process.

⁶⁰ See section 8, *Provider Reimbursement*, for a discussion of these options.

proposals for service, and may be provided to all entities that meet the minimum standards detailed in the RFP, or may be limited to a fixed number of specific types of vendors.⁶¹

Advantages of this option

1. From a pricing perspective, smaller bidders will be able to successfully compete against large established VRS vendors. The result may be that many awards may be possible.
2. This option has the strong advantage of keeping program costs at a set and affordable level that can be budgeted, without changes in program costs due to unpredictable rate changes.⁶²
3. Awarded VRS providers, regardless if a single provider or multiple providers, are discouraged from forcing the program to accept increasing rates over time, and are incented to control their costs to match the rates offered.
4. The selection of bidders for award of services is primarily based on proposed plans, capabilities, and quality of service. Cost may or may not be a factor in evaluation, (for example if cost is not evaluated all bidders would agree to offer services at the rates stipulated. Therefore, the selection and award can be to the companies that will offer the best services at a pre-established affordable price.

Disadvantages of this option

1. The pre-established rate may not be the lowest rate based on actual competitive market conditions.

15.3. Recommendation

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.⁶³ During the research phase determine if a fully deployed VRS services would best be competitively acquired through an adjusted fixed rate, multi-vendor RFP, or by a multi-vendor flexible rate RFP.⁶⁴

⁶¹ See section 4, *Type of Providers*, and section 5, *Number of Providers*. These kinds of detailed choices are typically worked out in an operational design and RFP process.

⁶² See this study's phase 10, *Cost Variables and their Forecasts*, for the U.S. example of extreme VRS rate changes and program costs over time.

⁶³ See section 16, *Implementation*, for additional discussion and recommendations.

⁶⁴ 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 pre-established or a competitively established rate for interpreter time, or for per conversation minute reimbursement rate for relayed calls. Awards for fully deployed services would be offered to providers qualified by a competitive RFP, either to all interested and qualified bidders or to a set maximum number of bidders. The awards could be for a fixed duration, or could contain continuance provisions and the potential for other entities to receive awards at later dates. The
[footnote continues on next page]

16. Implementation

Implementation of a VRS program will require careful multi-step, coordinated planning and execution requiring the cooperation and commitment of many stakeholder organizations. Implementation is a process not an event. The VRS provider part 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.

16.1. Desired Outcomes

Some of the primary desired outcomes of a successful implementation process are:

- A process that is timely and not delayed by lack of participation or poor communication
- Carefully planned stages of implementation with clearly defined goals and responsibilities
- Cooperative participation and consensus throughout among the involved stakeholders
- Participation and leadership by the stakeholders representatives, including the CRTC

16.2. Options

The options associated with implementation have to do with the degree of commitment to planning and management and 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.

16.2.1. Fully deployed services with the VRS providers determining implementation

In this option the CRTC orders permanent fully deployed VRS, either directly or through an RFP, and the awarded VRS providers determine the implementation process and details. This is a typical “hands-off” implementation in which the awarded firm is totally responsible for their success. This follows the U.S. model.

RFP would not be expected to contain the additional non-call services included in the initial research phase, such as testing and evaluation, consumer surveys, evaluation and recommendation of interpreter standards, etc. All these types of details should be determined during program design and RFP development. Information gained from the initial research phase can assist in making these decisions.

Advantages of this option

1. This approach offers the fastest way to get VRS up and running.
2. This approach initially requires minimal planning or management time by any oversight bodies.

Disadvantages of this option

1. This type of implementation carries the highest risk of significant problems or failure.⁶⁵
2. Oversight bodies, i.e., the CRTC, and stakeholders will always be playing catch-up, trying to mitigate program problems after they occur.
3. It is very difficult to get the vendors to change inappropriate or damaging practices without first establishing carefully planned expectations, reporting relationships, and controls. Without such management involvement it is often not apparent that there is a problem until after the damage has already occurred.⁶⁶
4. In this option the focus of the VRS providers will be to set up their service and generate revenue. They will not be concerned or proactive with the many management and stakeholder needs that are not directly related to the providers' profits. These issues will likely receive minimal provider resources and attention.

16.2.2. Fully deployed services with management controls

In this option the CRTC establishes overall program goals and requirements, but also establishes a third party administrative entity to plan and manage the VRS program. This entity then plans for and awards fully deployed VRS, including all necessary VRS program components, and it also maintains program control over the contractors.

Advantages of this option

1. This option establishes the VRS program planning and management function so that VRS can be designed and implemented in a manner that offers a higher level of success and a lower level of risk compared to simply turning the program over to the VRS providers.
2. This option provides a means to consider, plan and control the many different aspects of the VRS program that should be managed for success.
3. This option results in a fully deployed service when VRS becomes operational.

⁶⁵ Most new major initiatives for program services or systems fail in the implementation stage (not in the procurement stage) as a result the concept that upon award implementation becomes the contractor's responsibility.

⁶⁶ Examples of awareness of damage after the fact would be the hiring of most existing interpreters away from community interpreting, or the distribution of non-interoperable consumer video devices.

Disadvantages of this option

1. This option takes longer to implement and takes more money to manage.⁶⁷
2. This option initiates a permanent fully deployed service without first determining optimum or perhaps necessary requirements based on the results of a programmatically planned and controlled research phase.

16.2.3. Initial research phase of services with controls, followed by fully deployed services

In this option the CRTC establishes overall program goals and requirements, but also establishes a third party administrative entity to plan and manage the VRS program. This entity acquires a VRS platform and registration database and plans for and awards a multi-year initial research phase of VRS (for at least three years). The research phase investigates a wide variety of program elements while also providing limited VRS services. During the research phase the third party administrator works with all stakeholder groups through selected representatives to develop the final detailed program design (inclusive of all necessary VRS program components) and RFP(s). The third party administrator also maintains program control over the contractors.

Advantages of this option

1. This option establishes the VRS program planning and management function so that VRS can be designed and implemented in a manner that offers the highest level of success and the lowest level of risk.
2. This option provides a means to consider, plan and control the many different aspects of the VRS program that should be managed for ongoing success.
3. A well designed research phase will provide the information that is needed for the completion of a final detailed program design and requirements, such as: consumer registration and preferences, call flow and networking, VRS interpreter qualifications, reporting, minimizing opportunities for fraud and waste, interface with 9-1-1 and necessary interpreter training, platform suitability, consumer education, provider cost projections, usage factors and forecasts, contract requirements, etc.
4. If implemented as recommended in section 5, *Number of Providers*, subsection 5.3, this option can also have the benefit of stimulating the development of more interpreters for VRS and community interpreting.

Disadvantages of this option

1. This option takes longer to implement and initially takes more money to manage. (However, a correctly designed and implemented program based on needed information should be less expensive in the long run, i.e., for fully deployed services.)⁶⁸

⁶⁷ See phase 10 *VRS Cost Variables and Forecasts* section 5.4.2 or phase 12 *Final Report* section 7.3.1 for estimated costs; and see phase 12 section 7.1.1 for a potential one-and-a-half year timeline of administrator tasks before VRS begins.

16.3. Recommendation

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.

Suggested general implementation steps associated with this recommendation are:

1. CRTC VRS public proceeding from which the CRTC orders:
 - a. The establishment of the VRS program with general goals, requirements, responsibilities and processes.
 - b. The establishment of a third party VRS program administrative authority within a time certain, e.g., four months.⁶⁹
 - c. A program revenue process, spending and accountability process, and an initial budget.
 - d. A multi-year (three or more) initial VRS research phase and its associated requirements.
 - e. Periodic progress reports by the third party VRS program administrator to the CRTC, including an initial program design, an RFP for the research phase, and ongoing findings.
2. The formation of the third party VRS program administrative entity and its operations:⁷⁰
 - a. Committee charter, membership, operational policies and processes, etc.
 - b. Hiring an Executive Director and staff.
 - c. Acquiring and provisioning a permanent office location.
 - d. Develop public information and a website.
 - e. Development of the first stage of VRS program design for the initial research phase and with consideration for potential fully deployed services.
 - f. Development of the RFP for VRS research phase grants, approval of the RFP by the CRTC, and award of the grants.
 - g. RFP development and procurement (ownership, lease or license) of a VRS platform for use by the research phase (and potentially for fully deployed services), including a consumer registration system.
3. Establishment of the initial VRS research phase, including:
 - a. A minimum of an ASL-English awardee and an LSQ-French awardee, both Canadian college or university interpreter training programs (ITPs).⁷¹

⁶⁸ See phase 10 *VRS Cost Variables and Forecasts* section 5.4.2 or phase 12 *Final Report* section 7.3.1 for estimated costs; and see phase 12 section 7.1.1 for a potential one-and-a-half year timeline of administrator tasks before VRS begins.

⁶⁹ As suggested in section 13, *Program Governance and Management*, especially subsection 13.2.3, *Managed by a third party administrator*.

⁷⁰ See section 13, *Program Governance and Management*, especially subsection 13.2.3, *Managed by a third party administrator*.

⁷¹ The LSQ relay and research center would need to be located in Quebec, preferably in Montreal. Preliminary discussions have been held with the LSQ ITP at L'Université du Québec à Montréal (UQAM) and with the ASL ITP at George Brown College of Toronto. Both ITP representatives were extremely positive about the possibility of a VRS research phase with their organizations.

- b. Appropriate timeline and duration (at least 3 years from grant award dates).
 - c. Potential expansion of the research phase to additional ITPs and interpreter agencies.
 - d. Awardee functions to include:
 - i. Expansion and development of their interpreter training program for application to VRS.
 - ii. Consumer registration services for the research phase participants.
 - iii. Limited operational VRS call centers (limited by hours and interpreter staffing).
 - iv. Use of the VRS platform acquired by the third party administrator.
 - v. Collaboration with other research phase awardees.
 - vi. Collaboration with other ITPs for development information and support.
 - vii. Collaboration with interpreter agencies for qualified interpreters and staffing support as necessary.
 - viii. Collaboration with Deaf advocacy groups for consumer education and outreach.
 - ix. Consumer research phase participant surveys and feedback.
 - x. Consumer technical support in sign language, text and voice.
 - xi. Employment of people who are Deaf.
 - xii. Assessment and recommendations for VRS interpreter qualifications and proficiency standards.
 - xiii. Assessment and recommendations for VRS interpreter working conditions, schedules and productivity.
 - xiv. Coordinated trial development and testing of other related services as requested by the third party administrator, including 9-1-1 interface.⁷²
 - xv. Measurement, forecasts and reporting of operational costs.
 - xvi. Measurement, forecasts and reporting of consumer demand, minutes of use, and other usage and performance factors in a scientific and neutral manner.
 - xvii. Development, assessment and reporting of factors associated with VRS quality of service.⁷³
 - xviii. Regular reporting to the third party administrator.
4. Third party administrator follow up activities:
- a. Monitor and collaboratively contribute to the resolution of issues raised during the research phase.
 - b. With ongoing research phase results, develop the second stage of VRS program design for fully deployed services.
 - c. Obtain CRTC approval of the design.
 - d. Develop an RFP for fully deployed VRS, and obtain CRTC approval of the RFP.
 - e. Conduct the RFP procurement and awards. Obtain CRTC approval of the awards.
 - f. Develop plans for consumer education and outreach, and as appropriate support the plans.⁷⁴
 - g. Coordinate VRS technical solutions with vendors.⁷⁵

⁷² See section 12, *Other Related Services*.

⁷³ See this study's phase 7, *Quality of Service*.

⁷⁴ See section 11, *Education and Outreach*.

⁷⁵ See section 10, *Consumer Technical Support*.

5. Awarded VRS providers offer VRS services as contracted.
6. Third party administrator manages the ongoing VRS program and its contractors, reporting to the CRTC.
7. The CRTC makes changes in the program requirements as necessary.

17. Summary Recommendations

The recommended VRS model for Canada includes the following recommended elements. Please see the recommended text in each section for more descriptive information.

Types of providers

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

Number of providers

- Begin in a research phase with multiple interpreter training programs only, then expand the research phase to include multiple interpreter agencies, and then after the research phase when regular VRS is deployed, allow multiple interpreter training programs, interpreter agencies, and experienced VRS providers to contribute to VRS in Canada.

Location of providers

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

VRS platform and interoperability

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

Provider reimbursement

- Adopt a payment methodology that initially uses a fixed amount for a specific time period, such as an initial research phase. For a full deployment phase, consider paying vendors for each hour of contracted VRS interpreter's time, or paying vendors based on relayed conversation minutes.

Consumer costs

- Consumers are responsible to obtain their own VRS equipment or software, and pay for their broadband access to VRS. There is no additional cost to consumers to use VRS, i.e., outbound calls are free.
- Non-relayed VRS calls are free to consumers.

Consumer technical support

- The providers of each part of the service are responsible to offer their own consumer technical support.

Education and outreach

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

Other related services

- Do not allow VRI except to extend the VRS platform licensing for VRI use by authorized VRS providers in a cost neutral manner.
- 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.
- All of the specialized interpreter functions should be allowed.
- 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.

Program governance and management

- Manage the VRS program by a third party administrator.

Funding

- No special CRTC mandated funding or subsidies for consumer network services.
- No special CRTC mandated funding or subsidies for consumer video devices.
- Provide funds as a percent of telecommunications operations revenue of all TSP as mandated by the CRTC, for VRS provider services, VRS platform, VRS consumer technical support, and VRS program administration.
- As an initial stimulus to increase the capacity and capability of the college and university ITPs, provide a VRS grant program that requires both program expansion and offering of VRS as a service to consumers. After a predefined term, such as three to six years, when the ITPs are self sustaining and robust enough to meet the training needs for interpreters, discontinue the grant program.

Acquisition

- Initially award VRS provider services as part of a competitively bid RFP for grants for, multi-vendor service at a pre-established fixed annual amount for a research phase of VRS services. During the research phase determine if fully deployed VRS services would best be competitively acquired through an adjusted fixed rate, multi-vendor RFP, or by a multi-vendor flexible rate RFP.

Implementation

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

18. Conclusion

VRS is highly feasible. The recommendations presented provide the optimum VRS model for Canada, given the variety of circumstances and issues affecting any potential video relay service. Not every recommended choice of VRS model element will be the choice of every stakeholder. With thoughtful planning it will be possible to establish an affordable and sustainable VRS that offers all Canadians a flexible and quality video relay service.

VRS Feasibility Study Final Report

Mission Consulting

February 24, 2012

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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- James Roots, Executive Director
- Doug Momotiuk, President
- Frank Folino, Vice-President
- Patrick Boudreault, Consultant

Canadian Hearing Society (CHS)

- Gary Malkowski, Special Advisor to the President, Public Affairs
- Jim Hardman, Director, Information Technology

Centre Québécois de la Déficience Auditife (CQDA)

- Monique Therrien, Exécutive Director
- Daniel Péloquin, Treasurer

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- Dean Walker, Executive Director
- Jeff Beatty, OAD Member

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Mission Consulting

- Bill Stobbe
- Kristi Downer
- Kevin O'Donnell
- Bill O'Sullivan
- Judy Viera
- Kristine Kowalewski

Jean-François Leger Professional Corporation

- Jean-François Leger, attorney

Mission Consulting, LLC
555 Capitol Mall, Suite 600
Sacramento, CA 95814 U.S.A.
www.missionconsulting.com
(916) 446-5624
info@missionconsulting.com

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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.

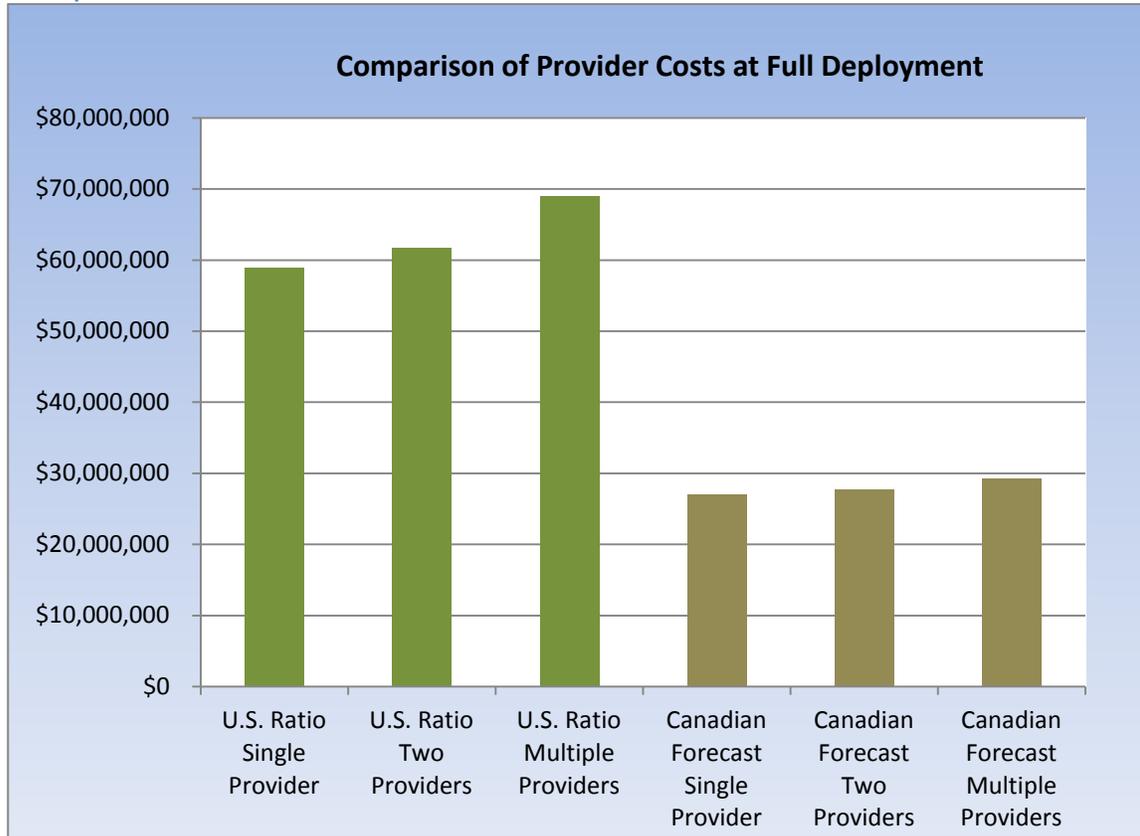
- The costs forecast for Canada are based on modified U.S. usage rates (lower minutes of VRS per person), and independently derived estimated Canadian VRS provider cost reimbursement rates.

- 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

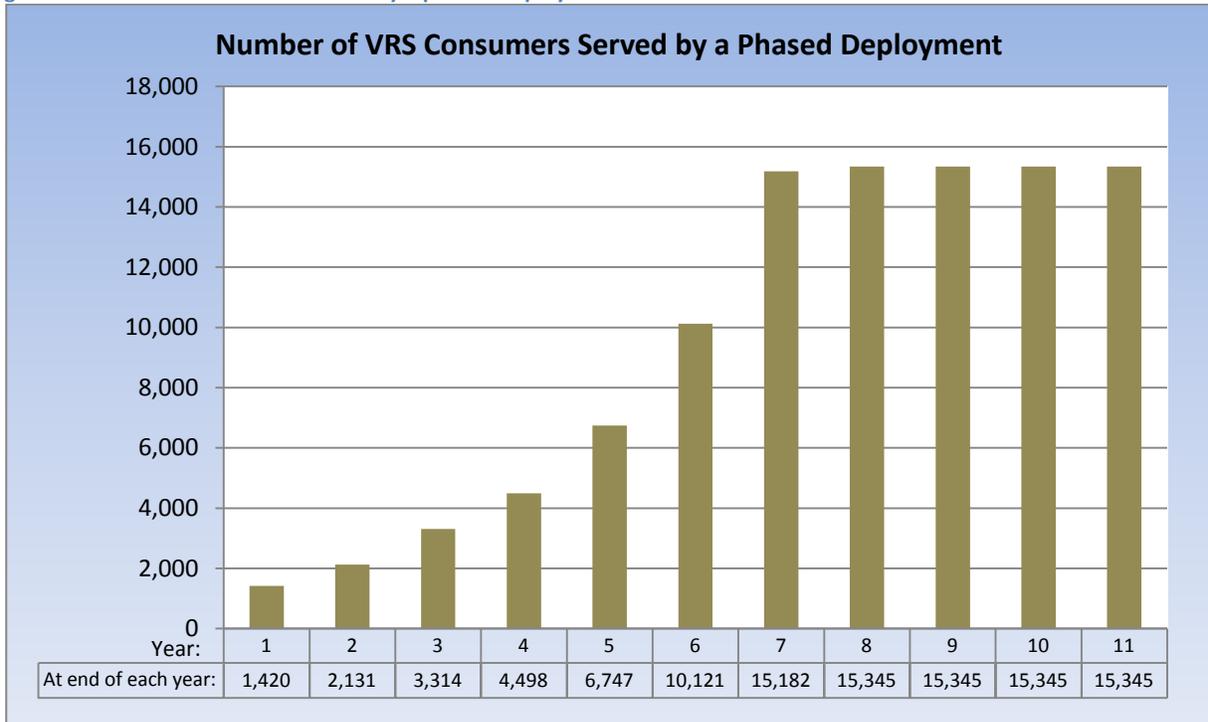
Final Report Considerations

- 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.

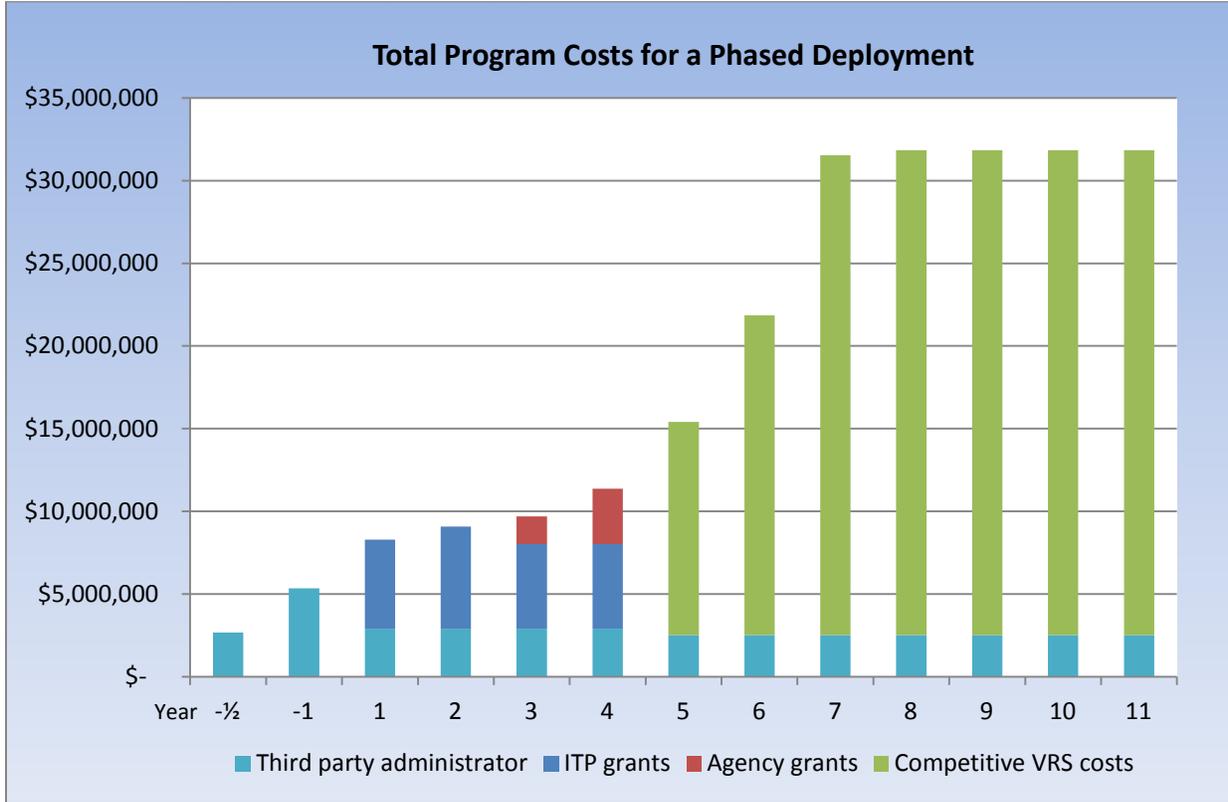
- The recommended two-phased approach is anticipated to facilitate an increase in the capacity of the interpreter training programs, and benefit from existing relationships with professional interpreters, thereby improving the availability of interpreters for VRS and allowing VRS to meet consumer demand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

Figure 2: Number of consumers served by a phased deployment



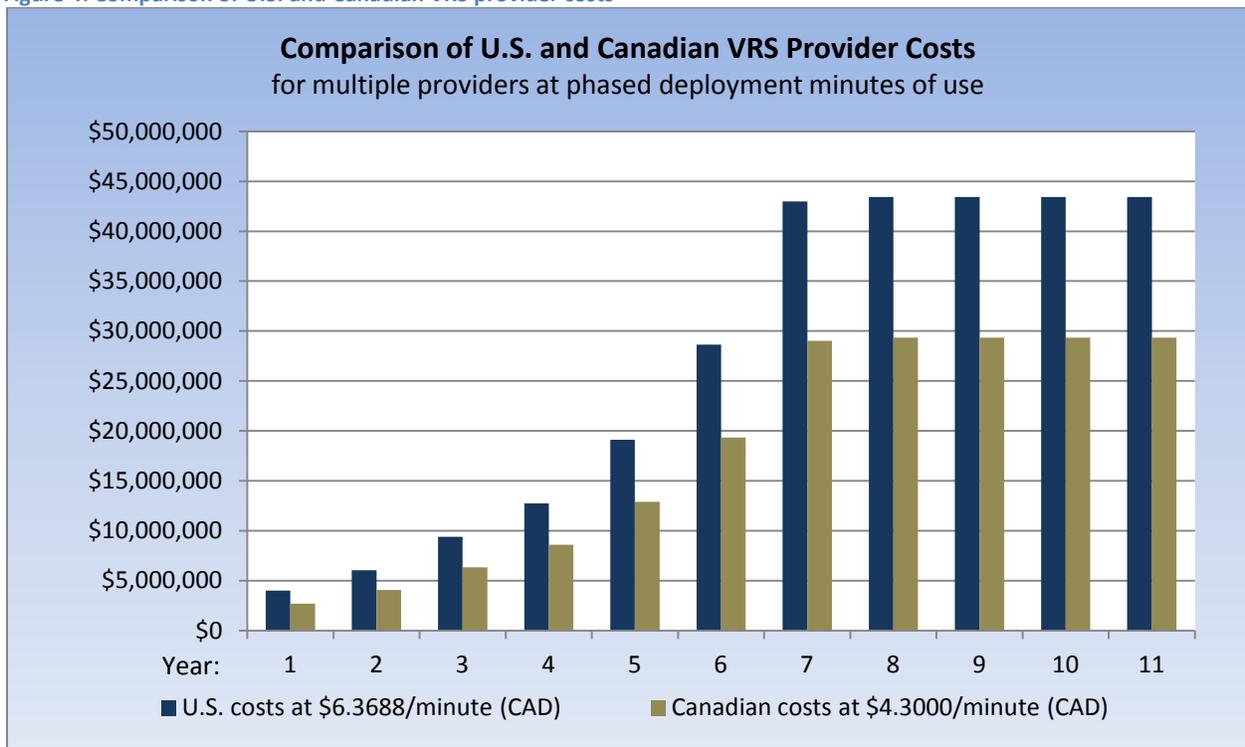
- Because more consumers are being served, the costs for the phased deployment are expected to be initially higher than for a non-phased approach, as shown below in Figure 3.

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.

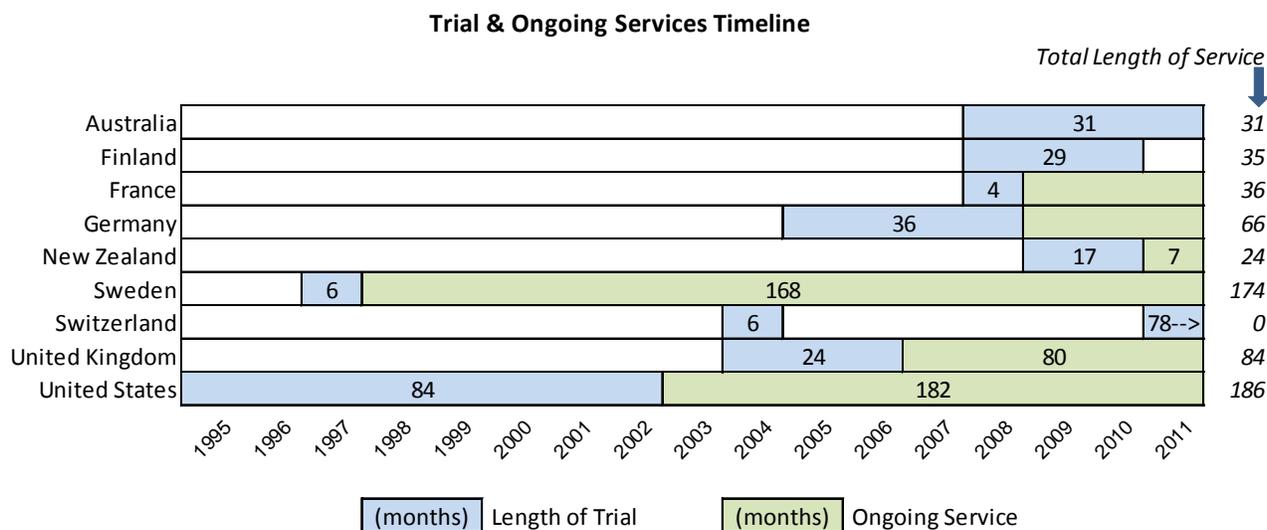
Recently, this has resulted in some U.S. VRS providers having legal problems related to VRS practices, and providers and regulators are very guarded in what they will discuss.³⁴

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.

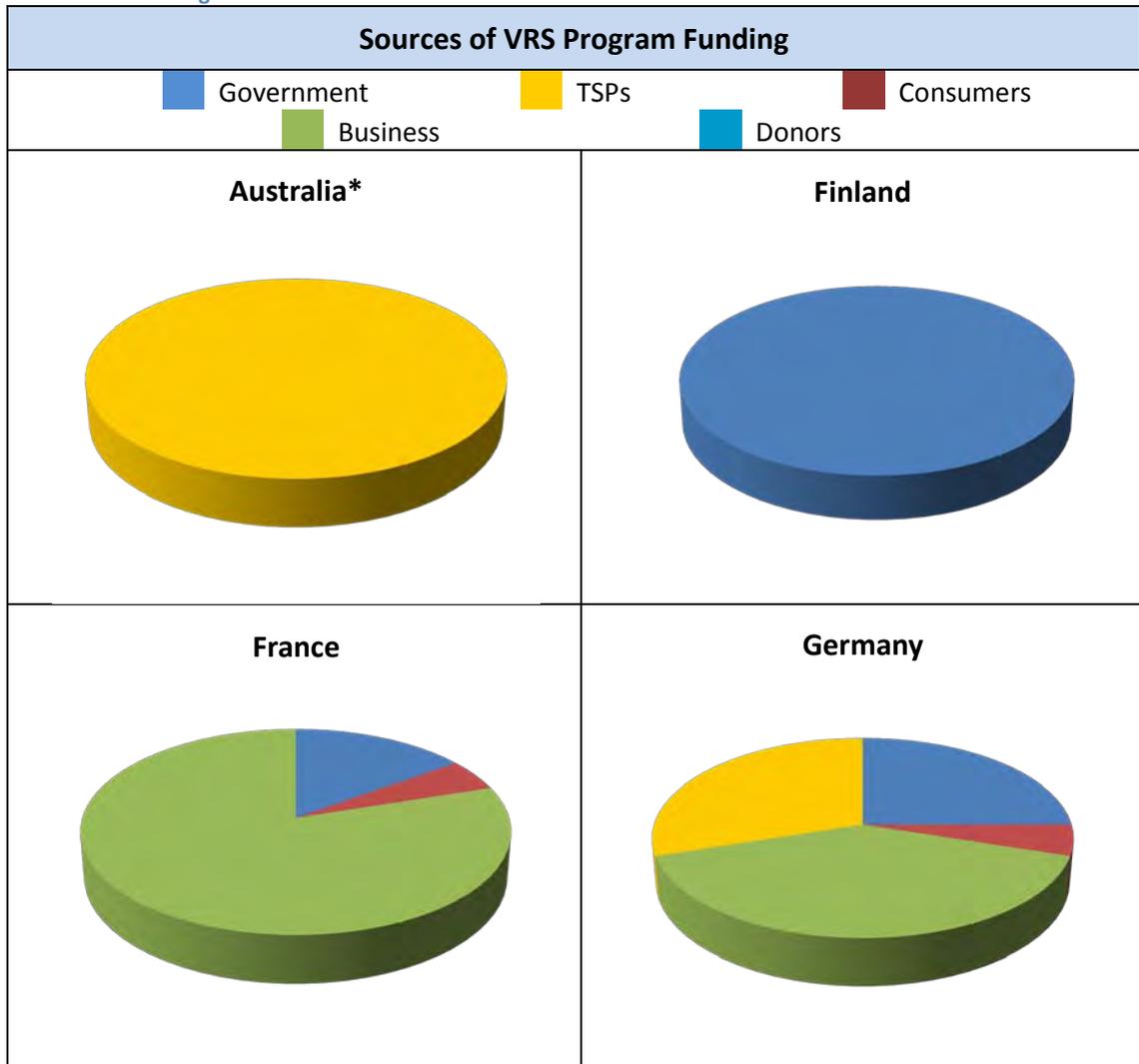
⁴⁴ Total Conversation is “An audiovisual conversation service providing bidirectional symmetric real-time transfer of motion video, text and voice between users in two or more location.” ITU F.703 Recommendation at <http://www.itu.int/rec/T-REC-F.703-200011-I/en>.

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

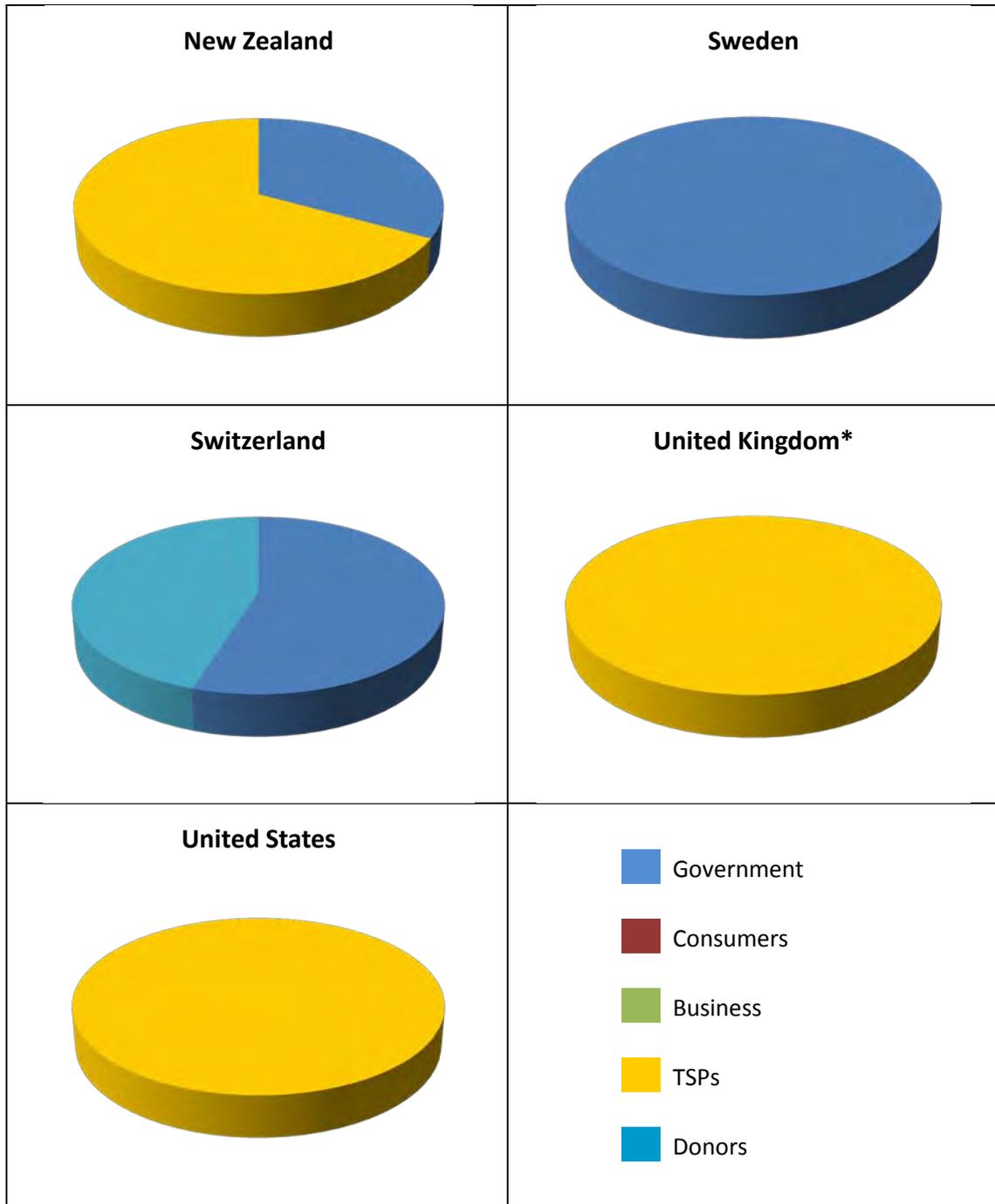
3.2.3. VRS Funding

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

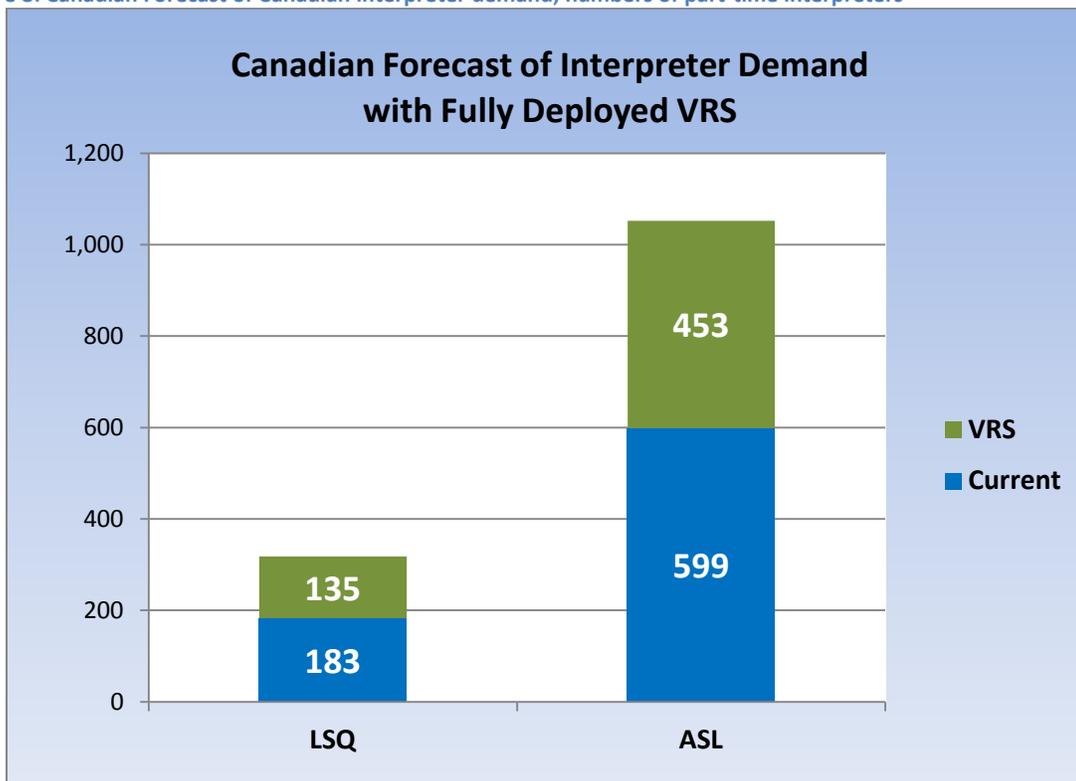
As demonstrated in phase 3, *Consumer Interests and Perspectives*, and phase 6, *Interpreter Considerations*, surveys of consumers, consumer advocacy groups, interpreter agencies all across Canada indicate that there are presently not enough ASL or LSQ interpreters to fulfill the current

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.

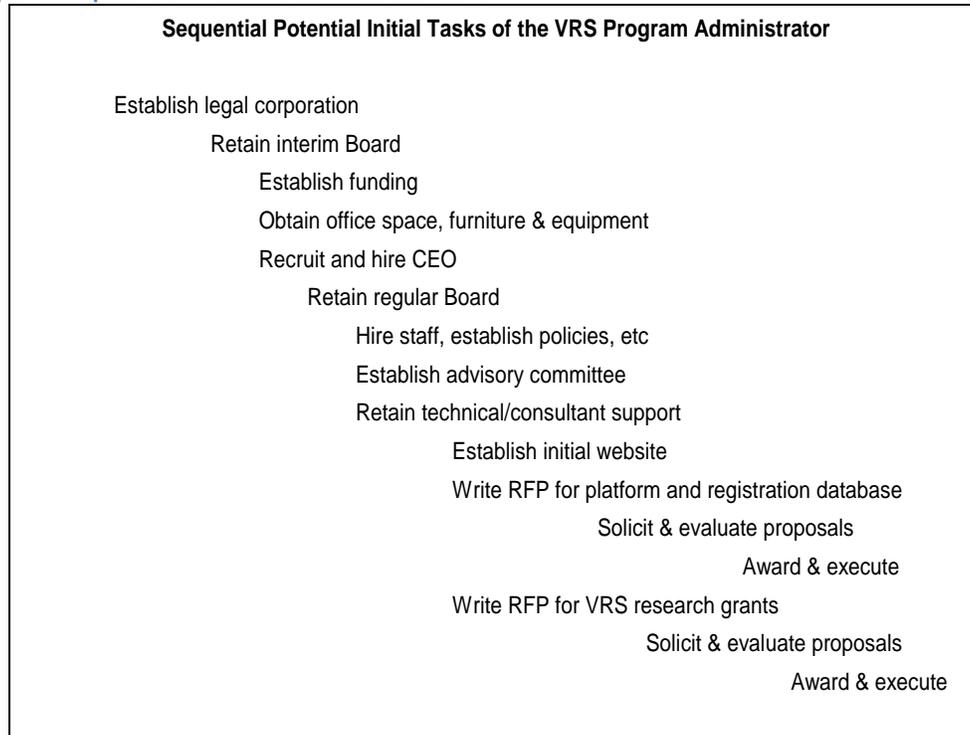
Suggested primary responsibilities of the third party VRS program administrator are listed in section 13.2.3 of phase 11, *Potential Canadian VRS Models*. In summary, these tasks are:

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.

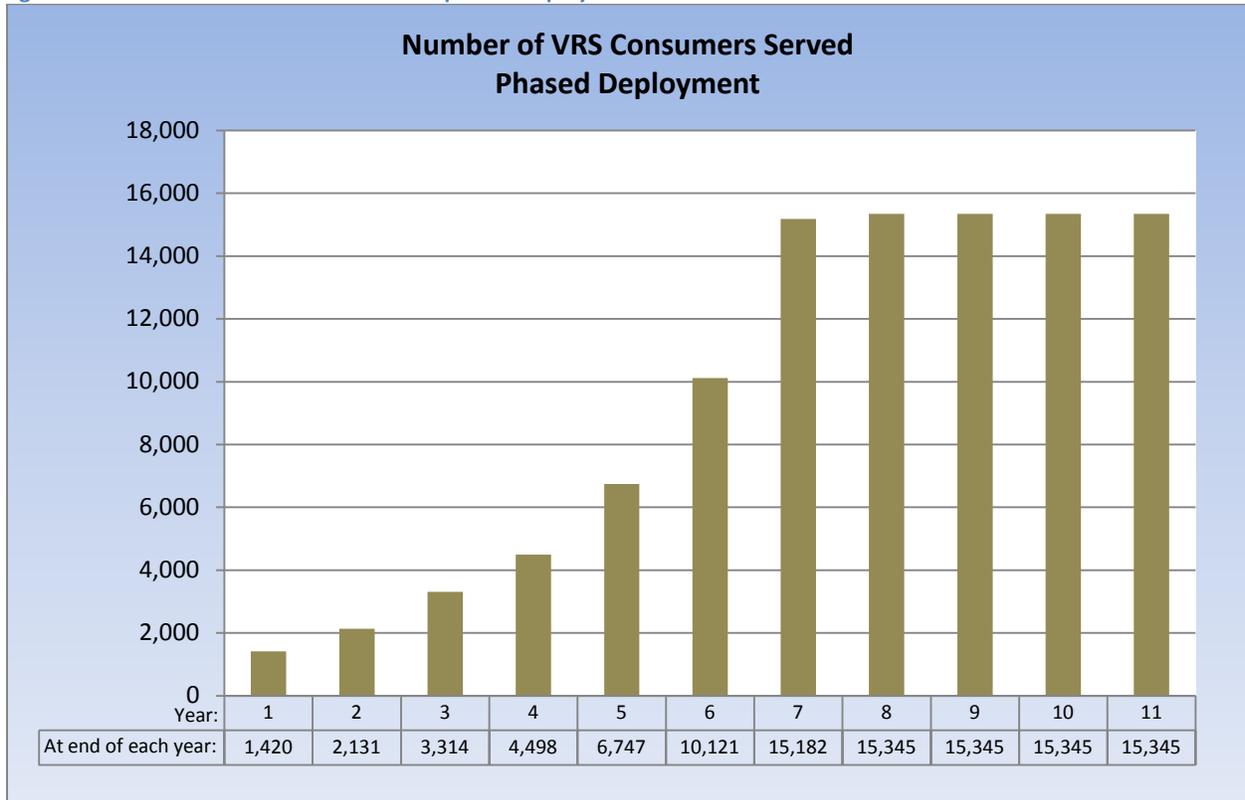
Thus the recommended phased approach, supported by a third party administrator, is forecast to result in the highest number of consumers being initially served by VRS, and for the maximum expected usage to be achieved in the seventh year as shown in Figure 10, below.⁷⁶ In both of the following two figures, 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.

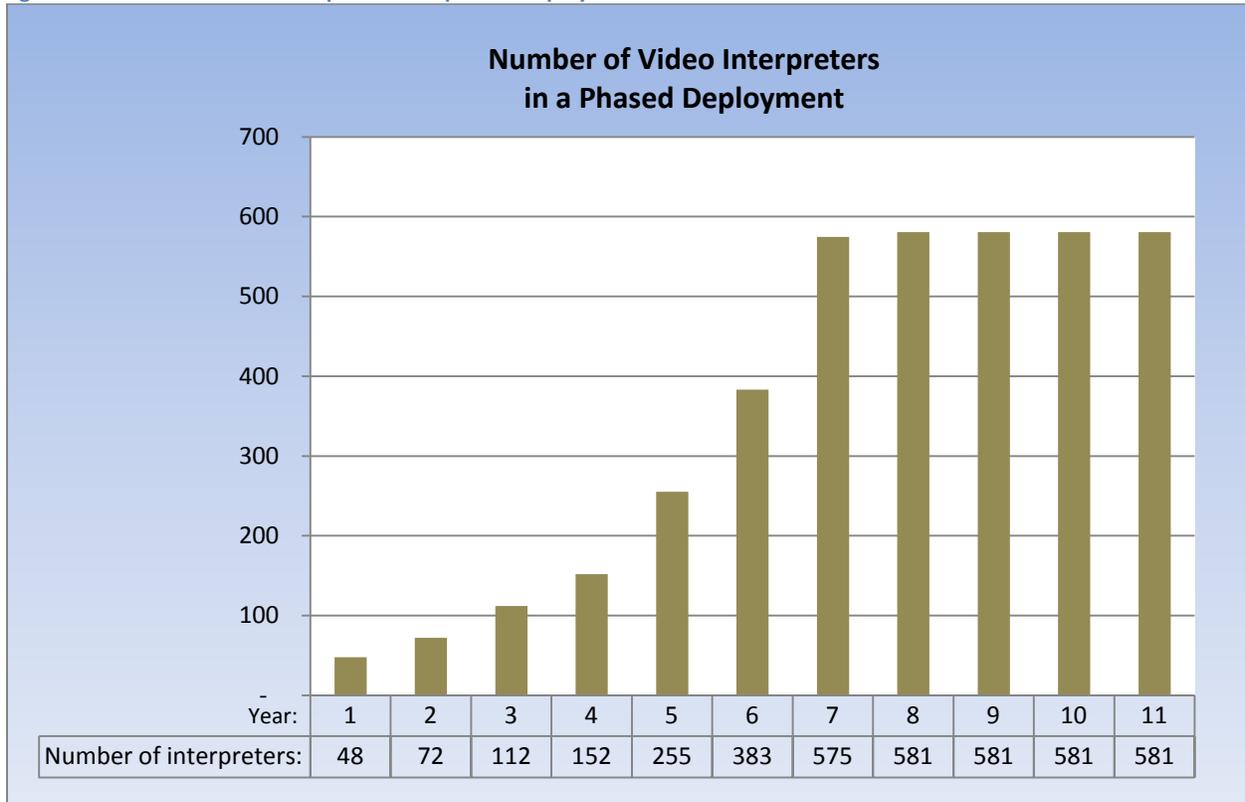
⁷⁶ This is in contrast to the fewer number of consumers served in a non-phased approach as described in this study's phase 9 *Forecasts of VRS User Demand*. The number of users continues to assume an average of 444.5 annual minutes of use per VRS user as described in phase 9.

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.

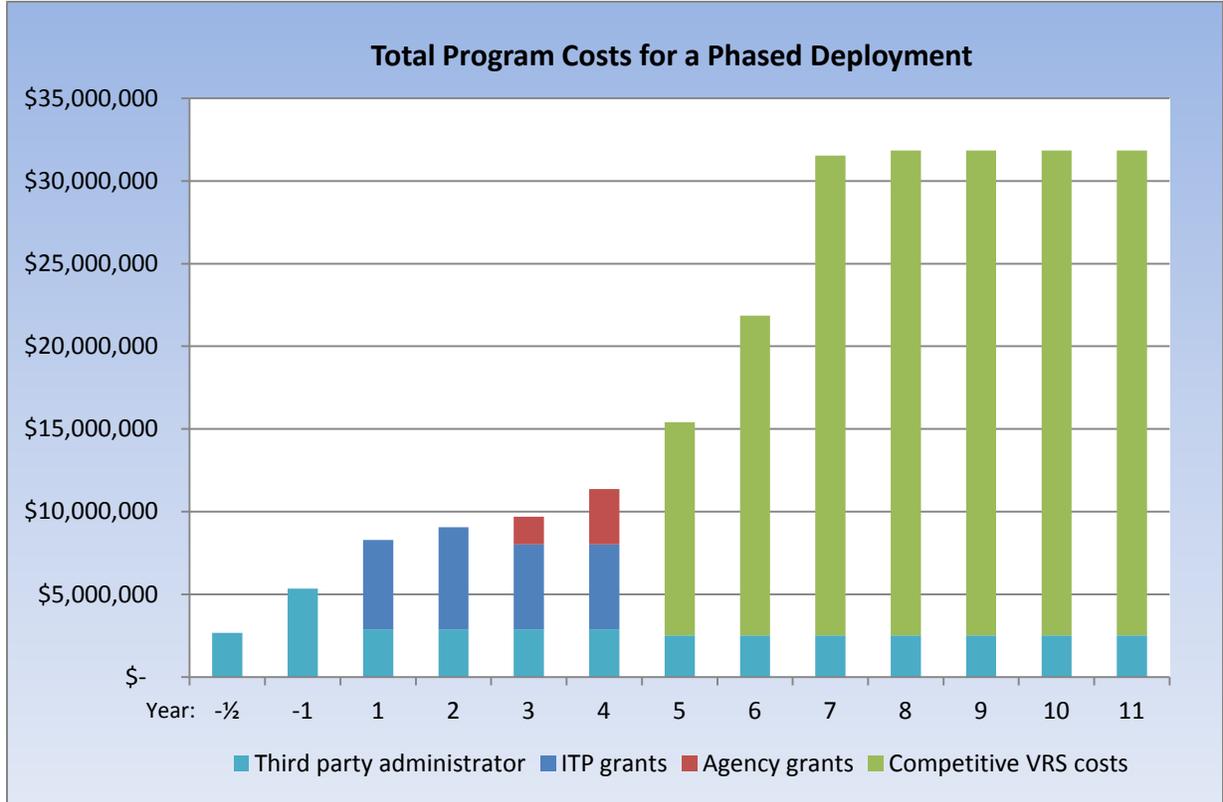
The third party administrator costs are expected to continue throughout the phase 2 full deployment. The administrator’s costs are reduced during this phase by charge backs to the VRS providers for their use of the VRS platform, database and networks as indicated above in Table 9. Actual charge backs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

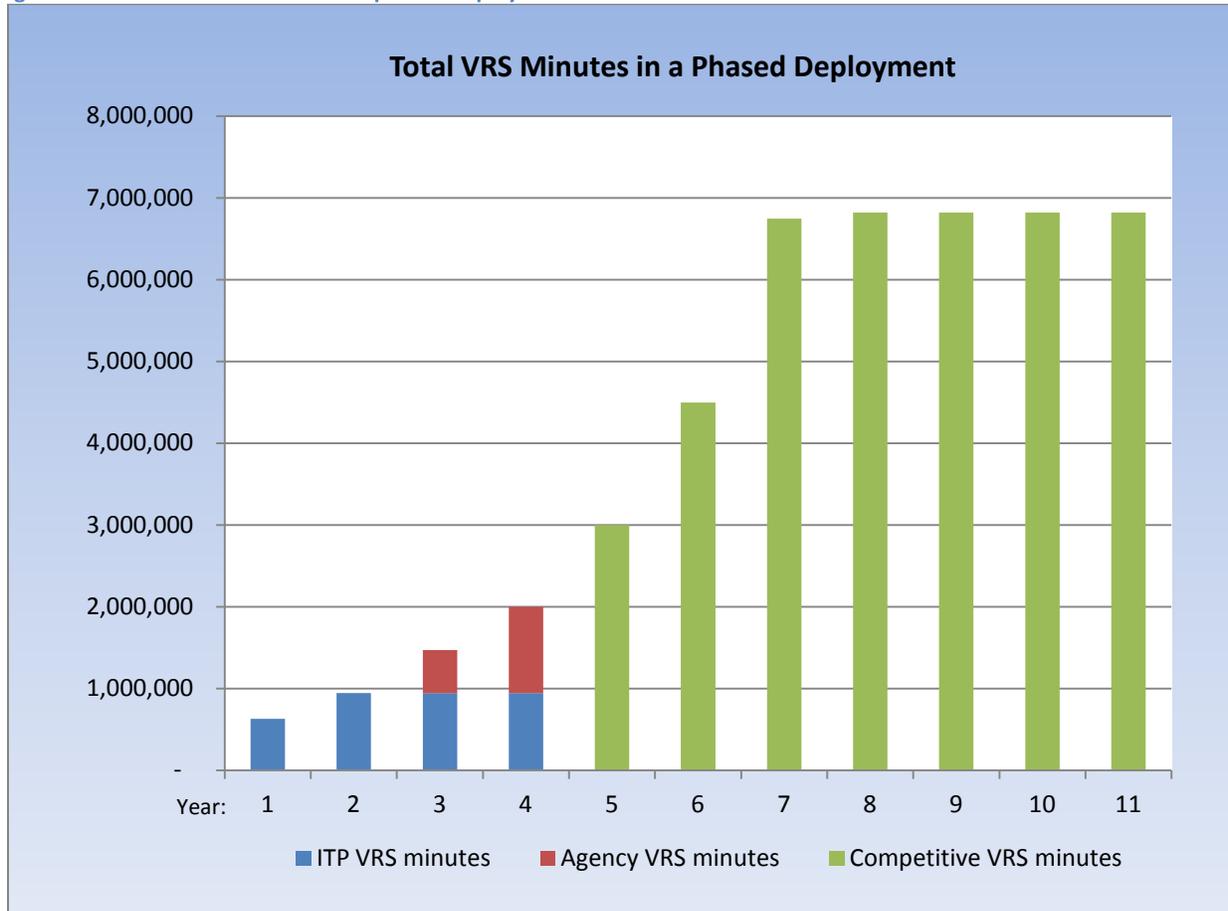
By combining the recommended phase 1 and phase 2 forecasted costs and number of minutes, the combined total costs per year are shown below in Figure 12.

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/>.

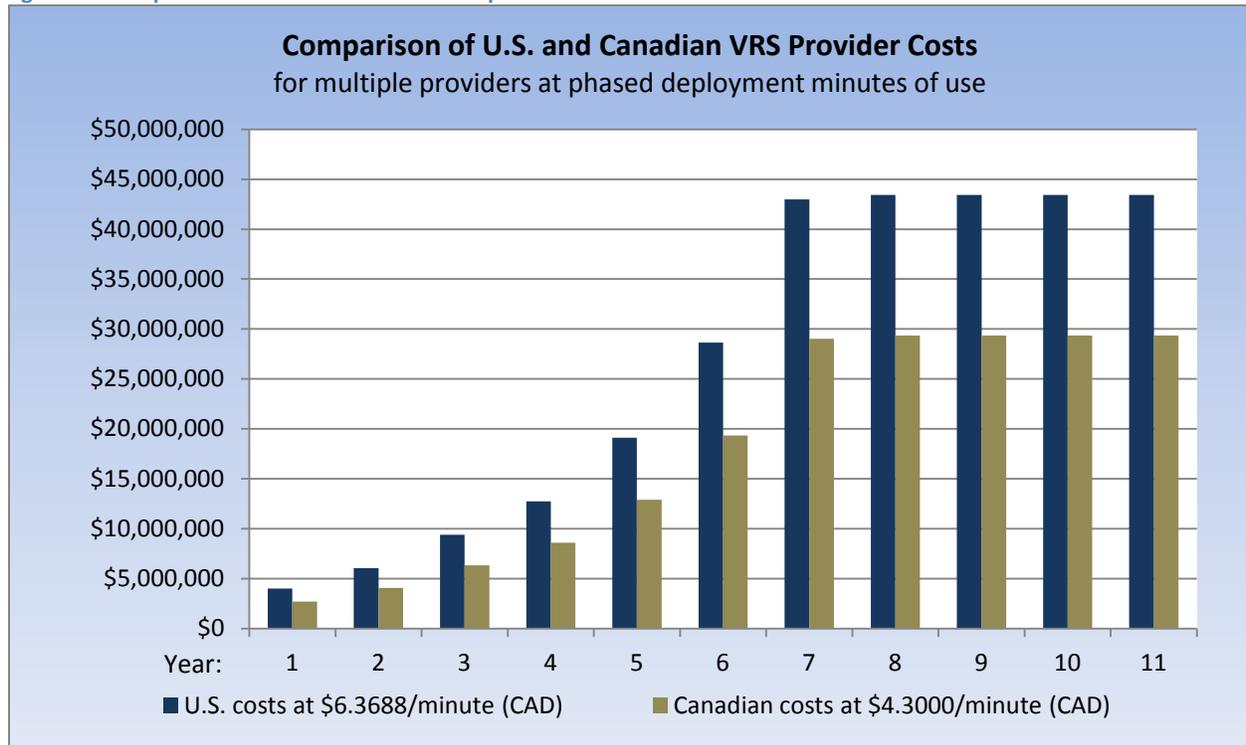
cost and profit analysis.⁹⁷ The resulting estimate of VRS provider costs for Canada, with different monthly tiered thresholds, is as follows:

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.

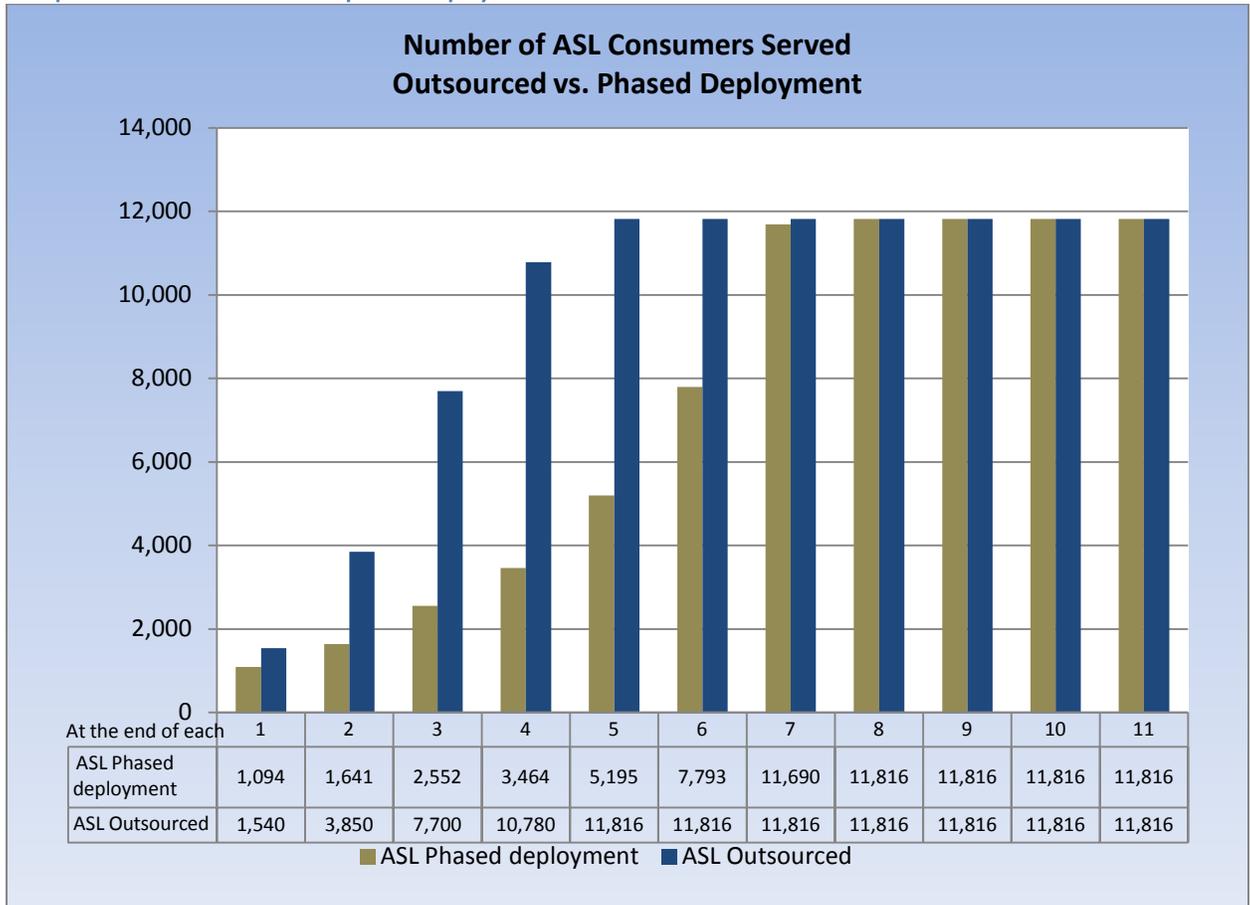
Outsourcing could speed up the availability of VRS to ASL consumers

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.

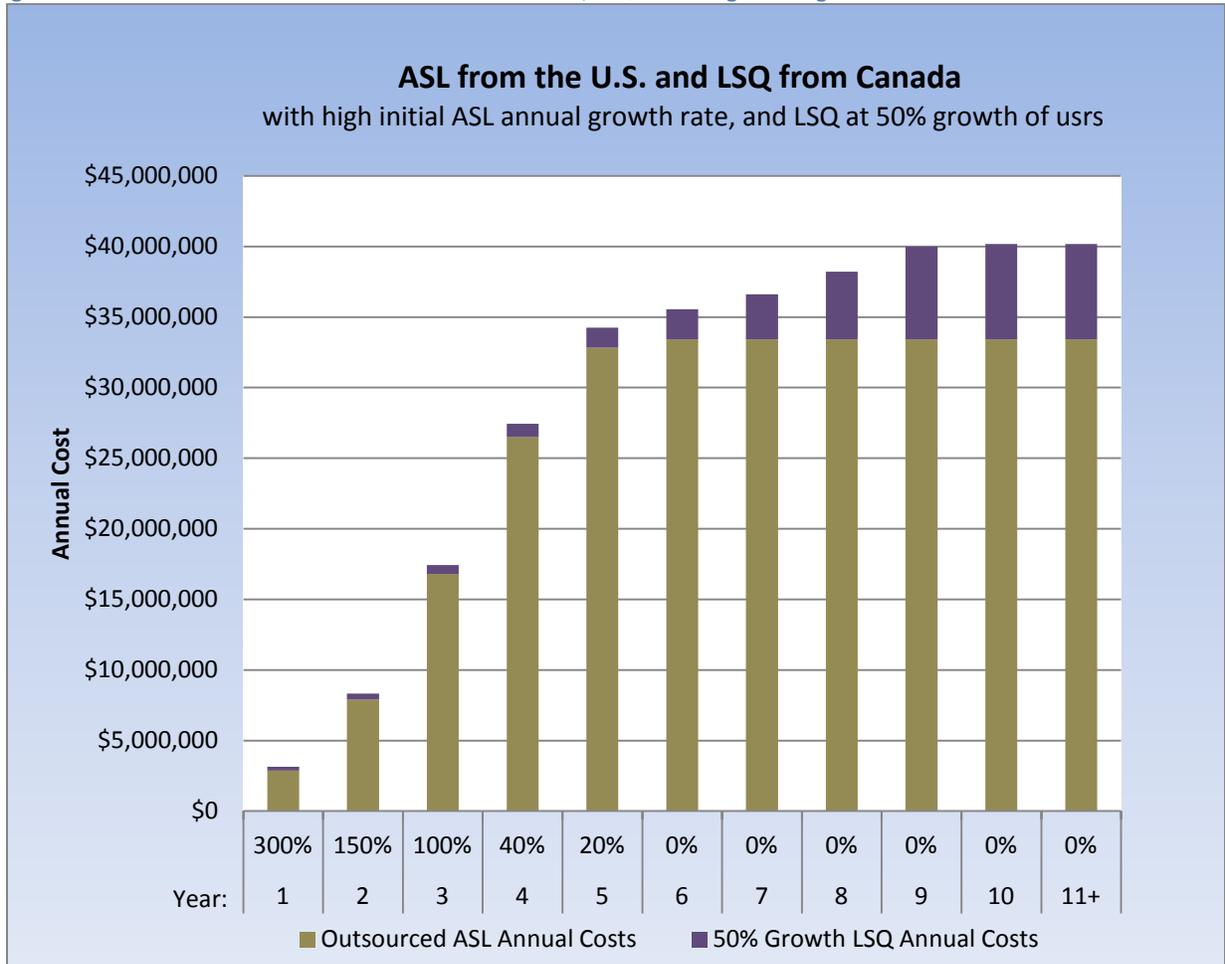
If Canadian ASL VRS were outsourced to the U.S., the primary factor limiting ASL growth or adoption, the shortage of interpreters, would be removed. In this case a more aggressive adoption rate for ASL VRS would be expected. A suggested VRS adoption rate for outsourced ASL and non-outsourced LSQ is shown 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).

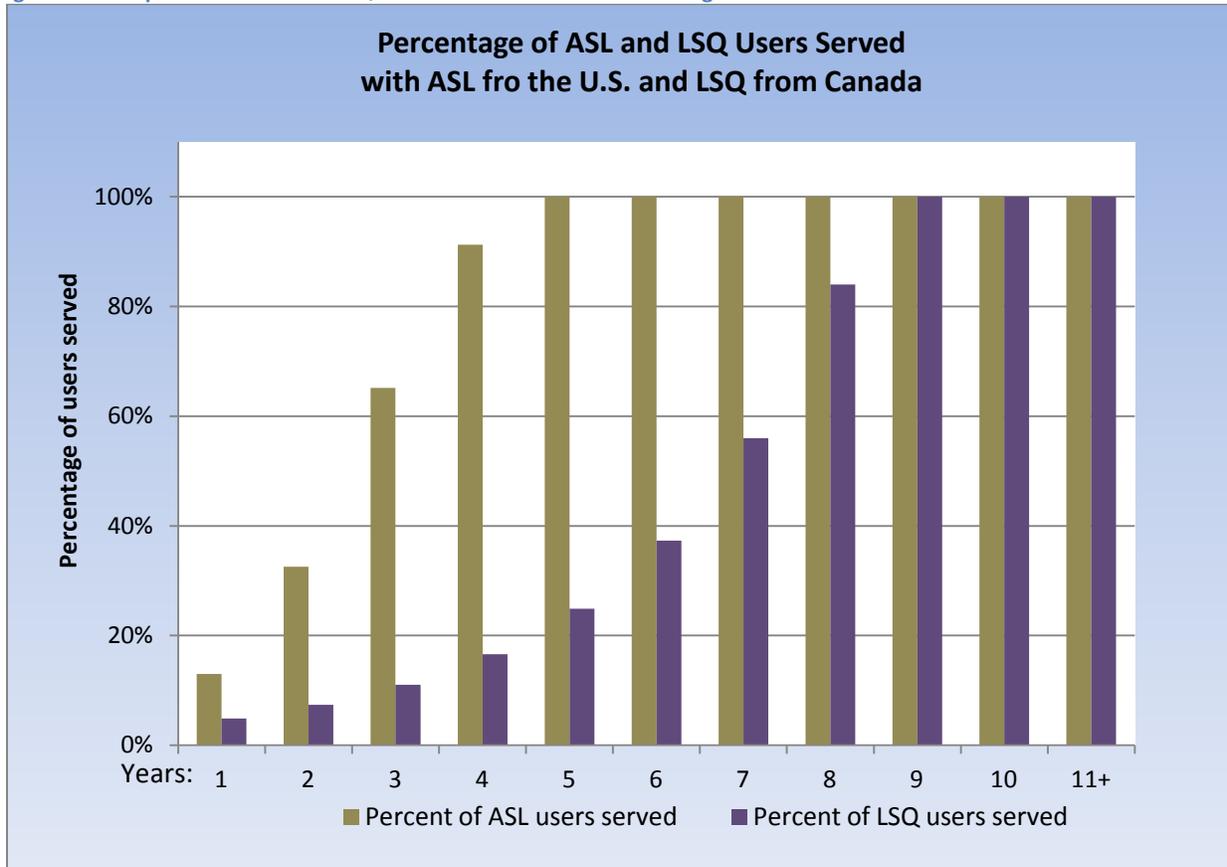
Other aspects of VRS program oversight and management of U.S. providers would also be problematic. Multinational legal systems, regulatory systems and other factors could potentially be significant.

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 Teleqramm - 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)