

Facts at a glance

Project name	South West Alliance of Rural Health Virtual Services Project (VISP)
Project duration	Two years, 2005 to August 2007
Project budget & sources	\$1.89 million from Multimedia Victoria. Total budget: \$2.83 million
Project stakeholders	SWARH, Aurora School for the Deaf and Deafblind Children, South West Healthcare, Western District Health Services, Portland District Health, Colac Area Health, Terang and Mortlake Health services, Timboon & District Health Services, Barwon Health, Casterton Health Service, Moyne Health Service, University of Melbourne, Royal Children's Hospital, Royal Victorian Eye and Ear Hospital, Lavers Hill P-12 School
Main project objectives	To investigate the technical and clinical feasibility of using broadband based videoconferencing to provide virtual health services to regional and isolated communities and clients in the South West region of Victoria
What the project involved	<p>Establishment of four related sub- projects:</p> <p><i>Virtual Reception (VR)</i></p> <p>To enable people living in communities with no GP or community health centre to access initial health advice and assessment as would be available when presenting in person at a local hospital. Videoconferencing technologies are typically installed in local facilities such as schools to link rural or remote communities with health service providers.</p> <p><i>Virtual Assessment (VA)</i></p> <p>To enable smaller hospitals to treat clients with complex or specialist issues locally using video-conferencing. Clinicians in central locations can provide real time and specialist advice to patients suffering serious trauma.</p> <p><i>Virtual Monitoring (VM)</i></p> <p>To enable clinicians to monitor heart rate and vital signs of cardiac patients, to conduct foetal monitoring during labour for midwifery patients and to provide clinical advice and guidance to staff tending these patients at smaller hospitals.</p> <p><i>Virtual Communications for the Deaf (VC)</i></p> <p>To enable Aurora School for the Deaf and Deafblind Children to support the delivery of early intervention and early education programs to children and their families living in regional Victoria</p> <p>Key steps included:</p> <ul style="list-style-type: none">• Securing health sector and technology partners• Purchasing equipment• Training staff in the use of equipment and adapting work practices• Identifying and training users (patients and clinicians) for the trial• Deploying patient monitoring systems and video conferencing equipment in hospitals and health care locations in over 29 towns and 60 locations• Undertaking quantitative and qualitative project evaluation
Main benefits sought	<p>Improved patient care and greater access to services throughout South West Victoria</p> <p>Reduced costs and time associated with provision of clinical services</p> <p>Improved access for remote families to Aurora School staff and services</p>
Biggest challenges	<p>Obtaining "buy-in" from multiple health agencies</p> <p>Generating demand for services from clients</p> <p>Creating incentives for providers to be involved</p> <p>Resolving liability issues</p> <p>Dealing with practical technology access issues</p> <p>Maintaining momentum and awareness after the project concluded</p>
Results and benefits	The VISP project has increased access to a range of health and deaf education services in South West Victorian communities and helped to raise awareness of the ways in which technology can be utilised to reduce travel costs and increase convenience for clinicians, patients, deaf children, their families and educators

Lessons learned

Start with an achievable, small scale and focused pilot to reduce complexity and achieve some early wins

Understand the legacy issues associated with obtaining short-term, project based funding for projects with an infrastructure development component

Drive technology use early in the project lifecycle based on a good understanding of users' needs, preferences, incentives and disincentives

Understand the practical and resource requirements of the project and the physical environment in which the technology is installed

Recognise that some of the barriers to uptake that are hardest to address are behavioural and systemic

Focus on those who are keen to be involved and have an internal champion to take the project forward

About the South West Alliance of Rural Health

The South West Alliance of Rural Health (SWARH) is an alliance of public health agencies in the South West of Victoria, formed in late 1997 to focus on the development of information technology for the region's acute public hospitals and associated health services. The region covers an area of approximately 60,000 square kilometres and extends west from Melbourne to the South Australian border.

Background to the project

Recognising the opportunity to use broadband

In 2000, South West Alliance of Regional Health (SWARH) built a \$9.8 million broadband telecommunications network to service the health care provider needs of South Western Victoria. The network, known as SWARHnet, was co-funded by SWARH and the Victorian Department of Human Services. By 2007, SWARHnet connected hospitals and associated health care facilities in over 140 sites.

The broadband network was originally envisaged as a means of enabling health sector personnel to access video conferencing, telephony, intranet and internet services, principally for administrative purposes. However, in 2005, SWARH recognised an opportunity to improve community health service delivery, specifically through the use of video-conferencing to link patients with health practitioners.

Video-conferencing had been used with some success for health service delivery overseas, and the value of such a service was ably demonstrated when a video-conferencing solution established for administrative purposes between Lismore Community Health Centre and Warnambool Hospital was used to link a cardiologist at the hospital with a Lismore resident who spontaneously suffered a cardiac arrest and required specialist treatment that was not available on location.

The envisaged benefits of video-conferencing for health service delivery were:

- Increased access, quality and scope of services
- Reduced costs for providers (associated with lower requirements to travel to administration meetings and regional communities for service delivery), and
- Reduced travel costs and inconvenience for clients/patients.

To test the benefits of video-conferencing for health service delivery, SWARH developed the concept of the Virtual Services Project (VISP). The overall vision of the VISP project was to improve patient care and service delivery in rural and regional communities in the South West region by providing specialist health services to local communities without requiring either the specialist or the community member to travel.

As there were many potential uses for video-conferencing, it was decided to scope out a number of distinct sub-projects that would test the technology in various settings. Four sub-projects were developed for VISP:

Virtual Reception (VR)

VR is designed to enable people living in communities with no GP or locally accessible community health centre to have 24 hour access to a video-conferencing unit that is permanently connected to the reception of the nearest hospital. VR enables patients in remote locations to receive initial assessment and advice on treatment pathways as though they are attending the hospital.

Virtual Assessment (VA)

VA is designed to link specialist staff in the large and continuously operating (i.e. 24/7) emergency departments of South West Healthcare (Warrnambool) and Barwon Health (Geelong) to staff in over ten smaller hospital emergency departments in the region. Smaller hospitals often only have general nursing staff with limited access to a local GP out of hours. By using VA, smaller hospitals are able to treat clients with complex/specialist issues - such as psychiatric assessment, wound management and occupational therapy needs - locally.

Virtual Monitoring (VM)

The VM sub-project has two components: cardiac monitoring and foetal monitoring. VM is designed to make clinical monitors in regional hospitals and healthcare agencies accessible over the web, so that remote specialists can access and interpret results via a workstation (located in the clinician's home, professional rooms or hospital) to initiate an appropriate clinical response. VM thus enables access to specialist services which would not otherwise be available to regional or remote communities.

Virtual Communications for the Deaf (VC)

VC is designed to enable deaf children and their families living in the South West and Gippsland regions to access classes and early language intervention services run by the Melbourne based Aurora School for the Deaf and Deafblind Children. Video-conferencing facilities are located in either the home of the deaf person or in a community facility.

The VC project was initiated by the Aurora School for the Deaf and Deafblind Children as a result of conversations held with Multimedia Victoria (MMV) staff.



An early photo showing the Aurora School for the Deaf Early Intervention staff conducting a service review with a family in Shepparton

Raising support and funding for the project

Having identified the four sub-projects of VISP, SWARH recognised that additional funding was required to advance the project. Specific activities included refinement of the virtual services model, securing the support of participants, installing video-conferencing and monitoring equipment in community and health services settings, training users, monitoring usage and benefits and ensuring that the existing SWARHnet infrastructure was capable of supporting the video-conferencing at acceptable levels of quality.

SWARH sought \$1.89 million funding from MMV under the Broadband Infrastructure Fund (BIF) to undertake VISP over a two-year period.

Implementing the project

VISP commenced in 2005 and concluded in August 2007. Broadly defined, the first phase of the VISP project concentrated on identifying partners, agreeing objectives, setting up the physical and network infrastructure and training users to utilise video-conferencing for clinical applications. Once this was achieved, the second major phase focused on encouraging and stimulating use by both clients and providers.

Critical to success of VISP was the governance and project management approach adopted by SWARH, designed to support what was a complex technology and change management project incorporating multiple stakeholders, multiple locations, and a diverse range of issues.

A robust governance structure was created, comprising a steering committee to oversee the overall project and to ensure objectives were met, augmented by four advisory committees whose role was to oversee each sub-project, monitor implementation and facilitate open and responsive communications between stakeholders. The steering committee comprised the SWARH CIO and clinical, technical, management and project management representatives derived from numerous participating organisations. The advisory committees comprised key stakeholders involved in each sub-project. Initially, the committees met on a monthly basis.

To ensure effective project management, SWARH appointed a project manager with overall responsibility for delivery of the VISP project. The VISP project manager's work was assisted by four sub-project managers, with day-to-day responsibility for ensuring progress of the sub-projects.

The approach to project implementation was founded on a decision to offer VISP initially to communities that did not have access to any health care services and then expand to other communities that had limited access to health services. The VISP project manager held discussions with organisations in over 40 sites to determine levels of interest, identify equipment and training needs and to discuss the type of incentives that would be required to secure participation. These discussions led to refinement of the project and selection of participants from small and large hospitals, community health centres and other community sites. Relationships and responsibilities were formalised through a Letter of Agreement signed by both SWARH and the participating organisations. The letter specified the procedures, protocols and standards of training and service each provider was required to meet. Once the letter was signed, the project officially commenced.

Throughout the project a strong emphasis was placed on regular stakeholder communications. The VISP project manager communicated regularly with sub-project managers, sub-project managers with participating organisations, and the advisory committees with the steering committee. This integrated approach to communications ensured that stakeholders were aware of milestones, able to meet

expectations and were responsive to project needs. It also assisted in delivery of the project on time and on budget.

An important element of the VISP project involved the identification of training needs, development and distribution of training manuals and delivery of practical onsite and follow-up training. Each project site was encouraged to identify an onsite “expert” – an individual who would manage the video-conferencing facilities and technology.

Once the initial roll out of technology was complete and users were trained, the emphasis of the VR, VA, and VM projects shifted to growing usage. Although SWARH recognised that usage was influenced by awareness and willingness of both clinicians and their clients, a choice was made to target the general public rather than clinicians in the belief that this would be most effective within a limited promotional budget. An integrated media campaign comprising television, newspaper and other print advertising was developed to stimulate client demand for video-conferencing services.

Challenges experienced throughout the project and solutions

SWARH faced a number of challenges over the course of the VISP project which presented barriers to uptake and use of video-conferencing for health service delivery. Key challenges related to:

- Concerns about clinical accountability, liability and privacy
- Established practices and systemic disincentives, and
- Physical and technical infrastructure issues.

Concerns about liability, privacy and clinical accountability

The health sector has well-established protocols and arrangements to manage liability, to ensure privacy of patient health information and to accommodate the need for clinical accountability. In order to participate, hospitals and health practitioners needed to satisfy themselves that existing insurance arrangements would cover these issues when the mode of health service delivery changed from a face-to-face or telephone consultation to a virtual one.

Several hospitals intending to participate in the VISP project had engaged their own legal advice to investigate the liability issues but after over 12 months had not successfully obtained a determination. To address this, SWARH sought advice from the Victorian Managed Insurance Authority (VMIA) – the body which insures hospitals and community health centres - on who was liable when a virtual consultation took place and what effect, if any, virtual consultation would have on clinical liability. SWARH was able to obtain a letter from VMIA indicating that virtual consultations would not increase risks for hospitals or clinicians using video-conferencing as part of the VISP project. This letter was provided to hospitals and helped to secure their participation.

Similarly, there was significant concern about the responsibility of health care providers to protect the privacy of patient information. The concept of transmitting data in real-time over a broadband network and recording and storing consultations raised concerns about whether using video-conferencing would breach privacy obligations.

To address this, SWARH first took steps to reassure participants of the security of data transmission over the SWARHnet network. Virtual consultations leveraged the same security that had been built into the network when it was used solely for administrative purposes. A more problematic issue was the interest in recording consultations for future use. SWARH discouraged this on the basis that it would

introduce a host of issues in relation to linking footage to client records, retention, storage, retrieval and freedom of information requests.

Finally, doctors have a duty of care under both common and statutory law. Under the former, a doctor's duty of care is to take reasonable steps to save or prolong a life or to act in a patient's best interests. Part of this duty of care encompasses the concept of informed consent. To address concerns about informed consent, SWARH instituted a protocol that required participating health service providers to obtain written consent from patients before receiving a virtual consultation. Where the client was unable to give this consent themselves, the system relied on the normal duty of care health professionals have under the law.

Established practices and systemic disincentives

One of the ongoing challenges of the VISP project was encouraging behavioural change in the face of established practices and systemic disincentives. For many technology projects, success is determined by how well users adjust pre-existing behaviour and practices and adapt to change. This was well understood at the outset of the project, and SWARH put considerable time and effort into ensuring that participating health sector organisations and their staff understood that part of their responsibilities included promoting video-conferencing as an alternative to in-person consultations. However, the actual extent of the behavioural change required and the nature of the barriers became more evident as the project progressed.

SWARH launched the VISP project expecting that clinicians would need some incentives to use video-conferencing, but that the cost and convenience would be compelling for both patients and clinicians. SWARH was also encouraged by the fact that health sector organisations in the South West region had already keenly adopted video-conferencing for administrative purposes. Assumptions were challenged over the course of the VISP project, and today, despite conduct of an average of over 600 video-conferencing sessions each month on SWARHnet, only twenty per cent of these are for clinical purposes.

Three main factors were identified as either behavioural or systemically based blockers.

The first was difficulty in raising levels of long-term awareness in the general public of the availability of video-conferencing as a clinical care option. The media campaign instituted as part of the project led to some increase in awareness and usage, but a lack of funds to continue the campaign once the VISP project was completed meant it did not saturate its audience.

Second, the long-established "in person" mode of consultation between patient and clinician has built expectations of what a medical consultation should be - a personal, private and physical encounter, conducted most typically in the rooms of a practitioner known to the patient, or in another clinical setting such as a hospital or community health centre. It was difficult to change these attitudes within the confines of a relatively short-term project.

Third, there is a significant systemic barrier to the uptake of video-conferencing by clinicians, resulting from the current definition of what constitutes a chargeable consultation. Currently, the Medicare Benefits Schedule precludes payments of benefits unless there is an "in person" consultation. Virtual consultations are not "in person", and therefore the definition removes a real incentive - remuneration - which would drive clinicians both to adopt and encourage patients to use video-conferencing technology as an alternative consultation or diagnostic mode. SWARH was able to partially address this systemic disincentive by obtaining agreement from some participating hospitals to pay clinicians using video-conferencing a fee for service equivalent to an "on call" fee. SWARH also lobbied government to introduce

a Medicare item number for virtual consultations and to change the definition of a claimable consultation in the Medicare Act from “in person” to “face-to-face”.

Physical and technical infrastructure limitations

Various difficulties encountered during the technology rollout had an impact on the rate of progress and effectiveness of the sub-projects.

For example, in the VR sub-project, the lack of suitably sized and located rooms in hospitals and community health centres in which virtual consultations could be held meant that in some cases, the video-conferencing technology was not situated to encourage use. Where a small, private tele-health room close to reception would have been ideal, sometimes the only real option was to situate the video-conferencing technology in a meeting or conference room. The fact that these rooms were large, generally not lockable, out of proximity of reception and often booked out for group events reduced both awareness of their existence as well as actual use.

In the VC sub-project, the Aurora School of the Deaf and Deafblind Children encountered difficulties in establishing broadband connections in the homes of some participants in the trial. More time and effort than originally anticipated was spent establishing broadband connections into the home. In one instance, due to the location in which one of the participating families lived, cabling to link the home to the broadband network had to traverse a public park. It took over six months to obtain local council approval before the works could be undertaken. This reduced the duration and potential benefits of the trial for some participants.

Limitations of the broadband network itself also had an impact on the VC project. The Aurora School of the Deaf and Deafblind Children sought to establish video links with deaf people in other parts of the state using the VISP technology. During the project SWARH established a video gateway between the five rural broadband health networks that operate in Victoria. The use of the gateway was dependent on each network modifying its video-conferencing equipment configurations. However, whilst there was in principle agreement, slow implementation meant that a linked up service was not generally available during the project. The alternative was ISDN based connectivity between SWARH and the other networks, however because the quality of video transmissions diminished beyond the SWARHnet coverage area it was not suitable for teaching and learning purposes, making it difficult for the Aurora School to leverage its involvement in SWARH into other Victorian regions.

Main outcomes and benefits of the project

Despite the challenges and limitations of the project, VISP has achieved some significant successes, as indicated by an end-of-project evaluation and ongoing interest from providers in the health and wellbeing sectors.

The VM sub-project has made cardiac monitors in the regional centres of Warnambool, Hamilton, Portland and Colac web-accessible. Remote access to foetal monitoring equipment is also available for patients in Warnambool. An estimated twenty per cent of patients now have their progress remotely monitored at some stage during labour and many obstetricians use this facility from their rooms, homes or within the hospital.

The VA sub-project has enabled smaller hospitals to treat clients with complex and special issues locally. Trials have indicated that the provision of virtual specialist services via video has substantially increased the scope and delivery of services to the community. Twenty-two VA sites across SWARH are operational and numerous agencies have used virtual services to assess clients with psychiatric assessment, wound management and occupational therapy needs. Additionally, the Royal Children’s Hospital has agreed to provide paediatric advice as required to agencies

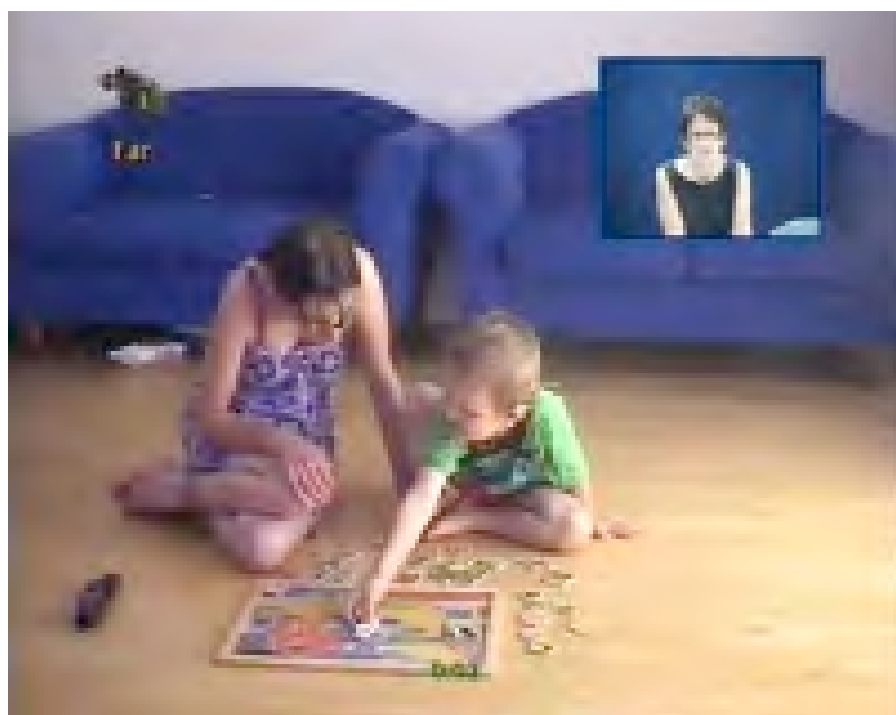
that are not supported by such services, and the Royal Victorian Eye and Ear Hospital (RVEEH) has agreed to provide emergency ophthalmology services to VISP participants.

The VR sub-project has resulted in the installation of video-conferencing facilities in six remote communities whose residents would otherwise need to travel to the nearest hospital to receive initial assessment and treatment advice during business hours. For out-of-hours service, the VR trial has been extended to incorporate testing of a hand-held video device that will enable staff to answer a video call without returning to the fixed video unit.

The VC sub-project has enabled the Aurora School of the Deaf and Deafblind Children to extend its reach to young deaf and deaf-blind children and their families who would otherwise, due to their regional location, be unable to benefit from the early intervention and early education offered by the school.

In addition to these benefits, evaluation of the VISP project demonstrated an estimated cost saving for direct transport alone¹ of between approximately \$300,000 and \$1.2 million.

Overall feedback from the project has been positive. The community has benefited from broadband infrastructure development and improved access to health services, and the project has attracted interest from outside the health sector use as a mechanism to deliver legal advisory and well-being services.



A screen image of an Corio family accessing an Aurora West video conference. These sessions are the most used programs in VC project

¹ i.e. excluding the value of staff, clinician time saved and the potential negative health and well-being impacts of patient transportation

Lessons learned

With the VISP project now complete, SWARH has learned some valuable lessons that may be useful to other organisations intending to undertake broadband technology assisted projects.

Planning the project

1. *Start with an achievable, small scale and focused pilot to reduce complexity and achieve some early wins*

The sheer size of the VISP project and the complexity involved in managing four sub-projects, a range of stakeholders from large hospitals to small rural community health centres and the practicalities of rolling out technology and training across geographically diverse locations made the VISP project ambitious from the beginning. Although VISP concluded successfully, in retrospect SWARH's experience suggests that the project may have been more easily managed if fewer providers were involved at the outset. Similarly, an initial pilot approach that reduced the scope and the number of services on offer may have been a more practical means of establishing a model, identifying and resolving implementation issues and proving effectiveness before transferring that knowledge to other services, providers and geographic locations. A simpler and more focused approach would also have the added advantage of delivering some early wins to build profile and enthusiasm amongst clinicians, patients and other critical stakeholders.

Financing the project and working with funding providers

2. *Understand the legacy issues associated with obtaining short-term, project based funding for projects with an infrastructure development component*

Most technology projects that use technological infrastructure for service delivery create legacy issues at the end of the project, mainly associated with costs and resources required to maintain and upgrade services and equipment. Making provisions for the future before the project concludes will help to ensure maximum value is derived from the initial investment.

Managing and implementing the project

3. *Drive technology use early in the project lifecycle based on a good understanding of users' needs, preferences, incentives and disincentives*

Through the VISP project, SWARH learned that even when it appears that there is a compelling reason to use technology – in this instance to save time and reduce costs and inconvenience associated with travel to obtain medical advice – uptake cannot be assumed. There is a need to actively drive and encourage technology use from the outset of a project – in effect, to create demand. Understanding the needs, incentives and disincentives of both patients and clinicians from an early stage and allocating time and budget to promoting awareness and use is critical to a project's success. SWARH's experience suggests that a concurrent focus on community demand as well as provider ability to deliver is a useful approach. Ultimately, the community can make or break technical health service delivery initiatives.

It also suggests that there may be value in establishing a health service delivery project on a demand driven model, informed through market research. This would enable early identification of reservations and perceptions of virtual services and would determine the scope and targets of a marketing campaign designed to drive use.

4. *Understand the practical and resource requirements of the project and the physical environment in which the technology is installed*

Although video-conferencing is a proven technology, its use as a clinical tool is relatively new. SWARH uncovered many issues surrounding the location and installation of the technology that impacted upon the project. Addressing these added extra time to project rollout and imposed resource requirements on participating organisations. Finding a suitable room in which a video-conferencing unit could be installed was one example. The room needs to be small, private, available and conducive to a medical consultation. Many hospitals have no ideal facilities and so compromises were made. A mechanism for users to book the facility is another requirement. People seeking to book a video-conferencing session need to know who to call. Systems must be implemented to manage room bookings. A person trained in how to use the technology is also required to show the patient what to do to initiate a video-conferencing session. In other parts of the VISP project establishing linkages into the SWARHnet broadband network was more cumbersome, time-consuming and costly than expected.

5. Recognise that some of the barriers to uptake which are hardest to address are behavioural and systemic

The VISP project demonstrated that people have a cultural attachment and loyalty to their local GP and the way health services have traditionally been delivered. Changing this attitude and maximizing the opportunity created through the BIF funding program requires time, education and an ongoing promotional campaign beyond the conclusion of a project.

Systemic issues such as the definitional constraints in the Medicare Benefits Schedule also present significant barriers to uptake and have the capacity to considerably reduce the benefits of new technologies for improved public health service delivery.

Working with stakeholders

6. Focus on those who are keen to be involved and have an internal champion to take the project forward

Securing the support of stakeholders is vital. SWARH found hospitals that had incorporated the project into their strategic plans, had an internal champion, and were willing to actively promote the service to the community were often the most committed. High levels of commitment were also frequent in the more remote communities, where limited access to health services is a well-recognised issue amongst locals and one which remote delivery can address.