

Court Appearances in Criminal Proceedings Through Telepresence

Identifying Research and Practice Needs to Preserve Fairness While Leveraging New Technology

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EXECUTIVE SUMMARY

Local jurisdictions, faced with caseloads of increasing complexity and cost, have adopted alternative approaches to criminal case processing—including new technologies—that have the potential to reduce backlog and improve judicial efficiency. *Telepresence technology*, which allows an individual or group of individuals to appear in a court proceeding from a remote location, is one prominent example. Although telepresence has the potential to increase court safety, reduce costs, and enhance court efficiency, its use also might involve some unanticipated disadvantages. Telepresence technology has been used in courts since the 1970s, but its potential to yield both benefits and burdens in various contexts has not yet been fully examined.

On behalf of the National Institute of Justice (NIJ), RTI International and the RAND Corporation convened the Court Appearances Through Telepresence Advisory Workshop in November 2018 as part of the Priority Criminal Justice Needs Initiative. The Priority Criminal Justice Needs

Initiative regularly convenes workshops to bring together experts, practitioners, scientists, and key stakeholders for discussions on the most-pressing challenges and opportunities for advancement within the criminal justice system. The conversations are designed to help NIJ prioritize areas in which further research and technological developments could directly improve justice system processes, procedures, policies, and outcomes.

The Court Appearances Through Telepresence Advisory Workshop (telepresence workshop) was designed to explore the potential benefits and burdens of telepresence technology and identify innovative solutions for addressing concerns regarding the use of these technologies for criminal court appearances. The 12 core participants in the workshop included five members from an academic, training, or research institute; five local court practitioners (one judge, one court administrator, one correctional administrator, one public defender, and one director of a special programs unit in a

PRIORITY NEEDS



RESULTS

- Research is needed on options for improving network connectivity and on best practices and minimum standards for audio setup.
- Research is needed to assess the impact of telepresence technology on the experiences of witnesses and victims.
- Technical issues that influence the effectiveness of telepresence technology should be identified, and national standards for the setup of telepresence systems should be developed.
- A training curriculum for each of the different court actors who interact with telepresence technology in some capacity should be developed.
- Model configurations that can be used to help purchasers make intelligent buying decisions should be developed.
- Research is needed to better understand the effect of telepresence technology on defendants' experiences with the court process and perceptions of procedural justice.
- Research should be conducted into the appropriate levels of video quality and image size, and implementation standards for courts should be developed.
- Research is needed to determine whether there is a difference in cross-examinations that occur in person versus via telepresence technology.
- Pilot courtrooms (e.g., laboratories) should be created where court staff can try new technologies and get more comfortable with them.



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District Attorney's office); and two staff members from state-level offices overseeing court services (one information technology [IT] director and one language access coordinator). The participants represented a broad spectrum of stakeholder voices, from victims to defendants to various members of

the courtroom workgroup. All participants had considerable experience using or researching the use of telepresence technology. Several panel members had previously served as experts for an NIJ workgroup specifically focused on videoconferencing at postarrest hearings (Davis et al., 2015).

WHAT WE FOUND

Panel members shared their insights about the impact of telepresence technology on various court stakeholders, including defendants, judges, witnesses, victims, and attorneys, and on different types of cases in criminal courts. They acknowledged the potential benefit of telepresence technology in expediting pretrial and trial case processing; providing cost savings; and expanding the ability of victims, witnesses, language interpreters, and other individuals to participate. However, the panel members also discussed the potential disadvantages of telepresence technology, which can result in a violation of the defendant's constitutional rights or increase the risk of an unfavorable outcome. Participants also expressed the need for detailed

technical standards and stakeholder-specific trainings that ensure the proper setup and high-quality multipurpose use of telepresence technology in court. Given the complexity of the issues involved, the participants emphasized the need to enable state and local courts to handle data collection and storage in a manner that preserves the trial record.

Through an interactive discussion, panel members outlined and ranked pressing needs and proposed solutions related to the use of telepresence technology for criminal court appearances. This report provides a summary of the workshop discussion and proposes key areas for future research based on the panel members' prioritization of research needs.

INTRODUCTION

Definition of Telepresence Technology

Over the past several decades, growing case volumes and costs, coupled with tightening resource constraints, have prompted U.S. courts to seek out cost-saving and efficiency-enhancing technologies that facilitate the administration of justice. Telepresence technologies are one such innovation.

Telepresence encompasses a diverse set of technologies that send data signals through a circuit, allowing parties in remote locations to communicate with one another in real time. There have been considerable advancements in information technology in recent decades, making the use of individual telepresence and videoconferencing commonplace in a wide variety of contexts. This includes individual use on personal computers or mobile devices and business and education applications with dedicated systems for telepresence collaboration and meetings. The logistics of telepresence for court appearances are simple: The party appearing in court from a remote location sits in front of a monitor with a camera and a microphone that capture video and audio data, respectively. The courtroom where the proceeding is taking place also is equipped with an audio and video setup. Video and audio data are transmitted between the remote party and the courtroom via a network connection, allowing those present in both locations to see and hear one another in real time. Thus, telepresence technology allows an individual or group of individuals to participate in court proceedings remotely rather than appear in the courtroom in person.

Courts have been using some form of telepresence since 1972, when an Illinois court conducted the first video phone bail hearings. As technological advancements have enabled faster and higher-quality videoconferencing at lower costs, more and more courts have invested in these systems.

Current Uses of Telepresence Technology in Criminal Courtrooms

There are no national estimates on the prevalence of telepresence technology in the legal system. It is unclear exactly how many U.S. courts permit the use of telepresence and for what purposes. However, telepresence technology appears to be geographically widespread. Fifty-seven percent of pretrial services programs that responded to the Pretrial Justice Institute's 2009 survey reported conducting initial court appearances via video. According to the National Center for State Courts' (NCSC's) State Court Organization data set, which was last updated in

June 2017, state-level offices of courts oversee the use of videoconferencing in 35 states and the District of Columbia (Strickland et al., 2017).

Telepresence technologies are used in local, state, and federal courts to facilitate the remote appearance and presentation of evidence by various court parties, including witnesses, victims, defendants, and outside experts (Center for Legal and Court Technology, 2014). For example, telepresence technology is used to allow the remote appearance of defendants in prisoner civil rights cases and in pretrial proceedings (e.g., arraignments), postconviction proceedings (e.g., parole revocation hearings) and immigration removal hearings (Davis et al., 2015; NCSC, undated; Pretrial Justice Institute, 2009). In criminal trial proceedings, the use of telepresence generally is restricted to the remote appearance of witnesses and victims. However, some courts allow defendants to appear remotely for certain types of sentencing hearings (Bridenback, 2016). Problem-solving courts use telepresence to facilitate the participation of outside parties, such as service providers, who are involved in cases and working directly with defendants. These technologies also are used to facilitate other court functions, including remote interpreting and remote court reporting.

The spread of telepresence technology in courts is governed by legal and constitutional considerations. In addition to state or local-level protections that might exist in a jurisdiction, there are several constitutional rights that criminal courts must consider and protect when determining whether to use telepresence technology, including the following:

- The Fifth Amendment grants criminal defendants the right to substantive and procedural due process, and telepresence technology might make it difficult to determine whether a defendant who waives certain rights understands what they are agreeing to and can therefore consent to this waiver.
- The Sixth Amendment grants criminal defendants the right to adequate assistance of counsel, including the ability to confer with their defense attorneys during proceedings and to receive competent legal representation.

The Sixth Amendment's confrontation clause grants defendants the right to confront or challenge a witness on cross-examination. In *Maryland v. Craig*, the Supreme Court held that the defendant's Sixth Amendment rights were not violated because the use of one-way videoconferencing technology still allowed the witness to be placed under oath, the defendant to cross-examine the witness, and the jury or finder of fact to

ascertain the witness' credibility by viewing their demeanor (Brooks, 2012, pp. 198–199; *Maryland v. Craig*, 497 U.S. 836, 1990; Devoe and Frattaroli, 2009).¹ In *Crawford v. Washington*, the Supreme Court further clarified that it is a violation of the defendant's Sixth Amendment rights under the confrontation clause to be denied the opportunity to confront or challenge an adversarial witness who makes a testimonial statement that is offered to prove the truth of the matter asserted. If a witness made a testimonial statement prior to trial and the defendant did not have an opportunity to cross-examine or confront this witness previously, then this witness' statement is not admissible at trial unless this witness is available for cross-examination during the trial proceedings (*Crawford v. Washington*, 541 U.S. 36, 2004).

The violation of a defendant's constitutional and legal rights warps the aim of the criminal justice system to ensure a fair process and increases the likelihood that decisions made during the pretrial or trial proceedings will be challenged on appeal. To reduce these risks, jurisdictions that use telepresence technologies most often employ them during pretrial court proceedings, which lessens the risk of violating the defendant's constitutional rights (Bridenback, 2016). Defendants are most likely to appear remotely through telepresence technology during pretrial proceedings, while victims, witnesses, language

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interpreters, and attorneys might appear remotely during both pretrial and trial proceedings. The NCSC's 2010 Video Conferencing Survey found that more than half of the jurisdictions using telepresence technology reported using it for initial appearances and criminal arraignments, whereas less than 20 percent reported its use in motion hearings or court trials (NCSC, undated).

Potential Advantages and Disadvantages of Telepresence Technology in Criminal Proceedings

Like any other technology, telepresence in U.S. courts creates both challenges and opportunities. To identify the potential benefits and burdens of telepresence technology, RTI staff conducted an extensive academic and legal literature review of research on the use of telepresence technology in criminal cases. To date, there has not been a comprehensive landscape analysis to fully examine the key factors courts should consider in making determinations about the adoption of telepresence technology in different types of settings and proceedings. Among the most commonly cited advantages of videoconferencing in a legal setting are increased safety for court stakeholders and corrections personnel, reductions in costs associated with transportation, and enhanced court efficiency. Potential advantages include the following:

- **improved safety:** By allowing individuals to appear in court remotely, telepresence eliminates the need to transport defendants and offenders from correctional facilities to courthouses, reducing potential threats to the safety of court personnel, corrections staff, victims, witnesses, and the public (Maryland Administrative Office of the Courts, 2012; Concurrent Technologies Corporation and CONSAD Research Corporation, 2000).
- **cost reductions:** Telepresence technologies have the potential to reduce expenditures on the transportation of defendants and offenders to and from court facilities; the medical services made necessary by the exposure of sick inmates to court personnel; and travel for the attorney, correctional staff, and other inmates, which is charged to litigants (CONSAD Research Corporation, 2000; Devoe and Frattaroli, 2009; Kloepfel, Janku, and Vradenburg, 2011).
- **increased court efficiency:** By cutting down transportation time, videoconferencing could allow for faster case processing, reducing case backlogs (CONSAD Research Corporation, 2000; Shubik-Richards, Stemen, and Eichel,

2011; Webster and Hall, 2009; Wisconsin Supreme Court, Office of Court Operations, 2017).

- **reduced detention time for defendants:** Eliminating the need to transport and secure defendants could expedite pretrial proceedings, reducing the amount of time defendants spend in jail prior to their court dates. For instance, the Philadelphia Research Initiative found that the use of videoconferencing in traffic cases and in courts designed to expedite pleas for individuals held before trial for low-level misdemeanors (e.g., “crash courts”) reduced the amount of time defendants spent in jail and doubled the number of cases resolved annually (Shubik-Richards, Stemen, and Eichel, 2011).
- **expanded access to the criminal justice system:** Telepresence technology could increase access to the legal system for expert witnesses, victims, and other court stakeholders who live in remote locations or who fear for their safety in court (Kenniston, 2015; Lynch, 2015). Such technologies could render distant courthouses in large jurisdictions more accessible. Telepresence might be used to assist individuals with disabilities who would otherwise have difficulty attending court proceedings. The use of this technology also might increase the availability of judges by making it possible for them to perform their roles and functions without having to be present in a courtroom (Willis and Kirven, 2004).
- **greater access to language interpreters:** Telepresence technologies can facilitate the provision of language interpretation services, allowing non-English speakers and individuals with communications disabilities to access the criminal justice system more easily (Bridenback, 2016; MacCabe, 2016).
- **reduced trauma for victims:** Telepresence technology enables victims of crimes, such as rape, sexual assault, and child abuse, to testify against the defendant without experiencing the revictimization and trauma of being physically present with their offender (Garvin et al., 2011; Kenniston, 2015).

Although telepresence technology might offer courts valuable advantages, concerns remain regarding its potential impact on legal and constitutional rights, the behavior of court actors, perceptions of credibility, and ultimately, the case outcomes. Potential disadvantages of telepresence technology in the courtroom include the following:

- **legal and constitutional considerations:** As noted previously, in addition to protections under federal and state law, a criminal defendant is granted several protections under the U.S. Constitution that function to promote a fair and just process, including the Fifth, Sixth, and Fourteenth Amendments. Although the defendant has some of these legal and constitutional rights during pretrial proceedings, all of these rights, such as the defendant’s constitutional right to confront adversarial witnesses, are present and must be preserved and protected at trial. Depending on the type of proceeding, telepresence technology might be interpreted as infringing on these legal and constitutional rights (Cimino, Makar, and Novak, 2014; Davis et al., 2015; Haas, 2006; Raburn-Remfry, 1993). However, in other scenarios, telepresence technology could preserve the defendant’s rights by ensuring that the defendant is not held in custody longer than necessary.
- **impact on perceptions of the legal process:** Social science researchers have voiced concerns that videoconferencing might influence the judgment and behavior of individuals who appear in court remotely. Defendants and witnesses who are not physically present in the courtroom might not fully appreciate the gravity of the proceeding in which they are appearing, increasing the risk that they engage in impulsive or contemptuous behavior, or alternatively, that they become disengaged from the legal process (Eagly, 2015; Gibbs, 2017; Lederer, 2009; Raburn-Remfry, 1993).
- **issues of credibility:** As a mode of presentation, videoconferencing could affect assessments of demeanor and nonverbal cues (e.g., eye contact, body language) in ways that lessen the speaker’s ability to connect emotionally with listeners and that reduce the speaker’s perceived credibility (Landström and Granhag, 2010; Landström, 2008; Landström, Ask, and Sommar, 2015; Walsh and Walsh, 2008).
- **impact on outcomes:** Stakeholders have observed that telepresence might have an appreciable negative impact on the outcomes of cases in which it is used. Removing the defendant from the physical courtroom might inadvertently encourage harsher responses on the part of the court.
- **technical issues:** Telepresence technologies are far from infallible. A poor-quality audio, video, or network connection raises concerns for the constitutional rights of court parties. More-serious technical issues could delay or disrupt court proceedings (Devoe and Frattaroli, 2009).
- **data storage and security:** Securely storing the large quantities of video and audio data generated by video-

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conferencing that must be preserved according to court policies can be both costly and burdensome (Webster and Hall, 2009; NCSC, undated; Maryland Administrative Office of the Courts, 2012).

- **impact on the defendant-attorney relationship:** Telepresence might negatively affect the attorney-client relationship by threatening the ability of clients and their attorneys to carry out private communications (Bellone, 2015; Dona et al., 2005; Gibbs, 2017; McDonald, Morgan, and Metze, 2016).

RTI's review of the literature informed the identification of the invited panel participants. To foster a dynamic discussion that would address diverse stakeholder perspectives, RTI staff sought the input and participation of judges, court and jail administrators, prosecutors, public defenders, researchers, law professors, pretrial services providers, and IT professionals. This initial review of extant literature also assisted in the identification of subject-matter experts. Many of the panel members have made significant contributions to the literature on telepresence technologies or have been involved directly in the implementation of telepresence pilot projects that were the subject of research studies. A few of the participants were members of a workgroup convened for a study of videoconferencing at postarrest release hearings funded by NIJ (Davis et al., 2015).

Beyond the identification of panel members, the literature review also served as a guiding framework to structure the workshop discussion around the potential advantages and disadvantages of telepresence technology from different court perspectives or contexts, including pretrial and trial proceedings and various types of cases in criminal and civil courts.

RESEARCH AND DEVELOPMENT NEEDS RELATED TO TELEPRESENCE TECHNOLOGY IN THE COURT SYSTEM

Over the course of a day and a half, the workshop participants discussed the positive and negative aspects of using telepresence technology in court proceedings for a variety of court stakeholders (e.g., defendants, judges, witnesses, victims, attorneys). The participants were asked to consider areas where further research is needed to fully understand the implications of this technology. The panel members weighed the benefits in cost savings and broader access to the criminal justice system against delays and challenges created by technical issues and the potential violation of the defendant's legal and constitutional rights. Ultimately, the participants identified 24 specific research and development needs related to the use of telepresence technology in the court system. The remainder of this report focuses on the discussion among workshop participants about these needs and the recommendations for addressing them. The discussion and identified needs are categorized broadly into three main areas:

1. the need for a better understanding of the impact of telepresence technology on court outcomes and actors
2. the need for technical standards, training, and guidelines related to the setup and operation of telepresence technology
3. potential areas of expansion for telepresence technology.

Each of these three main categories is addressed in the following sections.

Understanding the Impact of Telepresence Technology on Court Outcomes and Actors

As noted previously, the criminal justice system is structured to protect a defendant's legal and constitutional rights and to ensure the fairest possible process. A threshold question in determining whether to implement telepresence technology is the potential for this technology to make the defendant appear less truthful or trustworthy, thereby diminishing the defendant's credibility and potentially increasing the likelihood of harsher case outcomes.

The Impact of Telepresence Technology on Defendants

Legal and Constitutional Considerations

The participants discussed concerns about the potential violation of a defendant's legal and constitutional rights through the use of telepresence technology. Although Justice Antonin Scalia stated in an opinion that confronting a person who is testifying remotely is not the same as the person physically being in the same courtroom (Scalia, 2002), one panel member asserted that a defendant's ability to engage in "contemporaneous cross-examination under oath" through telepresence technology is the same as being in the same courtroom. This participant argued that the most important question is whether the appearance of a witness remotely affects the truthfulness of the testimony. In their view, if a person is not any more likely to be untruthful when testifying remotely, then the use of telepresence technology during court proceedings should not be a concern.

Perceived Credibility

In both civil and criminal proceedings, the credibility of a defendant can be an essential element in the strength of a litigant's case. This is true in pretrial hearings, when a defendant is appearing before a judge, and at trial, when a defendant's demeanor, statements, and presentation can affect individual jurors. Factors contributing to perceptions of a defendant's credibility include such nonverbal expressions as eye contact and posture and the defendant's tone and responsiveness when speaking (Landström and Granhag, 2010; Landström, 2008; Landström, Ask, and Sommar, 2015). Telepresence technology has the potential to negatively affect each of these elements. Although no known studies have confirmed this directly, poor lighting could affect how well the judge can see the defendant onscreen and could affect the judge's perceptions of that individual. Similarly, if the camera and video monitors are set up

in such a way that the defendant's face appears too large or too small on the court's video monitor, it might be difficult for the judge to assess the defendant's body language. Panel members theorized that having a defendant appear before the camera in a correctional uniform could lead to a perception that the individual is guilty simply because they are dressed in the required jail or prison uniform. However, this is a consideration regardless of whether the defendant appears before camera or in person.

Other participants stated that they were less concerned about the potential impact of telepresence technology on a judge's assessment of a defendant's credibility because people are not especially skilled at accurately reading an individual's demeanor, whether in person or via videoconference. Studies have demonstrated that the assessment of one's demeanor is not a reliable means by which to assess credibility (Bennett, 2015; Blumenthal, 1993; Ogden, 2000; Roth, 2000; Timony, 2000). Therefore, the diminished ability to read a person's demeanor because of the use of cameras and monitors might not be the key issue for determining whether to embrace telepresence technology.

Regardless, panel members noted that more research is needed to understand whether the use of telepresence technology affects perceptions of a defendant's credibility and whether this results in differential case outcomes. Some studies that have examined the impact of telepresence technology on pretrial case outcomes when a defendant is appearing remotely found differences in case outcomes (Diamond et al., 2010; Eagly, 2015). Other studies have found that individuals who testify live are perceived more positively and are seen as more

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credible by jurors than those who testify via videoconference (Landström and Granhag, 2010; Landström, 2008; Landström, Ask, and Sommar, 2015). In contrast, Bellone (2015) found no major differences in perceptions of credibility because of the use of telepresence technology.

Defendant Satisfaction and Perceptions of Procedural Justice

A defendant who is appearing remotely at a pretrial hearing might face unique challenges that are distinct from appearing physically in the courtroom. For example, a defendant who is appearing remotely might be in a room where other people are talking or where other background noises are present. One panel member described an instance in which videoconferencing equipment was installed in the loud boiler room of a jail, making it difficult for the defendant to hear and be heard. By contrast, a courtroom is expected to remain silent during proceedings, which can reduce distractions and help foster the defendant's perception that the proceeding is serious and that the judge is weighing all factors. Participants noted that, in general, defendants do not get adequate guidance on what to expect in the courtroom, what the purpose of the particular proceeding is, how to behave, and what they will be expected to do. This lack of guidance is particularly problematic when the defendant is appearing remotely and potentially has even less awareness of what is happening in the courtroom. Defendants who feel that the judge does not care or has not heard them or who feel removed from the process might perceive that the judi-

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cial process is not procedurally just or that they did not have a chance at a fair outcome.

Furthermore, there are ways to counteract any risk that appearances through telepresence technology result in defendants feeling unsupported by friends and family in the judicial process. One panel member explained that sometimes the defendant's friends and family will sit directly behind the prosecutor to ensure that the defendant is aware of their presence.

In general, participants questioned whether quality interactions through telepresence technology would result in similar perceptions of satisfaction with the process and of procedural justice as an in-person appearance. More research is needed to understand the procedural and technical implications of breakdowns in the technology on defendant perceptions.

Bail Hearing Outcomes

One consideration that courts must take into account is whether remote appearances might influence how a judge rules at a particular preliminary hearing. The panel members noted that telepresence technology was largely discontinued in Cook County, Illinois, bail hearings after a study found that the use of telepresence technology during bail hearings resulted in bail being set at higher monetary amounts or not being offered at all (Diamond et al., 2010). However, the participants referenced potential limitations in that study, noting that the placement of cameras in the court prevented speakers from seeing key courtroom parties (e.g., judge, jury) and that this limited view might have influenced their level of comfort, making them appear untrustworthy. Questions remain about whether the technical setup of the equipment has as much of an impact as the technology itself on a judge's determination during a bail hearing. Panel members also noted that research on the impact of social media platforms on communication suggests that individuals who are communicating behind a screen tend to speak more harshly, aggressively, and unkindly than they would in a face-to-face interaction (Cookingham and Ryan, 2015; Groshek and Cutino, 2016; Krzyżanowski and Ledin, 2017; Lee et al., 2014; Richards, Caldwell, and Go, 2015; Siddiqui and Singh, 2016).

There is a need for additional, rigorous research to study the impact of telepresence technology on hearings and judicial interactions with defendants. This is particularly needed as bail reform efforts around the country encourage judges to focus their decisionmaking on the release or detention of the defendant rather than on the offer or set amount of monetary bonds.

Amount of Time Spent in Jail

One of the participants said that defendants who have been surveyed about their experience with telepresence technology understand that appearing remotely could result in spending less time in jail or prison. Appearing remotely can enable the judge to move through the scheduled docket more efficiently and reduce delays that might force a defendant to spend more time in jail.

On the other hand, defendants might be forced to spend additional time in jail during the pretrial phase if telepresence equipment does not function properly or if the use of telepresence technology increases the likelihood of a judge denying bail. Panel members discussed the need to collect data to assess the impact of using telepresence technology on the amount of time a defendant spends in jail. A better understanding of this effect is important because of the potential negative consequences to defendants directly and the costs associated with incarcerating a defendant for a longer period.

Perceptions of the Seriousness of the Proceedings

The participants agreed that it is critically important for defendants to recognize that a remote appearance is still part of a legal proceeding. The participants discussed the psychological weight that is part of the experience of appearing in a courtroom. One panel member noted that when the defendant is removed from the courtroom setting, they might not fully grasp the importance of the situation, the implications of the proceedings, or the weight of what it means to be appearing in court. Additionally, if defendants do not get adequate guidance on what is happening in the courtroom, being on the other side of a videoconference camera might feel more like watching a television show than participating in a hearing. The defendant might shift from an active participant to a passive observer. Finally, panel members hypothesized that younger defendants who use social media or play games that require remote communication might be more comfortable with the technology and view the court proceedings as something like a game. A lack of appreciation for the seriousness of the proceeding, coupled with the feeling of being removed from the process (or that it is a game) could affect the defendant's likelihood of following the terms of pretrial release because of a lack of perceived seriousness of the outcome.

Outer Bounds of Telepresence Technology

In addition to noting that courts are unlikely to allow defendants to appear remotely at trial because of concerns about

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the potential violation of the defendant's constitutional or legal rights, the participants stated that telepresence technology likely would not be adopted in death penalty cases. It is unlikely that the prosecutor, defense attorney, or judge would want to risk diminishing the credibility of the defendant or another key individual when the impact could have irreversible consequences. One panel member made the point that it also would not be good practice to allow a witness to testify remotely in a death penalty case because of the risk of the ruling being thrown out on technical grounds if there were any problems with the functioning of the telepresence technology.

The Impact of Telepresence Technology on Defense Attorneys

Younger attorneys, jurors, witnesses, and other participating individuals who have grown up with access to widespread technology and sophisticated technological devices might be more at ease with the use of telepresence technology. For some attorneys, the use of telepresence technology can be as routine as filing legal documents through e-filing systems. In addition, a remote appearance might be less unique to younger attorneys, jurors, and witnesses who are more used to virtual interactions in their personal and professional lives and might be more adept at incorporating technology into court proceedings.

In addition to the adjustment it might require for an attorney to represent a defendant who is appearing remotely, participants acknowledged that a defense attorney's experience providing counsel to a client during pretrial proceedings when they are appearing remotely can be entirely different from that of providing counsel in person. This observation led to a broader discussion about the level of potential dissatisfaction

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defense attorneys might experience when representing defendants who are appearing remotely. One panel member noted studies done around the use of telemedicine that found satisfaction among patients, but not among providers, and suggested that although defendants might largely be satisfied with the quality of representation in proceedings involving telepresence technology, the defense attorneys could find the experience less than satisfying. However, one panel member pointed out that the challenge of not having sufficient time with the defendant also exists in courtrooms where no telepresence technology is used. Telepresence technology might exacerbate this problem, but it did not create it.

The participants identified a need for further research on cases in which the defense attorney is physically present in the courtroom while the defendant is remote compared with cases where the defense attorney is in the jail or prison where the defendant is being held and also is appearing remotely. When telepresence technology is used for proceedings in which the defendant is held in another location, such as pretrial release hearings, a defense attorney has the option of being present either with their client or in the courtroom. Some panel members described this as a strategic decision. On one hand, the attorney might perceive an advantage to being physically present in the room with the judge (assuming that the judge is not also remote). On the other hand, if the defendant is not prepared to appear before the camera and does not come across as credible, their remote appearance can negatively impact the perceived credibility of the defense counsel as well. A defense attorney, particularly a public defender with a large workload, also might have to weigh the time it takes to travel to the location of the client.

The Impact of Telepresence Technology on Victims

The panel members discussed several issues relating to the impact of telepresence technology on victims. They discussed some of the reasons that a victim might wish or need to be physically present in the courtroom during a pretrial hearing

or a proceeding in which the defendant is appearing remotely. First, the prosecutor might ask the victim to appear at a pretrial proceeding to corroborate or speak to evidence the prosecutor wishes to present to the judge. The victim's presence and ability to speak could be relevant to the prosecutor's case. A victim also might have a constitutional or legal right to attend the pretrial proceeding. Some states, such as Ohio, have a victims' rights statute, which guarantees the victim the right to attend preliminary hearings (Ohio Rev. Stat. § 2930.09). However, one panel member pointed out that the perceived fairness of participating through telepresence technology might be influenced by other victims' or witnesses' experiences with the technology.

Second, the participants discussed the fact that a witness or victim who is concerned about their own physical safety is more likely to stay away from the courtroom if the defendant appears in person. Therefore, the use or availability of telepresence technology might encourage victims or other witnesses to participate in the proceedings. Telepresence technology might be especially beneficial in cases where physically appearing in court would be detrimental to the victim's physical safety and emotional well-being. For example, cases involving restraining orders, child custody, gang-related violence, or violence against women or cases with large financial stakes can place the victim at risk if they were to appear during the trial. One panel member explained that during a remote pretrial appearance by the defendant, the cameras in the courtroom could be positioned to exclude the victim from view. This could create a feeling of safety and security for the victim and thereby encourage the victim's presence in the courtroom.

Third, in addition to lessening fears among victims and witnesses, telepresence technology offers the benefit of enabling these individuals to participate in court proceedings if the physical location of the courtroom would otherwise create challenges. The panel members acknowledged that participating in a court proceeding not only might be inconvenient but also could place the person's job or other responsibilities at risk. The

ability to include such individuals in the process using telepresence technology is an important benefit.

Fourth, the participants discussed the psychological benefit to the victim of attending pretrial proceedings with a remote defendant. A victim who gains experience sitting in the courtroom during pretrial proceedings when the defendant is not physically present might be better prepared to be in the same room with the defendant when the actual trial begins. The panel members noted that it would be useful to have empirical data about how victims perceive the experience of telepresence technology.

The Impact of Telepresence Technology on Judges

One factor that affects how widely telepresence technology is used in the courtroom is the judge's level of comfort with the technology. Panel members explained that the judge is often the one who decides whether and when telepresence technology will be used, and these decisions are relatively arbitrary. As one participant explained, "Judges run their courtroom the way they like." This notion extends to the use of telepresence technology. Panel members noted that it is unrealistic for judges and other professionals in the criminal justice system to be tasked with acquiring a high level of technological competency in addition to their traditional duties. In many cases, courts cannot afford to hire technology consultants. As a result, it often is the judge who ends up troubleshooting technological problems and making necessary adjustments. As one participant noted, a judge might be less capable of fully using telepresence technology if the equipment setup is so complicated that "the bench looks like a cockpit."

The panel members discussed the benefits of using telepresence technology to enable judges to sign warrants electronically after hours, including over the weekend. Some states, such as Texas, do not allow judges to sign warrants digitally because the state constitution requires judges to be physically present within the jurisdiction when they sign a warrant. However, in jurisdictions where it is allowed, this capability could lead to an earlier release of the defendant during the pretrial phase of a case, which the participants agreed represented a good application of technology.

On the other hand, the panel members also considered the disadvantage of judges having the capacity to work over the weekend. One downside of the "24-7" nature of technology is that always being available can lead to overwork and fatigue. One potential solution could be to schedule judges to be on call one weekend per month, which is similar to the schedules

of medical doctors. Further research is needed to understand whether telepresence technology is leading to more-overworked judges.

The Impact of Telepresence Technology on the Court Increased Efficiency

The participants discussed the fact that telepresence technology was used first in jurisdictions that required a defendant to have a pretrial hearing within 24 or 48 hours because videoconferencing capabilities made it easier to meet these deadlines. Telepresence technology offers state and local courts, which often are working with limited resources to meet the demands of a heavy caseload, the potential for increased efficiency in case processing and cost savings. The ability for the defendant, an expert or lay witness, language interpreter, attorney, or other key individual to appear remotely can reduce disruptions that otherwise might occur if the person is unavailable on a particular court date, required to drive a large geographic distance and therefore subject to traffic delays, or subject to physical limitations that make travel difficult. A delay in one case can affect the court's entire docket on a particular day. The use of telepresence technology therefore can alleviate some of these scheduling challenges.

However, problems with telepresence technology can result in lengthy delays or lower-quality backup options. Panel members explained that if videoconferencing technology is

A victim who gains experience sitting in the courtroom during pretrial proceedings when the defendant is not physically present might be better prepared to be in the same room with the defendant when the actual trial begins.

not functioning properly during a pretrial release hearing, the available options might be to use an available program, such as Skype, or allow the defendant to waive the right to appear and conduct the proceedings through a regular conference call. More research is needed to understand the implications of these backup options. Although it might appear that allowing the proceedings to be conducted via conference call speeds up proceedings, saves money, and keeps the defendant from spending unnecessary time in jail, these advantages might be offset by a greater chance that bail will be denied or set at a higher monetary amount. If a judge is more likely to rule unfavorably based on the defendant's remote appearance, the use of telepresence technology ultimately might be more detrimental to a defendant's case.

Access to Language Interpreters

The participants discussed the potential benefits and consequences of a language interpreter who appears remotely. Skilled language interpreters are in high demand, and telepresence technology could afford the opportunity to hire qualified and experienced language interpreters who would not otherwise be able to participate. However, the panel members cautioned that even the best language interpreters might not be able to participate meaningfully if they are unable to operate the equipment and technology necessary. Language interpreters have a lot of responsibility in terms of who can hear their translations and what is recorded. The participants considered that language interpreters might not wish to use telepresence technology because of this recording feature, which can be used at a later time to grade the quality of their performance. More research is

Panel members noted that more research is needed to understand the circumstances in which the use of telepresence technology saves the court money and when it becomes costlier.

needed to understand whether the use of telepresence technology serves to improve or diminish the quality of language interpretation.

Cost Savings

If the camera, monitor, or other equipment used for telepresence is not functioning properly, either in the courtroom or in the location of the person participating remotely, it can cause disruptive delays that could end up being costly to the court and even to the parties involved. Rather than increasing efficiencies, delays because of technological issues can cause further backlog and result in additional costs from defendants being held in jail for longer periods. Panel members noted that more research is needed to understand the circumstances in which the use of telepresence technology saves the court money and when it becomes costlier. It is assumed that telepresence technology reduces costs, but this might depend to some degree on the backup plans put in place for when the technology fails.

Priority Needs Related to Understanding the Impact of Telepresence on Court Outcomes and Actors

Based on the discussion among workshop participants regarding the need to better understand the impact of telepresence technology on various court and case outcomes, several areas were identified as priority research and development needs. The panel identified and later ranked needs related to understanding the impact of telepresence technology on court proceedings. These needs include concerns about defendants receiving a fair hearing; whether the use of telepresence technology might violate defendants' constitutional rights; the potential impact of the technology on the quality of court proceedings; whether this technology improves witness participation; how the use of this technology might change the behavior of the defendant, witnesses, lawyers, or judge; and the degree to which telepresence technology results in cost savings.

Developing Technical Standards, Training, and Guidelines for the Setup and Use of Telepresence Technology

A core theme that arose in the panel discussions was the need to establish technical and training standards around the use, setup, and operation of telepresence technology in U.S. courts. From one jurisdiction to the next, there is substantial variation in how frequently telepresence technology is used and for which types of proceedings. At the federal level and in several states, such as Wisconsin (Wis. Stat. § 885[3], 2008), comprehensive

rules govern the use of telepresence technology in the courtroom. However, these standards are the exception rather than the norm. There is no national consensus around when the use of telepresence technology is appropriate or how it can be used in a way that maximizes benefits and minimizes burdens. The Supreme Court has not issued clear guidelines regarding when telepresence technology can be used in the courtroom outside the use of one-way telepresence technology in a case involving a child victim of sexual abuse (*Maryland v. Craig*, 497 U.S. 836, 1990).

Regarding the first question, panel members identified the need for a protocol that a jurisdiction could use to determine whether telepresence technology is appropriate, given the type of proceeding, type of case, safety considerations, resources of the jurisdiction, and potential disparities or other negative outcomes associated with its use. This protocol would help ensure that decisions about when to use telepresence technology are more consistent and transparent.

In response to the second question, participants emphasized that when the use of telepresence technology is deemed appropriate, standards and best practices should govern its setup and use. Specifically, these standards should regulate the placement of monitors and cameras; the quality and consistency of audio, video, and network connections; the background; and data storage and security. In addition to reducing the incidence of technical issues that disrupt and delay court proceedings, having technical standards would assist courts in making decisions about technology needs. As noted previously, the way in which telepresence technology is installed or operated can affect perceptions of credibility and case outcomes. Technical standards and training on proper setup and use could help insure against these negative consequences.

According to the panel members, the single greatest barrier to defining technical standards for the utilization and installation of telepresence technology is the lack of research in these areas. Little guidance is available on what constitutes an acceptable range of quality or consistency for video, audio, or network connections and on what kinds of functionalities should be supported by videoconferencing systems. Guidelines require that individuals appearing remotely and persons in the courtroom be able to see, hear, and communicate with one another but do not outline specific technical standards beyond this. For example, the Wisconsin Court System's standards require that video and sound quality adequately allow participants to observe the demeanor and nonverbal communications of other

court participants but do not define the standard against which adequacy is assessed.

Technical standards and best practices around the installation and use of telepresence technology would inform the development of training on how the technology should be used and provide logistical guidance around how court actors should appear for the purposes of audio and video clarity and how to communicate nonverbally in ways that would be possible in person. For some courtroom participants, the need for training is closely tied to the need for standards on the proper setup of equipment. For others, training is needed to help set expectations around the use of telepresence technology and to develop a better understanding of how it works.

In the remainder of this section, we detail the participants' discussion around the need for technical standards and training to promote the proper setup and high-quality, multipurpose functioning of telepresence technology in court.

User-Friendly Setup

Panel members commented on the difficulty of building internal support for and justifying the up-front costs of videoconferencing systems that are not “dead simple.” They pointed out that, in many cases, courts cannot afford to hire technology consultants. The onus for installing and operating these technologies is shifting to court and corrections personnel who lack training and expertise regarding the system's installation. Furthermore, depending on existing court processes and configurations, the use of technology (or the malfunctioning of technical systems during use) might create disproportionate impacts on proceedings. If such potential pain points are not identified and adjustments are not made to address them, further burden could fall on court personnel. Therefore, telepresence technology should be designed with user-friendly setups in mind that are easy to install in a variety of settings, including court and correctional facilities. Moreover, participants argued that telepresence vendors should automate system updates and provide ongoing technical support to promote the system's continued use. Furthermore, before new systems are implemented, an assessment of the implications of technology failure and the development of backup plans should be explored.

Optimal Viewing Arrangements

Panel members discussed the placement, size, and synchronicity of videoconferencing cameras and monitors. They observed that although these technical elements have the potential to influence perceptions of the speaker and case outcomes, they receive

Although panel members agreed that the remote location from which the speaker is appearing does not need to simulate a courtroom, they argued that it should, in some way, convey to the speaker that they are taking part in a formal courtroom proceeding.

insufficient attention from the court and the correctional personnel responsible for setting them up.

As noted earlier, defendants appearing in court via telepresence might not be able to make eye contact with the judge or other court parties in the same way they would in person, which can affect perceptions of their credibility. This issue is exacerbated when cameras and monitors are not set up in a manner that gives the appearance of eye contact. Panel members, referencing the aforementioned Cook County bail hearing study, contended that the placement of monitors and cameras in the courtroom is a matter that should be governed by technical standards (Diamond et al., 2010). Participants recommended that national standards be developed for the setup of telepresence technology, including the placement and synchronicity of cameras and monitors. The panel members agreed that there should be articulable standards on how cameras and monitors should be arranged to offer the fairest presentation of the defendant, who would be appearing at pretrial hearings and proceedings through telepresence technology. If such standards existed, the defense attorney could raise a formal objection demanding that a correction be made to the equipment's placement.

In addition to the need for standardized protocols governing the placement of the video cameras and monitors, the participants recommended that the design of courtrooms using telepresence technology have a basis in scientific evidence instead of continuing to reflect long-standing cultural norms that promoted a quiet courtroom space in which outside technological distractions were minimized. Many courtrooms have been designed to not allow for wireless internet connectivity or reliable cell phone reception. The panel members discussed the need to retrofit older courtrooms that were built long before the invention and availability of current technological devices and equipment to enable telepresence technology to be incorporated.

Participants also touched on the importance of the background for remote court appearances. Lighting and other environmental conditions of the remote court party have the potential to influence not only the judge's perceptions of the speaker but also the speaker's attitudes regarding the proceeding. Although panel members agreed that the remote location from which the speaker is appearing does not need to simulate a courtroom, they argued that it should, in some way, convey to the speaker that they are taking part in a formal courtroom proceeding. Participants felt that defining standards for the conditions of the location from which speakers appear in court remotely and developing training protocols for court and correctional personnel could address these concerns.

Additionally, the viewing arrangements and background in which an individual is physically located while appearing remotely could influence remote participants' behavior and style of communication. Panel members contended that attorneys, judges, defendants, and witnesses should be provided with strategies and considerations for how to improve their appearance in front of the camera. These strategies would provide guidance on, for example, how to dress in front of a camera and how to communicate clearly with other court actors via videoconferencing. Such trainings could help ensure that extraneous factors related to viewing arrangements do not negatively affect the outcomes of proceedings.

Network Connection

Panel members identified low network capacity as a common issue that hinders the use of telepresence technology, particularly in rural counties where networks are less accessible and affordable. Videoconferencing requires high-quality network connections that can simultaneously support live video-audio streaming and other types of network traffic. Without sufficient bandwidth, several technical issues can arise, including dropped signals, buffering, latency (i.e., video and audio delays), and

otherwise poor-quality audio and video. Participants recommended that research be conducted on network alternatives, such as wireless networks, that leverage existing resources.

Quality and Consistency of Sound Clarity

Sound quality and consistency was another aspect of videoconferencing for which panel members asserted that standards were needed. Participants expressed the concern that in the absence of specific guidelines, a subjective “good enough” standard would be applied, eroding the legal rights of defendants. In addition, panel members discussed the issue of audio-video synchronicity, observing that audio lags can create frustrating situations in which courtroom parties unintentionally talk over one another. As a solution to these and other audio-related issues, participants suggested that research should be conducted to identify best practices for videoconferencing audio setups and to determine which materials or other equipment could be used in the setup to minimize background noise and produce high-quality audio. The panel members agreed that there is a pressing research need to determine how best to remove background noise and improve the remote party’s ability to hear what is being said in the courtroom and vice versa.

Private Channels Between Certain Parties

If microphones are not properly muted when an attorney needs to confer with the defendant or the judge, the defendant’s rights could be jeopardized. Thus, participants identified the provision of private channels—in which certain court parties can engage in unrecorded communications—as another important videoconferencing functionality. Private channels, such as chat systems and meeting rooms, allow attorneys who are physically present in the courtroom to confer with their remotely located clients without having to disrupt a proceeding. In addition, they permit sidebars in proceedings when attorneys are appearing from remote locations. Private channels also can serve as waiting rooms in which remote participants are placed before a proceeding begins.

Panel members recommended that capabilities allowing court parties to communicate privately be incorporated into technical standards for telepresence technology. Although many commonly used “off-the-shelf” videoconferencing systems, such as Skype, do not offer private channels, participants suggested that at least having a mute button and offering training to ensure that it is used properly are critically important to preserving the ability of defense attorneys to confer privately with the defendant during court proceedings.

Data Storage and Security Requirements

Panel members stated that the use of telepresence technology in court necessitates the development of policies governing the storage and security of videoconferencing data. These data might supplement or constitute the court record, and thus, storage is a key consideration. Participants noted that many noncommercial videoconferencing systems do not allow users to record sessions. Standards for the maintenance and dissemination of court records that are based on paper filing systems might not provide adequate guidance on how to capture and store data generated by telepresence systems in ways that ensure that these data can be retrieved many years in the future.

According to panel members, “cost often drives the issue of storage.” Multimedia court records that include both video and audio data captured via videoconferencing offer a higher degree of accuracy but storing large amounts of video information is costly in terms of resources and staffing. Document duplication further exacerbates this issue.

In addition to high costs, participants expressed concern that multimedia court records would allow appellate courts to overturn lower court rulings more easily and make assessments about credibility and other factors that could usurp the function of the trial court. As a result, trial and appellate courts have shown little interest in multimedia court records.

Data captured for government purposes must be stored more securely than data collected for commercial purposes, and these additional security requirements could contribute to a court’s reluctance to adopt this technology. On the topic of cybersecurity, panel members expressed concern that without the proper security measures, external parties could listen in on or even disrupt ongoing proceedings. Although encryption technologies have become an industry standard for telepresence systems, the degree of system security varies across telepresence systems.

A related issue that was raised by participants was how to ensure that videoconferencing data stored by the courts have not been tampered with by outside parties. Many states adhere to the Federal Rules of Evidence’s Best Evidence Rule, which requires that the original version of a document or material that is introduced at trial be preserved for later review (Federal Rules of Evidence R. 1001, *et seq.*). A document must be authenticated to prove that it is the original version and not a duplicate copy. The panel members discussed the challenges of assessing the authenticity of video and audio files captured via telepresence technology. One common method is to assign the file a unique number or document key at the time it is

placed into storage. When the file is retrieved and needs to be authenticated, the court can run an algorithm that looks for this unique, identifying number to verify that a particular file is original. To ensure the authenticity of documents used during proceedings in which one or more parties is appearing remotely, participants recommended the use of digital signatures.

Multipurpose Infrastructure or Model Configurations

Building on the discussion of user-friendly setups, panel members noted the value of multipurpose infrastructure. Proprietary equipment and software that cannot be translated across devices might limit the ways in which telepresence technology can be used in court. For example, noncommercial systems, such as Skype and FaceTime, can be used on any device with a network connection; other telepresence systems might not offer that degree of flexibility.

Likewise, technical infrastructure can determine which telepresence systems courts can consider implementing and how these systems can be used. One participant described how their jurisdiction was able to implement a remote interpreting system at little cost to the court by using existing infrastructure that was designed to support digital court reporting. Given that the up-front costs of installing telepresence technology equipment can be high, efficiencies could be realized by ensuring that telepresence systems are designed to enable multiple functions.

However, panel members pointed out that court purchasers often neither are aware of their options when searching for telepresence systems nor sufficiently knowledgeable about the key features these systems should include and support. Telepresence vendors who could assist courts in identifying the most-suitable commercial products might not know how to communicate this information effectively to court purchasers, whose needs and concerns differ from those of corporate clients. To address these issues, participants recommended that model configurations for telepresence systems be developed that can help guide courts' decisions to purchase these technologies. They further proposed that a collaboration model be developed or identified

that would help court leadership, administrators, and technologists articulate their needs to court technology vendors.

File and Video Feed Sharing Between the Court and Remote Parties

The effectiveness of telepresence technology in the courtroom might be improved by ensuring that it supports certain functionalities, such as file and video feed sharing. Panel members discussed how telepresence technology could offer a means of quickly and easily sharing files and documents between courts and remote parties, complementing existing electronic case filing systems. They also observed that videoconferencing could facilitate greater public access to court proceedings via shared video feeds. Panel members recommended that best practices and policies be developed that would govern the public's and media's access to telepresence feeds and data.

Priority Needs Around Technical Standards

Using the discussion among workshop participants regarding the need for best practices and standards related to the technical aspects of and training on the use of telepresence technology, several areas were identified as priority research and development needs. In this realm, participants highlighted such problems as staff not having adequate and routine training on the functionality of telepresence systems; the lack of established protocols for how to handle technology failures; wide variation in audio quality and its impact on proceedings; the lack of guidelines on image size and video quality, both of which affect the experience of using telepresence technology; courtrooms not having sufficient bandwidth for telepresence solutions; and variation in when courts deploy telepresence technology. Associated needs included the development of a telepresence technology training curriculum; development of national standards and model configurations for the setup of telepresence systems; research on the appropriate levels of audio setup, video quality, and image size; and research into options for improving network connectivity.

Proprietary equipment and software that cannot be translated across devices might limit the ways in which telepresence technology can be used in court.

Potential Expansions of Telepresence Technology

The participants acknowledged that telepresence technology has many useful and important applications throughout the court system. However, the panel members expressed the need to develop standards around the implementation and use of telepresence technology. Such standards could help address some of the concerns raised earlier in this report about the potential negative impact of remote appearances on the outcome of defendants' cases and disruptions that can occur through equipment failures or problems. The participants discussed some of the specific areas in which the implementation of standards would be useful.

Telepresence Technology and Data Collection and Data Storage

One potential benefit to expanding the use of telepresence technology is the capability to collect data, which can be used to assess the impact of this technology on various outcomes. The panel members agreed that intentionally collecting data can make it feasible to do a cost-benefit analysis of whether and how telepresence technology is saving the court money and also to assess which aspects of the courtroom process could be improved. For example, some courts have assessed the cost implications of using telepresence technology when employing language interpreters. These data can inform future decisions about whether to upgrade or expand certain technology and can help shift courts away from making such determinations based solely on anecdotal evidence.

Overcoming the Cost Implications of Expanding Telepresence Technology

Many courtrooms intentionally prohibit the use of cell phones and other technological devices within the courtroom to reduce disruptions during court proceedings. Similarly, many courtrooms are designed to not be technologically savvy or adaptable. This can make it challenging to improve connectivity inside a courtroom. Telepresence technology used in a courtroom with limited technological capabilities might not function optimally if too many individuals are online at the same time.

One of the biggest challenges in the adoption and implementation of telepresence technology is the cost associated with bringing bandwidth technology to areas that do not already have an established technological infrastructure. This can be particularly burdensome and disruptive in rural areas where

Telepresence technology used in a courtroom with limited technological capabilities might not function optimally if too many individuals are online at the same time.

the implementation of bandwidth entails physically placing the wires under the streets.

One participant recommended the increased use of 4G wireless technology as the best option for areas with less technological bandwidth but that seek to use telepresence technology. Improving wireless coverage is less expensive and more feasible than adding more bandwidth or using satellites. A judge, attorney, or other individual who is appearing or participating remotely can check a wireless coverage map to determine the geographic areas that have the strongest wireless signals. However, it is important to consider the type of connectivity required inside the courtroom because continuously streaming a video places greater demand on infrastructure than simply clicking on websites.

An important consideration the panel members discussed is the need to ensure that security and privacy can be maintained no matter what software and form of internet connectivity are being used. In such cases as child protective court, it is imperative that the use of technology prevents those outside the courtroom from being able to listen in on the conversation and proceedings occurring in the courtroom. Even more pressing than protecting the privacy of conversations in the courtroom is the need to prevent someone, whether inside or outside the courtroom, from disrupting the legal proceedings.

The participants discussed potential advantages and disadvantages with using commercial video platforms, such as Skype and FaceTime. There were concerns about whether the degree of security that exists on these platforms is sufficient to protect confidentiality, particularly in situations where the conversation is recorded. The participants identified a need to establish best practices to maintain the confidentiality of conversations that

occur through telepresence technology. A panel member shared that one judge addresses this concern by clearing the courtroom when a conversation of a confidential nature is about to occur over Skype. Another courtroom is set up to prevent the unintentional overlap of language interpreters in court proceedings by requiring interpreters outside the state to wait until the court allows them to join. This function prevents language interpreters from accidentally listening in on other court proceedings.

A Fully Virtual Courtroom

After discussing the cost savings; the enhanced capacity to process cases more efficiently; and the ability of key individuals, such as witnesses and qualified language interpreters, to participate, the panel members explored the idea of implementing a fully virtual courtroom in which everyone appears remotely. The Center for Legal and Court Technology (2014) at the William and Mary Law School in Williamsburg, Virginia, exemplifies the capabilities and features of a technologically sophisticated courtroom. Although many jurisdictions might not have the resources or ability to replicate all of the components of the Center for Legal and Court Technology, state and local courts might consider implementing some of these capabilities for use in certain legal proceedings. If everyone participated through telepresence technology, any bias or negative consequences would be eliminated because the defendant or other key individuals would not be the only individuals who were appearing or participating remotely. Additionally, the younger generation that is used to interacting regularly with friends, family, and others through various non-face-to-face technological platforms might be more amenable to participating in court proceedings that are entirely virtual. For those who are less comfortable with the technology, participants discussed setting up a portable, “field-deployable courtroom” or “beta courtroom” for those who wish to test out telepresence technology before formally adopting it or who want to have the experience of a fully virtual courtroom for future consideration.

Other panel members raised serious concerns about the idea of most courtrooms becoming fully virtual courtrooms. For one, they noted that jury trials might be the one type of criminal justice proceeding that should not be adapted into a fully virtual courtroom. However, because jury trials make up a very small percentage of overall court proceedings, the widespread adoption of telepresence technology during pretrial proceedings could have a large impact. Other participants raised concerns that a fully virtual courtroom could impede the ability of defense attorneys, prosecutors, and judges to commu-

nicate and build professional relationships, which are an important component of how these practitioners function and work toward a fair and just criminal justice system. For example, it is not uncommon for the defense attorney and prosecutor to talk informally and come to an agreement in the courtroom, outside the regular procedures of a particular court proceeding. A fully virtual courtroom could eliminate the possibility of such unplanned communication, thereby affecting the case’s outcome. Some participants pointed out that a fully virtual courtroom could still have private chat or texting features that allow for such side conversations. For example, the judge could call for a private sidebar with the prosecutor and defense attorney by opening a side channel with just those participants. The participants acknowledged that such features hold the most value for individuals who already have established relationships with one another. In addition, a fully virtual courtroom could place more responsibilities on the presiding judge to acquire the training needed to operate and manage the technological aspects of the proceedings. However, a fully virtual courtroom could still follow the protocols of a physical courtroom in the compilation of the trial record and in that sidebars would not be officially recorded and stored.

The panel members raised a related concern about the potential impact a fully virtual courtroom could have on behaviors and interactions. As mentioned earlier, communicating behind a screen might change how an individual engages with others. It remains an open question whether the sum of such different behaviors could lead to different court outcomes.

Priority Needs Related to Expanding the Use of Telepresence Technology

Through the discussion around further expansion of telepresence technology throughout the court system, workshop participants identified two major priority needs. First, to address any reluctance on the part of court leadership to adopt telepresence technology, the participants expressed a need to develop pilot courtrooms where court staff could test out new technologies and become more comfortable with them. Second, participants recommended developing telepresence technology performance indicators, which could include metrics that might automatically be produced by these systems, such as time needed to connect to the system, system requirements needed to handle the amount of data transferred through the telepresence connection, and any gaps in connectivity during the session.

PRIORITIZING TELEPRESENCE NEEDS

The gaps in knowledge regarding the use of telepresence technology and the related research and development needs outlined earlier were recognized as pressing issues that could help advance the responsible use of telepresence technology. From the discussions with the 12 workshop participants, 24 different needs were identified that, if addressed, could shed light on the impact of telepresence technology on the court system and ensure that the technology is being used in a manner that maximizes efficiencies while safeguarding fairness and the protection of defendants' rights. These potential targets for effort and investment were prioritized based on the participants' ranking of several different factors, which allowed the most valuable or attractive needs to be identified.

The Logic of Rating the Telepresence Technology Needs

The needs were prioritized using a variation of the Delphi Method, a technique developed at RAND to elicit expert opinion about well-defined questions in a systematic and structured way (RAND Corporation, undated). The Delphi process used for the Priority Criminal Justice Needs Initiative builds on previous RAND work examining criminal justice technology, police, and practice needs (Hollywood et al., 2016; Jackson et al., 2015). Additional detail on the ranking methods and outcomes can be found on the RAND website and in the appendix to this report. For this workshop, participants were asked to rate

1. **how important each of the needs is for the continued or expanded use of telepresence technology.** Each participant rated each need on a scale of 1 to 9 for each category (where 1 corresponded to contributing nothing to the objective and 9 indicated that meeting the need could result in a 20-percent or greater improvement in performance).
2. **how practical it would be to meet the need** (while meeting some needs might require only minor adaptation, meeting others might be very difficult). The participants rated each need's chance of technical success on a scale of 1 (10-percent chance of succeeding) to 9 (90-percent chance of succeeding).

These two scales sought to capture the key components needed to calculate the expected value of a possible innovation:

how valuable it would be multiplied by the probability that it could be produced successfully. Rather than simply asking a group of experts to rank a set of options and taking the average of those responses, the Delphi Method seeks to identify and explore differences among experts' responses. As a result, ratings are done in multiple rounds, with discussions between each round focusing on specific ratings where there were divergences in the group. For this effort, the RAND team led the participants in three rating rounds and intervening discussions on the telepresence-related needs. The discussion focused predominately on those needs for which there was a great deal of spread in the prioritization across the panel members.

The Prioritized Telepresence Needs

The effectiveness of such expert elicitation processes as the Delphi Method relies on the knowledge and capabilities brought to the process by the participants. In identifying and selecting workshop participants, we sought to build a panel with a mix of perspectives and views within the context of needs related to telepresence in the courtroom. All of the workshop attendees except the project and NIJ staff participated in the ranking process.

We took each of the scores assigned by the participants and calculated an expected value for each need—multiplying the benefit scores and the probabilities of its success. To calculate the final ratings of each need, we used the median expected value assigned by the participants, which provides reasonable estimates of the center of the data even if there are outliers in the rankings. These expected values were used to cluster the needs into three tiers, as described in the appendix to this report. There were ten needs assigned to the top tier by expected value, which we present in Table 1.

The ten top-tier needs are (1) conducting research into improved network connectivity; (2) identifying best practices with regard to audio setup for telepresence technology; (3) conducting research to determine the impacts of telepresence technology on victims and witnesses; (4) developing national standards for the setup of telepresence systems; (5) developing a training curriculum on how to make use of telepresence technology; (6) developing model configurations for telepresence technology to be used by court purchasers; (7) conducting research into the effect of telepresence technology on defendants' experiences with the court process and perceptions of procedural justice; (8) developing standards on video quality and image size; (9) conducting research to understand differences in cross-examinations that occur in person versus via

telepresence technology; and (10) developing pilot courtrooms to help court staff get comfortable with the technology. The full ranked list of needs identified by workshop participants is included in Tables 1, 2, and 3, with the highest-priority opportunities and needs presented in Table 1, followed by the middle-tier needs in Table 2, and the lower-tier needs in Table 3. Each need corresponds to one of the following three categories, which were discussed earlier:

1. the need for a better understanding of the impact of telepresence technology on court outcomes and actors (measuring outcomes)
2. the need for technical standards, training, and guidelines related to the setup and operation of telepresence technology (technical standards and training)
3. potential areas of expansion for telepresence technology (areas for expansion).

Table 1. Top-Tier Concerns for Court Appearance Through Telepresence

Problem or Opportunity	Associated Needs	Corresponding Category
Courtrooms need high-quality network connections (bandwidth) to support telepresence solutions in addition to existing network traffic.	<ul style="list-style-type: none"> • Conduct research into options for improving network connectivity. 	Technical standards and training
The audio quality associated with telepresence technology varies widely but can have a large impact on proceedings.	<ul style="list-style-type: none"> • Conduct research to identify best practices and minimum standards for audio setup. 	Technical standards and training
It is unknown whether telepresence technology improves witness participation and reduces victim trauma (consistent with constitutional requirements).	<ul style="list-style-type: none"> • Conduct research to assess the impact of telepresence technology on the experiences of witnesses and victims. 	Measuring outcomes
There are critical effectiveness issues associated with the setup of telepresence technology that often receive insufficient attention from those responsible for the setup.	<ul style="list-style-type: none"> • Identify the technical issues that impact the effectiveness of telepresence technology and develop national standards for the setup of telepresence systems. 	Technical standards and training
To make the best use of telepresence technology, local and remote staff need initial and refresher training on the equipment and the ability to test the functionality of the system routinely.	<ul style="list-style-type: none"> • Develop a training curriculum for each of the different court actors who interact with telepresence technology in some capacity. 	Technical standards and training
Purchasers of telepresence systems are not sufficiently knowledgeable about the key features that are needed for different types of interactions (e.g., language interpretation, court reporting, remote testimony).	<ul style="list-style-type: none"> • Develop model configurations that can be used to help purchasers make intelligent buying decisions. 	Technical standards and training
Defendants might perceive that they cannot get a fair hearing via telepresence technologies.	<ul style="list-style-type: none"> • Conduct research to better understand the effect of telepresence technology on defendants' experiences with the court process and perceptions of procedural justice. 	Measuring outcomes
Image size and video quality affect the experience of using telepresence technology, but there are no criteria for the minimum, maximum, or ideal video quality and image size	<ul style="list-style-type: none"> • Conduct research into the appropriate levels of video quality and image size and develop implementation standards for courts. 	Technical standards and training
Courts have not established whether remote witness testimony (including two-way video and cross-examination processes) affects confrontation and due process.	<ul style="list-style-type: none"> • Conduct research to determine whether there is a difference in cross-examinations that occur in person versus via telepresence technology. 	Measuring outcomes
There is a reluctance or a lack of awareness on the part of court leadership to adopt telepresence technologies.	<ul style="list-style-type: none"> • Develop pilot courtrooms (e.g., a laboratory) where court staff can try new technologies and get more comfortable with them. 	Areas for expansion

Table 2. Middle-Tier Concerns for Court Appearance Through Telepresence

Problem or Opportunity	Associated Needs	Need Received a High-Importance Score (Yes/No)	Corresponding Category
Little is known about the actual cost savings associated with the use of telepresence technology and who benefits from these savings. Often, the savings are not experienced by the entities that would incur the costs.	<ul style="list-style-type: none"> • Conduct a cost-benefit risk analysis from the perspective of a local court system to understand best practices for using telepresence technology in a manner that would achieve cost savings. 	Yes	Measuring outcomes
There is insufficient information available about the impact of telepresence technology on courtroom outcomes.	<ul style="list-style-type: none"> • Conduct research to assess whether there are systematic differences in the outcomes of cases that involve telepresence technology versus in-person proceedings. 	Yes	Measuring outcomes
Telepresence systems naturally produce data, which could be used to identify patterns in usage and opportunities for improved or expanded usage.	<ul style="list-style-type: none"> • Develop best practices for useful performance indicators and the kinds of data that should be collected from these systems to inform the indicators. 	Yes	Areas for expansion
It is unknown whether telepresence technology is used effectively to mitigate witness and victim risk in high-risk scenarios.	<ul style="list-style-type: none"> • Conduct research to assess the impact of telepresence technology on the experiences of witnesses and victims. 	Yes	Measuring outcomes
Over time, members of the courtroom workgroup who repeatedly work in the same physical space develop a rapport that might be lost when interacting remotely.	<ul style="list-style-type: none"> • Conduct research to assess the long-term implications (advantages and disadvantages) of in-person versus virtual interactions. 	Yes	Measuring outcomes
There are no tested or established protocols for what to do or what backup measures to use when telepresence technology fails.	<ul style="list-style-type: none"> • Develop protocols and training to ensure due process. 	Yes	Technical standards and training

Table 3. Lower-Tier Concerns for Court Appearance Through Telepresence

Problem or Opportunity	Associated Needs	Need Received a High-Importance Score (Yes/No)	Corresponding Category
It is unknown whether the use of telepresence systems affects the quality of services (e.g., interpretation and court recording services) and how they are delivered	<ul style="list-style-type: none"> Conduct research to determine the effect of telepresence technology on the delivery of court services. 	Yes	Measuring outcomes
There is the potential for decisionmaking to suffer when some or all of the participants are remote (judge, court reporter, prosecutor, defendant, etc.).	<ul style="list-style-type: none"> Conduct research on the impacts on decisionmaking, communication, and perceptions of satisfaction with the process when one or more parties are participating remotely. 	No	Measuring outcomes
Courts have yet to determine the constitutionality of remote testimony from witnesses.	<ul style="list-style-type: none"> For cases in which remote witnesses are necessary, identify best practices that would eliminate all solvable issues so the appellate courts can focus on the constitutional issues. 	Yes	Technical standards and training
Court technology vendors and those purchasing technology for the court often have difficulty communicating with each other about needs and how particular products could meet those needs.	<ul style="list-style-type: none"> Develop or identify a collaboration model that will help court leadership, administrators, and technologists to specify needs. 	Yes	Technical standards and training
Social behavior and communication styles might change naturally when individuals are communicating via telepresence technology, which could introduce mode effects into case outcomes.	<ul style="list-style-type: none"> Conduct research into how the use of telepresence technology affects communication among those involved in a proceeding and whether this, in turn, affects outcomes. 	No	Measuring outcomes
Communication via telepresence systems might require additional skills on the part of participants.	<ul style="list-style-type: none"> Develop best practices for participants using telepresence technology (clothing colors and patterns, speaking slowly and clearly, looking into the camera, etc.). 	No	Technical standards and training
More evidence is needed to determine when courts should employ telepresence technology.	<ul style="list-style-type: none"> Conduct research on the most-appropriate situations in which to use telepresence technologies. 	No	Technical standards and training
Depending on local sharing policies, making telepresence feeds available to outside parties and the media can be a challenge.	<ul style="list-style-type: none"> Develop best practices and policies around access to and sharing of telepresence feeds. 	No	Technical standards and training

CONCLUSION: ENSURING THAT TELEPRESENCE TECHNOLOGY LIVES UP TO THE HYPE

As is often the case with technology, the introduction of telepresence technology to the courts has the potential to dramatically change the system. The use of telepresence technology can reduce court costs; improve safety; enhance efficiency; reduce pretrial detention times; and expand access to justice for people in remote areas, those who fear for their safety, and those who face other barriers (e.g., language) to navigating the court system. For these reasons, courtrooms around the country have adopted telepresence technology for use in certain types of proceedings. Many panel members expressed the sentiment that telepresence technology is the future of courts and envisioned a day when there will no longer be a need for physical courtrooms.

However, to date, the adoption of telepresence technology has been largely inconsistent and haphazard, with each court making separate determinations about how it should be set up, who should use it, and when it should be used. As one participant noted, the use of telepresence technology has been largely reactive rather than proactive. Courts, needing to reduce costs or solve an acute problem (e.g., too few interpreters), introduce telepresence technology as a quick solution without necessarily considering the multitude of factors that can affect whether it is used effectively.

Factors such as lighting, audio, placement of cameras and monitors, picture quality, and network connectivity affect the quality of interactions and how closely remote interactions mimic those that occur in person. Without standards and protocols regarding the technical aspects of telepresence technology, court purchasers often lack knowledge about the type of equipment needed. Those responsible for the setup of the equipment might not understand the implications of their decisions regarding viewing arrangements, network connectivity, and sound quality and clarity and might not know how to troubleshoot any problems that occur. In some jurisdictions, the lack of available information and guidance on how to set up and use telepresence technology results in a hesitance to adopt it at all; in other jurisdictions, it means that the quality and feel of interactions among parties might differ widely from one court proceeding to the next.

Little research has been conducted to evaluate the impact of differences between in-person and remote interactions or differences in the quality of remote interactions on court

outcomes. One panel member referred to telepresence technology as being “guilty until proven innocent.” In other words, without rigorous efforts to assess the impact of telepresence technology on such outcomes as bail hearing decisions, sentencing decisions, defendants’ perceptions of procedural justice, and the protection of defendants’ constitutional rights to due process and confrontation of accusers, perhaps the default should be to assume differential outcomes from the use of telepresence technology versus in-person appearances. One panel member expressed the belief that, until there is evidence that telepresence technology does not have an impact on defendants, it should not be used. Another participant stated that “You lose something when you use video. That concerns me.” However, to date, there has been little research to understand what, if anything, is sacrificed through remote versus in-person appearances and what impact this has on court outcomes.

As technology continues to advance and more and more court stakeholders feel pressure to adopt or expand the use of telepresence technology, panel members expressed the opinion that the development of technical standards and training protocols is essential for reducing differences from one remote proceeding to the next and ensuring that the potential cost savings of technology are realized. As demonstrated through the workshop, courts should be involved in the development of all standards, protocols, and best practice guidelines to ensure that they reflect the diversity of needs and experiences from one court and one court proceeding to the next. The need to understand the potential for differential case outcomes and perceptions of the justice system is as important as ever. Telepresence technology will play a major role in the future of the court system, but only through strategic, research-driven introduction and use will its full potential be realized.

TECHNICAL APPENDIX

In this appendix, we present additional details on the workshop agenda and the process for identifying and prioritizing technology and other needs specific to the use of telepresence technologies in the courtroom. Through this process, we developed the research agenda that structured the topics presented in the main report. The descriptions in this appendix are adapted from those in previous Priority Criminal Justice Needs Initiative publications and reflect adjustments to the needs identification and prioritization process implemented at this workshop.

Pre-Workshop Activities

The RAND and RTI team recruited panel members by identifying knowledgeable individuals through existing professional and social networks (e.g., LinkedIn) and by reviewing literature published on the topic. We then extended invitations to those individuals and provided a brief description of the workshop's focus areas.

In advance of the workshop, participants were provided an opportunity to identify the issues and topics that they felt would be important to discuss during the workshop. Using a comprehensive literature review and input from the workshop participants, the workshop agenda and discussion were structured as shown in Table A.1.

Identification and Prioritization of Needs

During separate sessions of the workshop, we asked the participants to discuss the challenges that they face during the pretrial and trial phases of a case, which panel members had identified prior to the workshop. While conducting this review, participants suggested additional areas that potentially are worthy of research or investment. Participants also considered whether there were areas that were not included in the existing list and suggested new ones.

To develop and prioritize a list of technology and policy issues that are likely to benefit from research and investment, we followed a process similar to one that has been used in previous Priority Criminal Justice Needs Initiative workshops (see, for example, Jackson et al., 2015; Jackson et al., 2016, and references therein). Participants discussed and refined problems related to each court telepresence category and identified potential solutions (or needs) that could address each problem. In addition, needs could be framed in response to opportunities to

improve performance by adopting or adapting a new approach or practice (e.g., applying a new technology or tool in the sector that had not been used before).

At the end of the discussion of each topic, participants were given an opportunity to review and revise the list of problems and opportunities they had identified. The participants' combined lists for each topic were displayed one by one using Microsoft PowerPoint slides that were edited in real time to incorporate revisions and comments.

Once the panel members agreed on the wording of each slide, we asked them to anonymously vote using a handheld device (specifically, the ResponseCard RF LCD from Turning Technologies). Each participant was asked to individually score each problem or opportunity and its associated need using a 1–9 scale for two dimensions: importance and probability of success.

For the *importance* dimension, participants were instructed that 1 was a low score and 9 was a high score. Participants were told to score a need's importance with a 1 if it would have little or no impact on the problem and with a 9 if it would reduce the impact of the problem by 20 percent or more. Anchoring the scale with percentage improvements in the need's performance is intended to help make rating values more comparable from participant to participant.

For the *probability of success* dimension, participants were instructed to treat the 1–9 scale as a percentage chance that the need could be met and broadly implemented successfully. That is, they could assign the need's chance of success between 10 percent (i.e., a rating of 1) and 90 percent (i.e., a rating of 9). This dimension was intended to include not only technical concerns (i.e., whether the need would be hard to meet) but also the effect of factors that might lead courts to not adopt the

Table A.1. Workshop Agenda

Day 1

Welcome and Introductions

Initial Discussion of Workshop Functions and Objectives

Pretrial: Negative and Positive Impacts of Telepresence Technology on Courtroom Parties

Trial: Negative and Positive Impacts of Telepresence Technology on Courtroom Parties

Do Impacts of Telepresence Technology Vary by Type of Case or Type of Court?

Review Key Benefits and Challenges Identified During Day 1, Prioritize Discussion for Day 2

Day 2

Summary of Day 1 and Overview of Agenda for Day 2

Additional Considerations Related to Telepresence Requirements

Review and Final Brainstorming Session

Final Needs Prioritization

Panel Review and Next Steps

new technology, policy, or practice even if it were developed. Such factors could include, for example, cost, staffing concerns, and societal concerns.

After the participants rated the needs displayed on a particular slide (i.e., for either importance or probability of success), we displayed a histogram-style summary of participant responses. If there was significant disagreement among the panel (the degree of disagreement was determined by the research team’s visual inspection of the histogram), the participants were asked to discuss or explain their votes at one end of the spectrum or the other. If a second round of discussion occurred, participants were given an opportunity to adjust their ratings on the same question. This second-round rating was optional, and any rating submitted by a participant would replace their first-round rating. This process was repeated for each question and dimension at the end of each topic area. Figure A.1 shows an example of a slide on the importance dimension, with related issue, need, and histogram. Figure A.2 shows a slide on the probability of success dimension.

Once the participants had completed this rating process for all topic areas, we put the needs into a single prioritized list. We ordered the list by calculating an expected value using the method outlined in Jackson et al., 2016. For each need, we multiplied the final (second-round) ratings for importance and probability of success to produce an expected value. We then calculated the median of that product across all of the respondents and used that as the group’s collective expected value score for the need.

We clustered the resulting expected value scores into three tiers using a hierarchical clustering algorithm. The algorithm we used was the “ward.D” spherical algorithm from the “stats” library in the R statistical package, version 3.5. We chose this algorithm to minimize within-cluster variance when determining the breaks between tiers. The choice of three tiers is arbitrary but was done in part to remain consistent across the set of technology workshops we have conducted for NIJ. Also, the choice of three tiers represents a manageable system for policymakers. Specifically, the top-tier needs are the priorities that should be the primary policymaking focus, the second-tier needs should be examined closely, and the third-tier needs are probably not worth much attention in the near term (unless, for example, they can be addressed with existing technology or approaches that can be readily and cheaply adapted to the identified need).

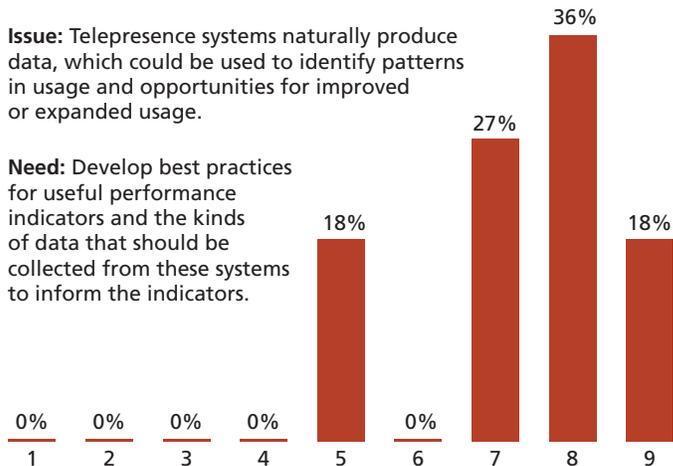
Because the participants initially rated the needs by one topic area at a time, we gave them an opportunity at the end

Figure A.1. Example Slide for Rating the Importance of a Need

18a. How *important* is it to solve this problem?

Issue: Telepresence systems naturally produce data, which could be used to identify patterns in usage and opportunities for improved or expanded usage.

Need: Develop best practices for useful performance indicators and the kinds of data that should be collected from these systems to inform the indicators.



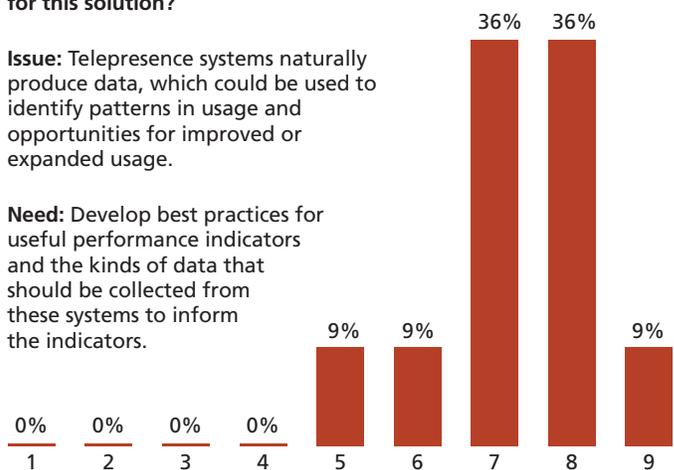
NOTE: Percentages on each question did not always sum to 100 percent due to rounding and variation in the number of participants who voted on each need.

Figure A.2. Example Slide for Rating the Probability of Success of a Need

13b. What is the *probability of success* for this solution?

Issue: Telepresence systems naturally produce data, which could be used to identify patterns in usage and opportunities for improved or expanded usage.

Need: Develop best practices for useful performance indicators and the kinds of data that should be collected from these systems to inform the indicators.



NOTE: Percentages on each question did not always sum to 100 percent due to rounding and variation in the number of participants who voted on each need.

of the workshop to review and weigh in on the tiered list of all identified needs. The intention of this step was to let the panel members see the needs in the context of the other tiered needs and allow them to consider whether there were some that appeared too high or low relative to the others. To collect these assessments, we printed the entire tiered list and distributed it to the participants. This step allowed the participants to see all of the ranked needs across the court telepresence categories,

providing a top-level view that is complementary to the rankings provided session by session. Participants were then asked to examine where each of the needs landed on the overall tiered list and whether this ordering was appropriate or needed fine-tuning. Participants had the option to indicate whether each problem and need pairing should be voted up or down on the list. An example of this form is provided in Table A.2.

We then tallied the participants’ third-round responses and applied those votes to produce a final list of prioritized and tiered needs. To adjust the expected values using the up and down votes from the third round of prioritization, we implemented a method equivalent to the one we used in previous work (Hollywood et al., 2016). Specifically, if every panel member voted “up” for a need that was at the bottom of the list, then the collective effect of those votes would be to move the

need to the top. (The opposite would happen if every participant voted “down” for a need that was at the top of the list.) To determine the point value of a single vote, we divided the full range of expected values by the number of participants voting.

To prevent the (somewhat rare) situation in which small numbers of votes have an unintended outsized impact—for example, when some or all of the needs in one tier have the same or very similar expected values—we required that at least 25 percent of the workshop participants must have voted on that need (and then rounded to the nearest full participant). In this workshop, there were 12 participants, so for any votes to have an effect, at least four participants would have had to have voted to move the need up or down.

After applying the up and down vote points to the second-round expected values, we compared the modified scores with

Table A.2. Example of the Delphi Round 3 Voting Form

Question	Tier	Vote Up	Vote Down
Tier 1			
Issue: Courtrooms need high-quality network connections (bandwidth) to support telepresence solutions in addition to existing network traffic. Need: Conduct research into options for improving network connectivity.	1		
Issue: Courts have not established whether remote witness testimony (including two-way video and cross-examination processes) affects confrontation and due process. Need: Conduct research to determine whether there is a difference in cross-examinations that occur in person versus via telepresence technology.	1		
Tier 2			
Issue: Little is known about the actual cost savings associated with the use of telepresence technology and who benefits from these savings. Often, the savings are not experienced by the entities that would incur the costs. Need: Conduct a cost-benefit risk analysis from the perspective of a local court system to understand best practices for using telepresence technology in a manner that would achieve cost savings.	2		
Issue: It is unknown whether telepresence technology is used effectively to mitigate witness and victim risk in high-risk scenarios. Need: Conduct research to assess the impact of telepresence technology on the experiences of witnesses and victims.	2		
Tier 3			
Issue: There is the potential for decisionmaking to suffer when some or all of the participants are remote (judge, court reporter, prosecutor, defendant, etc.). Need: Conduct research on the impacts on decisionmaking, communication, and perceptions of satisfaction with the process when one or more parties are participating remotely.	3		
Issue: Courts have yet to determine the constitutionality of remote testimony from witnesses. Need: For cases in which remote witnesses are necessary, identify best practices that would eliminate all solvable issues so the appellate courts can focus on the constitutional issues.	3		

NOTE: Shaded cells indicate that up or down votes were not possible (e.g., Tier 1 is the top tier, so it was impossible to upvote items in that tier).

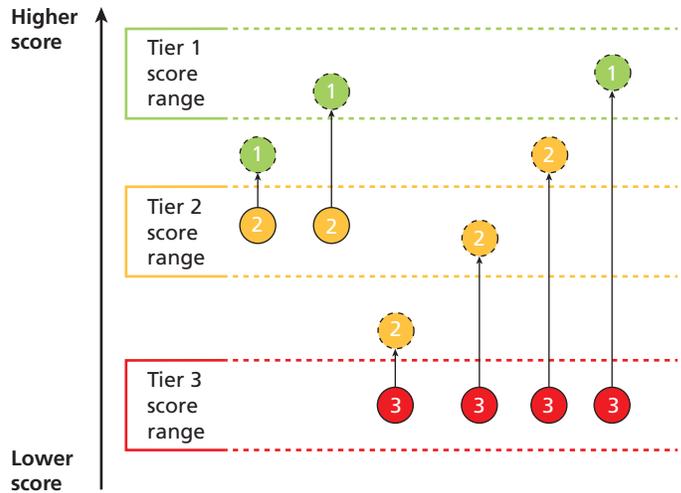
the boundary values for the tiers to see whether the change was enough to move any needs up or down in the prioritization. (Note that there were gaps between these boundaries, so some of the modified expected values could fall between tiers. See Figure A.3.) As with prior work, we set a higher bar for a need to move up or down two tiers (from Tier 1 to Tier 3, or vice versa) than for a need to move to the tier immediately above or below. Specifically, a need could *increase by one tier* if its modified expected value was higher than the highest expected value score in its initial tier. A need could *decrease by one tier* if its modified expected value was lower than the lowest expected value in its initial tier. However, *to increase or decrease by two tiers* (which was only possible for needs that started in Tier 1 or Tier 3), the score had to increase or decrease by an amount that fully placed the need into the range two tiers away. For example, for a Tier 3 need to jump to Tier 1, its expected value score had to fall within the boundaries of Tier 1, not just within the gap between Tier 1 and Tier 2. Figure A.3 illustrates the greater score change required for a need to move two tiers (i.e., the need on the far right of the figure) compared with one tier (all other examples shown).

Applying these decision rules to integrate the participants’ third-round inputs into the final tiering of needs resulted in numerical separations between tiers that were less clear than the separations that resulted when we used the clustering algorithm in the initial tiering. This can occur because, for example, when the final expected value score for a need that was originally in Tier 3 falls just below the boundary value for Tier 1, that need’s final score could be higher than that of some other needs in the

item’s new tier (Tier 2). See Figure A.4, which shows the distribution of the needs by expected value score after the second-round rating process and after the third-round voting process.

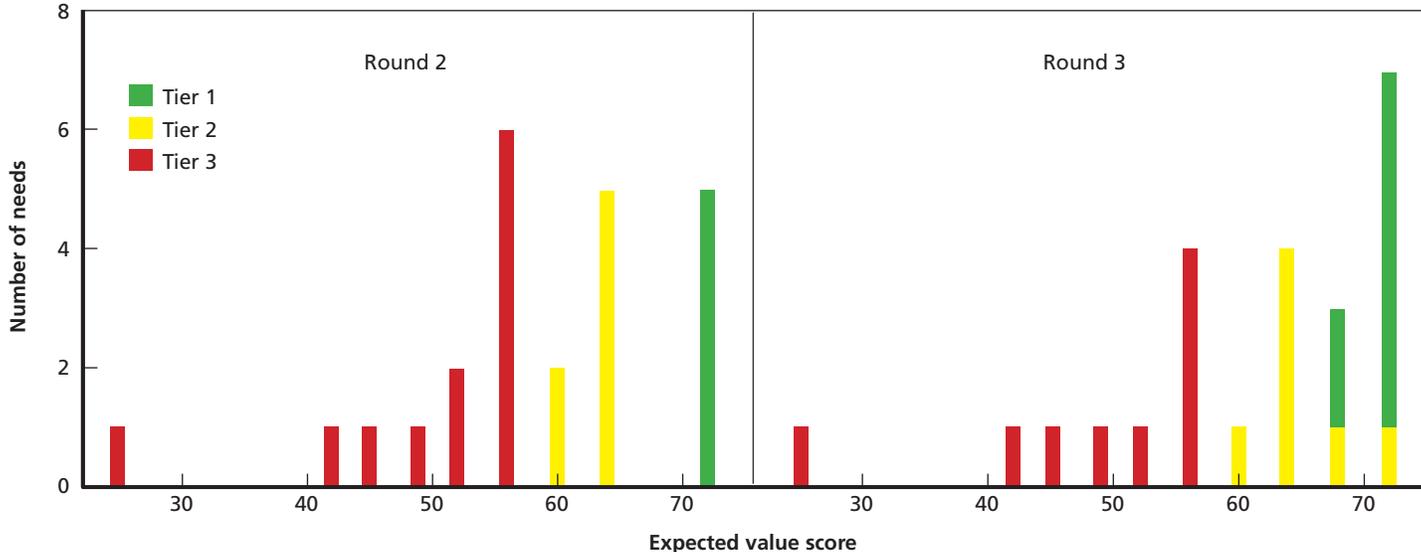
As a result of the third round of voting, 18 needs did not change their position and six needs rose by one tier. No needs fell by one tier or changed by two tiers. The output from this process became the final ranking of the panel’s prioritized results.

Figure A.3. How a Need’s Increase in Expected Value Might Result in Its Movement Across Tier Boundaries



NOTE: Each example need’s original tier is shown by a circle with a solid border (the two needs starting in Tier 2 and the four needs starting in Tier 3). Each need’s new tier after the third-round score adjustment is shown by the connected circle with a dotted border.

Figure A.4. Distribution of the Tiered Needs Following Rounds 2 and 3



Notes

¹ The Sixth Amendment's confrontation clause applies to state court proceedings through the Fourteenth Amendment's due process clause. Many states' legislation, court rules, or state constitutions also contain a confrontation clause further preserving and protecting the defendant's right to cross-examine and confront a witness (Weber, 2013, p. 149).

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The RAND Justice Policy Program

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About This Report

On behalf of the U.S. Department of Justice, National Institute of Justice (NIJ), the RAND Corporation, in partnership with the Police Executive Research Forum (PERF), RTI International, and the University of Denver, is carrying out a research effort to assess and prioritize technology and related needs across the criminal justice community. This initiative is a component of NIJ's National Law Enforcement and Corrections Technology Center (NLECTC) System and is intended to support innovation within the criminal justice enterprise. For more information about the NLECTC Priority Criminal Justice Technology Needs Initiative, see <https://www.rand.org/well-being/justice-policy/projects/priority-criminal-justice-needs.html>

This report is one product of that effort. It presents the results of an expert workshop that explored the benefits and drawbacks of the use of telepresence technology in criminal courtrooms and identified research needs around the use of this technology for court appearances. This report and the results it presents should be of interest to planners from courts, other judicial agencies, corrections agencies, research and operational criminal justice agencies at the federal level, private-sector technology providers, and policymakers active in the criminal justice field. Mentions of products do not represent approval or endorsement by NIJ or the RAND Corporation.



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