

BRIDGING THE DISTANCE

Implementing Videoconferencing in Wisconsin

2005

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Prepared by: The Planning & Policy Advisory Committee Videoconferencing Subcommittee

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Foreword

The use of videoconferencing in both the public and private sectors continues to increase. Numerous organizations are taking advantage of the technology to reduce travel expenses, increase training opportunities, and save resources.

The Wisconsin Court System began to explore possible uses of video conferencing in the early 1990's. In 1998, the Supreme Court's Planning and Policy Advisory Committee (PPAC) and the Wisconsin Counties Association jointly formed a statewide videoconferencing subcommittee. The committee's charge was to develop a "standards of good practice" manual to help jurisdictions understand and implement videoconferencing technology. *Bridging the Distance* is a result of that committee's work. It contains general information about videoconferencing technology, suggestions for how it can be used and who to involve in planning. It also includes recommended technology guidelines and discusses specific design issues associated with implementing this technology in the justice system.

In 2004, PPAC recognized the need to update *Bridging the Distance* to reflect technological advancements, as well as the Wisconsin court system's experience with videoconferencing. As the original 1999 version of the manual indicated, "the world of technology is constantly advancing. While every attempt was made to ensure that the information contained in this manual is current, technology specifications and prices are ever changing."

Therefore, PPAC reactivated the videoconferencing subcommittee (with new membership) to update *Bridging the Distance*, as well as to explore ways to encourage greater courtroom use of the technology while ensuring the rights of litigants. This revised manual is a result of the subcommittee's efforts. I wish to thank all of the subcommittee members for their hard work during the past year. I also want to recognize the invaluable contributions of Jamie Poindexter with the University of Wisconsin Extension Office in Madison. Ms. Poindexter led a subgroup to review and update all of the technical information contained in the manual, an important task that went beyond the expertise of most subcommittee members.

I hope you find this revised manual helpful in your efforts to implement videoconferencing in your jurisdiction.

Sincerely,

Judge W.M. McMonigal
PPAC Vice-Chairman and Videoconferencing Subcommittee Chairman

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Section I. What is videoconferencing?

Videoconferencing is an interactive technology that sends video, voice, and data signals over a transmission circuit so that two or more individuals or groups can communicate with each other simultaneously using video monitors. As an interactive medium, video-conferencing offers people the ability to share resources and information, cooperatively solve problems, and work at a distance. In state and local government, videoconferencing has the potential to make better use of taxpayer resources by:

- Reducing travel requirements for all courtroom participants,
- Saving prisoner and patient transportation costs,
- Improving courthouse security,
- Reducing the cost of health care to prisoners and patients through telemedicine,
- Reducing logistical barriers to conducting meetings,
- Providing access to additional training/educational opportunities, and
- Increasing efficiency of legal proceedings

Types of Systems

How a videoconferencing system is designed and installed will depend on the applications requirements, level and frequency of use, and available funding in the jurisdiction. The most common system design classifications are as follows:

Custom integration or Site-built rooms: Site-built rooms are permanent facilities equipped with fixed systems to support videoconferencing. Equipment is often built into walls or tabletops. The number of participants accommodated by this design is usually determined by room size and layout. This type of system is most applicable for a courtroom setting.

Stand-Alone Units: Stand-alone units are usually stationary, cabinet-mounted systems containing most of the equipment required for videoconferencing. Stand-alone units usually provide the same high-visibility applications and accommodate the same number of participants as custom-built rooms at less cost, but offer limited mobility.

Portable/Rollabout Units: Rollabouts are self-contained systems configured on carts with room for storing peripherals. This system design provides transportability for use in multiple rooms, and convenience. However, their use in courtrooms is limited and not recommended. Portable units are more appropriate, for example, for jail-to-jail communication.

Desktop/Tabletop or Set-top units: A tabletop or set-top unit is a smaller version of a stand-alone system intended for use at a desk or in small meeting areas for one to three people. Although they are relatively small, most desktop systems are not designed to be transported.

Implementation Considerations

Jurisdictions investigating video technology must begin by reviewing possible applications of the technology. Because of the wide range of system options and uses available, a thorough assessment of a jurisdiction's present and future needs must be conducted. Some of the questions that should be asked include:

- What is the intended application or use?
- How many different sites must communicate?
- How many people (groups of people, individuals) will appear on camera at each site?
- Does each video participant need to see the other participants?
- Does a video participant at a remote location need to see and hear everyone at the other site including non-participants?
- Do documents need to be transmitted between sites?
- Is a mechanism needed for confidential communication between sites?
- How frequently is the equipment to be used?
- What funding is available for one-time equipment purchases?
- What funding is available for recurring expenses?
- What future uses can be identified?
- What communication services do the local carriers offer?

Basic Definitions

This manual uses a number of technical terms to describe videoconferencing technology. Refer to the Glossary (page 30) for detailed definitions of many of these words and phrases. Following are definitions of some frequently used terms as they relate to videoconferencing:

Analog signals - Audio/video signals between cameras and TV monitors and the videoconferencing codec.

Bandwidth - A measure of spectrum (frequency) use or capacity. For instance, a voice transmission by telephone requires a bandwidth of about 3,000 cycles per second (3KHz). A television channel occupies a bandwidth of 6 million cycles per second (6 MHz) in terrestrial systems. In videoconference-based systems a larger bandwidth of 17.5 to 72 MHz is used to spread or “dither” the television signal in order to prevent interference.

Bridge – In videoconferencing vernacular, a device that connects conference sites so that they can communicate simultaneously. Bridges are often called MCU’s—multipoint conferencing units. The term bridge can also be used in audio conferencing to refer to a device that connects multiple (more than two) voice calls so that all participants can hear and be heard.

Codec (Coder-Decoder) - A device that converts an analog signal into a digital signal for transmission and converts it back to analog for display at the remote site. Codecs used for videoconferencing compress the analog video signal, allowing it to be transmitted less expensively.

Digital signals - Analog information that has been converted into bits of data for transmission through a videoconference.

H.32x standards

International Telecommunications Union H-series umbrella standards that govern communications between codecs, supporting real-time conversational two-way video and audio. Extensions allow multipoint operation, encryption, and remote control.

H.320 standard: Standard for videoconferencing over ISDN and fractional T1 lines. These are typically provided by telephone companies.

H. 323 standard: Standard for videoconferencing over networks such as the Internet, Internet2 and BadgerNet2.

ISDN (Integrated Services Digital Network) - A digital telephone network sometimes used by videoconferencing systems that support the H.320 standard.

Ethernet (Internet, TCP/IP, IP) – Digital network used by videoconferencing systems that support the H.323 standard.

T1 lines - The transmission bit rate of 1.544 millions bits per second. This is also equivalent to the ISDN Primary Rate Interface for the U.S. The European T1 or E1 transmission rate is 2.048 million bits per second.

Section II. How can we use videoconferencing?

To help users and policy makers envision both immediate and future applications, this section provides an overview of the potential uses of videoconferencing. The described applications should not be considered all inclusive, nor should the uses identified be perceived as appropriate for every county. Each jurisdiction's planning committee should determine appropriate uses, which do not violate Wisconsin Statutes, Supreme Court Rules, or case law presently governing videoconferencing of certain proceedings.

Planning for potential uses of videoconferencing in the justice system involves more than technical decisions. This is summarized in U.S. v. Nippon Piper Industries CO. LTD (17 F. Supp.2nd 38, 42 (D. Mass 1998)), which noted that:

[I]n the most important affairs of life, people approach each other in person, and television is no substitute for direct personal contact and hence.... we should be cautious about technology lest we begin to practice "virtual justice," since "[m]uch of the interaction of the courtroom is missing."

Accordingly, in planning the use of videoconferencing, it is important to consider its impact on the dignity and fairness of court proceedings and the functioning of the court and the participants in the court proceedings.

Videoconferencing can be used for court proceedings, training and education, committee meetings, and public outreach, as described below:

Court Uses

State statutes specifically authorize certain court proceedings to be conducted by videoconferencing ("live audio visual means"); while other proceedings may be conducted by videoconferencing upon stipulation of all parties and the court.

Civil proceedings: Some motions, oral argument, non-evidentiary court hearings, and pretrial matters might be conducted through videoconferencing.

Wis. Stat. § 807.13 (2) provides that in civil actions and proceedings, including those under Chapters 48

(Children's Code), 51 (Mental Health Act), 55 (Protective Service System), and 880 (Guardians and Wards), the court may under certain circumstances admit oral testimony by telephone or live audio/visual means, subject to cross examination.

Criminal proceedings: Certain criminal proceedings according to Wis. Stat. § 967.08 may be conducted by telephone or live audio/visual means unless good cause to the contrary is shown. These include the following:

- initial appearance under § 970.01,
- waiver of preliminary examination under § 970.03, competency hearing under § 971.14 (4) or jury trial under § 972.02 (1),
- motions for extension of time under § 970.03 (2), 971.10 or other statutes,
- arraignment under § 971.05, if the defendant intends to plead not guilty or to refuse to plead,
- setting, review, and modification of bail and other conditions of release under Ch. 969,
- motions for severance under § 971.12 (3) or consolidation under § 971.12 (4),
- motions for testing of physical evidence under § 971.23 (5) or for protective orders under § 971.23 (6),
- motions under § 971.31 directed to the sufficiency of the complaint or the affidavits supporting the issuance of a warrant for arrest or search,
- motions in limine, including those under § 972.11 (2)(b),
- motions to postpone, including those under § 971.29, and
- providing victims who are incarcerated to attend court proceedings under § 950.04 (1v)(b).

Language interpretation: The court may permit an interpreter to act in any civil or criminal proceeding other than trial by telephone or live audio/visual means, according to § 807.14 and § 967.09.

Cross-jurisdictional hearings: Judges often travel to other counties to conduct court proceedings. Videoconferencing between jurisdictions would allow

judges to conduct some proceedings from their home counties, reducing travel costs and time spent outside their jurisdictions.

Prisoner litigation: As stated in § 807.04 (2) (1997 Wisconsin Act 133), all hearings in which oral testimony is to be presented in an action or special proceeding commenced by a prisoner, as defined in § 801.02 (7) (a) 2, shall be conducted by telephone, interactive audio/video transmission, or other live interactive communication without removing the prisoner from the facility or institution if the prisoner's participation is required or permitted and if the official having custody of the prisoner agrees. The court in which the action or special proceeding is commenced shall, when feasible, also allow counsel, witnesses, and other necessary persons to participate in the hearing by telephone, interactive video and audio transmission, or other live inter-active communication. The procedures and policies under § 807.13 shall apply to the extent feasible.

Training and Educational Uses

Training for staff: Training sessions are becoming available via videoconferencing. Access to this technology may allow employees to take advantage of training opportunities without expending as much time or money on travel to training sites. One example is the future availability of judicial or law enforcement education via videoconferencing.

Education for inmates: The growing number of educational opportunities offered by technical schools via videoconferencing would allow inmates to participate in educational programming without leaving the secured facility.

Administrative Uses

Meetings between individuals at different locations: The greater use of statewide multi-disciplinary committees has increased travel time for staff. Videoconferencing can provide a time- and cost-effective means to participate in these meetings. In addition, the technology may increase face-to-face communications with colleagues from other institutions or adjacent jurisdictions.

Public Outreach Uses

Public hearings: Governmental units are beginning to use videoconferencing to conduct public hearings, thereby increasing participation of constituents in both statewide and county issues.

Public access: Private organizations may be interested in renting videoconferencing facilities from public agencies. The feasibility of this access will need to be considered by each jurisdiction.

Section III. How do we plan for the successful implementation of videoconferencing?

After a jurisdiction decides to utilize videoconferencing, several issues should be addressed to ensure successful implementation. Critical planning factors include:

Policy and Procedures: Videoconferencing systems that involve multiple agencies require careful coordination of procedure, rule and policy changes for each entity.

Project Manager: A project manager must oversee the development and ongoing operations of the videoconferencing system at all agencies and must be supported by user groups at each site.

Training: Adequate time and resources must be allocated for training in the operation of and in new procedures concerning videoconferencing.

Staffing: Users must develop a clear understanding of what staffing is required to operate the videoconferencing system. Staffing will depend on the complexity of the system and application.

These factors raise both business and technical issues. Business issues include how videoconferencing can be used to improve service and efficiency to the taxpayer in both the short and long term. Technical issues include what level of picture quality and level of interaction is required, the number of locations to be connected, and whether the jurisdiction's video network will be linked to other sites.

Business Issues

Users and Policy Makers

Because of the range of videoconferencing uses and systems, a thorough assessment of the present and future needs of the court and county must be conducted. This assessment should include the perspectives of both potential users of the technology and the policy makers of the jurisdiction. The goal is to develop a comprehensive approach for program planning, funding, and implementation with the cooperation of all potential users and policy makers.

The following individuals should be involved in the planning process:

- Community Corrections Staff
- Presiding Judge
- Sheriff/Jail Administrator
- District Attorney
- Victim/Witness Coordinator
- A Private Practice Attorney
- Public Defender
- Clerk of Circuit Court
- District Court Administrator
- County Executive or designee
- County Board Supervisor(s)
- Information Technology Services Director
- Local Department of Health and Human Services Director
- Anticipate other users (i.e. interpreters, Other Department Heads, court reporters, etc.)

A number of different approaches may be used to ensure that these individuals are consulted in the planning process. However, the most effective approach is to establish a users' committee at the early stages of videoconferencing planning. This committee should identify the types of court appearances, hearings, and meetings that would benefit from the use of videoconferencing. After the short-term and long-term uses of videoconferencing are identified, the committee should consider the associated operational issues, including how to ensure confidential conversation when necessary, how to transmit documents between sites, and who will set up and operate the equipment.

The committee should visit other videoconferencing installations as part of their analysis (see Resource List). Viewing different systems will help users identify the design and equipment features that would best meet their needs.

Current and Future Uses

Planning for the use of videoconferencing requires balancing immediate needs with the inevitable needs of expansion and extension. The immediate need may

be for a connection between a courtroom and a jail. The expanded need may be for connections to other locations within the state, nation, or world. Identifying present and projected uses is an important step because they can affect initial equipment specifications and technical requirements.

Some of the questions that need to be considered when reviewing various applications include:

- How many sites must communicate?
- How frequently will the equipment be used for each application?
- How many people will appear on camera at each site?
- Does each video participant need to see all other participants?
- Will the proceeding be recorded?
- What network options do local carriers offer?
- What is the cost of one-time equipment purchases?
- What are the recurring expenses?
- Is the application being considered currently permitted by statute and/or case law?

These questions will be answered differently depending on the intended use of videoconferencing (refer to Section II for a list of possible videoconferencing uses). Technical decisions should be made based on the requirements of the most frequently used applications.

For example, if mental health proceedings are the top priority, technical decisions should reflect the best method for communicating with the mental health facility, which may be a good distance away. On the other hand, if video arraignment is identified as a priority, the issue of distance may not be critical if the jail is in close proximity. Each of the applications considered in a vacuum will likely result in different equipment and transmission requirements; therefore, consideration of both present and future applications, as well as prioritizing uses, is critical in making the best long-term decisions concerning technical issues.

Technical Issues

When identifying uses for videoconferencing, jurisdictions must make some technical decisions concerning equipment and transmission. Initially this involves planning for which type of signal will be utilized for audio and video transmission signals. Subsequently, decisions on the type of equipment will be required. This section will provide an overview of the types of video signals available, while Section IV

will discuss equipment and system administration standards.

• Transmission Options: (Analog vs. Digital)

Video can be transmitted between two locations either by analog or digital signals. The quality of the video image depends on the bandwidth available in the transmission medium. Analog transmissions have become outdated with the introduction and widespread use of high definition and digital TV technology.

Unlike analog signals, digital video signals can be compressed and transmitted over a smaller bandwidth. However, compressing the signal requires an extra piece of equipment at each site—called a codec. The codec compresses the signal for transmission and reconstructs the signal once it has been received. The compressed, or “smaller” signal, can then be transmitted over existing public switched digital networks, which employ special equipment such as ISDN, Switched 56 or 64 Kbps, T-1 lines, or over the local area (LAN) or wide area network (WAN), such as your IP network and the Internet (see Glossary for definitions). Compressed images can be transmitted satisfactorily using as few as two 64 Kbps channels, but justice system applications require between 336-384 Kbps to be acceptable

Transmission Requirements (336-384 Kbps)

Transmission Option	Number of Channels	Number of Lines
ISDN	6	3
Switched 56/64	6	6
T1	6	1
Ethernet	Limited by bandwidth	

Although compressed digital video signals may not yield the same quality picture as uncompressed analog signals, the digital approach is more flexible, especially when sites are far apart, because digital signals can be transmitted over existing lines that already link many locations. With analog signals a direct link is necessary to connect each videoconferencing site to one another.

- **Infrastructure**

Considerations also must be made regarding the infrastructure by which a jurisdiction transmits either analog or digital signals. Jurisdictions have the option of using the existing public system, installing or leasing a private communications network, or contracting to use the private-public network, called Badgernet, to transmit data, as described below:

Public Communications Network

This is traditionally known as the “phone company.” This network is a combination of all local and long-distance companies that provide service on the public switched network.

Private Communications Network

Rather than use an existing public system to transmit video signals, a jurisdiction may consider installing or leasing a network of communication lines between multiple locations (as close as across the street or as distant as several hundred miles).

Depending on the type of signal used, the network can be constructed of coaxial cable (providing service for analog signals) or fiber-optic cable (providing service for either analog or digital signals). Using a private communications network may offer long-term cost savings depending on the frequency of use and the distance between videoconferencing sites.

Private-Public Network (Badgernet)

Another option may be the use of one of the networks included in Badgernet. Badgernet is a term used to describe a variety of tele-communications services provided by the State of Wisconsin - Department of Administration under one umbrella. One of the services available to users is access to voice or switched data lines. This includes compressed video channels using T1 or ISDN circuits. Wisconsin counties are eligible to utilize the services offered through Badgernet

Section IV. Videoconferencing

Equipment

Core Components

Videoconferencing equipment may be purchased as part of a complete, self-contained videoconferencing system or on a piece-by-piece basis. The intended uses of the system will determine which components are necessary and which are optional. Packaged videoconferencing systems usually include the following:

Video Monitor/Projector: Monitors are used to display video and graphic images. Most videoconferencing systems rely on one monitor to display both the incoming and outgoing video images. This is accomplished through picture-in-picture display, whereby a small window displaying one image is superimposed upon the main window. Dual monitors often split display between incoming and outgoing video, or between incoming video and graphics. The number and size of monitors depends largely upon the application, room characteristics, and type of videoconferencing installation. Your specific application will determine the type of monitor you need (e.g., display of people vs. graphics).

Camera(s): Cameras capture participants, video and graphics, and document images for transmission. The number and arrangement of cameras is a function of the number of conference participants, application requirements, room characteristics, and type of installation.

Audio System: Audio quality is as important as picture resolution. Audio systems should provide clear, simultaneous, interactive (full-duplex) communication. In custom-built rooms, speakers are usually permanent fixtures, but are generally packaged into desktop or rollabout units. Microphones may be permanently implanted in a conference table or control panel, affixed to a table top, hand-held, or clip-on. The audio system should include acoustic and line echo cancellation. The audio system should also include a mechanism to accommodate confidential communications, primarily those between attorney and client.

Codec (coder-decoder): A codec transmits and receives analog and digital signals. It is the key component needed to do a videoconference.

Control Panel or Hand-held Remote Control: The control panel is the interface between participants and the system equipment. In most cases, the control panel includes functions for controlling call initiation, camera positioning, volume, and peripheral equipment.

Minimum Technical Standards for Videoconferencing Systems

Compressed digital video and audio communications conferencing equipment, whether custom developed or a package system, must meet minimum industry standards to facilitate interoperability locally and globally. Videoconferencing systems installed within the justice system should meet additional standards to ensure the short-term and long-term success of videoconferencing. With the exception of the system administration standards, all the following standards are recommended. However, in very specific applications a few of these standards may not be critical. For example, if the transfer of data is never envisioned as part an application (i.e. prisoner visitation) the need for the data transfer standard would not be necessary.

The following are common industry standards and considerations for the criminal justice organizations contemplating / using videoconferencing. (*while reading this section it may be necessary to refer to the glossary for definitions of technical terms*):

1.) H.320 Standard for Video over ISDN.

The H.320 standard, as well as other communication standards, was established by the International Telecommunications Union and is a set of specifications adhered to by videoconferencing equipment manufacturers. These standards include guidelines for video compression and transmission, and for audio and control signals. Manufacturers also develop their own proprietary video compression algorithms. When used in a conference session with another system of the same manufacturer, these

algorithms give superior performance and picture quality above H.320. However, when a video system of one manufacturer conferences with another brand, both video systems automatically revert to the common denominator of H.320.

This standard also suggests that codecs have a line level input and output at 0 DBm, 600 ohm to permit connection to a public address system, VCR, or other equipment.

2.) H.323 Standard for Video over Internet.

The H.323 standard provides a foundation for audio, video, and data communications across Internet protocol-based networks, including the Internet and BadgerNet 2005. By complying with H.323, multi-media products and applications from multiple vendors can interoperate, allowing users to communicate without concern for compatibility.

3.) T.120 Standard for Data Conference.

The T.120 standard is a set of protocols and services that provide support for real-time, multi-point data communications. In addition, by adhering to this standard dissimilar video systems can screen share software applications and simultaneously mark-up online documents posted on the "white board."

4.) Picture quality standard of 30 frames per second Common Intermediate Format (CIF) at between 336-384 kbps (kilobits per second).

The standard of 30 frames per second ensures a near-broadcast quality picture. Less than 30 frames per second may result in a jerky or ghost-like picture. Examples of International Telecommunications Union standards that meet this requirement are H.263 and H.264.

5.) Minimum of 6 channels for room videoconferencing systems using ISDN or Switched 56/64 service.

Video systems running as the sole application on a personal computer or larger room-type system should have the capacity to use 3 BRI ISDN lines. This capacity is necessary to achieve 384 kbps at 30 frames per second. In general, the greater the bandwidth of the connecting circuits and processing power of the codec, the better picture quality. This is important when using larger monitors, which require better picture quality for acceptable viewing.

Another type of switched digital service is Switched 56/64. With this service, customers

can dial up and transmit digital information up to 56/64 kbps, similar to an analog telephone call. In most Switched 56/64 videoconferencing applications, two channels are combined to yield one 112/128 kbps circuit. Users of Switched 56/64 can also place calls to ISDN customers as long as the ISDN equipment can accept Switched 56/64 calls. In addition, ISDN customers can place calls to Switched 56/64 users.

No matter which switched service is used, it should be capable of at least 384 kbps (as specified in the previous item).

6.) H.261, H.263 and H.264 Standards for Codecs.

The primary function of the codec is to compress and decompress video and audio. The codec should be equipped with at least one output jack that provides standard NTSC baseband video output. This ensures that the system can provide a video signal to external monitors, a videocassette recorder (VCR), or other equipment.

Television broadcasters prefer to have a direct feed from the incoming audio and video signal in order to ensure good broadcast quality. This requires the availability of multiple identical outputs from the videoconferencing system. Multiple identical outputs can be provided from the single output system by a device commonly known as a "distribution amplifier." To accommodate the broadcasters, this distribution system would need to be created for both the audio and video signal.

7.) Bandwidth On Demand Inter-Networking Group (BONDING) standards (ISDN and H.320 only) for inverse multiplexers.

Inverse multiplexers combine individual 56K or 64K channels to create more bandwidth, which equals better picture quality. Manufacturers of inverse multiplexers have adopted the "BONDING" standard to ensure communication between systems. This equipment can be incorporated in the design of the system or added on. If the multiplexer is added to the system, then additional costs and maintenance become considerations. If the multiplexer is internal, remote diagnostics is impossible.

8.) H.320/H.323 Standard for Bridging Technology.

Multi-point bridging equipment is addressed under the standard H.243. The bridge works

much like a telephone conference call system; it connects all the participants by allowing a videoconferencing system to connect to more than two sites. A user can either purchase a bridge or contract for the service from a company that provides multi-point bridging on a usage basis. It is important for the user to verify that the provider's service meets the appropriate standards and has ISDN/IP access lines or equivalent.

9.) Picture-in-picture (PIP).

Picture-in-picture, or People Content or DuoVideo H.239, permits the codec to display at least two images on the monitor. The distant end video will usually occupy the whole screen except for a small window inserted in the corner of the screen, which can be closed when not needed.

10.) Separate modem and telephone lines for remote diagnostics (ISDN only).

Remote diagnostics decrease repair time, maximizing the use of the system. It is best if a technician can dial into the system and perform online troubleshooting from a remote location. The system should support standard remote control software or provide such software as a standard component of the package.

11.) Echo cancellation microphones with a 100 to 7,000 Hz frequency response, audio muting, on/off switch and full-duplex audio

12.) Camera(s) with ability to pan, tilt, and zoom, both manually and using presets.

System Administration Standards

1. System administrator.

When multiple agencies share video-conferencing resources, a central system administrator should manage and coordinate scheduling, system and equipment maintenance agreements, and financial issues. The system administrator should be the clearinghouse for all system information, including inventory of current hardware and software configurations, and contact personnel.

2. Equipment maintenance agreements.

All equipment should be covered by maintenance agreements to ensure prompt service. It is recommended that agreements be with the manufacturer or a third-party provider who has the expertise to provide proper maintenance. Multi-year agreements are usually less expensive than one-year agreements.

3. Initial/on-going staff training.

Initial and on-going staff training is important to ensure the success of the system to accommodate changes in staff as well as system upgrades. Continuous training on video systems and overall system programs and processes should be established. Training can be supplied by the vendor, by well-trained internal staff, or through seminars, workshops, and conferences. The vendor will often provide some training at no added cost with the initial installation. Training internal staff will provide an in-house resource and will encourage full use of the system.

4. Method for cost allocations.

Multiple departments may share the use of video systems, telephone circuits, etc.; therefore, a method for allocating costs to users should be established. Policy makers should arrive at an equitable formula for cost allocations.

Section V. Design Considerations

Implementing videoconferencing in the justice system presents unique challenges, primarily in the area of design. When videoconferencing is used in a legal setting, the rights of participants and the design of the facilities must be considered. The number and placement of cameras, monitors, and microphones are critical to the success of the justice system application.

General Design Issues

Multiple vs. Single Camera Recommendation

A single camera system is generally found in cart-based systems where the camera rests upon the TV monitor on a movable cart. The best use of these systems is in non-courtroom settings, jails, prisons, conference rooms and ancillary rooms. These types of systems are portable and can be moved to other locations provided there exists the appropriate cabling in the new location. These systems inherently are cheaper to purchase. However, the initial cost savings of not purchasing a multi-camera system may be lost over a period of time because there is a significant reduction in the effectiveness, acceptability and flexibility of the video conferencing system for courtroom use. These systems do not allow for simultaneous viewing of the various participants in the court proceeding. Though not critical for every court event this ability helps promote a sense of fairness, inclusion and completeness.

The long-term success and acceptability of video conferencing use in court proceedings rests on the use of multi-camera systems that allow all court participants the ability to simultaneously see one another. Courtrooms have designated areas for a judge, plaintiff's attorney, defendant's attorney, and witness stand. To maximize the effectiveness of the video conferencing session the signal from the courtroom should be able to show the judge, each of the individual attorneys, and the witness stand *at the same time*. No single-camera system or courtroom arrangement adequately allows for this type of coverage. In addition, the set up of a single camera cart based system visually is unappealing and does not flow with the decorum of the court. In short, the ambiance and reality of an actual courtroom experience is compromised.

Recommendation: *The Committee recommends that to maximize the effectiveness, acceptability and flexibility of a video conferencing program, courtrooms should be equipped with permanent multi-camera video conferencing systems that provide monitors that are viewable by both the court participants and the public. The best use of single camera video conferencing systems are in non-courtroom settings, jails, prisons, conference rooms and ancillary rooms.*

Audio System/Acoustics

Although often less carefully evaluated, audio quality in videoconferencing is at least as important as picture resolution. Audio systems should provide for clear, simultaneous, interactive communication. If the parties involved are unable to hear the proceedings, the full value of videoconferencing cannot be achieved.

Courtroom use of an audio system begins with a sound reinforcement system. Microphones should be placed at the judge, witness, clerk, and attorney positions, and on the podium, if used, to provide coverage of the proceeding. Consideration should also be given to having a microphone available in the gallery if needed.

The signals are then amplified throughout the courtroom. When planning an audio system for the courtroom the following guidelines should be considered:

- The audio system should interface with telephone and videoconferencing equipment, and should provide full-duplex audio operation and echo cancellation. Automatic echo cancellation is desirable because it adjusts the incoming and outgoing audio signals in accordance with the acoustics of a particular room.
- Installing acoustically absorbent materials if necessary should minimize in-room echoes. Exposed glass may need drapes for better acoustics.
- The audio system should be connected to an assisted listening system for the hearing impaired.
- The audio needs of the court reporter and the spectator(s) should be considered. The court reporter must to be able to hear all the testimony that occurs either in person or by video. A well-

designed audio system will also ensure that spectators can easily hear the proceedings. A recording output should be provided.

- The audio system should provide the media with any audio/video information that occurs at court proceedings. Media feeds outside the courtroom reduce the need for cameras and other equipment in the courtroom.

Lighting, Coloring and Windows

Lighting is an essential consideration when using video in the courtroom. According to the book *Courtroom Audio, Video, and Videoconferencing*:

Lighting should include combinations of direct and indirect lighting to enhance visibility and reduce glare. Lighting is also critical to ensure proper coloring from video cameras. Poorly designed lighting can turn dark hair blue through the eye of a camera. Glare on the monitor can make the most expensive presentation system useless if the juror cannot read the screen.

Background color can also affect an individual's appearance on camera. While not as easily controlled in the courtroom, background colors in locations in which individuals are appearing, such as the jail, should be reviewed. In general, more neutral colors are preferable; a light blue-gray seems to work best. Other colors may distort the appearance of individuals appearing via video, which may affect viewers' credibility assessments of those appearing.

The presence of windows in courtrooms and ancillary rooms will have a significant impact on the quality of a proceeding conducted by video conferencing. The weather conditions outside affect the camera's ability to obtain a sharp picture. If windows or the presence of natural light cannot be avoided, it is recommended that black out shades be used on all windows during a video conferencing hearing to ensure the highest quality picture.

Cabling/Wiring

The primary consideration when wiring for videoconferencing is future growth. In this technological age future needs are difficult to determine. Thus, wiring systems should allow for growth. Without the ability to accommodate new technology, the courtroom floor could soon be covered with a sea of cable.

It is common practice to run wiring through walls or under the floors. But even installing additional capacity when constructing or remodeling a courtroom will not ensure that future needs will be met. If conduit is run through the walls, the amount

should be calculated to allow for as much future growth as possible. A raised-floor system might also be considered. Such a system allows relatively easy expansion of the cabling, and can be removed or replaced in sections for convenient access.

Further, the wiring should be installed as home runs to the equipment area and not in a series design, which can cause bottlenecks. In addition, wiring closets should be able to easily connect to other floors if necessary.

Another concern is the courtroom wiring termination point, which is often where the equipment rack is located. This point should be accessible and adequately ventilated. If the equipment rack is inconveniently located, servicing and adjusting will be difficult. In addition, if the termination point is placed under the judge's bench careful consideration should be given to the affect on the judge's legroom and comfort.

In *Courtroom Audio, Video, and Videoconferencing*, Martin Gruen and Tom Wetter suggest a formula for reviewing equipment space requirements. The following questions should be asked:

- How many square feet will the equipment require?
- How many square feet does the wiring connection need?
- How much space is required for operators to use the equipment?

Add these space allocations together and multiply by at least two—three if conditions permit—to determine the total space needed to accommodate videoconferencing equipment for the short and long term.

Design Requirements

Each videoconferencing system will be unique because the size and configuration of the courtroom and the intended applications will vary. The applicable provisions of SCR 70.38 and 70.39 (8) and (9) should also be considered in this process.

Rather than prescribe specific requirements for the implementation of videoconferencing, this section will identify some basic design considerations and provide jurisdictions with a checklist of considerations to review when designing a videoconferencing system. This checklist is organized by the type of facility and the needs of the participants that are usually involved in court

proceedings. Ideally, all the questions on the checklist should be answered yes.

Following are also a few basic issues to consider when planning the design of a videoconferencing system:

- Speakers tend to look at the person to whom they are speaking.
- To produce a good picture, cameras need a direct (head-on) shot with the person speaking to the camera.
- The same quality standards should be applied to all sites in your control so that all participants can observe each other's demeanor, verbal, and nonverbal communication.
- Monitors should be large enough for easy viewing.
- Perception can be affected by camera placement. Depending on the angle of the camera, a participant may appear to be "looking up" or "looking down" at others. If a sight angle exists it should be consistent with what would occur in the courtroom.

Design Checklist: Questions to consider when designing a videoconferencing system:

In the courtroom:

Judge

- Does the judge have an overall mute control for the audio system?
- Can the judge have confidential conversations with both attorneys?
- For discussions with the individual(s) appearing via video, can the judge view a camera and monitor simultaneously?
- Can the judge see the remote participant(s) and the surrounding area to ensure that intimidation or coaching is not taking place off screen?
- Does the judge/clerk have the ability to control the cameras on both ends?

Attorneys and Litigants

- Do the attorneys have microphones at the counsel tables?
- Can the attorneys mute the audio system to have confidential conversations?
- Does the defense attorney have access to a confidential telephone line to the remote location?
- For discussions with anyone appearing via video, can the attorneys view a camera and monitor simultaneously?
- Do the attorneys have a clear line of sight to a video monitor?

- Are data ports available for attorneys' laptop computers?
- Does the system allow attorneys to display electronic documents?
- Is there a sufficient power supply at the counsel tables?
- Has consideration been given to providing a document camera for the presentation of evidence?

Court Clerk

- Does the clerk need a microphone?
- Is a fax machine or other document transmission equipment available to the clerk in the courtroom?

Court Reporter

- Can the court reporter clearly hear courtroom participants and those appearing via videoconferencing?
- Does the reporter have a clear line of sight to a video monitor?
- Can the system integrate real-time reporting?

Jurors

- Can the jurors see and hear anyone or anything presented on the video monitor?

Public

- Can the public hear and see the proceedings, including anyone appearing via video?
- Is a camera positioned so that individuals appearing via video can clearly see who is attending the proceeding?

Witnesses

- Do witnesses have a microphone at the witness stand?
- Can witnesses see documents presented on the video monitor or is a separate monitor located at the witness bench?

Interpreters

- Can interpreters appearing by video clearly see and hear the individual(s) requiring interpreting services?
- For discussions with the interpreter, can the individual requiring interpreting services simultaneously view a camera and monitor?
- Can the interpreter be seen by everyone in the courtroom?
- Can the interpreter see everyone in the courtroom?
- Can the interpreter be involved in confidential conversations between the lawyer and litigant?

Media

- Does the media have access to the video feed if requested?

In the remote location:

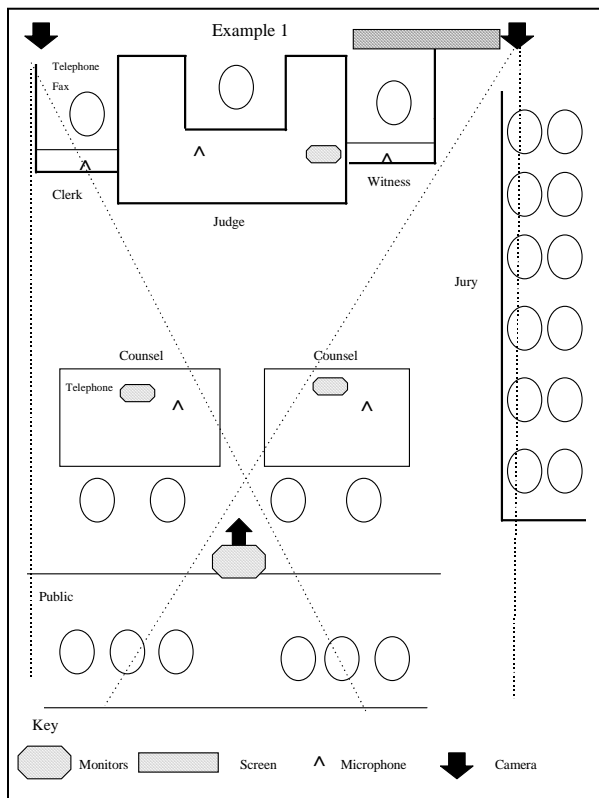
- Can remote participants see exactly what and whom they would see if they were actually in the courtroom, including relatives and friends attending the proceeding?
- Does the facility permit an attorney to be physically present with his/her client upon request?
- Can the client have a confidential conversation with his/her attorney?
- If the attorney is in the courtroom, is a phone to the courtroom available to the client?
- Is the video arraignment room in a relatively quiet area?
- Is the background one color, preferably light blue-gray, without highly reflective surfaces?
- Is the lighting a combination of direct and indirect lighting?
- Does the lighting reduce glare on the monitor?
- Is a fax machine or some type of document transmission equipment available?
- Is it possible for the defendant to have confidential telephone conversations with family members?
- If there is an overall mute control, can an attorney in the remote location indicate to the judge that the attorney/client would like to be heard?

In the conference/training room:

- Is the room in a quiet area, away from elevators, air conditioning units, telephones, cafeterias, and entrances?
- Is the room sound insulated so those outside of the room are not disturbed?
- Does the room measure at least 10' x 12'?
- Are the walls uniform in color, preferably a light blue-gray or neutral color, without highly reflective surfaces?
- Is the lighting a combination of direct and indirect?
- Does the lighting reduce glare on the monitor?
- Can all participants clearly see the monitor?
- Can all participants clearly hear the video presentation?
- Are there microphones available on the conference table?
- Is the technology available to record proceedings?

Courtroom Design Schematics

To provide additional design information, this section contains eight courtroom design schematics, plus two schematics for remote sites. Because each courtroom may have specific design nuances, these examples are meant for information only; many additional design options are possible. However, each of the following examples is designed to meet the checklist included in this section. Some designs may require more than the three cameras, as illustrated in the schematics.

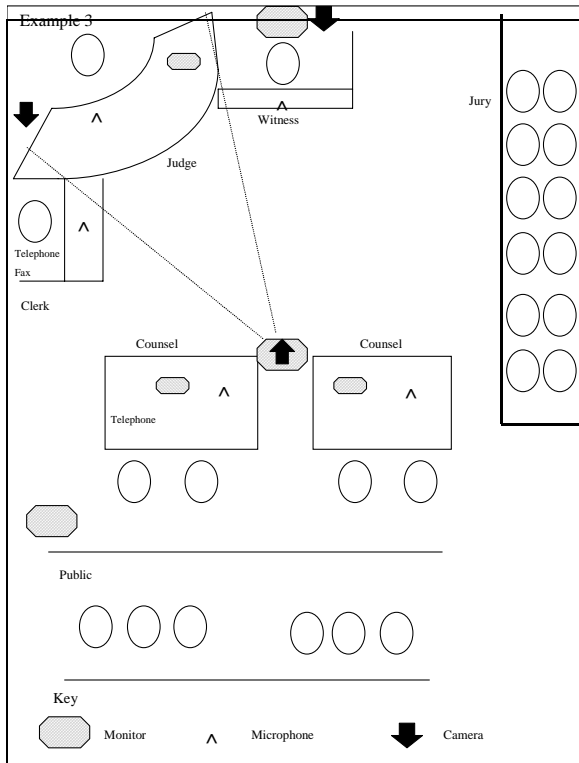
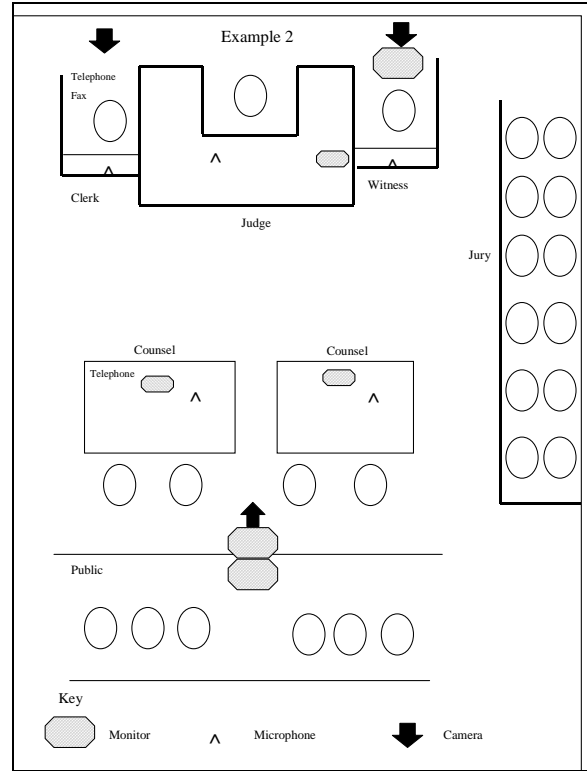


Example 1: Large Screen/Middle Bench

This courtroom example, with the judge's bench located in the middle of the room, includes three cameras, three small monitors for the bench and counsel tables, one large monitor, and a large screen positioned behind the witness box. To take advantage of the large screen, it would be necessary to mount projection equipment from the ceiling of the courtroom. The large screen would then permit the public to see the video image without additional monitors. Microphones are available for the clerk, judge, witness, and attorneys.

Example 2: Multiple Monitors/Middle Bench

This courtroom example, with the judge's bench located in the middle of the room, includes three cameras, three small monitors for the bench and counsel tables, one large monitor behind the witness stand, and two large monitors located at the back of the well area (one for the judge to speak to and one for public viewing). In addition, microphones are available for the clerk, judge, witness, and attorneys.

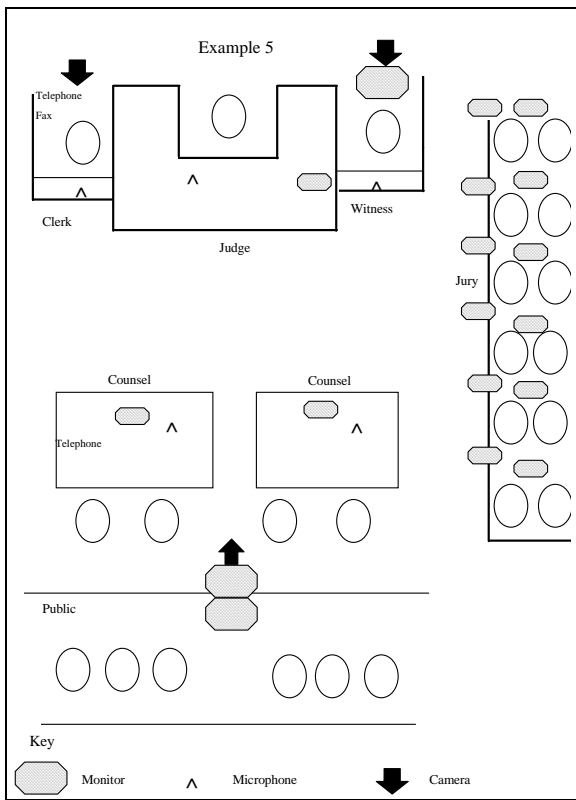
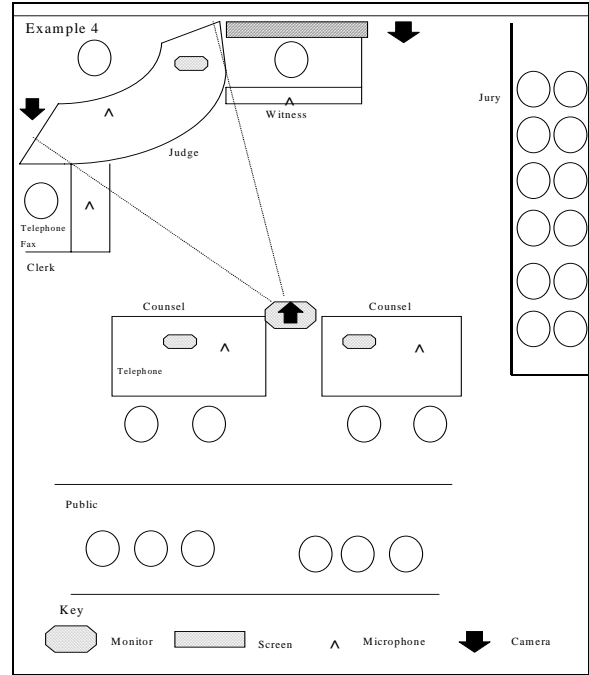


Example 3: Multiple Monitors/Corner Bench

This courtroom example, with the bench located in the corner of the room, includes three cameras, three small monitors for the bench and counsel tables, one large monitor located behind the witness stand, one large monitor located between counsel tables, and a large monitor located at the back of the well area for public viewing. In addition, microphones are available for the clerk, judge, witness, and attorneys.

Example 4: Large Screen/Corner Bench

This courtroom example, with the bench located in the corner of the room, includes three cameras, three small monitors for the bench and counsel tables, a large screen located behind the witness stand, and one large monitor located between counsel tables. In addition, microphones are available for the clerk, judge, witness, and attorneys.

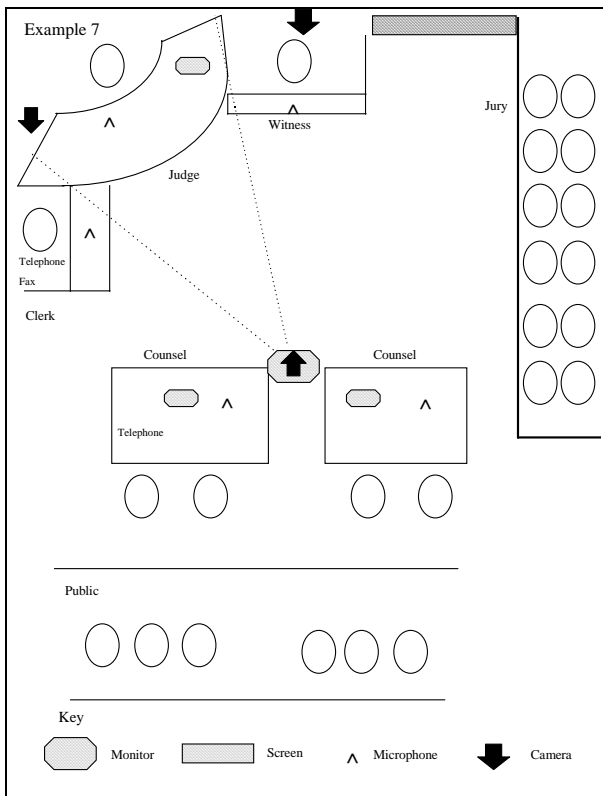
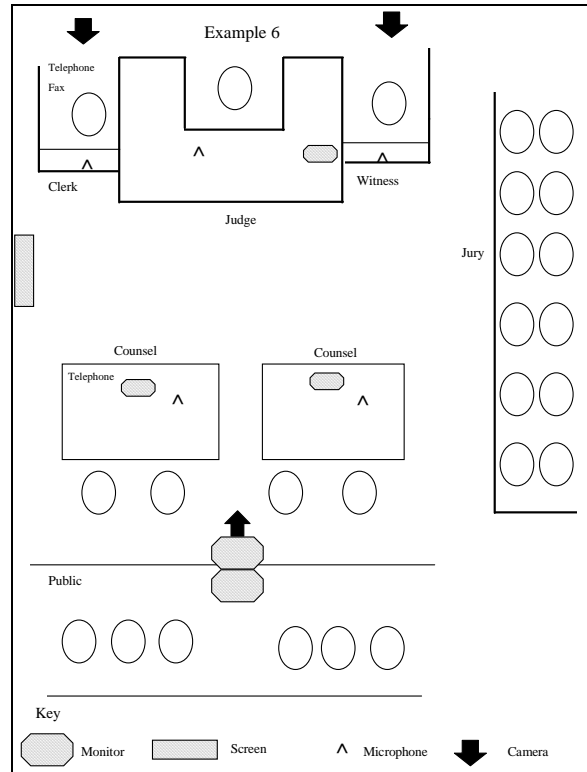


Example 5: Multiple Monitors/Jury Monitors/Middle Bench

This courtroom example, with the bench located in the middle of the room, includes three cameras, three small monitors for the bench and counsel tables, one large monitor behind the witness stand, and two large monitors located at the back of the well area (one for the judge to speak to and one for public viewing). In addition, twelve small monitors are placed in the jury box for the jurors, and microphones are available for the clerk, judge, witness, and attorneys.

Example 6: Alternative Monitor Placement/Middle Bench

This courtroom example, with the bench located in the middle of the room, includes three cameras, three small monitors for the bench and counsel tables, two large monitors, and a large screen positioned opposite the jury box. Ceiling-mounted projection equipment would be necessary to use the large screen. The large screen should allow the jury to see the video image without additional monitors. Microphones are available for the clerk, judge, witness, and attorneys.

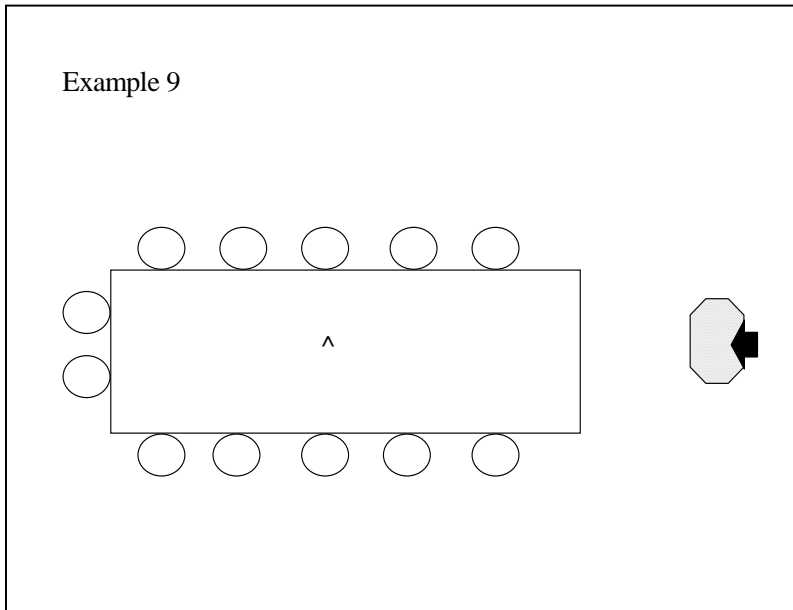
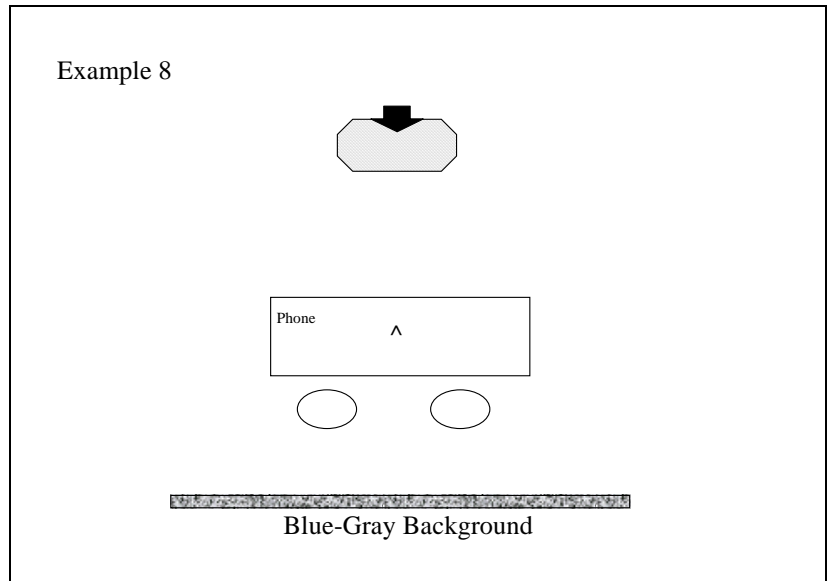


Example 7: Alternative Monitor Placement/Corner Bench

This courtroom example, with the bench located in the corner of the room, includes three cameras, three small monitors for the bench and counsel tables, two large monitors, and a large screen positioned opposite the jury box. Projection equipment mounted from the ceiling would be necessary to use the large screen. In addition, microphones are available for the clerk, judge, witness, and attorneys.

Example 8: Remote Site

This remote site at the jail includes one monitor, one camera, a phone to the courtroom, and one microphone. The background in this room should be a neutral color, preferably light blue-gray.



Example 9: Conference Room/Office

This remote site includes one camera, one monitor, and one microphone. The monitor and camera are placed at the end of a rectangular table, allowing all participants to see the monitor and be seen. The microphone is located at the

Section VI. What are the staffing considerations?

Users must develop a clear understanding of what staffing is required to operate videoconferencing systems. Although the complexity of the system and type of application will vary, it is usually possible to implement videoconferencing in justice system settings without adding additional staff. Nonetheless, staffing considerations must be reviewed prior to implementation. These considerations include system operation, staff training, and system administration.

System Operation

The operation of the videoconferencing system will require the assignment of certain responsibilities. These include checking the equipment prior to each proceeding, turning the system on, making connections with remote sites, and controlling the equipment during the proceeding. These responsibilities can usually be handled by existing non-technical court staff. However, it is important that the staff identified for these responsibilities receive sufficient training before the system is used in a court proceeding.

Staff Training

The success of system operation will largely depend on the amount of training provided to staff. In addition to the initial training, ongoing training will be necessary as members change or the system is upgraded. Ongoing training may be provided by an outside vendor or a well-trained internal staff member.

System Administration

Help Desk

Because non-technical staff will most likely operate the videoconferencing system, a help desk should be available to assist with any technical problems that occur. This resource may be established by your internal IT staff or included in the maintenance agreement provided by the vendor.

Equipment Maintenance

A jurisdiction's approach to maintenance can have staffing implications. Although a jurisdiction may consider using in-house staff for equipment maintenance, it is recommended that equipment be covered by maintenance agreements. These agreements will ensure prompt service and diminish any potential "downtime" for the system.

Information Clearinghouse

Information concerning inventory, hardware and software configurations, maintenance agreements, help desk responsibilities, and video phone numbers should be maintained by a central authority. Which agency or individual is responsible for this task may vary, depending on the size and structure of the administrative functions in a given jurisdiction.

Section VII. Evaluating Videoconferencing

This section provides information on the key components necessary for evaluating the use of videoconferencing in the courtroom. These components help in the establishment of goals and objectives and determining whether or not a videoconferencing program is producing an overall benefit in relation to its cost.

In order to establish an effective videoconferencing program the following should be done:

- Create an evaluation process
- Conduct a cost/benefit analysis if appropriate
- Identify equipment costs
- Identify transmission costs
- Identify costs incurred by all participants, agencies and organizations

Evaluation Process

A videoconferencing program must continually be evaluated. Changing needs, new applications and the evolution of telecommunications options necessitate the regular review of videoconferencing systems.

The key to any successful evaluation process is the establishment of a videoconferencing user group. This user group should meet regularly, review the progress of the program, formulate, modify and implement policy and procedure decisions through the collection and review of data. It should consist of the same members who participated in the original planning and establishment of the videoconferencing program.

An evaluation of the videoconferencing program should include both subjective and objective measures. The preservation of constitutional rights, due process and the ability to litigate in a fair and just environment are priorities of a videoconferencing program.

Cost/Benefit Analysis

A cost/benefit analysis can be conducted prior to the decision to implement videoconferencing in the courtroom. This analysis frames the goals and sets the level of technology a certain jurisdiction is willing to commit its fiscal resources toward. It also

demonstrates the maximum “potential” fiscal savings.

However, another cost/benefit analysis may need to be completed once the videoconferencing program has been defined, implemented and operating for a period of time. It is this analysis that will help determine whether the initial policy decisions on video use are, in fact, providing the fiscal and non-fiscal benefits. If they are not then the videoconferencing committee has the data to change the direction in which the program is heading in order to maximize the overall benefits.

Data collection is a key component when evaluating the effectiveness of videoconferencing in the courts. It helps put into perspective the tangible elements that need to be reviewed and included with the intangible elements to ultimately decide whether or not the video conferencing program is working effectively.

It is important to establish a database in which future queries can be made to pull desired information for analysis. A videoconferencing log sheet can be developed and utilized at a videoconferencing session (see sample appendix A). This information will help track what type of matters the video conferencing unit is being used for over a period of time. It will also help in accessing overall system reliability versus human error.

The following is a series of suggested data elements that should be included in a log sheet. This list is not exhaustive and should be expanded to address the type of information a county is interested in reviewing:

- Date
- Case number
- Type of Transmission (IP or ISDN)
- Activity Held (Hearing, Trial, Meeting, Etc)
- Define event (Probable Cause, TRO)
- Who appeared by video
- Facility participating in video session
- Start and End time of session
- Whether a connection was obtained
- Technical difficulties
- General comment section

A financial benefit for the sheriff's department may be obtained through the redeployment of deputies to tasks other than transporting criminal defendants from the jail to a courtroom. (See "Cost Savings from Videoconferencing" October, 2003, <http://oja.state.wi.us> for information regarding the use of video versus transporting offenders in Wisconsin counties).

In-custody defendants are a major cost and security risk to the courts and Sheriff's departments. In addition to the cost of transport, if the in-custody defendant needs to stay for any period of time the Sheriff's department assumes housing, safety and medical responsibility for these individuals. The following information can be reviewed when looking at potential or actual benefits of using video conferencing instead of transporting in-custody defendants:

- Number of Writs or Orders to Produce (OTP) per month.
 - Correctional Facilities
 - Out of County Jails
 - Mental Health Facilities
- Average Length of Stay in Jail (ALOS) per OTP
- Pickup and return mileage
- Personnel time usage

This information will allow for an analysis that depicts the amount of costs, lost man hours, bed space, mileage, etc. that is generated for those in-custody defendants that were brought to court

Other quantitative information will further assist in determining overall benefits and costs:

- Revenue from private or public use of videoconferencing equipment.
- Number of training opportunities via video.
- Changes in reported security incidents during transport.
- Extrapolating increases or decreases in judge\staff availability and productivity due to reduction in travel and waiting time.
- User satisfaction surveys.

A regular review of this collected information will make it easier to determine if the system is meeting operational goals and providing a return on both the initial and on-going investment.

Equipment and Transmission Costs

An equipment vendor or consultant can assist with configuring a system to meet your application needs so a base cost of equipment can be determined.

The State of Wisconsin has two in-place contracts that other governmental entities can utilize for the acquisition of video equipment. Details of both can be found through Wisconsin's VendorNet system at <http://vendornet.state.wi.us>. They are Contract 15-84056-400, Compressed Video Conferencing Equipment, Accessories and Maintenance and Contract 11-17810-802, Classroom Audio and Video Equipment, Installation and Maintenance. These can provide component pricing of equipment as well as contract vendors.

When buying videoconferencing equipment it is difficult to accept that the technology has a shelf life. None-the-less, a well-maintained system, in use, should have a useful life for four to six years. Plans should be in-place to budget for equipment maintenance and replacement, both of which are dependent on the amount of usage.

In addition to the equipment costs users will need to budget for the transmission costs associated with videoconferencing. There are generally both recurring monthly costs plus some usage costs. Your local and/or long distance service provider can assist in determining these costs. Governmental agencies and courts may be able to take advantage of statewide contracts (see link in "Video Conferencing Equipment" section).

Intangible Costs

Any evaluation process must include an assessment of intangible costs. The use of videoconferencing in the courtroom may impact the public's perception of the judiciary, law enforcement, attorneys and the overall fairness of the system. This is especially a concern with the use of videoconferencing in criminal proceedings when the defendant appears by video from a remote location. Great care must be taken to assess any negative impact that occurs by reliance on videoconferencing for appearances.

The court's perspective of criminal defendants may be altered by videoconferencing. Camera angles, inadequate equipment and poor facilities may distort the courts interaction with criminal defendants.

Videoconferencing may impact a criminal defendant's perspective of the judiciary and the criminal justice system. Consideration should be given to whether removing the defendant from the courtroom reduces the judge's impact on the defendant, whether it is conducive to courtroom decorum, and how it affects the defendant's perception of the fairness of the court.

Courts need to be sensitive to the impact that video conferencing has upon the quality of legal representation. The attorney-client relationship will be altered by videoconferencing when the defendant appears by video because attorneys will have to choose between appearing in court without the client or appearing from a remote location outside of the presence of the prosecutor, judge and other participants. The evaluation process needs to consider the cost and impact of videoconferencing to defense attorneys as well as other criminal justice organizations. All users will need to evaluate and measure the tangible and intangible costs of videoconferencing on their systems.

Conclusion

The reason for a continued evaluation process is that the costs and benefits of using videoconferencing change over time. Initially there may be little or no cost benefit, the use of video may make current procedures take longer and the desire to use it may drop off once it is purchased. If this occurs the program will flounder despite the great possibility of costs savings. The evaluation ensures that there exists continued interest in the long-term success of the program.

It is important that each jurisdiction calculate both the short- and long-term costs of installing a videoconferencing system as well as the intangible costs to all participants. To maximize the benefits to offset these costs it is critical that the equipment is utilized in a wide variety of situations (i.e. court appearances, meetings, training, rental to private sector, etc.) and that the use of video conferencing respects the rights of all litigants.

Section VIII. Good Practices and Tips

The following are suggestions on good practices and tips for videoconferencing. They can be used to help those individuals who are just starting a video program and also strengthen existing programs.

Good Practices

Local Rules on the Use of Videoconferencing

Since no statewide rules currently exist, it is a good idea to establish local rules (county or district-wide) on the use of video conferencing (see appendix B). These local rules provide a framework for judges, court commissioners, court personnel and counsel in utilizing videoconferencing in the courtroom.

Remote Location

The court should establish an understanding or policy that the remote location will be treated as an extension of the court.

Review of Remote Site

The judge or court commissioner should conduct a review of any new site that they intend to use for a videoconferencing hearing. This review can be done through a test call or physically visiting the site. The purpose of the review is to establish that the lighting, sound and visual appearance of the remote location do not impede the court from conducting a fair court proceeding. The applicable provisions of SCR 70.38 and 70.39 (8) and (9) should be considered in this process.

Test Calls

Initiate a test call with the remote location, prior to any videoconferencing hearing. These test calls can be done either the night before or the morning of the hearings. The test call is conducted for the following purposes:

- Establishes that a good audio and visual connection is available.
- Confirms with remote location that a hearing is scheduled.
- Establishes contact between the court and the remote location in case there is a technical or other problem.
- Establishes call speed connection (what is the maximum speed the facility can support).

The test call does not need to last very long (i.e. 5 minutes or less). If the court conducts daily business

with the remote location, a test call may not always be necessary.

Trouble Shooting Procedures

There is always a possibility that a technical problem may arise when using videoconferencing equipment. The problem may be in the video unit, the telephone line, the remote location, or simply human error. The following are some general procedures to follow before calling a vendor for service:

1. Check to see if the power is on.
2. Look for loose connections.
3. Shutdown and reboot the system.
4. Check to see if you are correctly following the start up procedures.

Video Appearance Colloquy

A colloquy between the court and the individual appearing by video should be conducted at to the beginning of the court proceeding (see appendix E).

The colloquy has the following purposes:

- Establishes that a good audio\visual connection has been made.
- Takes the necessary steps to ensure the protection of the defendant/litigant's rights.
- Provides a solid foundation in creating a good court record.
- Assists a judge or court commissioner in a proceeding that they may not conduct on a regular basis.

Tips

Utilize *Bridging the Distance...* Manual for Wisconsin Video Sites

Bridging the Distance is a dynamic tool that will be regularly updated as the use of videoconferencing its practices continue to evolve. The manual should be bookmarked on your computer for ready reference at: <http://www.wicourts.gov/about/committees/docs/ppa/cvidconf.pdf>

Create a Video Conferencing Ready Reference Manual

A ready reference manual should be created and placed in every courtroom that has video conferencing equipment, as well as at any remote locations. The manual should include the trouble shooting procedures, colloquy, log sheet template and local rules. In addition, this manual should have site

contact name and numbers (i.e. phone, ISDN, LAN, Fax, etc.).

Purchase a Maintenance Agreement

It is strongly recommended that a full maintenance package with emergency 24- or 48-hour on-site repair be purchased or maintained with the videoconferencing equipment. The maintenance agreement can be purchased separately or through the vendor who sold the equipment.

Maintain Strong, Continuous Support

Videoconferencing offers new method to conduct some court processes. A successful videoconferencing program will need strong, active support from the Judiciary and all potentially affected entities (i.e., Sheriff's department, Public Defender's office, Clerk of Circuit Courts, Register in Probate, Clerks of Juvenile Court, District Attorney's office).

To achieve acceptance and support, communicate the benefits of videoconferencing, and involve these entities in the implementation of the program. Utilize an active committee that brings all court users together on a regular basis for the purpose of being innovative in the use of videoconferencing. This will increase the effectiveness of the technology while protecting the rights of the litigants and maximizing the benefits to all court users.

Test it out

Always engage in a practice run when attempting a videoconferencing proceeding that has not been tried before to work out any potential procedural\technical problems.

Understand the Capabilities

Try not to engage in proceedings where it is critical that the videoconferencing unit function beyond its optimum efficiencies (i.e., a need for a multiple camera system where one does not exist, so the court flips back and forth with one camera).

Proceed when Ready

If a technical problem exists with the unit, LAN, or telephone line, do not proceed until the troubleshooting procedures have been exhausted and the court is comfortable with the quality.

Identify Special Needs

Identify with counsel any special needs they may have in order to facilitate the use of videoconferencing. If counsel needs to have **constant** communication with their client, the court may need to provide breaks more often and provide a phone so that counsel and client can communicate.

Collect Data on Videoconferencing Use

To plan for the long-term and identify key needs of your videoconferencing program, develop a database or system to track its use. Examples of potential tracking systems are available in Appendix A. Data entered into a tracking system could generate reports that formulate cost savings, recognize strong and weak points of the program, and identify other potential uses for videoconferencing.

Be Flexible in Your Use of Videoconferencing

How videoconferencing is implemented and the level of active support for the program dictates its level of success in many areas. For example taking a slow approach to implementation allows for technical and procedural problems to be worked out, but may not show savings over costs at first. From another perspective, establishing videoconferencing to be used in only one type of court proceeding (i.e., initial appearances, mental commitments) may provide initial cost savings, but could also be minimizing additional savings that could be attained if the program were being used in other court proceedings. Decide which approach may initially work best in implementing your program but allow for flexibility and growth.

Identify and Evaluate Benefits

Videoconferencing has the capability to produce significant benefits in the areas of fiscal savings, worker productivity, security, jail bed space, etc. Be sure to establish an accurate evaluation system that covers all potential areas of your program.

It is also important to note that some benefits may not be realized until more videoconferencing hearings are held. One example is in prisoner transport. Initially, a larger sheriff's department may have established runs to certain facilities. The initial use of video may not necessarily affect that system; however, as use increases, fewer overall runs will be needed and those transport officers can be re-assigned to other duties.

Change is Difficult

The court system is comprised of different entities across multiple branches of government. The goals and objectives of each entity may be different. The real or perceived impact video conferencing has on those entities will directly affect the speed and success of a video conferencing program. The desire to continue to business as usual should not be underestimated.

Frequently Asked Questions

The use of videoconferencing can generate a lot of questions. The following is just a few of the most prevalent frequently asked questions.

1. **What is videoconferencing?** It is the simultaneous transmission of audio and video image between two points.
2. **Who can I talk to in Wisconsin?** The *Bridging the Distance* manual, located at <http://www.wicourts.gov/about/committees/docs/ppacvidconf.pdf>, has a resource listing of all the circuit courts, county jails, correctional facilities, educational sites and mental health facilities around the state that have videoconferencing. This list includes contact names and numbers.
3. **What are some of the potential benefits?** The following is just a few of the potential benefits that can be realized by using videoconferencing:
 - Reduction in transportation costs.
 - Reduction in personnel costs.
 - Increase in personnel productivity.
 - Reduction in the average length of stay in county jail for transports.
 - Increase security for litigants and staff.
 - Reduced health care costs for inmates in county jail.
4. **What should I beware of with videoconferencing?** Videoconferencing forces many different entities (public and private) to change the way they currently do business. This may incur some initial costs and/or slow down in how the court or entities have been functioning. When implementing a videoconferencing program a committee should be created with all the intended users providing input and actively working out issues.
5. **Should I use ISDN or IP?** Initially a system should have the capability to do both. The future connectivity of video is IP; however, many of the existing public facilities have only ISDN capabilities. The benefits of both allow for greatest flexibility at the current time.
6. **Is ISDN expensive?** The cost of ISDN service and on line can become expensive; however, if the video systems are used effectively these costs are offset by the savings in transports, lost work time, etc. The State of Wisconsin has two in-place contracts that other governmental entities can utilize for the acquisition of video equipment. Details of both can be found through the state Vendornet system (<http://vendornet.state.wi.us>). They are Contract 15-84056-400, Compressed Video Conferencing Equipment, Accessories and Maintenance and Contract 11-17810-802, Classroom Audio and Video Equipment, Installation and Maintenance. These can provide component pricing of equipment as well as contract vendors.
7. **How many cameras should I purchase?** To maximize the effectiveness, acceptability and flexibility of a video conferencing program, courtrooms should be equipped with permanent multi-camera video conferencing systems that provide monitors that are viewable by both the court participants and the public. The best use of single camera video conferencing systems are in non-courtroom settings, jails, prisons, conference rooms and ancillary rooms.
8. **Do I need a video technician?** This depends on the size of the video conferencing program. Small programs may not be able to justify the hiring of a technician; however, larger jurisdictions with multiple systems most likely will need additional personnel.
9. **Should I purchase a Maintenance Agreement?** Yes. Videoconferencing systems are not like a car. You just cannot take them anywhere to be fixed. It is very important for the long-term success of a program to purchase a sound maintenance agreement. When it expires you should shop around to other vendors for the best value for the price.
10. **Do I need to have bridging capabilities?:** No. This service can be purchased through a third party vendor. Jurisdictions need to analyze whether or not they plan to use this feature enough to justify purchasing it outright or going through a service.

Glossary

A...

Analog Signals

Transmission of information by a continuous wave. Broadcast television, cable television, and AM/FM radio are examples of analog transmissions. (Contrast with *digital transmission*.)

ANSI

American National Standards Institute; the U.S. standardization body. ANSI is a member of the International Organization for Standardization (ISO).

Aspect Ratio

The ratio of a picture's width to height. In videoconferencing, this ratio is 4 units wide by 3 units high, or 4:3.

Audio Bridge

Equipment that mixes multiple audio inputs and feeds back composite audio to each station after removing the individual station's input. This equipment may also be called a mix-minus audio system.

Audio Privacy

The ability to mute microphones from the control panel so that sound in the local room does not transmit to remote rooms.

B...

B-Channel

The ISDN circuit-switched bearer channels, capable of transmitting 56 or 64 Kbps of digitized information.

Backlight

A special light, controlled by its own power switch, on the graphics camera used for 35mm slides.

Bandwidth

A measure of spectrum (frequency) use or capacity. For instance, a voice transmission by telephone requires a bandwidth of about 3,000 cycles per second (3KHz). A television channel occupies a bandwidth of 6 million cycles per second (6 MHz) in terrestrial systems. In videoconference-based systems a larger bandwidth of 17.5 to 72 MHz is used to spread or "dither" the television signal in order to prevent interference.

Baud

The rate of data transmission based on the number of signal elements or symbols transmitted per second. Today most digital signals are characterized in bits per second.

Bit

A unit of information represented by a binary digit, either 0 or 1.

Bit Error Rate

The fraction of a sequence of message bits that are in error.

Bit Map

The total of all bit planes used to represent a graphic. Its size is measured in horizontal, vertical, and depth of bits. In a one-bit (monochrome) system there is only one bit plane. As additional planes are added, color can be described. Two bit planes yield four possible values per pixel, eight yields 256, and so on.

Bit Rate

The speed of a digital transmission measured in bits per second.

Blanking

An ordinary television signal consists of 30 separate still pictures or frames sent every second. This occurs so rapidly that the human eye blurs the frames together to form an illusion of moving pictures. This is the basis for television and motion picture systems. The blanking interval is that portion of the television signal that occurs after one picture frame is sent and before the next one is transmitted. During this period of time special data signals can be sent that will not be picked up on an ordinary television receiver.

Bps

Bits per second: a unit of measurement of the speed of data transmission and thus of bandwidth.

BRI

Basic Rate Interface: 3 digital signals over a single pair of copper wires: 2 information (B) channels and 1 signal (D) channel.

Bridge

In videoconferencing vernacular, a device that connects conference sites so that they can

communicate simultaneously. Bridges are often called MCU's—multipoint conferencing units. The term bridge can also be used in audio conferencing to refer to a device that connects multiple (more than two) voice calls so that all participants can hear and be heard.

Broadband

The term applied to networks having bandwidths significantly greater than those found in telephony networks. Broadband systems are capable of carrying a large number of moving images or a vast quantity of data simultaneously. Broadband techniques usually depend on coaxial or optical cable for transmissions. They utilize multiplexing to permit the simultaneous operation of multiple channels or services on a single cable. Frequency division multiplexing or cell relay techniques can both be used in broadband transmission.

Byte

A group of eight bits; usually the smallest addressable unit of information in a data memory storage unit.

C...

Carrier

A term used to refer to various telephone companies that provide local, long distance or value-added services; alternately, a system or systems whereby many channels of electrical information can be carried over a single transmission path.

Cascade

Connection of two multipoint control units.

CCITT

Consultative Committee for International Telegraphy and Telephone (now called the International Telecommunications Union's Telecommunications Standardization Sector or TSS); international body responsible for establishing interoperability standards for communications systems. CCITT is the world's leading telecommunications standards organization.

CIF

Common Intermediate Format; an international standard for video display formats developed by TSS. The QCIF format, which employs half the CIF spatial resolution in both horizontal and vertical directions, is the mandatory H.261 format. QCIF is used for most desktop videoconferencing applications where head and shoulder pictures are sent from desk to desk. QCIF displays 176 pixels grouped in 144 non-interlaced luminance lines.

Clipping

The shortening or the cutting off of words because more than one person is speaking at a time or because there is noise beyond the range of the audio equipment.

Closed Circuit Television (CCTV)

Closed circuit television (CCTV) is a television system in which signals are not publicly distributed. Cameras are connected to television monitors in a limited area such as an office building or between two fixed locations. CCTV is commonly used in surveillance systems or communications between two "hard-wired" points. CCTV systems have no connectivity to the outside without additional equipment and/or system modifications

Codec (Coder/Decoder)

A device that converts an analog signal into a digital signal for transmission and converts it back to analog for display at the remote site. Codecs used for videoconferencing compress the analog video signal, allowing it to be transmitted less expensively.

Compression

The process of reducing the information content of a signal so that it occupies less space on a transmission channel or storage device and a fundamental concept of video communications. An uncompressed NTSC signal requires about 90 Mbps of throughput, greatly exceeding the speed of all but the fastest and shortest of today's networks. Squeezing the video information can be accomplished by reducing the quality (sending fewer frames in a second or displaying the information in a smaller window) or by eliminating redundancy.

Compressed Video

A video signal requiring less information to transmit than broadcast quality or full-motion video. Digital technology is used to encode and compress the signal.

Computer Conferencing or Web Conferencing

Allow persons at different locations to communicate directly with each other through computers. Communication may be real-time or delayed. Document conferencing is a type of computer conferencing.

Control Panel

A device used to select images to be seen by other sites. Used to control camera position and select other videoconferencing features.

D....

D-Channel

In an ISDN network, a signaling channel over which packet-switched information is passed by the carrier. The D-channel can also support the transmission of low-speed data or telemetry sent by the subscriber.

Delay

The time it takes for a signal to go from the sending station through the videoconference to the receiving station. This transmission delay for a single hop videoconference connection is less than one-eighth of a second.

Demodulator

A videoconference receiver circuit that extracts or “demodulates” the “wanted” signals from the received carrier.

Dial Up

The ability for sites to call one another at the time they want a videoconference to start.

Digital Signals

Conversion of information into bits of data for transmission through wire, fiber optic cable, videoconference, or over air techniques. The digital method allows simultaneous transmission of voice, data, or video.

Distance Learning

The incorporation of video and audio technologies into the educational process so that students can attend classes and training sessions in a location distant from that where the course is being presented. Distance learning systems are usually interactive and are becoming a highly valuable tool in the delivery of training and education to widely dispersed students in remote locations or in instances where the instructor cannot travel to the student’s site.

Digital Transmission

Transmission of information by a code of discrete binary signals (on and off, zero and one, high and low, etc.). Digital transmission is expressed by number of bits per second. (Contrast with *analog transmission*.)

Document Conferencing or Web Conferencing

Allow persons in two locations to use their PCs to work simultaneously on a single electronic file. The videoconferencing system is used to establish the connection between the PCs. (See also *computer conferencing*.)

Downlink Site

The remote site in instructional television, which receives the transmission signal from a satellite. Also called receive site.

E...

Echo

The reflection of signal energy, which causes the signal to return to the transmitter or to the receiver. In videoconferences, echo is typically caused by improper positioning of microphones or high volume of incoming sound.

Echo Canceller

An electronic circuit that attenuates or eliminates the echo effect on videoconference telephony links.

Echo Effect

A time-delayed electronic reflection of a speaker’s voice. The echo effect is largely eliminated by modem digital echo cancellers.

Echo Suppression

Used to reduce annoying echoes in the audio portion of a videoconference. An echo suppressor is a voice-activated “on/off” switch that is connected to the four-wire side of a circuit. It silences all sound when it is on by temporarily deadening the communication link in one direction. Unfortunately, not only the echo is stopped but also the remote end’s new speech, which results in clipping.

Ethernet (Internet, TCP/IP, IP)

Digital network used by videoconferencing systems that support the H.323 standard.

F...

Far-End Camera Control

The ability for the participants in a videoconference to control the camera(s) of the other participants.

FEC

Forward error correction; adds unique codes to the digital signal at the source so errors can be detected and corrected at the receiver.

Fps (Frames per Second)

30 fps is considered an acceptable frames per second.

Fractional T1

Any data transmission rate between 56 Kbps and 1.544 Mbps. Fractional T1 (or FT1) is typically provided by a carrier in lieu of a full T1 connection and is a point-to-point arrangement. A specialized

multiplexer is used by the customer to channelize the camera's signals.

Frequency

The number of times that an alternating current goes through its complete cycle in one second. One cycle per second is also referred to as one hertz; 1,000 cycles per second, one kilohertz; 1,000,000 cycles per second, one megahertz; and 1,000,000,000 cycles per second, one gigahertz.

Full-Duplex (FDX)

Two-way, simultaneous transmission of data; a communication protocol in which the communications channel can send and receive data at the same time. Compare to half-duplex, where information can only be sent in one direction at a time.

Full-Motion Video

Video reproduction at 30 frames per second (fps) for NTSC signals or 25 fps for PAL signals. Also known as continuous-motion video. In the videoconferencing world, the term "full-motion video" is often used, and often misunderstood. Videoconferencing systems cannot provide 30 fps for all resolutions at all times nor is that rate always needed for a high-quality, satisfying video image. Picture quality must sometimes be sacrificed to achieve interactive visual communication across the telephone network economically. Videoconferencing vendors often use "full-motion video" to refer to any system that is not still-frame. Most videoconferencing systems today run 30 frames per second at 384-768 Kbps.

Full-Motion Graphics

Live-mode transmission of a picture on the graphics camera so that participants can see writing or annotation as it occurs. The picture is displayed on the left monitor. (Contrast with *still mode*.)

G...

Graphics Camera

An optional camera and stand used to send graphics and visuals to remote sites.

H...

H.261, H.263 and H.264 Standard for Codecs

The recommendation of the National Television Standards Committee for the compression and decompression of the audio and video signals in videoconferencing to insure transmission quality.

H.320 Standard for Video over ISDN

A recommendation of the ITU-T based on Discrete Cosine Transform, CCM, and motion compensation techniques. It can be a video system's sole compression method or supplementary algorithm, used instead of a proprietary algorithm when two dissimilar codecs have needed to interoperate. H.320 includes a number of individual recommendations for coding, framing, signaling, and establishing connections. It also includes three audio algorithms, G.721, G.722, and G.728.

H.323 Standard for Video over Internet

A compression method or algorithm that allows compressed video transmission over the Internet, intranet, or enterprise local area network.

Handshake

The electrical exchange of predetermined signals by devices wishing to set up a connection. Once the handshake is completed, the transmission begins. Used in video communications by codecs wishing to interoperate whereby they seek out a common algorithm.

Hertz (Hz)

The name given to the basic measure of radio frequency characteristics. An electromagnetic wave completes a full oscillation from its positive to its negative pole and back again in what is known as a cycle. A single Hertz is thus equal to one cycle per second.

I...

Interactive Video

The ability to transmit and receive two-way video transmissions between two or more sites.

Internet Protocol (IP) Videoconferencing

Video transmitted via a Local Area Network (LAN) – Wide Area Network (WAN) data system using the Internet to connect to other sites.

Interoperability

The ability of electronic components produced by different manufacturers to communicate across product lines. The trend toward embracing standards has greatly furthered the interoperability process.

ISDN

Integrated Services Digital Network. A digital network that provides seamless communications for voice, video, and text between videoconferencing systems. One ISDN line consists of 2 B-Channels to transmit at 128 Kbps.

ISDN/T1 Dial-Up Videoconferencing

Video transmitted over the public telephone network over circuits (lines) passing data at either 56 or 64 kbps.

ITU

International Telecommunications Union; one of the specialized agencies of the United Nations.

K...

Kbps

Kilobits per second; refer to transmission speed of 1,000 bits per second.

L...

LAN

Local Area Network; a computer network linking workstations, file servers, printers, and other devices within a local area, such as an office. LANs allow the sharing of resources and the exchange of both video and data.

Leased Line

A dedicated circuit typically supplied by the telephone company.

M...

Mbps

Megabits per second.

Megahertz (MHz)

Refers to a frequency equal to one million Hertz, or cycles per second.

Microwave

Line-of sight, point-to-point transmission of signals at high frequency. Many CATV systems receive some television signals from a distant antenna location with the antenna and the system connected by microwave relay. Microwaves are also used for data, voice, and all types of information transmission. The growth of fiber optic networks have tended to curtail the growth and use of microwave relays.

Modulation

The process of manipulating the frequency or amplitude of a carrier in relation to an incoming video, voice, or data signal.

Modulator

A device that modulates a carrier. Modulators are found as components in broadcasting transmitters and videoconference transponders. Modulators are also

used by CATV companies to place a baseband video television signal onto a desired VHF or UHF channel. Home video tape recorders also have built-in modulators that enable the recorded video information to be played back using a television receiver tuned to VHF channel 3 or 4.

MPEG

Moving Picture Experts Group; MPEG has established standards for compression and storage of motion video.

Multiplexer

A device that takes input from a number of sources and combines them into a single data stream for simultaneous transmission. In videoconferencing, video, audio, and data signals are combined.

Multiplexing

Techniques that allow a number of simultaneous transmissions over a single circuit.

Multipoint

Communication configuration in which several terminals or stations are connected. Compare to point-to-point, where communication is between two stations only.

MCU

Multipoint Control Unit; a device that bridges together multiple inputs so that more than three parties can participate in a videoconference. The MCU uses fast switching techniques to patch the presenters or speaker's input to the output ports representing the other participants.

N...

Network

A group of stations (computers, telephones, or other devices) connected by communications facilities for exchanging information. Connection can be permanent (via cable) or temporary (using telephone or other communications links). The transmission medium can be physical (via copper, wire, fiber optic cable, etc.) or wireless (via satellite).

Node

A concentration point in a network where numerous trunks come together at the same switch.

NT-1

Network Termination type 1. The NT-1 is a device that converts the two-wire line (or "U" interface) coming from your telephone company into a 4-wire line (or "S/T" interface). The NT-1 is physically

connected between the ISDN board of your videoconferencing system and your ISDN phone line. The NT-1 supports network maintenance functions such as loop testing. Check to see if your ISDN equipment requires an external NT-1 to operate.

NTSC

National Television Standards Committee. A video standard established by the United States (RCA/NBC) and adopted by numerous other countries. This is a 525-line video with 3.58-MHz chrome subcarrier and 60 cycles per second. Frames are displayed at 30 frames per second.

P...

Packet Switching

Data transmission method that divides messages into standard-sized packets for greater efficiency of routing and transport through a network.

Pan

To pivot a camera in from side to side. (Compare to *tilt*, which means up and down.)

PBX

Private Branch Exchange; a telephone switch, usually located on a customer's premises, connected to the telephone network but operated by the customer. A PBX provides pooled access to a given number of inside (extension) lines in a smaller number of outside lines (trunks). Often, outgoing calls are dialed directly, and incoming calls are handled by an operator or switched automatically by the PBX software.

Phone Add

A feature that adds participants at a non-videoconference site to the videoconference by telephone.

Picture in a Picture (PIP)

The capability of the codec to show two images on the same screen. Generally the far end is shown on the majority of the screen with the near end on the smaller portion.

Pixel

The smallest element of the computer or television display on the raster scale.

Point-to-Point Conference

A videoconference between two sites.

POTS

Plain Old Telephone Service; conventional analog telephone lines using twisted-pair copper wire. This line is used to provide residential service.

Preset

A camera position that has been stored.

Preview

The ability to view a camera shot before (or while) it is transmitted.

PZT – Pan, Zoom, Tilt

A term used to describe the capability of the cameras associated with videoconferencing.

R...

Real-Time

The processing of information that returns a result so rapidly that the interaction appears to be instantaneous. Telephone calls and videoconferencing are examples of real-time applications. Real-time information not only needs to be processed almost instantaneously, but it needs to arrive in the exact order it is sent. A delay between parts of a word, or the transmission of video frames out of sequence, makes the communication unintelligible. The telephone network is designed for real-time communication.

Receiver (Rx)

An electronic device that enables a particular videoconference signal to be separated from all others being received by an earth station, and converts the signal format into a format for video, voice, or data.

Remote Site

The site receiving the local room transmission. Also called distant, remote, or receiving room or far-end site.

Room System

A cabinet housing monitors, the camera, the audio system, the video system, the codec, and other telecommunications equipment. Also called console, rollabout, or main unit.

S...

Scrambler

A device used to electronically alter a signal so that it can only be viewed or heard on a receiver equipped with a special decoder.

Spectrum

The range of electromagnetic radio frequencies used in transmission of voice, data, and television.

Split Screen

Sometimes referred to as “Hollywood Squares”, this is the capability of a video system to show multiple participants at one time on the monitor or screen.

Spread Spectrum

The transmission of a signal using a much wider bandwidth and power than would normally be required. Spread spectrum also involves the use of narrower signals that are frequency hopped through various parts of the transponder. Both techniques produce low levels of interference between the users. They also provide security in that the signals appear as though they were random noise to unauthorized earth stations. Both military and civil videoconference applications have been developed for spread spectrum transmissions.

Still Mode

Transmission of a graphic, chart, or other picture so that it appears frozen on the right monitor. (Contrast with *full-motion graphics*.)

Switched 56/64

Service that allows customers to dial up and transmit digital information up to 56,000/64,000 bits per second in much the same way that they dial up an analog telephone call. The service is billed like a voice line—a monthly charge plus a cost for each minute of usage. Individuals circuits of this type are bundled together to provide for the transmission of the audio and video signals in videoconferencing.

Synchronization (Sync)

The process of orienting the transmitter and receiver circuits in the proper manner so that they can be synchronized. Home television sets are synchronized by an incoming sync signal with the television cameras in the studios 60 times per second. The horizontal and vertical hold controls on the television set are used to set the receiver circuits to the approximate sync frequencies of incoming television picture, and the sync pulses in the signal then fine tune the circuits to the exact frequency and phase.

T...

T1 Lines

The transmission bit rate of 1.544 millions bits per second. This is also equivalent to the ISDN Primary Rate Interface for the U.S. The European T1 or E1 transmission rate is 2.048 million bits per second.

T.120 Standard for Data Conferencing

A standard for audiographics exchange. Although H.320 provides a basic means of graphics transfer, T.120 will support higher resolutions, pointing, and annotation. Users can share and manipulate information much as they would if they were in the same room, even though they are working over distance and using a PC platform. T.120 allows audio bridge manufacturers to add graphics to their products in support of a wide range of applications.

T3 Channel (DS-3)

A digital circuit transmitting at 45.304 Mbps.

Talking Head

The portion of a person that can be seen in the typical business-meeting style videoconference; the head and shoulders. This type of image is fairly easy to capture with compressed video because there is little motion in a talking head image and most occurs in facial expression and torso movement.

Telecommuting

The process of commuting to work electronically rather than physically. Telecommuting will find much greater acceptance as the public switched telephone network becomes more robust and digital and as videoconferencing and multimedia technologies arrive at the desktop.

Telemedicine

The practice of using videoconferencing technologies to diagnose illness and provide medical treatment over a distance. Telemedicine is used in rural areas where health care is not readily available and to provide medical services to prisoners, among other applications.

Tilt

To pivot a camera up and down. (Compare to *pan*, which means to pivot a camera from side to side.)

Train

A method of setting the acoustic echo canceling system to the current room acoustics.

U...

Uplink

The earth station used to transmit signals for a satellite videoconference.

Uplink Site

The local site in instructional television. Also called broadcast or transmit site.

V...

Video Input\Source

Any device capable of transmitting a video image, such as a main, an auxiliary, or a graphics camera or a VCR.

Voice-Activated Switching

Process where the video-transmitting location is determined by the location generating the most sound. The picture on the left screen is normally originating from the site of the person currently speaking.

W...

WAN

Wide Area Network; a communications network that services a geographic area larger than that served by a local area network or metropolitan area network. WANs include commercial or educational dial-up networks such as CompuServe, InterNet, and BITNET.

Whiteboarding or Webconferencing

A term used to describe the placement of shared documents on an on-screen “shared notebook” or “whiteboard.” Desktop videoconferencing software includes “snapshot” tools that enable users to capture entire windows or portions of windows and place them on the whiteboard. Familiar Windows operations (cut and paste) can also be used to put snapshots on the whiteboard, and the electronic whiteboard can be “marked up” much like a traditional wall-mounted board.

White Noise

A random noise that contains an equal amount of energy per frequency band. Typically a “hissing” sound similar to what is heard when a radio is tuned between stations.

X...

X.25 Standard for Packet (Data) Switching

A set of packet switching standards published by the CCITT.

Z...

Zoom

Movement of the camera in and out to change the scope of the image.

Sources and Links

The following are resources that were utilized in the 1999 *Bridging the Distance* manual and have been kept as reference material for the 2005-updated version of the manual:

Sources:

John Arstein and James Goodwin, III, *The Technology of Videoconferencing* (October 1994) 8, 9

John Matthais and James Twedt, *Telejustice – Videoconferencing for the 21st Century* (September 1997) 1, 4, 5, 8

MCI, *Videoconferencing Application Brief* (1992) 9

The California Judicial Council's report on the use of videoconferencing in the courts can be found on the California Judiciary Web site at

<http://www.courtinfo.ca.gov/reference/documents/videoreport.pdf>

Martin E. Gruen and Tom Wetter, *Courtroom Audio, Video, and Videoconferencing* (September 1997) 2, 10, 11,12

Judicial Council of California, *Report on the Application of Video Technology in the California Courts* (August 1997)

Links:

Videoconferencing in Wisconsin Courts: a comprehensive Web Site of videoconferencing information compiled by the Wisconsin State Court System.

<http://www.courts.state.wi.us/about/committees/ppacvideo.htm>

Instructional Communications Systems, UW-Extension, in Madison, provides multipoint bridging services and gateway connections between sites using ISDN, IP or BadgerNet. ICS also provides meeting and training facilities for videoconferencing in Madison and can arrange public video rooms around the state.

<http://www.uwex.edu/ics>

Appendices

The following appendix items are meant to serve as examples for entities creating or formalizing their own videoconferencing program. These forms and policies are samples from various court videoconferencing programs throughout the state of Wisconsin and meet the needs of each specific area. Individual entities will need to create policies and forms that meet the specific needs of their respective areas and are applicable to current statutes and local rule.

SAMPLE

Appendix A Sample Tracking Form

Waukesha County Video Conferencing Log Sheet

This Sheet is to be filled out for every video event. For example, if two hearings are conducted then two log sheets should be completed. If there are any questions to filling out the log sheet please contact the District Court Administrator. The log sheets should be sent to District Court Administrators office located at the Waukesha County Courthouse, room C359.

1) Date: _____ 2) Case Number: _____

3) County: _____

4) Room Location: Rm 266 Courthouse MHF Juvenile Courtroom Jail
 Other: _____

5) Who Appeared by video (Check all that apply):

Defendant\Respondent Prosecution\Plaintiff Witness Expert Testimony
 Caseworker Interpreter Judge Other _____

6) Court Activity (Check one):

Jury Trial (JT) Hearing (HE) Court Trial (CT) Meeting Testing

7) Define Event (i.e. plea, review, dispo., placement, probable cause):

8) Was video use contested?: Yes No

9) Name facility contacted: Rm 266 Courthouse MHF Juvenile Courtroom Jail
 Other _____

10) Start Time: _____ 11) Completion Time: _____

12) Did any party pay for the video service: Yes No
If yes state which party: _____

13) Who presided over the event? (Check one):

Judge Commissioner Administrator Staff

14) Responsible Official's name: _____

15) Technical difficulties: Yes No
If yes state describe:

16) General Comments:

SAMPLE

Appendix B
EXAMPLES of Local Court Rules

STATE OF WISCONSIN

CIRCUIT COURT
THIRD JUDICIAL DISTRICT

WAUKESHA COUNTY

IN THE MATTER OF:
The Use of Interactive Video in Court
Proceedings

ORDER

WHEREAS, the Waukesha County Judiciary is utilizing the use of interactive video (video) for remote appearances to assist in the effective and efficient disposition of cases in the court system, and

WHEREAS, The Chief Judge has the responsibility under SCR 70.19 (3) (b) to maintain an effective system and management of case flow through the District, and

WHEREAS, the Chief Judge has the responsibility under SCR 70.19 (3) (e) & (f) to adopt local judicial administrative rules and establish policies and plans, and

WHEREAS, the Chief Judge believes it is in the best interest of the court system to develop policies on the use of interactive video for the Waukesha County Court System,

AND THEREFORE, IT IS ORDERED that the following rules are established as it relates to video use in the court system:

- 1) All video court events and appearances are to be indicated on the court record.
- 2) Any location where a remote appearance is being conducted with a Waukesha County Circuit Judge or Court Commissioner is to be considered an extension of the courtroom in which the hearing is taking place.
- 3) Any proceeding or appearance allowable by statute, case law and/or at the discretion of the court may be conducted by video either by request of a party or at the discretion of the presiding court official.
- 4) Any party requesting (including the court) the use of video for an upcoming court event should attempt to do so within a reasonable amount of time prior to the hearing\trial and\or to the physical transport of the prisoner\patient\detainee, witness, etc.
- 5) If any party objects to conducting a hearing via video, they shall orally (on the record) or in writing notify the court the reason why and all counsel of record and/or parties not represented by counsel of record of such objection within a reasonable time prior to the hearing. The judge shall make a determination on the record, whether to proceed with the video proceeding or allow or require counsel/litigant to personally appear.
- 6) Parties to a video proceeding authorized by the court may file by facsimile any papers necessary for the completion of the proceeding.
- 7) During a video proceeding the court shall maintain full control of the remote camera and courtroom camera. No movement or adjustments of the video cameras or sound shall be made unless authorized by the court.
- 8)The circuit court shall have priority use of video units, not withstanding any arrangements made with private entities.

IT IS SO ORDERED this _____ day of _____, 200X.

HON. JUDGE NAME
JUDGE TITLE

817. COURT APPEARANCE BY IN-CUSTODY DEFENDANTS

- (a) This section is adopted to fulfill the requirement of ss. **800.01**
- (b) It applies to defendants who are in custody of a law enforcement officer and who are scheduled for court appearance via the interactive video system.

- (b) If a defendant has a physical disability such as hearing, seeing and/or speaking that will make communication via video difficult for either the defendant or the judge or both, the defendant shall be brought personally before the judge, unless an interpreter is made available and both the defendant and the interpreter can be heard and seen via video during the proceedings.

- (c) If the judge has reason to believe that the defendant is mentally incompetent, Municipal Court procedures relating to appointment of a guardian ad litem shall apply.

- (d) The in-custody calendar shall be prepared by the law enforcement officer with custody of the defendants in accordance with the directions of the court, and provided to the court staff in time for preparation of the physical and computer case files as necessary.

- (e) The video proceeding shall be as follows:
 - (1) The judge shall ask the defendant to state his/her name and address.

 - (2) The judge shall order judgment, adjournment, program referral, extension of time to pay, or other action.

 - (3) Judicial notices, referral notices, adjournment slips or other notices as required by judicial action shall be given personally to the defendant.

- (f) The courtroom shall have a video monitor that enables the public to hear and see the proceedings as conducted in the area where the defendant is physically located.

- (g) The courtroom shall have a video monitor that enables the judge to hear and see a clear image of the defendant and to hear a clear transmission of the defendant's (or his/her interpreter's) voice.

- (h) The video appearance area where the defendant is physically located shall have a video monitor that enables the defendant to see a clear image of the judge and the courtroom, and to hear a clear transmission of the judge's voice

SAMPLE

STATE OF WISCONSIN

CIRCUIT COURT
FIFTH JUDICIAL DISTRICT

LAYFAYETTE COUNTY

508

Telephone and audio-visual proceedings may be had in the Lafayette County Circuit Court pursuant to sec. 807.13, Stats., (1988 as amended).

The party requesting such proceedings shall arrange them after consultation with other counsel, the court and non-represented parties in the action.

SAMPLE

Appendix C

Waukesha County Video Appearance Colloquy

To protect a defendant's rights and the court record, the court should follow these procedures on the record before beginning any video proceeding:

1. Judge\Magistrate should identify the person appearing by remote testimony and then identify themselves and their branch (i.e. Hello Mr. Smith I am Judge STATE FULL NAME, BRANCH, COUNTY appearing to you by means of video conferencing).
2. Colloquy:
 - a. "Can you hear me?"
 - b. "Can you see me?"
 - c. "If at any time there is a problem with your ability to physically hear or see what is transpiring in court today you are to immediately inform the court by speaking into the microphone."
 - d. "Do you understand that you are testifying in regards to your case today by means of video in a court of law?"
 - e. "Do you object to the use of video in making your presentation?" If yes the court needs to rule on that objection.
 - f. "Even though your testimony and participation in this case is occurring from a remote location, the same rules and decorum are applicable as if you were physically present."
 - g. "Who is in the room with you at this time?"
 - h. "If at any time anyone in your room, other than your counsel, tells you what to say or tries to influence your answers in any way, you are to immediately inform the court."
3. Identify for those appearing from a remote location any person in the courtroom who may not be visible to them. If the litigant or counsel wishes to physically see a particular individual, the court should accommodate that request if appropriate.
4. Make a determination and make a record as to whether the equipment to be used and the remote location(s) meet the minimum standards for video appearances approved by the court or local rules. (I have concluded that the quality of sound and audio meets the courts minimum standards for video appearances).