



JUDICIAL COUNCIL OF CALIFORNIA

INFORMATION TECHNOLOGY
ADVISORY COMMITTEE

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INFORMATION TECHNOLOGY ADVISORY COMMITTEE

MINUTES OF OPEN MEETING

January 31, 2024

12:00 PM to 1:00 PM

Videoconference

**Advisory Body
Members Present:**

Hon. Sheila F. Hanson, Chair; Hon. Samantha P. Jessner, Vice- Chair; Assembly Member Damon Connelly; Mr. Brian Cotta; Mr. Adam Creiglow; Hon. Tara Desautels; Mr. Jason Galkin; Hon. Michael S. Groch; Mr. A.J. Guzman; Brett Howard; Hon. Kimberly Menninger; Hon. Ioana Petrou; Mr. Jake Pison; and Hon. Bruce Smith.

**Advisory Body
Members Absent:**

Mr. Mike Baliel; Hon. Julie Culver; Ms. Rebecca Fleming; Hon. Amy Guerra; Mr. Neal Taniguchi; and Hon. Truc Do.

Others Present:

Hon. Kyle Brodie; Ms. Heather Pettit, Chief Information Officer, Judicial Council

OPEN MEETING

Call to Order and Roll Call

The chair called the meeting to order and took roll call.

Approval of Minutes

There were no written public comments received for this meeting.

DISCUSSION AND ACTION ITEMS (ITEMS 1-4)

Item 1

Chair's Report

Update:

Hon. Sheila F. Hanson welcomed members and informed them that public comments on SB 133 minimum technology standards opened on December 12 and closed on January 12. Three (3) public comments were received.

Next, Judge Hanson announced that the Chief Justice made an announcement at the January 19 Judicial Council meeting dedicating resources to examine the immediate concerns within the realm of Artificial Intelligence or AI. As a result ITAC proposed the new project: Support Branchwide Efforts to Understand Emerging Technology Impacts on the Courts that will contribute to investigations into the use of AI throughout the judicial branch.

Finally, Judge Hanson reviewed the topics on today's agenda.

Item 2

2024 ITAC Annual Agenda

Update: Hon. Sheila F. Hanson reviewed the draft 2024 Annual Agenda and informed the members that two (2) updates were made to the draft agenda since the committee's extensive review at the December 5 meeting. The updates are 1. to consider is a new workstream recommended by Hon. Judge Brodie: Exploring Systems for Providing Public Access to Court Records; and 2. the addition of a new ITAC project: Support Branchwide Efforts to Understand Emerging Technology Impacts on the Courts.

Action: The committee discussed the draft agenda and asked questions. The committee voted to approve the draft annual agenda to be forwarded to the Technology Committee for approval.

for review.

Item 3

SB 133 Minimum Technology Standards

Update: Hon. Samantha P. Jessner, Vice-Chair of ITAC; Ms. Saskia Kim, Attorney, Judicial Council Policy and Research Division; and Ms. Jenny Grantz, Attorney, Judicial Council Legal Services Division presented the draft invitation for public comment of the proposal to adopt minimum technology standards for courtroom necessary to permit remote participation in court proceedings, as required by Senate Bill 133.

Action: The committee voted to approve the draft Judicial Council report to adopt minimum technology standards for the courtroom technology necessary to permit remote participation in court proceedings as required by Senate Bill 133 to be submitted to the Judicial Council for approval.

ADJOURNMENT

There being no further business, the meeting was adjourned.

Approved by the advisory body on [enter date].



Electronic Evidence Workstream Phase II

Findings and Recommendations

March 2024

Based on workstream research conducted in years 2020–2021. Additional study recommended.



Judicial Council of California

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1.0 EXECUTIVE SUMMARY

This report is the work product of the Electronic Evidence Workstream II conducted during the 2021–2022 timeframe. This workstream was previously called Digital Evidence Workstream II, however the name was updated and is referenced as Electronic Evidence Workstream II in this report. The goal of this report is to provide the outcomes and recommendations stemming from the workstream’s original analysis of the need and current use of electronic evidence in the California courts. Conducting additional research and discovery is essential to ensure a more current report.

The Electronic Evidence Workstream II endeavored to:

1. Understand the court needs;
2. Evaluate the solutions in use;
3. Make recommendations on technologies;
4. Make recommendations on court processes and procedures; and
5. Identify rules and laws that need to be considered.

The set of circumstances that the workstream determined could benefit from electronic evidence include:

- Remote proceedings;
- Hybrid proceedings;
- Live court hearings;
- Organization of evidence;
- Electronic storage of evidence; and
- Electronic movement of evidence from court to reviewing courts.

Three courts—the Superior Courts of Orange, Placer, and San Diego Counties—developed pilot projects in this area: Orange, with a project directed specifically at testing electronic evidence solutions; Placer, with a project to develop an integrated solution for video appearances, which was later expanded to include electronic evidence; and San Diego, with a project that allows litigants in small claims and limited unlawful detainer case types to search their cases and submit exhibits electronically for an upcoming trial. This report describes these three projects and includes their summary findings.

In its review of technologies and projects, the workstream quickly concluded that no one solution fits all; each court has a different suite of technologies, serves different constituents, and has vastly different resources available. Therefore, this report does not recommend any specific technologies, but rather describes some of the many operational and technical considerations that may apply to electronic evidence projects and solutions.

The recommendations in this report include support for branch funding for pilot projects; creation of a user group to mature the best practices in the branch; development of statewide

master agreements (as needed); support for rule changes enabling use of electronic evidence (none were identified at the time of this study); and monitoring of legislation to inform the branch of any impacts. Collectively, these recommendations begin to provide a road map for enabling and advancing the use of electronic evidence in the courts.

2.0 INTRODUCTION

Electronic access to the courts in California has been slowly expanding. In 2018, the first phase Digital Evidence Workstream conducted a survey and found that few courts reported receiving digital evidence in significant volume, and many had no documented processes or technology to accept, store, view, or retain digital evidence differently from other evidence. Therefore, digital evidence was managed almost entirely in physical form. Anticipating growth in this area, both the courts and justice partners reported significant interest in establishing statewide guidelines, as well as technology recommendations and solutions, to address this growing evidentiary medium.

In its April 8, 2019, report to the Technology Committee, the workstream recommended that a future workstream investigate and document (1) proposed best practices, policies, and standards and, where appropriate, pilot technology standards and solutions; (2) a need for statewide statutes or rules of court to provide clear authority and processes; and (3) best practices for receiving, storing, submitting, viewing, protecting, redacting, annotating, transmitting (between courts), and evaluating solutions and services for managing electronic evidence.

In March 2020, the COVID-19 pandemic created new, very serious and challenging struggles. Many courts closed their doors—some indefinitely—leaving litigants looking for help, direction, and access. Then—Chief Justice Tani G. Cantil-Sakauye quickly responded, and the courts followed suit, to provide access remotely. Access to the public to watch and/or participate in court proceedings using remote technology was quickly adopted. The speed with which the courts adapted to these mass closures by using technology for increased remote proceedings was extraordinary. Rules of court and many laws were amended and created (some temporarily) to provide opportunities for the courts to operate remotely, in a manner that had never been imagined before.

This workstream had already begun when the pandemic hit in March 2020, and the issue of electronic evidence loomed large in addressing court users' needs. Many courts jumped into using electronic evidence, and they adopted a variety of solutions. Since then, many laws have been amended to allow for electronic evidence and others are still being considered by the Legislature. However, one thing is clear: Remote proceedings are here to stay, and now is the time to identify best practices for the use of electronic evidence and to share them branchwide.

3.0 GOAL ALIGNMENT

Supporting the advancement of electronic evidence practices in the courts aligns with Goal 1 of the *Strategic Plan for Technology, Advance the Digital Court*. The judicial branch will increase access to the courts, administer justice in a timely and efficient manner, and optimize case

processing by supporting a foundation for the digital court and implementing comprehensive digital services for the public and for justice partners. Moreover, advancing electronic evidence management is a specific initiative included in the [*Tactical Plan for Technology*](#).

Beyond this direct alignment to the governing documents for branch technology, this report, *Electronic Evidence Workstream Phase II: Findings and Recommendations*, furthers the goals of the branch to support the expansion and continuation of hybrid and remote court appearances. Security of the evidence is of the highest priority; the requirements for any solution adopted must adhere to branch security standards. Lastly, this report supports the goal of innovation and information sharing through establishment of pilot projects to identify the best available solutions for managing electronic evidence in California's diverse courts, which differ in size and expertise and, therefore, may require more than one overall solution.

4.0 WORKSTREAM OBJECTIVES

To advance the strategic and tactical plan goals, the Information Technology Advisory Committee (ITAC) included the Electronic Evidence Phase II Workstream in its 2019 annual agenda and launched the workstream on September 25, 2019. Following were its objectives:

- a. Investigate and report on existing local pilots and court practices, including policies and standards, for transmitting, accepting, storing, and protecting electronic evidence.
- b. Research and recommend available technology and services that would support transmission, acceptance, storage, and protection of electronic evidence.
- c. Develop and propose changes to rules of court and statutes related to electronic evidence in collaboration with the Rules and Policy Subcommittee.
- d. Develop a framework for successful possible future pilots, including use-case scenarios, costs and benefits, and success criteria.

5.0 WORKSTREAM STRUCTURE AND APPROACH

Appendix A is the roster of workstream members. The membership, led by Judge Kimberly Menninger of the Superior Court of Orange County, included participants from a diverse set of courts. These participants were selected to provide a variety of perspectives on electronic evidence.

During the workstream's exploration, four tracks were formed:

Rules & Statutes. Develop and propose changes to rules of court and statutes related to digital evidence in collaboration with the Rules and Policy Subcommittee.

The track identified the following areas of research:

Rules and Statutes
<ol style="list-style-type: none">a. Identify any/all that need to change.b. Identify and create new rules and/or statutes, where appropriate.

Business Practices and Integrated Justice. Investigate and report on existing local pilot projects and court practices, including policies and standards, for transmitting, accepting, storing, and protecting digital evidence.

The track identified the following considerations:

Business Practices
<ol style="list-style-type: none">a. Identify procedures for receipt of electronic evidence.<ol style="list-style-type: none">i. Determine what processes need to change to exchange electronic evidence among governmental agencies (i.e., district attorney, police department, county counsel, child support services).ii. Create exchanges for self-represented litigants and their evidence, including but not limited to:<ul style="list-style-type: none">• Cell phones;• Documents;• Pictures;• Video;• Text messages;• Surveillance cameras on walls; and• Social media.iii. Create or identify procedures to allow private attorneys to submit electronic evidence to the court.iv. Create or identify procedures to allow police officers to submit electronic evidence to the court (traffic, gun violence protection orders). Consider the ability to allow litigants the opportunity to see this proposed evidence before they appear in court in order to evaluate their cases.b. Create or identify procedures for storage.c. Create or identify or enhance procedures to allow jury view.d. Create or identify procedures to transfer evidence to reviewing courts.e. Identify training issues for operations staff.
Integrated Justice Governance
<ol style="list-style-type: none">a. Identify case types where digital evidence needs to be used.b. Identify interested or appropriate justice partners and products that courts are already using or considering using.c. Identify or create solutions for self-represented litigants to view submitted electronic evidence, to submit evidence from within the courthouse, and to submit evidence from a remote location.d. Identify information that will need to be communicated to the State Bar about electronic evidence procedures; technical requirements, if any; and rule or statute changes.e. Identify opportunities for, and running pilots in conjunction with, justice partners and the courts.

Technology Standards, Practices, and Governance. Research and recommend available technology and services that would support transmission, acceptance, storage, and protection of digital evidence.

The track identified the following considerations:

Technology Standards, Practices, and Governance	
a.	Security
b.	Hosting method
c.	Storage
d.	Vendors
e.	Technology solution
f.	Privileges and access rules relevant in the electronic evidence realm
g.	Presentation in court and in the jury room
h.	Protection of privacy and confidentiality in conformance with the <i>Privacy Resource Guide</i>
i.	Retention
i.	Length of time
ii.	Cost of retention

The tracks met multiple times to develop initial recommendations, with a focus on improving access to justice through the exchange of electronic evidence and ultimately providing a foundation for increasing feasibility of remote hearings in various case types. Track leads presented findings at monthly meetings.

6.0 LOCAL PILOTS AND COURT PRACTICES

The workstream researched three court pilot projects:

- The Superior Court of Orange County initiated an electronic evidence project to support the court’s response to the COVID-19 pandemic.
- In 2017, the Superior Court of Placer County initiated a Court Innovations Grant Program project for a comprehensive remote appearance system, which was then expanded to include electronic evidence.
- The Superior Court of San Diego County launched an online application that allowed litigants in Small Claims and Limited Unlawful Detainer case types to search their cases and submit exhibits electronically for an upcoming trial.

These three projects are of varying scope, origin, and complexity. Any electronic-evidence solution will need to be specific to local needs and environments. Any court that is considering a similar project is more than welcome to contact any of these courts for more detailed information and documentation.

To gain a more global view of court practices, the workstream additionally surveyed all trial and appellate or reviewing courts, as well as justice partner agencies. The local pilot project descriptions summarize the responses received. The detailed responses are included as Appendix E to this report.

6.1 Project Description: Superior Court of Orange County

Because of the pandemic and the rapid rise in COVID-19 cases, the Superior Court of Orange County had an urgent need to find an automated solution to receive exhibits to support remote hearings. The court had to quickly transition to remote proceedings to continue providing access to the public. Additionally, the court needed to discover a solution for receiving electronic evidence for a trial to allow for adequate social distancing, as required throughout the state.

At the beginning of the pandemic, temporary avenues were established to receive evidence such as email, a SharePoint workflow, and the dropping off of hard-copy evidence. These avenues were used in various case types, including Family Law, Small Claims, Civil, and Probate. These case types involved a high percentage of self-represented litigants. The longer the pandemic state of emergency continued, the more evident it became that a more secure and streamlined solution was needed.

The Superior Court of Orange County decided to issue a request for proposal (RFP) for an electronic evidence solution to initially support the case types conducting most proceedings remotely. These case types most urgently required a reliable and secure electronic evidence solution. For the Superior Court of Orange County, the highest need was in Small Claims, Family Law, and Probate.

The court conducted the RFP process in pursuit of a vendor that could provide the ability to receive exhibits electronically and with the functionality necessary in a courtroom. Before the pandemic, the court had attempted to provide an electronic evidence solution in Criminal Traffic but experienced limited success and never moved forward.

6.1.1 Learning experiences

With the expansion of the portal, the court has learned useful lessons along the way. The project team has remained in close communication with the courtrooms using the portal and has gathered valuable feedback to improve the process. Criminal Traffic participated at the beginning of the POC and was taken offline to allow for further refinement of the process for that case type.

The portal proved it was possible to find a streamlined approach to exhibit statuses, exhibit numbers, and options in the portal that worked across multiple case types. Key successes included identifying a process for the return and purging of exhibits in Small Claims, the creation of a variety of profiles to best serve the needs of court staff and judicial officers, and enhanced tracking in the portal, including an activity log useful for future auditing. The portal has been successful because of the partnership of the project team, involvement of courtrooms, and support from supervisors and area leaders. This support—along with consistent, outlined

communication with the contractor—has ensured that feedback received from the users and court staff have targeted goals. The project team works with the contractor to push quarterly releases to the portal. These releases include a comprehensive approach, with training and communication every step of the way.

Discussions are still under way regarding exhibit retention and sharing of exhibits during hearings. Parties participating in a remote hearing on a mobile device may lack the resources to be able to launch the portal and share the portal with the court via their screen. Thus, *the court* may have to share screens and have parties walk through the exhibits that need to be shared next. This continued commitment to provide access to the public has ensured that an innovative approach is maintained with regard to electronic exhibits.

Refer to Appendix B for additional information about the Superior Court of Orange County’s pilot project and electronic evidence web portal.

6.2 Project Description: Superior Court of Placer County

In 2017, the Superior Court of Placer County received \$560,000 in Court Innovations Grant Program funding for a comprehensive remote appearance system. The funding provided the court with the means to implement the technological infrastructure to enable video appearances at all court locations and provide self-help services for those who are not in the immediate proximity of Roseville. With the ability to appear remotely came the need to be able to submit evidence remotely.

6.2.1 Evidence considerations and lessons learned

Defining eligible hearings

The electronic evidence system is not designed to support complex trials with hundreds of exhibits per party. Therefore, the court offered it in Small Claims, Civil, and Family Law trials and evidentiary hearings. Although designed for Small Claims and Unlawful Detainer trials, the system was used much more effectively in Family Law cases with attorneys for one or both sides.

On each of the case type webpages, the hearings that are eligible for evidence sharing are indicated. When parties schedule for an eligible hearing type, they receive a second confirmation with information about electronic evidence.

The court will not facilitate discovery. The system is focused on the court process and intended only for sharing evidence on the day of the hearing.

Evidence sharing before and during hearings

If at least one person has registered for a video appearance for an upcoming eligible hearing, parties are able to upload files to a document collaboration site hosted by the court. Evidence uploaded by a user does not become available to the opposing side until the time set by the court (for example, 1 hour). Each party will see their own folder, the other side’s folder, and the

court’s “Admitted” folder. The court has access to both parties’ folders and all court folders and may review uploaded files at any time. The videoconference does not link to this site, so participants may have the evidence website open in a second web browser or tab during the hearing.

For hybrid proceedings, a support model for the in-person party was created by the court. The judicial officer, courtroom clerk, and support staff identify cases where one party is remote and one is in person, and staff assist those in person with scanning and uploading their evidence at the “scanning station.” This station includes a computer, scanner, and camera. Staff are able to override the cutoff time to upload exhibits and do so for the in-person parties. Once the party has uploaded the exhibits and reviewed the opposing side’s exhibits, support staff email the courtroom indicating who is ready for their hearing and who will be assisted next. During the hearings, a laptop is provided to the party to reference file names.

If a party reaches out before an event, support staff can schedule a time for the party to make an appointment to scan and upload exhibits before the hearing.

Court’s management of electronic exhibits

The evidence process is the same for electronic evidence as physical evidence. The most effective way of discussing electronic exhibits has been when the judicial officer and parties or attorneys review uploaded files and discuss how to mark and admit files and whether there are any objections. This way, the courtroom clerk only has to electronically mark and admit a select number of files. This discussion does not always happen, which increases workload for courtroom clerks.

As to retention, the requirements are the same for electronic evidence as for evidence physically submitted in court. The only procedural difference is that courtroom clerks must email the information technology (IT) department to request that electronic evidence is removed or deleted, instead of physically destroying evidence. However, implementing the process of emailing IT has been slow.

Refer to Appendix C for additional information about Superior Court of Placer County’s pilot project and their remote appearance user guide.

6.3 Project Description: Superior Court of San Diego County

The digital evidence application in San Diego County allows litigants in Small Claims and Limited Unlawful Detainer case types to search their cases and submit exhibits electronically for an upcoming trial. The solution accepts exhibits of various types—including documents, pictures, and video files—to be submitted in various file formats. Security checks such as antivirus scanning and file signatures are performed on the submitted files. The litigant is notified via email once files are accepted by the court. Judicial officers and staff can view these exhibits using an internal version of the application, which integrates with the court’s case management system to pull calendar data. The courtroom can choose to present the evidence to

in-person or remote case participants using the *share* feature of a standard videoconferencing solution specified by the court.

Refer to Appendix D for the Superior Court of San Diego County’s *Small Claims Exhibit Upload Application* user guide.

7.0 FINDINGS FROM THE STAKEHOLDER SURVEYS

To meet the objective of investigating and reporting on existing local pilots and court practices—including policies and standards for transmitting, accepting, storing, and protecting electronic evidence—the workstream conducted three separate surveys, from March through April 2021, of various electronic-evidence stakeholder groups. Group 1 was the reviewing courts; all six California appellate courts and the California Supreme Court responded to the survey. Group 2 was the California trial courts. Of the 58 trial courts in California, 35 trial courts responded. Group 3 included various California criminal justice partners. Forty-six justice-partner agencies across 30 counties responded to the survey. Most justice partners were prosecuting, public/alternate defender, or law enforcement agencies. The results from the three surveys are briefly outlined below. More of the detailed survey results are included as Appendix E of this report.

7.1 California Courts of Appeal

Most appellate courts accept some electronic evidence via electronic transmission, although in some cases electronic evidence is heavily limited by size and file type. Generally, the appellate courts are not equipped to handle video and audio files through electronic transmission. Most stated practices and procedures for electronic evidence via electronic transmission apply to PDF documents only.

Electronic evidence is received through a mix of email, web portals like TrueFiling and OnBase, and file-sharing software like Axway. Only the Third Appellate District of the Court of Appeal identified itself as possessing a distinct electronic evidence solution, but its solution does not handle audio or video files. None of the courts had contracted with vendors to expand their current solutions.

The appellate courts and the Supreme Court all use a single case management system. Most courts attach files to the CMS only if they are submitted through the web portal in PDF format. Generally, video and audio files remain on physical media. Two courts anticipated needing new information technology staff to manage tasks like uploading electronic evidence to the case management system and distributing electronic evidence to chambers.

Most appellate courts hoped to transition to accepting electronic evidence only via electronic transmission, and most courts anticipated a short-term need for an electronic evidence solution that would move away from storing audio and video files on physical media.

7.2 California Superior Courts

7.2.1 Current business practices

Courts used a range of solutions for storing, managing, and presenting electronic evidence, and those solutions varied in complexity. Eighteen courts, or 51 percent of respondents, reported accepting electronic evidence via electronic transmission, although some are limited to accepting only PDF documents. Email is the most common platform for transmitting electronic evidence, although web portals and file sharing software are also used.

Over half of courts surveyed reported having trouble viewing and presenting proprietary file formats. In these cases, the slightly more common action was for courts to ask the submitting party to provide a solution—such as converting the file or providing the needed software—than to resolve the issue using court IT staff. Some courts have also ameliorated the issue by stipulating file formats for submissions. The Superior Court of Sacramento County, for example, has published a policy on electronic evidence for its criminal justice partners to facilitate electronic evidence transfer.

Self-represented litigants present additional challenges to coordinating electronic evidence submission and management. Whereas some courts apply the same policies and procedures to self-represented litigants, some courts handle these instances on a case-by-case basis, and some allow self-represented litigants to present evidence on their phone without prior submission. As a Superior Court of San Diego County survey respondent described, navigating audiovisual and videoconferencing technologies may be difficult for self-represented litigants.

Using electronic evidence is increasingly common in Traffic, Criminal, and Long-Cause Criminal matters: for example, 94 percent of respondents accept electronic evidence in Traffic and Criminal court cases, and 71 percent accept electronic evidence in Long-Cause Criminal hearings. In these cases, electronic evidence is overwhelmingly submitted and managed on physical media such as CDs and DVDs.

7.2.2 Future plans

Except for one court, all responding courts hoped to transition to an increased use of electronic transmission for electronic evidence. Fourteen courts, or 40 percent of respondents, hoped to transition completely to electronic transmission. Additionally, many courts hope that a future electronic-evidence solution will be integrated with other services, such as videoconferencing technology, hearing scheduling technology, and case management systems. On the other hand, a smaller number of courts are hoping to adopt a solution for electronic evidence only, because they have yet to adopt a process for handling electronic evidence or want to wait as other solutions develop. In determining their future goals, survey respondents cited factors including the improvement of remote appearances, efficiency, access, the transition to a wholly electronic system, and a lack of physical storage space.

Most courts do not anticipate needing additional staff to manage electronic evidence. Respondents indicated that no new clerk's office or courtroom staff would be needed to manage

electronic exhibits, but that the tasks for information technology staff would increase. Additional support would be needed to scan for viruses, guide users through the submission process, guide users through presenting their evidence, attach files to the case management system, distribute files to hearings, and offer general troubleshooting.

Lastly, 16 courts, or 46 percent of respondents, reported an interest from parties in accepting electronic evidence through electronic transmission in native formats. Civil attorneys and self-represented litigants were the most likely to make these requests. Civil, Criminal, and Family Law cases were the top three hearing types in which electronic transmission was requested.

7.3 California Criminal Justice Partners

For criminal justice partners, the collection and storage of photo, video, and audio evidence is near ubiquitous. Accordingly, many agencies use web-based cloud software and locally installed software to store digital evidence, although they often also hold some electronic evidence in physical formats. Only 11 agencies indicated that they did not have software to manage their electronic evidence.

Although most criminal justice partners collect electronic evidence, only half submit electronic evidence to the superior court of their county. Most agencies submit this evidence through physical media, with a smaller number using email and web portals. Only three agencies submit 75 to 100 percent of their evidence as electronic evidence.

Of the agencies that submit electronic evidence to their superior court, around 40 percent report that the court has had trouble viewing electronic evidence in the proprietary file formats they have submitted. This difficulty is common with officer body cameras, car dashboard cameras, and surveillance videos. Solutions include converting the file, providing the needed software and hardware to view the file, and submitting a paper printout of the file.

Refer to Appendix E, Digital Evidence Survey Results, for snapshots of the digital evidence survey report.

8.0 ANALYSIS AND CONSIDERATIONS

In reviewing the three pilots, workstream track findings, and survey results, the workstream identified business and technical considerations that courts interested in establishing an electronic evidence system will want to keep in mind as they start to design pilots or proofs of concept.

9.0 BUSINESS CONSIDERATIONS

9.1 Introduction

In today's post-COVID world, providing access to justice for all litigants includes providing remote access. All litigants who appear remotely need to be able to submit and share their

evidence with the court and the opposition regardless of case type or parties. To facilitate this requirement, each court must identify and adopt a solution that will meet litigants' needs.

Evidence can and does come to the court in a variety of formats, including cell phones, documents, photos, videos, recordings, and social media, to name a few. Courts need to be able to receive electronically every type of evidence that it could receive in person unless it is a physical item like a gun or a bullet. Electronic evidence requires a technical platform for litigants to share or discover the evidence with each other.

All courtrooms need to be able to effectively display the electronically received evidence remotely as well as in the courtroom. Procedures must be developed to identify, admit, and store the evidence once it is submitted, as well as to purge what evidence the court does not need to maintain. Courts must adopt clear rules and procedures surrounding their electronic-evidence policies, including security and management of the evidence. Courts may need to redesign courtrooms to allow for evidence presentation equipment, and may need to revise or create new job descriptions.

Special attention should be paid to the needs of each case type and the ability for the litigants to successfully participate. To this end, courts need to provide detailed training guides for litigants, especially self-represented litigants, to allow them to participate. Courts should consider educating the bar and bench in any solution they select before it is implemented. Educating and encouraging justice partners to participate in the solution will be critical to its success. Courts will benefit if they can align these projects with their justice partners. Delivering training, providing courts an opportunity to test out a solution in a safe test environment before it goes live, and allowing for vigorous and current feedback will serve a court well in the implementation. Courts will find some litigants to be slower than others to adopt these solutions but will most likely not find self-represented litigants in that category. If the court can select a solution that provides an upload process that is most commonly used for other noncourt purposes, the court's success with its self-represented community will improve.

9.2 Use Cases

The use cases that can benefit from electronic evidence include:

- Remote proceedings
- Hybrid proceedings
- Organization of evidence
- Electronic storage of evidence
- Electronic movement of evidence from court to reviewing courts

9.3 Policies

Policies and processes need to be created that address the following questions:

- Do you have an issue with memorandums of understanding that prohibit certain tasks to be done by certain types of employees?
- Who will number the exhibits?
- How will the numbering on the exhibits occur?
- Who is responsible for management of the system in the courtroom?

9.4 Procedures

Procedures need to be created that address the following questions:

- Who will display the electronic evidence?
 - Judge
 - Clerk
 - Bailiff
 - Technology Staff
 - Support staff
- Who will have access to the electronic evidence and when?
- Is there a way to limit or discontinue a session with a litigant or witness, when appropriate?
- If evidence is presented on paper, will the court work with paper and electronic evidence simultaneously or will the court convert the paper to electronic evidence?
- In a hybrid courtroom, the court will need to decide how it wants the evidence to be converted to electronic evidence so that the person appearing remotely can see the evidence. Who will be doing the conversion and, in that capacity, the numbering and description?

Additional procedures need to be created that address the following topics:

- Create categories of evidence (uploaded, marked, admitted).
- Create a process to dispose of evidence that is not admitted or marked.
- Store evidence that is marked.
- Store evidence that is admitted.
- Allow parties to mark evidence as confidential or to ask to have it sealed.
- Provide an electronic retention process for exhibits under the codes.

10.0 TECHNICAL CONSIDERATIONS

Acceptance, management, and presentation of digital evidence within the court environment presents a complex set of business process and technical challenges that affect multiple stakeholders throughout the process. There is no singular preferred path for a court to take when developing its approach for how to incorporate digital evidence into its business processes. Regardless of the approach chosen, some common issues need consideration when developing a strategy for digital evidence with a court.

10.1 Infrastructure and Storage

Storage of digital evidence is a significant consideration in any electronic-evidence platform. The amount of storage required will be a function of the volume of, type of, and retention period for the evidence submitted. A logical assumption is that the amount of electronic evidence submitted in the future will continue to increase given the ubiquity of devices that can produce digital files. Storing evidence on locally hosted infrastructure versus cloud infrastructure is a fundamental consideration. If cloud infrastructure is being considered, the court may want to consider any privacy or security enhancements provided by using a government cloud. Most large vendors in cloud infrastructure provide government clouds. Locally hosted and cloud-hosted storage have various cost and scalability considerations. Also, given the importance of electronic evidence to the business of the court, disaster recovery and business continuity should also be considered when deciding how to manage the storage of electronic evidence.

Following are considerations for courts:

- Develop a methodology to determine the current and future amounts of storage required for digital evidence based on the type and amount of evidence that may be submitted to a court for various case types. Most likely, video evidence will require the most storage and continue to increase in volume because of the proliferation of modern devices such as smart phones, web-based cameras, and officer body-worn cameras.
- Weigh the functional and cost implications of locally hosted storage and cloud storage. Consider how long evidence must be retained by the court in any storage calculation methodology.

10.2 Format

Courts must consider how digital evidence will be viewed or played as part of their electronic-evidence strategy. Limiting the acceptable format to fewer, more standardized formats would reduce technical complexity and cost for courts but may come with challenges regarding conversion from, loss of functionality from, or meta-data associated with the native format. For example, certain proprietary body-worn camera players may include certain meta-data for a video being played within the native player. This meta-data may be lost if the video is converted into a more open video format such as WAV or MP4. Additionally, if a court allows any type of evidence format to be submitted, the court may need to procure many types of file format viewers or players to view or play the evidence.

Following is a consideration for courts:

- Weigh the benefits of accepting any type of evidence format against the operational and technical costs to court processes and court staff having to play, view, and/or convert the evidence to a more standard format. Having court staff convert evidence from one format to another may open a door for questioning whether the evidence was altered as part of the conversion process.

10.3 Evidence Retention

In alignment with other considerations such as where and how to store the electronic evidence, courts will also need to consider the retention and preservation method and duration of that evidence. Any retention schedule should be aligned with existing physical evidence retention policies. Given that appellate proceedings may occur well after a case is dispositioned at a trial court, it may be important for a trial court to have a process to retrieve metadata information about the evidence submitted. Examples of metadata information that may be helpful in properly retaining evidence include date of evidence submitted, date of case disposition, and current status of case. When determining how to store electronic evidence for longer periods, courts may consider price-tiered storage because of finances.

Following are considerations for courts:

- Align any electronic-evidence retention schedules to existing physical-evidence retention schedules.
- Allow for metadata to be associated with any evidence submitted so that the metadata may be queried as part of any processes for identifying electronic evidence that may be purged.
- Consider how and where the electronic evidence is backed up, from a retention-management perspective.

10.4 Branchwide Solutions Versus Local Court Solutions

As the California judicial branch considers its electronic evidence strategy, discussions should be held to analyze the opportunities and obstacles of a locally configurable, centrally provided branch solution for electronic evidence vis-à-vis local court solutions. A centrally hosted solution may expedite adoption, provide economies-of-scale, and provide a somewhat consistent process across jurisdictions. Conversely, a specific, local solution may be more tailored to fit a specific court's needs but come at the cost of additional procurement and deployment overhead.

Following are considerations for courts:

- Consider developing a working committee of both court operational and technical staff to define the business and technical needs with regard to electronic evidence.
- In the development of any requirements documentation, leverage lessons learned by the Superior Court of Placer County, the Superior Court of Orange County, and the Superior Court of San Diego, given that they have been live with an electronic-evidence solution for some time.
- Based on the outcome of a working committee, determine if a one-size-fits-all solution works best for the majority of California courts given each court's uniqueness or if, because of that uniqueness, local solutions must be considered.

10.5 Submission of, Management of, and Access to the Electronic Evidence

Secure submission of electronic evidence is a critical step in any electronic-evidence process flow. Identity management for any user of an electronic-evidence system is important to

determine if a user of the solution may access the evidence submitted and at what level. The submission process should also be capable of inspecting the files for any viruses or malware as part of the process. Any electronic-evidence solution considered must allow the court to secure the evidence from any possibility of tampering. Courts are not the originator of most electronic evidence, but courts are responsible for the integrity of the evidence. In addition to securing the electronic evidence, courts must consider how the system will allow secure, configurable party access to the evidence. As with any system, the court should also consider the staffing impact to managing and providing access to the electronic evidence.

Following are considerations for courts:

- Develop an identity management approach for electronic evidence before developing or implementing the core system. As part of an identity management approach, any court implementing a solution will want to research and consider any statewide judicial branch solutions in place or under way.
- Consider using a role-based access approach over an individual-based access approach.
- Consider the business process and staffing impact of managing and maintaining user access for an electronic-evidence solution.

10.6 Vendor Management

As a general statement, most court case management systems do not have robust, web-accessible electronic-evidence management capabilities. Most electronic evidence solutions will require the court to partner with a vendor, so the court should be prepared to have an ongoing relationship with the vendor. If the court stores its electronic evidence on a vendor partner's platform, the court will want to make sure it has the ability to migrate any evidence to another platform if it chooses to do so. Given that the electronic evidence environment is still evolving, any platform that is implemented will likely need to continue to evolve.

Following are considerations for courts:

- Determine any synergies or economies of scale that result from having an electronic evidence solution embedded or integrated as part of the court's case management system.
- If a court is considering a vendor-hosted solution, be sure to consider the long-term viability and sustainability of the vendor.

10.7 Presentation of Digital Evidence

Any evidence the court allows to be submitted must be able to be viewed, played, or presented in courtrooms and/or juror deliberation rooms. Therefore, any electronic-evidence solution must be accessible by any existing or future courthouse solutions for viewing or playing evidence. As part of the requirements for a custom solution, the court may want to consider the use case of limited access to some or all electronic evidence in a juror deliberation room. The court's presentation solutions will need to account for both visual and audio evidence. Depending on the

choices made regarding acceptable file formats for the evidence, the court will need media players capable of playing those types of files.

Following are considerations for courts:

- Consider how the electronic evidence will be presented as part of the overall evidence solution.
- Determine the various use cases for how and where the evidence will be presented, and align any solution to the requirements for those use cases.

11.0 RULES ANALYSIS

At the ITAC meeting on November 2, 2020, the [*Digital Evidence Workstream Rules and Statutes Subcommittee Report*](#) was presented. The workstream reported its recommendations relative to areas to change in the California Rules of Court and statutes to further allow courts to implement and receive electronic evidence.

On January 11, 2021, ITAC’s Rules and Policy Subcommittee circulated three proposals for public comment. One rule proposal (amending permissive electronic filing and electronic service rules to reference Penal Code section 690.5) was approved by the Judicial Council on October 1, 2021. One rule proposal (governing “lodged electronic exhibits”) and one legislative proposal (authorizing the use of vendors to store exhibits and evidence in electronic format) were deferred during the review cycle and pending a recommendation of the Rules and Policy Subcommittee on whether to revise and recirculate them in 2022.

Any additional initiatives, including rule work around digital evidence, were deferred because of the other efforts happening during and after the pandemic so as not to conflict with that work.¹

12.0 OVERARCHING RECOMMENDATIONS

Based on its research and analyses, the workstream recommends the following actions for the branch:

1. Seek and provide funding for additional electronic-evidence pilot projects.
2. Convene a branch user group to assess use cases, additional best practices, and funding models necessary to support secure, reliable, and branchwide digital evidence practices.
3. Consider the need for any master service agreements to benefit the courts and the branch.
4. Support and adopt rules and regulations that enable electronic-evidence submission, receipt, display, transfer, and storage.
5. Establish or identify an entity responsible for monitoring legislative changes, informing those affected, and updating solutions to meet the changing laws.

¹ Judicial Council of Cal., meeting minutes, Information Technology Advisory Committee’s Rules and Policy Subcommittee (June 2, 2022), [itac-20221103-rps-materials-PUBLIC.pdf](#).

13.0 CONCLUSION

As a result of the COVID-19 pandemic, the California judicial branch adapted very quickly to an environment with a significantly increased need and demand for remote participation in court proceedings. The branch is supported by ongoing technology modernization funding to continue building on this momentum. The submission, sharing, and storage of electronic evidence is a foundational component of providing remote access to justice.

The Electronic Evidence Workstream hopes that this report can help courts interested in starting an electronic-evidence project. In addition, the workstream recommends that the Technology Committee create a strategy for courts to identify, obtain, and adopt policies and procedures to support a robust electronic-evidence culture designed to support hybrid and remote appearances and increased access to the courts.

APPENDIX A: ELECTRONIC EVIDENCE WORKSTREAM ROSTER

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Hon. Mariano-Florentino Cuéllar

Associate Justice, Supreme Court of California

Hon. Julie R. Culver

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Hon. Michael J. Gaffey

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Judicial Council staff

From these Judicial Council offices:

Facilities Services

Information Technology

Legal Services

APPENDIX B: SUPERIOR COURT OF ORANGE COUNTY PILOT PROJECT REPORT AND ELECTRONIC EVIDENCE WEB PORTAL

Project Description: Superior Court of Orange County

Because of the pandemic and the rapid rise in COVID-19 cases, the Superior Court of Orange County had an urgent need to find an automated solution to receive exhibits to support remote hearings. The court had to quickly transition to remote proceedings to continue providing access to the public. Additionally, the court needed to discover a solution for receiving electronic evidence for a trial to allow for adequate social distancing, as required throughout the state.

At the beginning of the pandemic, temporary avenues were established to receive evidence such as email, a SharePoint workflow, and the dropping off of hard-copy evidence. These avenues were used in various case types, including Family Law, Small Claims, Civil, and Probate. These case types involved a high percentage of self-represented litigants. The longer the pandemic state of emergency continued, the more evident it became that a more secure and streamlined solution was needed.

The Superior Court of Orange County decided to issue a request for proposal (RFP) for an electronic evidence solution to initially support the case types conducting most proceedings remotely. These case types most urgently required a reliable and secure electronic evidence solution. For the Superior Court of Orange County, the highest need was in Small Claims, Family Law, and Probate.

The court conducted the RFP process in pursuit of a vendor that could receive exhibits electronically and with the functionality necessary in a courtroom. Before the pandemic, the court had attempted to provide an electronic evidence solution in Criminal Traffic but experienced limited success and never moved forward.

RFP approach

In August 2020, the court initiated an RFP that captured a solution for submitting electronic evidence. Court procurement released the RFP in early September 2020 with three evaluation phases: (1) technical qualifications, (2) demonstrations-presentations and price proposals, and (3) proof of concept. Based on the RFP Committee's evaluation of the respondents' demonstrations-presentations relative to their price proposals, the RFP Committee determined that Omnigo Software, LLC offered the best value to the court, and selected Omnigo to provide a POC that kicked-off in December 2020.

Legal considerations—Contract

The POC and electronic evidence solution technology posed unique legal considerations regarding the confidentiality, storage, and security of electronic evidence. Although the court required Omnigo to sign the court's nondisclosure agreement before beginning the POC, the

court undertook special vetting and implementation of operational protocols, as well as contract provisions applicable to electronic evidence, its storage, and the contractor's application.

Meetings with the court's general counsel, judicial officers, subject-matter experts, and other key stakeholders ensured that the variety of viewpoints and considerations of those affected were accounted for. The Superior Court of Orange County ensured that correct protocols in the receipt of electronic exhibits were put into place because they were not clearly defined by statute. Contract provisions were added to clarify responsibility for security and compliance, Omnigo's hosted application and the court's use, and access to and ownership of confidential information, including evidence and data, for Omnigo's cloud-hosted solution to operate with the court's own cloud storage.

The court's General Counsel reviewed the flow for the receipt and storage of evidence. An [Administrative Order](#) was written, signed, and posted to the public website to ensure that the court's expectations for uploading exhibits were understood. The court's privacy policy and Administrative Order were also linked on the electronic evidence portal. Parties and all others creating accounts are still required to read and acknowledge both before account creation.

Pilot case types

The court selected five pilot courtrooms in which to launch the portal: Small Claims, Unlawful Detainer, Civil Harassment, Family Law, and Probate. The combination of self-represented parties and attorneys across the case types ensured that the court had an audience similar to that in a typical case with physical exhibits.

Before the launch of the portal in the selected case types, the court formed a judicial working group, comprising the project's judicial sponsor, supervising judges, and judicial officers from the pilot courtrooms. This group assisted with formulating decisions and design ideas before the launch of the portal. Because the portal was used across the various case types and differences existed between case statuses, exhibit numbering, and exhibit tags, decisions were made to streamline these processes. As a result, the portal automatically affixes a digital exhibit tag and exhibit numbers when exhibits are uploaded to the portal. All participants for those case types agreed to use exhibit numbers for exhibits, as opposed to letters or a combination thereof. Also chosen for use were three exhibit statuses: lodged, marked, and admitted.

The portal allows access for court staff not only to view exhibits, but also to make edits to the exhibit record, when necessary. For example, if any user errors occur during the upload process with regard to exhibit description, once the upload process has been completed, court staff can make adjustments. The court also has access to tracking and history on each exhibit that is opened, viewed, and shared, for future auditing purposes. Reports and statistics can also be generated from the portal, as necessary.

Launching this project in specific case types allowed for focused attention, increased productivity, success, and buy-in from others. The focus on these courtrooms resulted in

important lessons that allowed for decisions to be made about the portal and contributed to larger success. The feedback provided from experiences with these cases, courtrooms, and parties allowed for improvements to be made to the portal and to the process in the courtroom.

Development of the project approach

Before launch, a plan was put into action to ensure that the necessary considerations for the portal were being vetted throughout the process. Working groups of judicial and subject-matter experts were created to assist with vetting the portal and discussing processes.

Once the portal was live, parties received notice from the pilot courtrooms and were directed to the court's public website, where they found each department's policies and procedures, as well as instructions on how to use the portal. Parties were encouraged to familiarize themselves with the portal before the launch and to contact their assigned courtroom with any additional questions.

After initial feedback was received from parties, additional adjustments were made to the portal and to instructions on the court's website.

Measurable outcomes

Since the launch of the portal in April 2021, the five pilot courtrooms have expanded to include a few more. The Superior Court of Orange County added a courtroom in Civil Unlimited to the pilot, as well as additional courtrooms for other case types already using the portal.

As of September 2022, more than 7,300 party/attorney accounts were created in the portal; over 5,600 cases had exhibits uploaded; and over 114,100 exhibits were uploaded to the portal across the various case types. In August 2022, the court successfully purged over 47,000 Small Claims exhibits from the portal. A survey was also added to the portal at the end of the sign-out process to gather additional feedback from portal users and to assist with ease of access.

Learning experiences

With the expansion of the portal, the court has learned useful lessons along the way. The project team has remained in close communication with the courtrooms using the portal and has gathered valuable feedback to improve the process. Criminal Traffic participated at the beginning of the POC and was taken offline to allow for further refinement of the process for that case type.

The portal proved it was possible to find a streamlined approach to exhibit statuses, exhibit numbers, and options in the portal that worked across multiple case types. Key successes included identifying a process for the return and purging of exhibits in Small Claims, the creation of a variety of profiles to best serve the needs of court staff and judicial officers, and enhanced tracking in the portal, including an activity log useful for future auditing. The portal has been successful because of the partnership of the project team, involvement of courtrooms, and support from supervisors and area leaders. This support—along with consistent, outlined

communication with the contractor—has ensured that feedback received from the users and court staff have targeted goals. The project team works with the contractor to push quarterly releases to the portal. These releases include a comprehensive approach, with training and communication every step of the way.

Discussions are still under way regarding exhibit retention and sharing of exhibits during hearings. Parties participating in a remote hearing on a mobile device may lack the resources to be able to launch the portal and share the portal with the court via their screen. Thus, *the court* may have to share screens and have parties walk through the exhibits that need to be shared next. This continued commitment to provide access to the public has ensured that an innovative approach is maintained with regard to electronic exhibits.

Electronic Evidence Web Portal:

Access the Portal

For information regarding current protocols for remote trials and hearings, please check the [COVID-19 webpage](#).

To access your case through the portal, you will need the case type, case number, and hearing date.

For the best experience, utilize a desktop computer and the Chrome or Microsoft Edge browser.

If you have difficulties with the electronic evidence process, please see the instructions below for your scheduled courtroom for contact information. Please also view the instructions and video posted below.

[Access the Electronic Evidence Portal](#) 

Instructions

Creating Accounts and Uploading Exhibits:

- [Instructions to Upload Evidence \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions to Create an Account and Upload Exhibits \(\(English\)](#) 
- [Video Instructions to Create an Account \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions to Upload Evidence \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions to Upload Evidence for Civil Unlimited Cases \(English\)](#) 

Navigating the Site

- [Instructions to Print an Exhibit List \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Instructions to Share Evidence With Other Parties \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions for Navigating the Site \(English\)](#) 
- [Video Instructions to Share Evidence With Other Parties \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions to Downloading Exhibits \(English\)](#) 
- [Video Instructions to Print an Exhibit List \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 

Preparing For Your Hearing & Presenting Exhibits

- [Instructions to Present Exhibits \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions for Preparing for Your Hearing \(English\)](#) 
- [Video Instructions to Present Exhibits in the Courtroom \(English\)](#)  [\(Spanish\)](#)  [\(Vietnamese\)](#) 
- [Video Instructions to Present Exhibits When the Court Displays on a Party's Behalf \(English\)](#) 

Department Rules:

- [Department CM2](#) 
- [Department CM8](#) 
- [Department C61](#) 
- [Department L64](#) 
- [Department L66](#)
- [Department L72](#)
- [Department W2](#) 

Court Policies:

- [Privacy Policy](#)
- [Administrative Order 21.06](#) 

To access and view the direct pages, visit the [Superior Court of Orange County Electronic Evidence Portal website](#).

APPENDIX C: SUPERIOR COURT OF PLACER COUNTY PILOT PROJECT REPORT AND REMOTE APPEARANCE SYSTEM USER GUIDE

PROJECT DESCRIPTION: SUPERIOR COURT OF PLACER COUNTY

In 2017, the Superior Court of Placer County received \$560,000 in Court Innovations Grant Program funding for a comprehensive remote appearance system. The funding provided the court with the means to implement the technological infrastructure to enable video appearances at all court locations and provide self-help services for those who are not in the immediate proximity of Roseville. With the ability to appear remotely came the need to be able to submit evidence remotely.

Legal considerations—Evidence

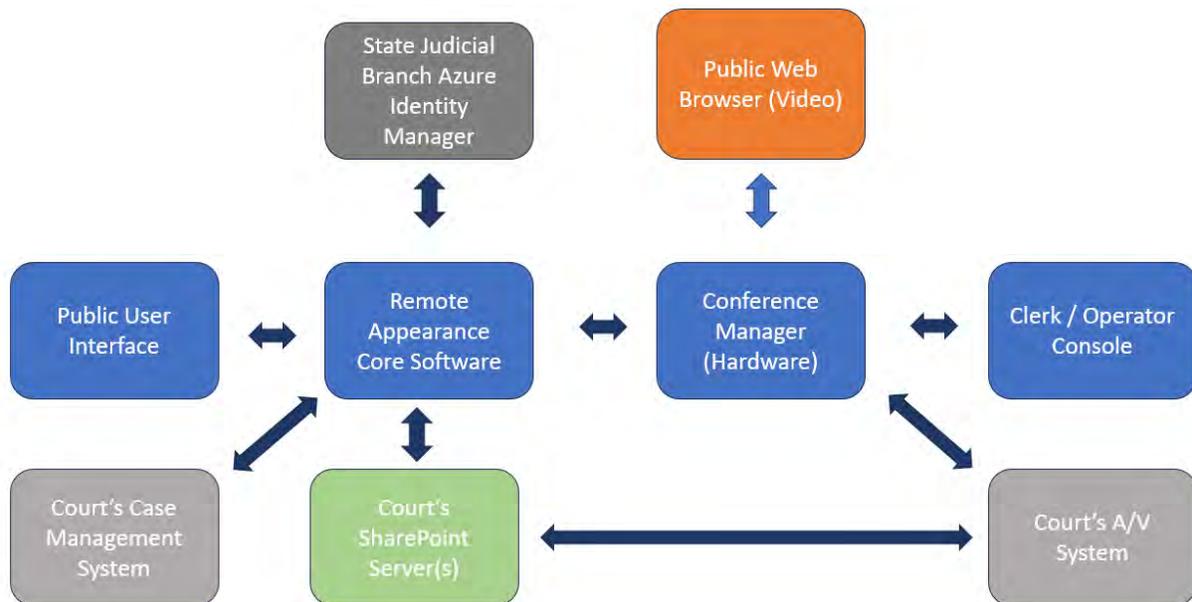
No specific legal requirements define how a trial court is to store exhibits submitted for a hearing. [Government Code section 68150\(c\)](#) provides discretion to the judicial branch to develop standards and guidelines for record retention; therefore, there are no specific statutory requirements for the storage of routine exhibits. Following are the relevant code sections that outline management of exhibits and appeal periods: [Code of Civil Procedure section 1952](#) and California Rules of Court, [rule 2.400\(c\)](#) for Civil and Small Claims cases; [Penal Code section 1417 et seq.](#) for Criminal cases; and California Rules of Court, rules [8.400](#), [8.405](#), and [8.406](#) for Juvenile cases. The Judicial Council is designated with the responsibility to develop rules to establish these standards (Gov. Code, § 68150(c)). In turn, the Judicial Council has published [Trial Court Records Manual](#) (rev. Jan. 1, 2020). This manual recognizes the specialized nature of exhibit retention and does not dictate specific requirements for storage of exhibits. Instead, it provides flexibility to the trial courts and encourages each court to develop local procedures for the management of exhibits.

Based on the statutory guidelines and requirements for exhibit storage and retention, electronic exhibits uploaded by court users could be treated the same as physical exhibits introduced in court, in person. As defined in the court's Exhibit Policy, an exhibit is any physical object introduced and identified in court. The exhibit may be admitted into evidence or marked for identification only. Once an exhibit is introduced, marked for identification only, or received and admitted into evidence, the exhibit becomes the sole responsibility of the courtroom clerk ([Penal Code, § 1417](#)). At the conclusion of the hearing, sentencing, or trial, the courtroom clerk should inquire if the exhibits are to be returned to the submitting party. The courtroom clerk must not release any exhibit except on order of the court, and the courtroom clerk must require a signed receipt for a released exhibit (Cal. Rules of Court, [rule 2.400\(c\)\(1\)](#)). If the exhibits are to be maintained by the court, the courtroom clerk will maintain the exhibits that do not meet the long-term criteria until an appeal is filed or until the appeal period has expired.

System and process design

In 2014, the court entered into an agreement with American TeleSource Incorporated (ATI) for the implementation of a telephonic appearance system (vCourt). With the Court Innovations grant, the court worked with ATI to leverage the existing vCourt application for parties to register, pay for, and attend video appearances, in addition to telephonic appearances. Later, this same system was further enhanced to support electronic evidence sharing. As shown in Figure 1, the system design integrates all the various components to create a single end-to-end solution that seeks to authentically replicate the in-person court process to the greatest extent possible.

Figure 1: Integrated Remote Appearances Diagram



The public-facing StreamWrite vCourt application is connected to the Judicial Council’s Azure Identity Manager and prompts users to sign in or create an account to schedule or upload electronic evidence for eligible event types. If an event is eligible, users can sign up to appear remotely, pay relevant fees, or cancel their remote appearance. The email confirmations sent to users are customized to provide specific event instructions based on the event code in the case management system (CMS), eCourt. The hyperlink sent to users in their confirmation emails directly connects them with the corresponding courtroom and event date for their hearing.

The evidence component of StreamWrite is also based on a report of event type codes deemed eligible in the court’s CMS. Users who schedule themselves for eligible hearing types receive a second confirmation email that indicates that they have access to vCourt evidence and provides a link to access the site. Users are prompted to log in to the branch enterprise identity management solution. The email address associated with a party’s scheduled appearance and CalCourt account becomes the owner of the folder for that party, “locking” the folder. This ties ownership

of the folder to that party's email, and only that party can edit the contents (unless the party delegates access to another email address). Staff set the deadline for uploading evidence at one hour before the hearing, designing it to reflect the process of evidence exchange for Small Claims and Unlawful Detainer matters (discovery taking place at the time of the hearing).

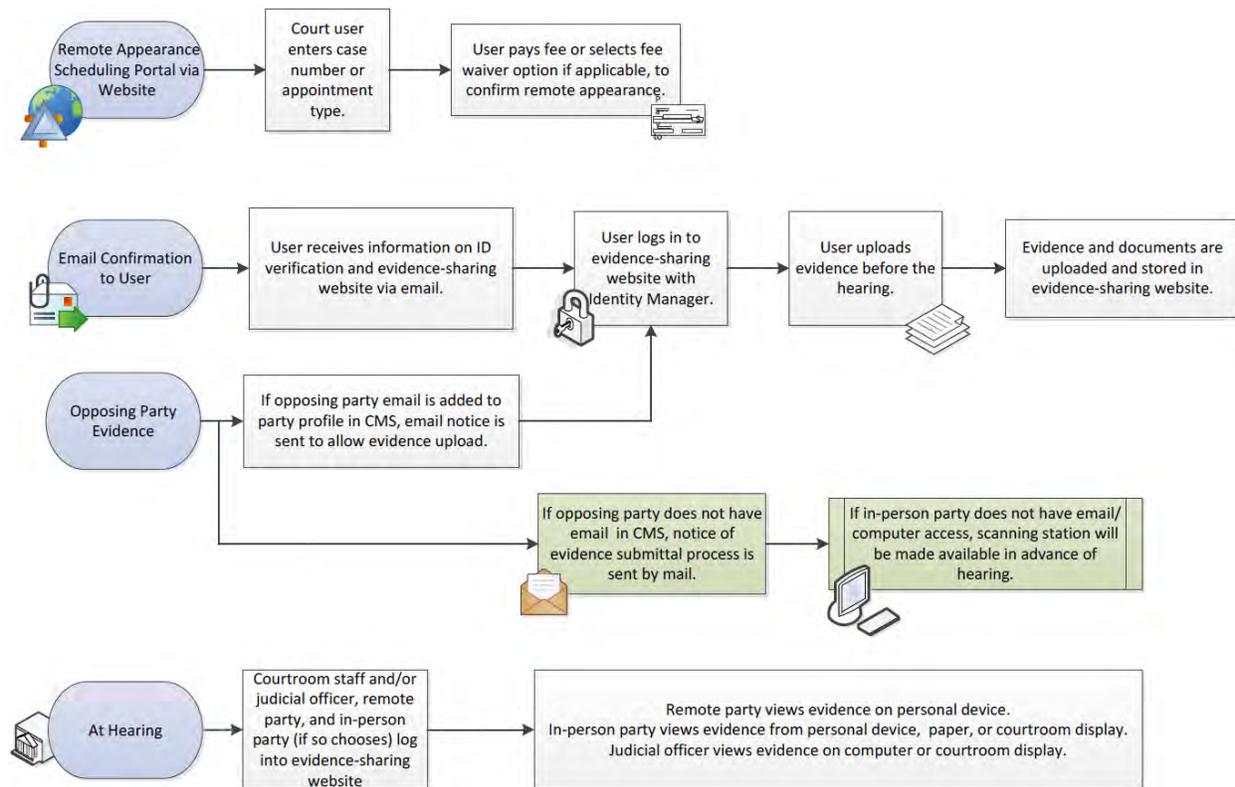
Parties, or delegates, can then upload files at any time before the deadline. The only limitations set for files are that they must be less than 50 megabytes, be one of the permitted file types (.doc, .docx, .xls, .xlsx, .jpg, .jpeg, .png, .wav, .pdf, .avi, .flv, .wmv, .mp4, .mov), and have no special characters in the file name. Uploaded files are scanned six times with four different antivirus software applications and stored using a document collaboration solution. The court also installed a scanning station equipped with a camera, scanner, and computer for situations where one or more parties appear in person and one or more parties are remote. Staff are available for assistance.

At the defined deadline, the system switches from "Upload Mode" (parties can edit their evidence folders but cannot yet review the opposing side's evidence) to "Viewing Mode" (parties can no longer upload files but can now see the opposing side's evidence and the court's "Admitted" folder). When the clerk marks uploaded files, the system automatically makes a copy of the uploaded file in the "Marked" folder and adds a prefix indicating which party uploaded that file. Exhibit numbers can be added to the prefix when in the "Marked" folder, or as the clerk moves files to the "Admitted" folder, which requires an exhibit number for each file.

Core to this process design was an effort to avoid inserting the court into the discovery process, which is clearly defined in law or rule of court. The judicial officer and courtroom clerk can view uploaded documents at any time before, during, or after the hearing. The clerk is also able to mark or admit evidence uploaded by the parties during the hearing, manage access to the parties' folders, and override the system to allow the parties to upload additional documents after the one-hour deadline. Additional instructional materials were created for remote parties in Small Claims cases and Evidentiary Civil and Family Law cases outlining how to upload exhibits and when they can review the other side's documents. Figure 2 outlines this process.

During the video conference, court users connect to the hearing on their own devices, whether a laptop, desktop computer, smartphone, or tablet. Once connected, the media conferencing solution streams the video from the court to the court user.

Figure 2: Evidence Sharing System Design



Pilot case types

The goal for the two civil pilot areas was to increase access in a high-volume case area and decrease costs for bringing a case to court. These hearing types were also selected to pilot the electronic evidence sharing platform, in which the court aimed to maintain the integrity of court processes for evidence submittal and display during remote appearances.

The pilot plan was divided into two phases. Beginning in Business Small Claims, court staff observed calendars for two weeks and approached parties whose cases had been continued to offer participation in the pilot study. On agreement to participate, parties would receive from staff an information sheet on how to schedule the video appearance through the court’s website. Following successful appearances in Business Small Claims hearings, the pilot would proceed by offering video appearances to parties in Unlawful Detainer and Small Claims calendars whose cases had been continued and for which the only evidence submitted would be via oral testimony. To complete Phase 1, three video appearances of each hearing type needed to occur.

The second phase of pilot testing involved opening scheduling to the public and including a pamphlet in case initiation packets to alert parties that video appearance was available. completion of the court’s evidence site, court users wishing to present documents, photos, or videos were able to appear remotely.

The COVID-19 rise in March 2020 altered the court's controlled pilot and rapidly shifted to the broader application of the video and evidence infrastructure. For example, to enable Small Claims cases to resume as rapidly as possible in 2020, the court mandated that Small Claims trials be heard by video in July 2020. Parties were required to schedule themselves for a video appearance and upload any documentary evidence to the court's digital evidence platform before the hearing. All Small Claims parties were mailed a detailed information packet explaining how to schedule themselves and upload evidence, as well as identifying related local Small Claims forms.

A similar video appearance mandate was established for Family Law court trials in November 2020. Parties were required to schedule themselves for a video appearance and upload any documentary evidence to the court's digital evidence platform before the hearing. Instead of mailing informational packets, all parties were advised of the remote requirement at their trial confirming conference, which typically took place one to two weeks before trial. A detailed user guide and instructional video were posted to the website for assistance with scheduling and uploading evidence. In both hearing types, parties were able to request that witnesses be scheduled for a video appearance or request an in-person appearance for good cause, subject to judicial discretion, using new local forms. If parties reached out to the court and indicated they did not have a computer, scanner, or other necessary equipment to upload exhibits, staff scheduled times for parties to come to the courthouse on a day before their hearing to use the scanner designated for evidence. Further, if parties had an approved in-person request and did not upload evidence in advance, they were assisted on the day of the hearing by project staff to scan, upload, and view exhibits.

Measurable outcomes

Court staff tracked the number of hearings each month pre- and post-implementation, the number and percentage of hearings conducted by video conference, estimated cost savings to court users, the number of sites created for remote sharing of evidence, and customer feedback gathered through a customer survey to assess satisfaction, efficiency, ease of use, and the technology's accessibility. The Small Claims pilot program was delayed until June 2020 because of the pandemic, after which the court updated its local rules to require video appearances for all Small Claims hearings. The video requirement lasted past the project end date, resulting in high numbers for participation and savings.

Small Claims

All 167 Small Claims cases with parties who scheduled remote appearances were eligible for electronic evidence. Of those cases, 160 (95.81 percent) had at least one party upload files. Of those, both parties uploaded files for 50.63 percent of the cases, and only one party uploaded files for 49.38 percent of cases. Nearly 2,900 files were uploaded to the system, with an average of 11 files per plaintiff and 11 files per defendant. Uploaded exhibits were formally marked or admitted in 39 cases.

Figure 3: Small Claims Hearings, July 2018–December 2020

Reporting Period	Total No. of Hearings	Hearings by Videoconference	Percentage by Video	Cost Savings
Q3 FY 18–19	244			
Q4 FY 18–19	266			
Q1 FY 19–20	306			
Q2 FY 19–20	241			
Q3 FY 19–20	175			
Q4 FY 19–20	44	4	9.09%	\$229.05 / 6.64 hrs
Q1 FY 20–21	231	133	57.58%	\$16,370.15 / 474.5 hrs
Q2 FY 20–21	133	90	67.67%	\$24,095.37 / 698.42 hrs
Total	1,640	227		\$40,694.57 / 1,179.56 hrs

FY = fiscal year; Q = quarter.

Unlawful Detainer

The court held only two Unlawful Detainer hearings that involved video appearances during data collection. The court planned to launch the pilot area in March 2020, but as a result of COVID-19 and emergency rule 1 of the California Rules of Court,¹ Unlawful Detainer matters did not resume until the fall. This pilot area was likely the most affected by COVID-19 and, therefore, did not resume normal hearing counts until January 2023. No survey feedback was received.

Other Civil

Exactly 92 Limited Civil, Unlimited Civil, Adoption, Mental Health, and Probate cases had hearings by video appearance, with a total of 223 video appearances. This use of technology saved court users \$23,046.72 in mileage costs and 668.02 hours of travel time. The evidence-sharing solution was offered in default prove-up matters, and evidence was uploaded to 12 of the cases, with an average of four files uploaded per party.

Family Law

Seventy-four Family Law cases had hearings that involved video appearances. Similar to other case types, many of the Family Law hearings had multiple appearances, and 195 attorneys, parties, and/or witnesses appeared by video from May to December 2020. Overall, users gained \$9,971.93 in mileage savings and 289.04 hours in time savings. The court also expanded use of the evidence-sharing solution to court trials, and 13 cases (72.22 percent of eligible cases) used evidence sharing. An average of 16 files were uploaded per party, with 9 files per petitioner and 24 files per respondent. Evidence was marked and admitted for a little more than half (7) of these trials.

Evidence considerations and lessons learned

Defining eligible hearings

The electronic evidence system is not designed to support complex trials with hundreds of exhibits per party. Therefore, the court offered it in Small Claims, Civil, and Family Law trials and evidentiary hearings. Although designed for Small Claims and Unlawful Detainer trials, the system was used much more effectively in Family Law cases with attorneys for one or both sides.

On each of the case type webpages, the hearings that are eligible for evidence sharing are indicated. When parties schedule for an eligible hearing type, they receive a second confirmation with information about electronic evidence.

The court will not facilitate discovery. The system is focused on the court process and intended only for sharing evidence on the day of the hearing.

Evidence sharing before and during hearings

If at least one person has registered for a video appearance for an upcoming eligible hearing, parties are able to upload files to a document collaboration site hosted by the court. Evidence uploaded by a user does not become available to the opposing side until the time set by the court (for example, 1 hour before hearing). Each party will see their own folder, the other side's folder, and the court's "Admitted" folder. The court has access to both parties' folders and all court folders and may review uploaded files at any time. The videoconference does not link to this site, so participants may have the evidence website open in a second web browser or tab during the hearing.

For hybrid proceedings, a support model for the in-person party was created by the court. The judicial officer, courtroom clerk, and support staff identify cases where one party is remote and one is in person, and staff assist those in person with scanning and uploading their evidence at the "scanning station." This station includes a computer, scanner, and camera. Staff are able to override the cutoff time to upload exhibits and do so for the in-person parties. Once the party has uploaded the exhibits and reviewed the opposing side's exhibits, support staff email the courtroom indicating who is ready for their hearing and who will be assisted next. During the hearings, a laptop is provided to the party to reference file names.

If a party reaches out before an event, support staff can schedule a time for the party to make an appointment to scan and upload exhibits before the hearing.

Court's management of electronic exhibits

The evidence process is the same for electronic evidence as physical evidence. The most effective way of discussing electronic exhibits has been when the judicial officer and parties or attorneys review uploaded files and discuss how to mark and admit files and whether there are any objections. This way, the courtroom clerk only has to electronically mark and admit a select

number of files. This discussion does not always happen, which increases workload for courtroom clerks.

As to retention, the requirements are the same for electronic evidence as for evidence physically submitted in court. The only procedural difference is that courtroom clerks must email the information technology (IT) department to request that electronic evidence is removed or deleted, instead of physically destroying evidence. However, implementing the process of emailing IT has been slow.

REMOTE APPEARANCE SYSTEM USER GUIDE

Navigating to Scheduling Website

To begin, go to <https://epayment.placerco.org/VCourtPortals/> and click on **Schedule**. Log into your CA Courts Identity account when prompted.



Step 1: Search for Case

Enter your case number, including any numbers, letters, and dashes. See the list of case numbers with X's as examples. Once entered, select **Proceed to Step 2**.

User: harveyramirez.pssc@gmail.com

Search For A Case

To schedule one or more remote appearances for an upcoming event, first enter the case number below. You will then select the party and enter attendee information, choose one or more events, and then finalize and pay (if applicable).

Step 1
Search For A Case

Enter your full case number, letters, numbers, and dashes. For example:
S-CV-XXXXXXX
M-CV-XXXXXXX
S-PR-XXXXXXX
S-FS-XXXXXXX
S-DR-XXXXXXX
R-SC-XXXXXXX
62-XXXXXXX
41-XXXXXXX

Enter Case Number:

Proceed to Step 2

Step 2: Attendee Info

Step 2 is how the court gathers your contact information and is able to identify you on the day of your hearing.

You will first be prompted to identify the type of attendee you are by selecting the empty circle for either **An Attorney**, **A Party to the Case**, or **Other**.

User: harveyramirez.pssc@gmail.com

Attendee Info

Enter the attendee information and select the affiliated party

Attendee An Attorney A Party to the Case Other

After you have chosen the Attendee type, the rest of the Attendee Info form appears. The form differs slightly for each category. For each Attendee type:

- All fields are mandatory, excluding the **additional email address for appearance information** field.
- The email fields (**Attendee Email** and **Confirm Email**) will be pre-filled in with the email address you registered for your CA Courts Identity account. These cannot be edited.
- The **additional email address for appearance information** field does not schedule additional attendees; if you enter any email addresses, they will receive a copy of your confirmation email.

Attorney

Attendee An Attorney A Party to the Case Other

Attendee Name

Firm Name

Bar Number

Attendee Email

Confirm Email

Attendee Phone

Party Name

Additional email addresses for appearance information (optional)

Schedule a reminder by:
 Email

A Party to the Case

Attendee An Attorney A Party to the Case Other

Attendee Email

Confirm Email

Attendee Phone

Party Name

Additional email addresses for appearance information (optional)

Schedule a reminder by:
 Email

Other

Attendee An Attorney A Party to the Case Other

Attendee Name

Attendee Role

Attendee Email

Confirm Email

Attendee Phone

Party Name

Additional email addresses for appearance information (optional)

Schedule a reminder by:
 Email

Once you have completed the required fields, select [Proceed to Step 3](#) to continue the scheduling process.

Step 3: Select Events

Select the event you are scheduling a remote appearance for by clicking on the empty box next to the date and time. Once selected, click on **Proceed to Step 4**.

User: harveyramirez.pcsr@gmail.com

Select Events

Choose one or more events to register for below.

✓ Step 1 Search For A Case	✓ Step 2 Attendee Info	Step 3 Select Events	Step 4 Review & Print
-------------------------------	---------------------------	-------------------------	--------------------------

62-999877 - People vs. Doe, John
Party: John MIDDLENAME Doe

Event Time	Event Description	Registration Fee	Total Fees
<input type="checkbox"/> 5/8/2022 1:00 PM	984220 - Warrant; Surrender	\$94.00	

NOTE: If you have a fee waiver and there is a remote appearance fee associated with your hearing, there will be a checkbox to apply your fee waiver to the remote appearance registration.

NOTE: If you are scheduling within 2 days (48 hours exactly) of the court event, there may be a late fee of \$30 applied to your remote appearance registration. A late fee will only be charged to hearing types that charge a fee for appearing remotely. There are exceptions to the late fee that can be selected on the Step 3 screen.

Step 4: Finalize & Pay

The user information and selected event appears appear on the Finalize & Pay page. Review and confirm the information is correct before selecting **Schedule**.

User: harveyramirez.pcsco@gmail.com

Finalize & Pay

Check to confirm everything is correct, and then finalize and pay (if applicable)

✓ Step 1 Search For A Case	✓ Step 2 Attendee Info	✓ Step 3 Select Events	Step 4 Finalize & Pay
-------------------------------	---------------------------	---------------------------	--------------------------

Attendee Information

Attendee Role: Party
 Attendee Name: John MI
 Attendee Email: harveyramirez.pcsco@gmail.com
 Attendee Phone:
 Reminders: None

Selected Events

Appearance Info	Case / Party	Event Details	Amount	
5/6/2022 1:00 PM Department 20	62-999877 - People vs. Doe, John Party: John MIDDLENAME Doe	Warrant Surrender	\$94.00	Remove
Total			\$94.00	

[Add More Appearances](#)

If you select **Add More Appearances**, you can schedule more appearances for the same attendee on other cases before paying. You will directed to complete steps 1-4 again for the second case.

If you are scheduling for an event that charges a fee, you will also need to add a payment method. Once entered, select **Submit Payment**. The Court accepts eChecks, Visa, and MasterCard.

Make Payment

Credit Card eCheck

Enter your payment information below. Please note: this system accepts Visa and MasterCard.

Name	<input type="text" value="John MIDDLENAME Doe"/>
Phone	<input type="text"/>
Email	<input type="text" value="harveyramirez.pcsco@gmail.c"/>
Credit Card Number	<input type="text"/>
Expiration Date (MM/YYYY)	<input type="text"/>
Billing Zip Code	<input type="text"/>
CVV Code	<input type="text"/>

[Submit Payment](#)

[Quit](#)

Confirmation

Once the appearance is scheduled, you will receive a confirmation email that replicates the confirmation page below. This email will include a personal Join link to join the web conference on the day of the hearing.

User: harveyramirez.psc@gmail.com

Confirmation

Thank you for your payment. The confirmation below has been sent to the email address you provided.

Print

This is a confirmation for John MIDDLENAME Doe from Placer Superior Court. You have been scheduled for the remote appearance(s) shown below.

How to Join Your Remote Event

On the date & time of your hearing:

- Click on the **Meeting Join Link** in the table below for your appearance.
- You can join up to 5 minutes prior to the start time of your appearance.
- **If you have audio or video problems, or do not have access to join by computer or smart phone, you may join using the backup conference phone number.** However, please note that participating by telephone severely impacts the efficiency of the courtroom as your name does not display and only your phone number appears. **Please join by clicking on the Meeting Join Link when possible.**
 - Backup conference phone number: (323) 876-6192
 - Enter the **Phone Meeting ID** for your appearance when prompted.
 - If you are still using video but calling by telephone, be sure to turn off your microphone and speaker on your computer or video device.

NOTE: Recording, streaming or rebroadcasting your hearing is prohibited by rule of court, including CRC 1.150 and local rules.

Remote Appearances Scheduled

Event Date & Time	Case / Party	Event Details	Amount	Meeting Join Link	Phone Meeting ID
5/6/2022 1:00 PM Department 20	62-999877 Party: John MIDDLENAME Doe	Warrant Surrender	\$94.00	Join Link	134290927

NOTE: If you do not reach this page nor receive the email confirmation, the remote appearance was not scheduled.

Uploading Evidence

Uploading Evidence

Evidence Sharing is accessible by either selecting the link in the **Evidence Sharing Set Up** email, or by returning to the VCourt home page at <https://epayment.placerco.org/VCourtPortals/>.

1. Select **Evidence** to be directed to the CA Courts Identity Sign In page. See [Creating Your CA Courts Identity Account](#) if you have not yet made an account.



2. Review the Evidence Sharing Disclaimer and select **I Agree** to navigate to the next page.



3. Click on your case number.

VCourt™ Evidence

Current Cases



R-SC-0025604 - Ramirez, Harvey vs. Hamilton Susan

Find a case not listed



If the Current Cases box says **No cases found** instead of listing your case, select **Find a case not listed** and enter your case number in the format similar to this example: **R-SC-00#####**.

VCourt™ Evidence

Current Cases



No cases found.

Find a case not listed

If you see a red message that says "Case not found, or there are no upcoming eligible events" for this case" (example below):

- Make sure your case is eligible for evidence sharing (confirm you received an email about evidence when scheduling your video appearance).
- Double check that you have correctly entered your case number.
- If the case number is correct and the event is eligible for evidence, this means that there are no video appearances scheduled for your case. **You must schedule your remote appearance before you can upload evidence.** Refer back to page two (2) for information on scheduling your video appearance.

VCourt™ Evidence

Search

If your case is not yet setup for Evidence Sharing for you, you can search for a case below, and then you will be able to select your party and attempt to participate in evidence sharing.

Case Number

Case not found, or there are no upcoming eligible events for this case.

Once you search and locate your case, click on your name from the list. By selecting your name, you have now claimed your "folder" to which you can upload your documents. Do not claim the other parties' folder or more than one folder.



SUPERIOR COURT OF CALIFORNIA
COUNTY OF PLACER

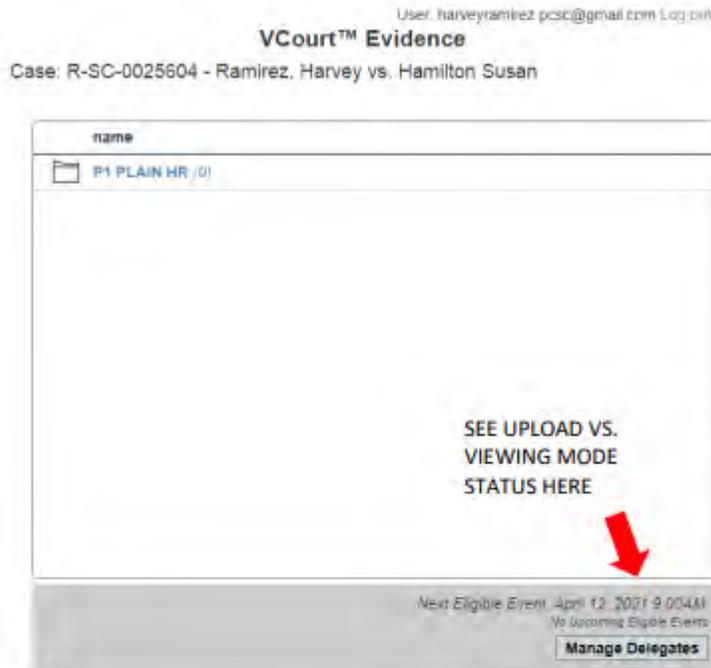
User: harveyramirez.ppsc@gmail.com Log out

VCourt™ Evidence

Case: R-SC-0025679 - Xanadu Cafe vs. JOMO Supplies.

Select your party below to become owner of the folder

4. You will be able to upload exhibits if the site is in **Upload Mode**. When in Upload Mode, you will only see your folder listed for the case. Select the on folder listed to upload your files.

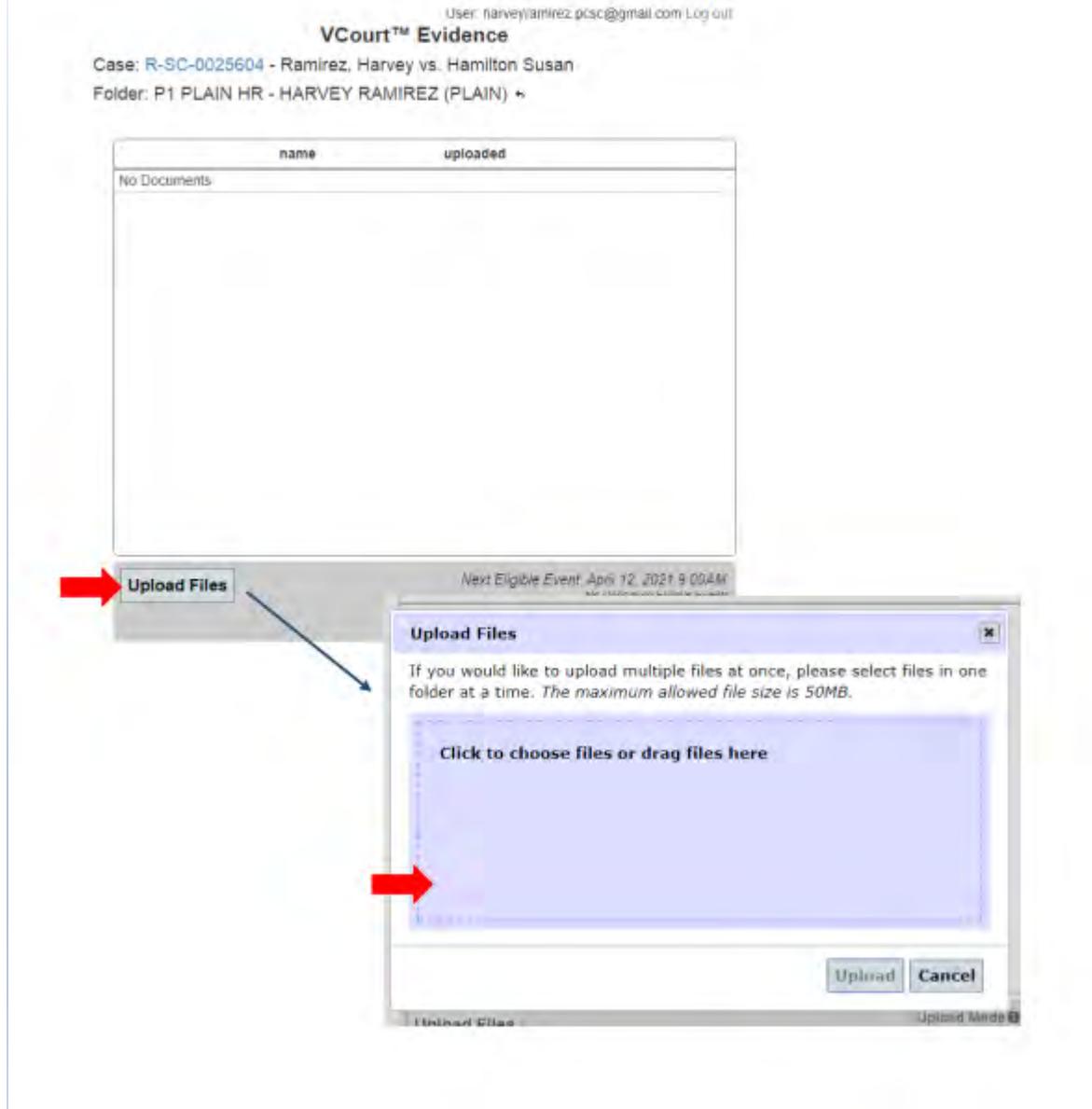


The naming convention for folders is as follows: [Party Number] [Party Type] [Party Initials]. For example, a folder name of "P2 DEF JS" means:



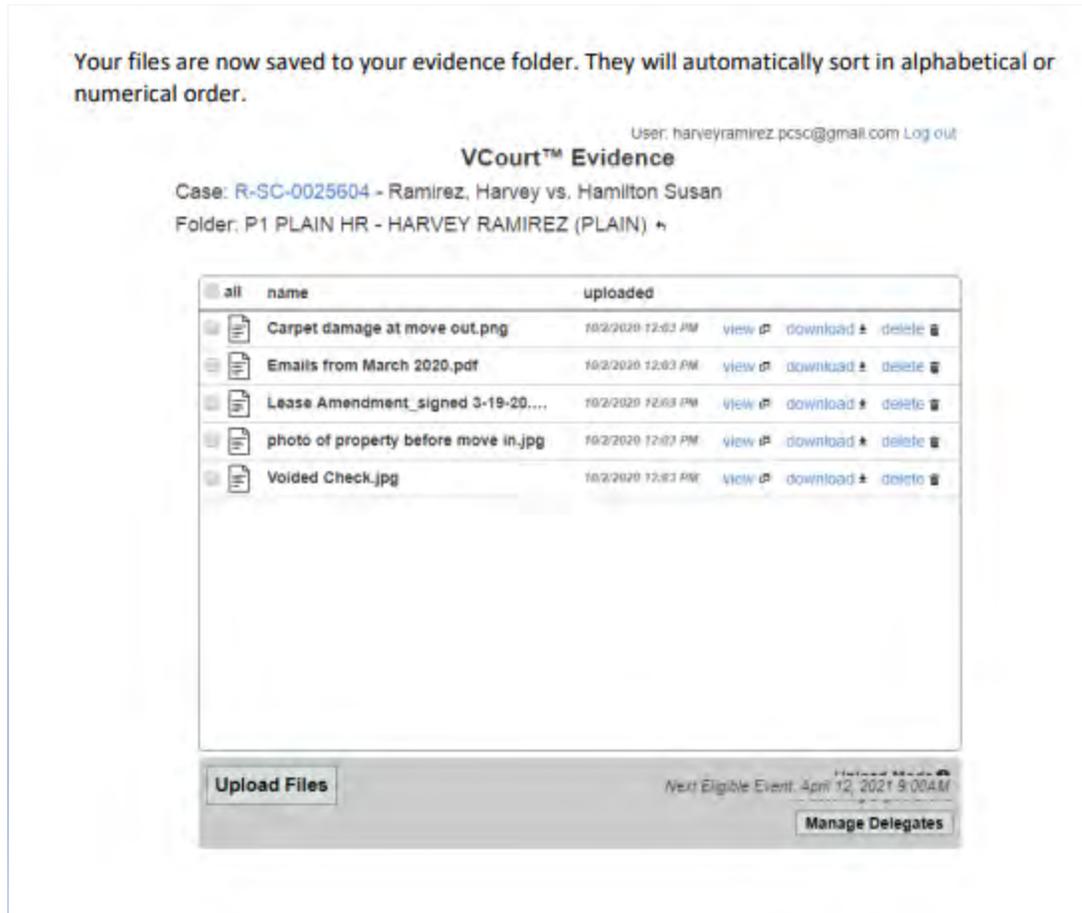
- P1: Party 1 – 1st party to register for evidence sharing for this case
- PLAIN: Plaintiff – This party is identified as the plaintiff in the Court's case management system. Other values may be: PET - Petitioner, DEF - Defendant, RES – Respondent
- HR: Harvey Ramirez – The initial party's first and last name as recorded in the Court's case management system
- (#): The number in parentheses next to the folder name refers to how many files have been uploaded.

5. To upload files, select the Upload Files button, and then click on the sentence **Click to choose files or drag files here** in the blue box. This will open a window to select files from your computer.



6. Select the files you would like to upload and then click on the **Upload** button. When each file listed has a checkmark to the right of the name, select the **Close** button.





The entire [Placer County Superior Court Remote Appearance System User Guide](#) can be accessed via the court’s public website. Additional information can be found on Placer County’s [“Evidence Sharing FAQ”](#) page.

APPENDIX D: SUPERIOR COURT OF SAN DIEGO COUNTY SMALL CLAIMS EXHIBIT UPLOAD APPLICATION USER GUIDE

Slide 1



Slide 2

A presentation slide with a white background and a blue footer bar. The title is "Launching The Application" in a large, black, sans-serif font. Below the title is a horizontal line. The slide contains a list of instructions and two images. The instructions are: "Navigate to the 'Court Applications Folder'", "Locate the 'SCE Upload' Icon", and "Double click to launch the Application". To the right of the first instruction is the text "Court Applications Folder:" followed by an image of a folder icon labeled "Court Applications". To the right of the second instruction is an image of a document icon labeled "SCE Upload". Below the instructions is a "Please Note" section: "Please Note: This application is designed to work with Microsoft Edge. Double Clicking on the icon will launch the application in your default internet browser".

- Navigate to the "Court Applications Folder" Court Applications Folder:

- Locate the "SCE Upload" Icon

- Double click to launch the Application

• Please Note: This application is designed to work with Microsoft Edge. Double Clicking on the icon will launch the application in your default internet browser

Slide 3

Home Screen

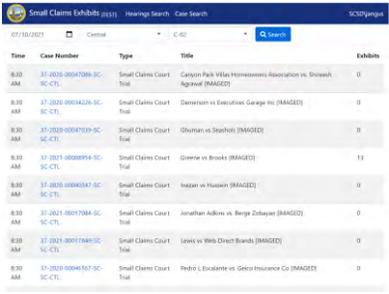
- Start your case search by clicking on “Search by Hearing Date” or “Search By Case Number”



Slide 4

Search by Hearing Date

- Narrow your search by Entering:
 - Hearing Date
 - Location
 - Court Room Assigned



Time	Case Number	Type	Title	Exhibits
8:30 AM	17-2020-00047088-SC-CT	Small Claims Court Trial	Carlyn Park Villas Homeowners Association vs. Shonwath Agency (IMAGED)	0
8:30 AM	17-2020-00018426-SC-CT	Small Claims Court Trial	Dierksen vs. Executives Garage Inc (IMAGED)	0
8:30 AM	17-2020-00047519-SC-CT	Small Claims Court Trial	Ghutan vs. Steinhilf (IMAGED)	0
8:30 AM	17-2021-00008974-SC-CT	Small Claims Court Trial	Greene vs Brooks (IMAGED)	13
8:30 AM	17-2020-00003047-SC-CT	Small Claims Court Trial	Inszen vs Hussain (IMAGED)	0
8:30 AM	17-2021-00017084-SC-CT	Small Claims Court Trial	Jonathan Adams vs. Berge Zolajquez (IMAGED)	0
8:30 AM	17-2021-00017840-SC-CT	Small Claims Court Trial	Lewis vs Web Direct Brands (IMAGED)	0
8:30 AM	17-2020-00043617-SC-CT	Small Claims Court Trial	Hedro L. Encalante vs. Getco Insurance Co (IMAGED)	0

Slide 5

Search by Case Number

- Start your search by entering the Case Number

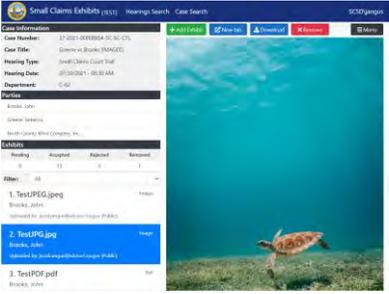


Case Number	Title	Previous Event	Next Event	Exhibits
07-2021-00000004-SC-JC, CT	Gippen vs Brooks (MAGJED)	7/30/2021 8:30 AM - Small Claims Court Trial		33

Slide 6

Viewing Exhibits

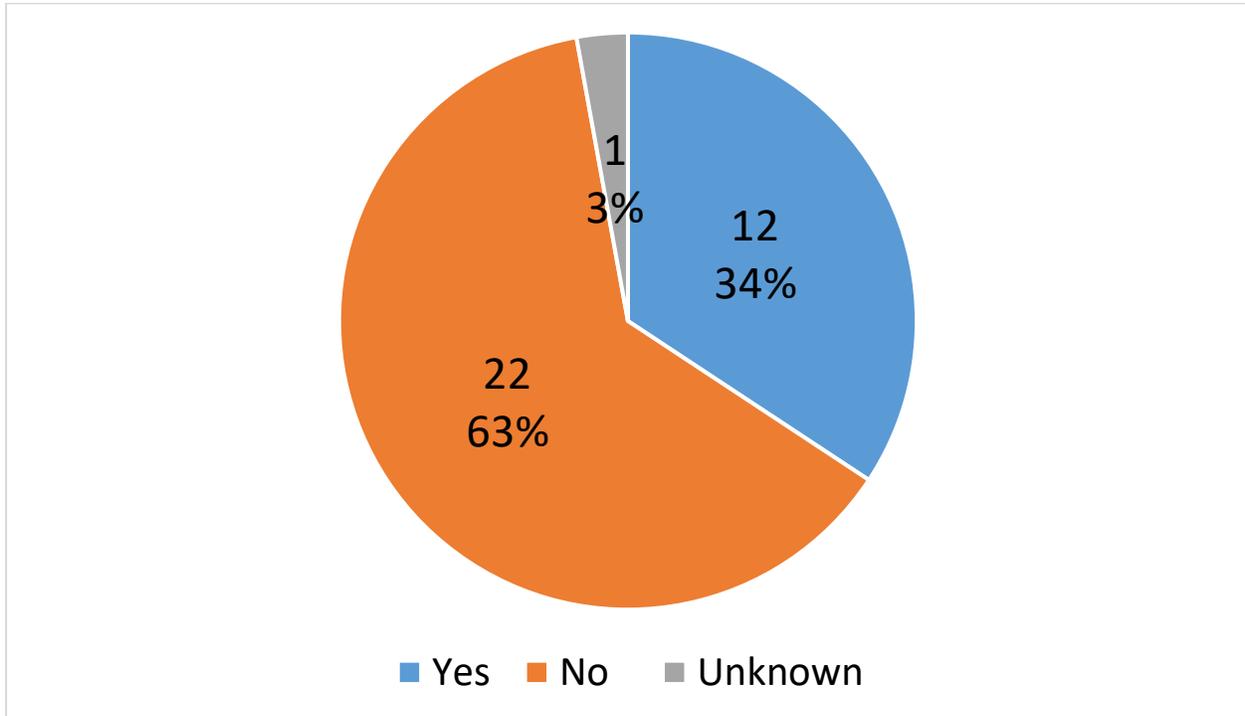
- Parties: Clicking on a name in this section will filter exhibits submitted by that party
- Exhibits for the case are filtered/listed in the lower left navigation window
 - Exhibit highlighted will appear on the right side of the app
 - Clicking "New Tab" will launch a new browser tab of the exhibit for viewing with out the navigation bar on the left
 - You may add exhibits manually using the "+Add Exhibits Button"
 - You may download the exhibit to your computer by clicking on the "Download" button
 - You may remove an exhibit from the case by clicking on the "x Remove" button



APPENDIX E: DIGITAL EVIDENCE SURVEY RESULTS

California Superior Court Digital Evidence Survey Results

QUESTION 7: Do you need or anticipate needing additional staff to manage electronic evidence?

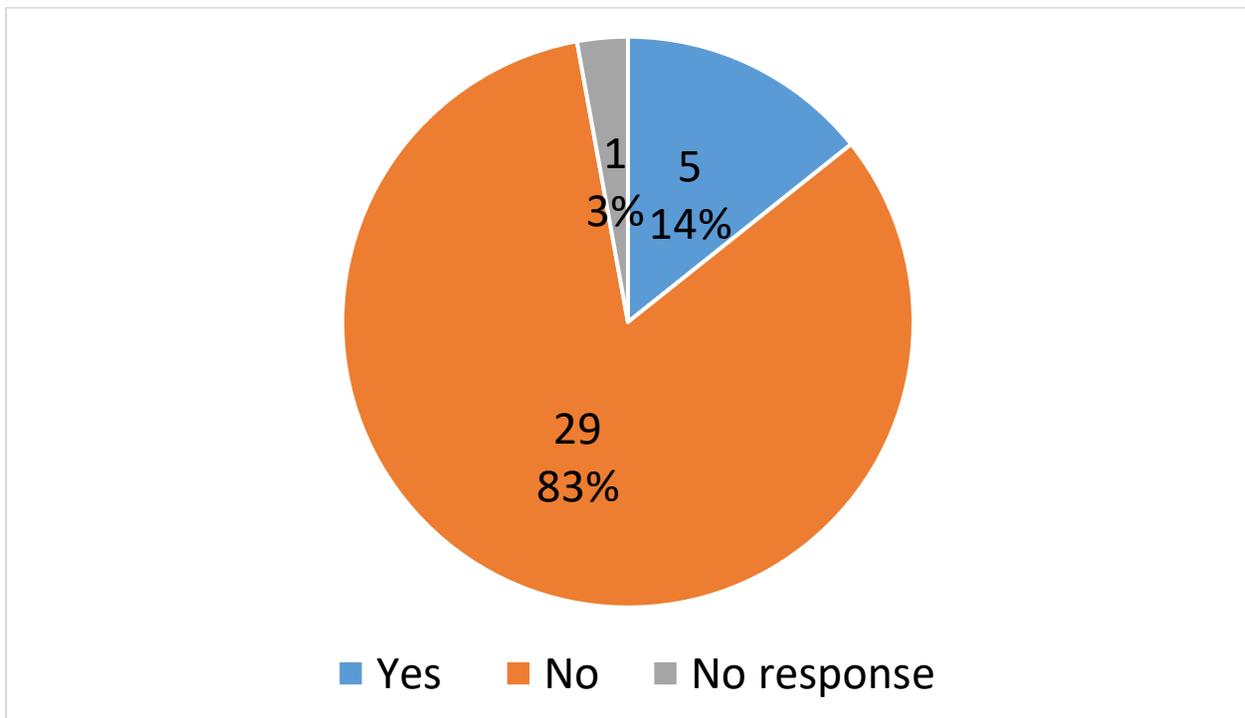


	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	0	5	3	4	12
No	5	9	5	3	22
N/A or Unknown	0	1	0	0	1
Percentage of Yes Respondents	0%	33%	38%	57%	34%

QUESTION 8: If you answered yes to question 7, please describe the tasks needing additional support:

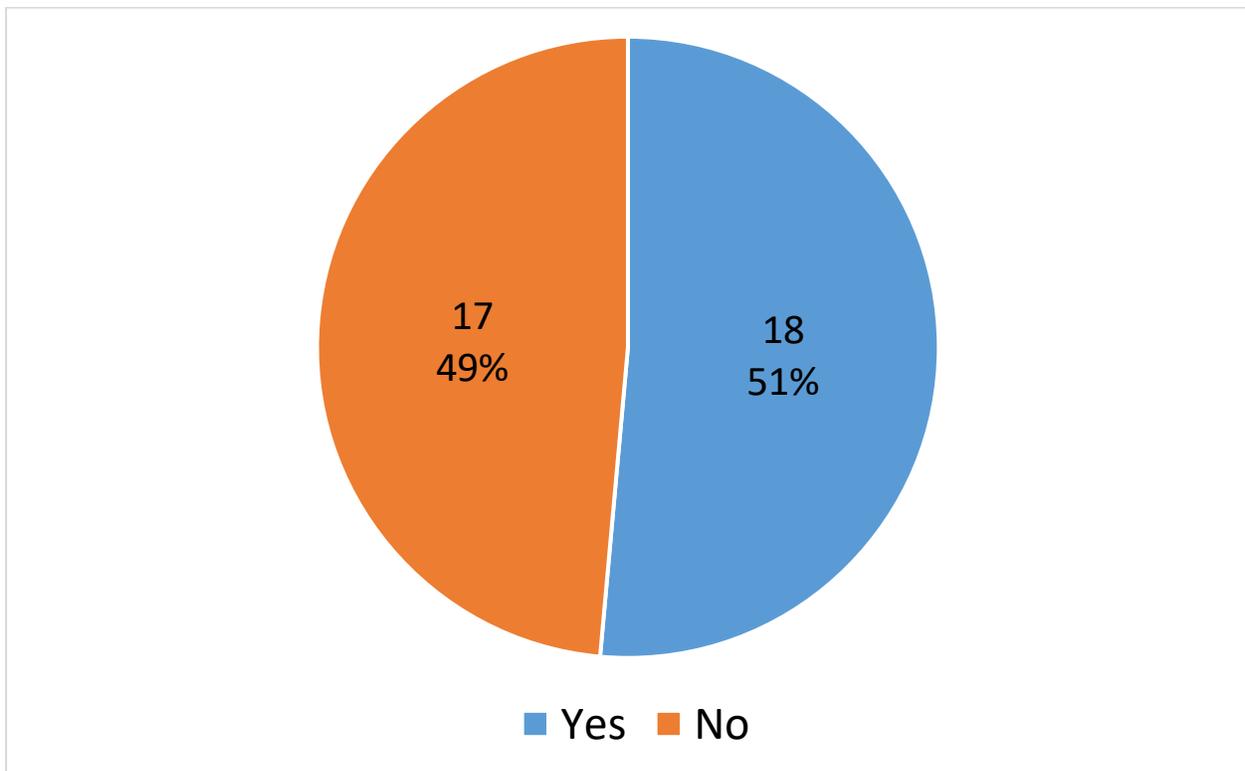


QUESTIONS 9 & 10: Has your court implemented a distinct solution to receive, store, manage, and/or present electronic evidence?



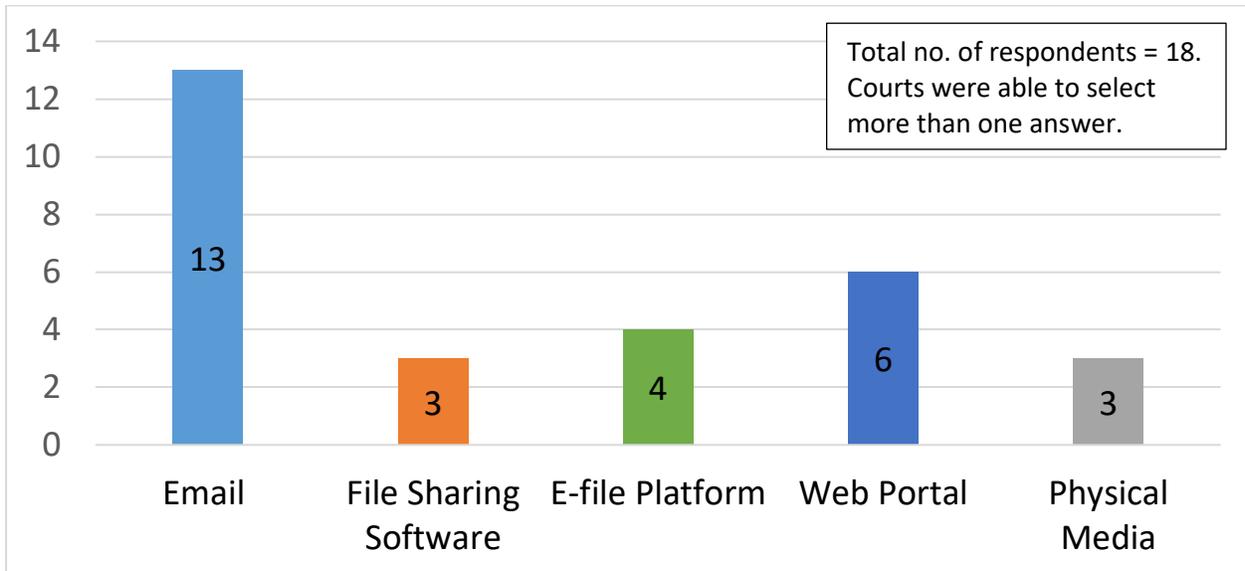
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	0	1	2	2	5
No	4	14	6	5	29
N/A or Unknown	1	0	0	0	1
Percentage of Yes Respondents	0%	7%	25%	29%	14%

QUESTION 13: Does your court accept electronic evidence via electronic transmission? This is as opposed to requiring submission of a physical storage device such as a USB Drive, CD, or DVD.

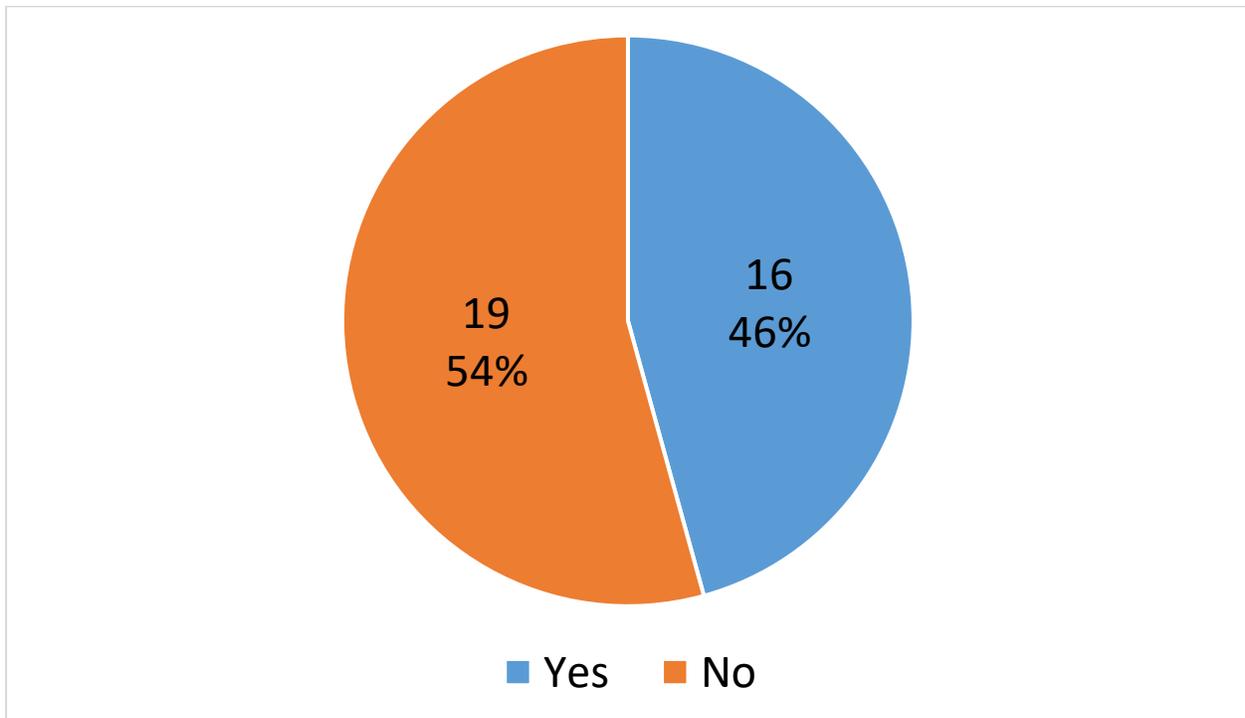


	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	1	8	6	3	18
No	4	7	2	4	17
Percentage of Yes Respondents	20%	53%	75%	43%	51%

QUESTION 15: If you answered yes to question 13, by what transmission method does your court accept electronic evidence (choose all that apply)?

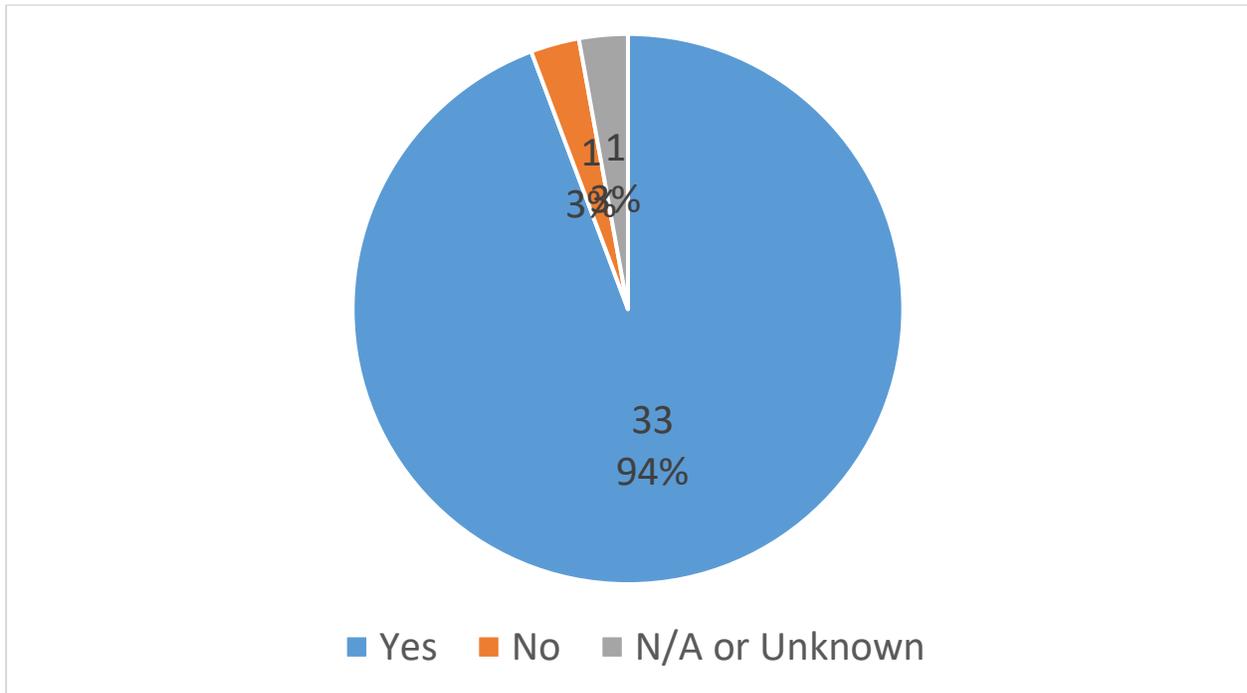


QUESTION 17: Has your court received evidence in proprietary file formats or viewing applications that were difficult to review?



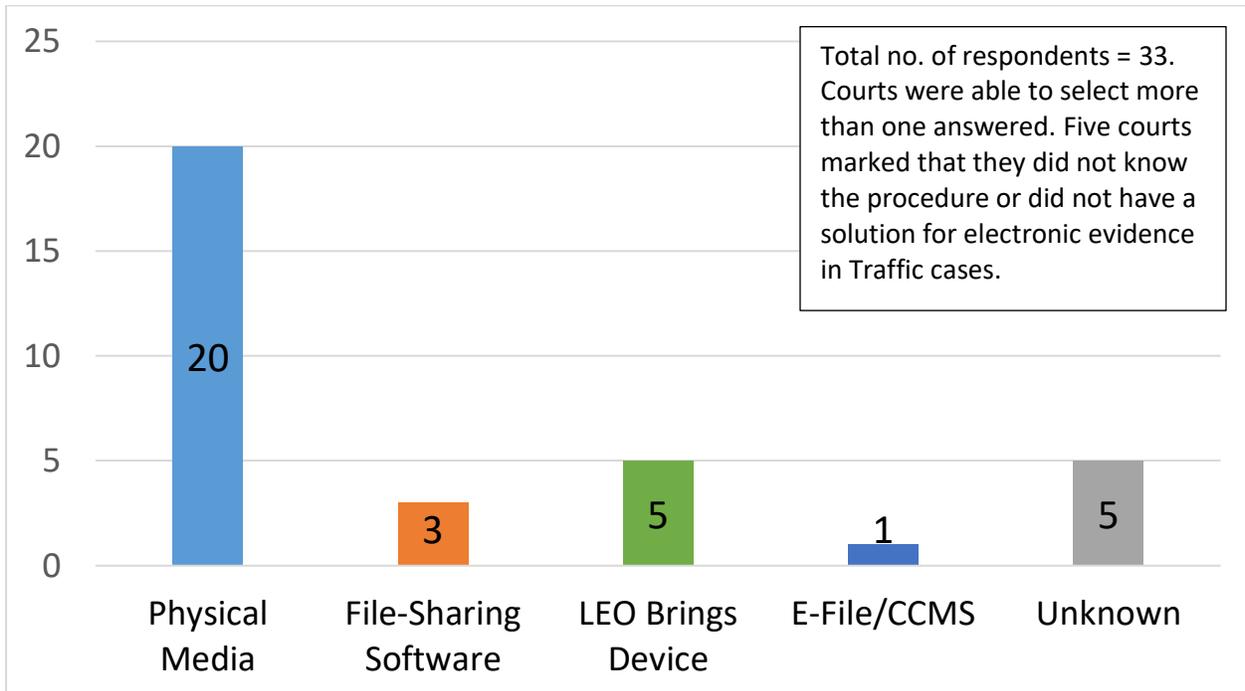
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	2	5	5	4	16
No	3	10	3	3	19
Percentage of Yes Respondents	40%	33%	63%	57%	46%

QUESTION 30: Does your court accept body-worn and/or traffic camera footage in court cases?

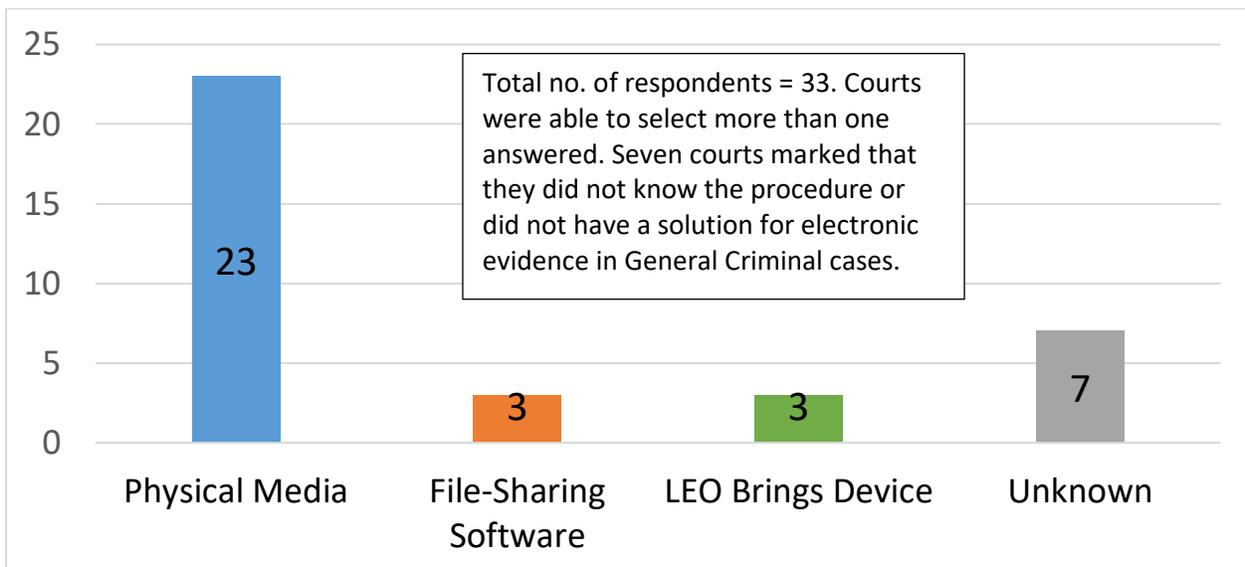


	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	5	13	8	7	33
No	0	1	0	0	1
N/A or Unknown	0	1	0	0	1
Percentage of Yes Respondents	100%	87%	100%	100%	94%

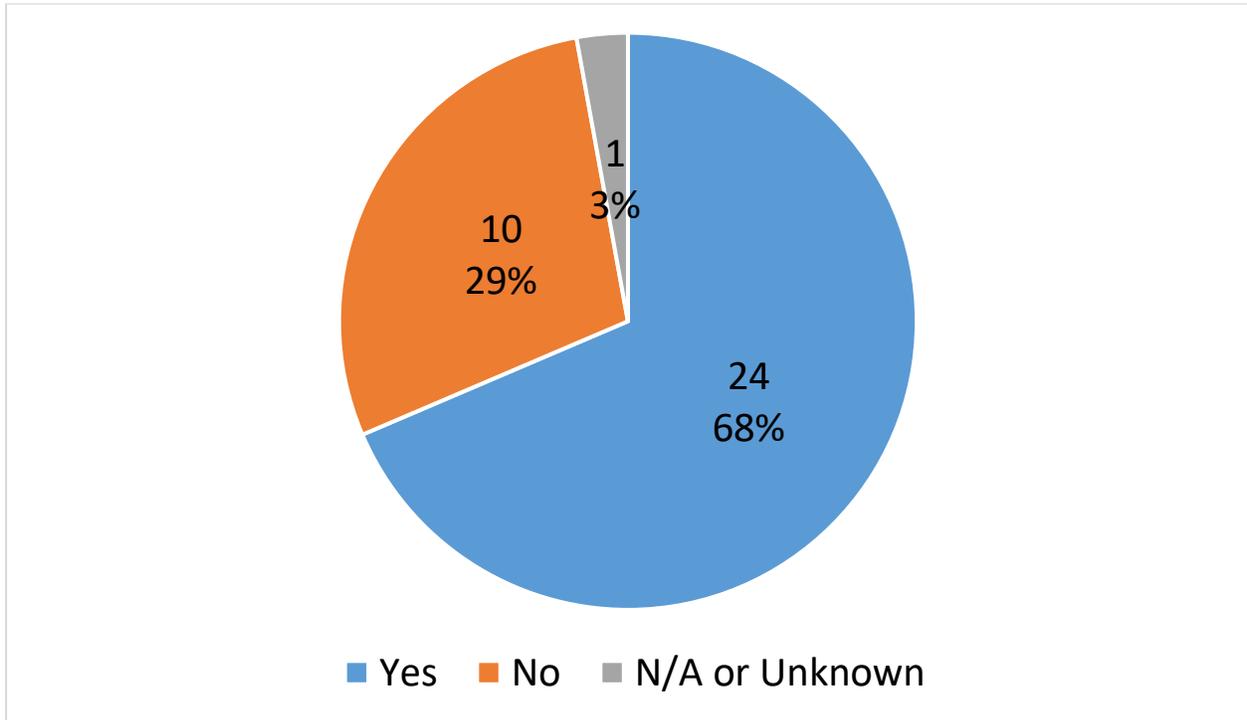
QUESTION 31: If you answered yes to question 30, how is the footage presented/received/stored/shared to and within your court in Traffic cases?



QUESTION 32: If you answered yes to question 30, how is the footage presented/received/stored/shared to and within your court in General Criminal cases?

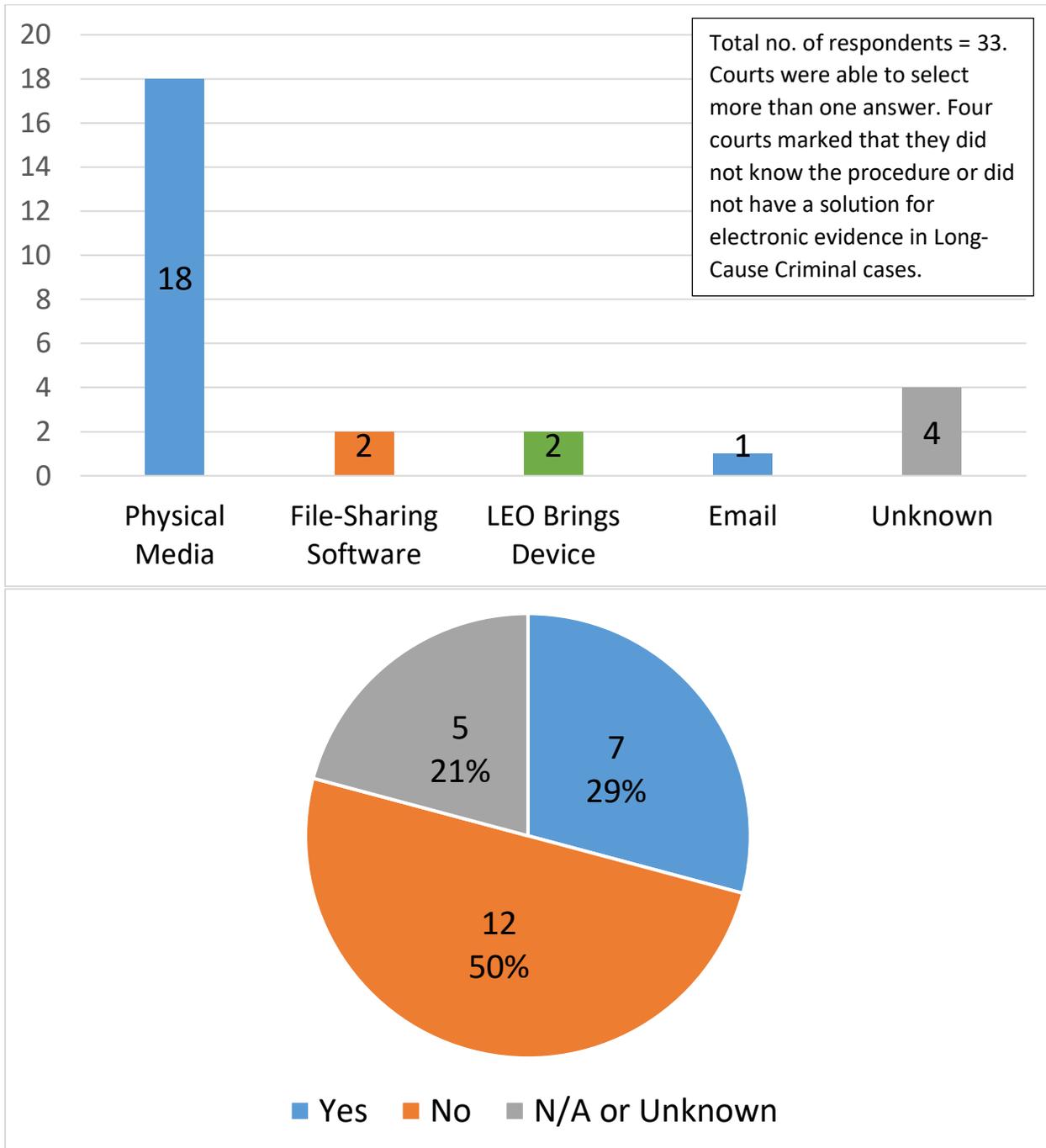


QUESTION 33: In long cause criminal cases, do parties use electronic evidence?



	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	3	8	7	6	24
No	2	7	1	0	10
N/A or Unknown	0	0	0	1	1
Percentage of Yes Respondents	60%	53%	88%	86%	69%

QUESTION 34: If you answered yes to question 33, how is electronic evidence in long cause criminal cases received by your court?



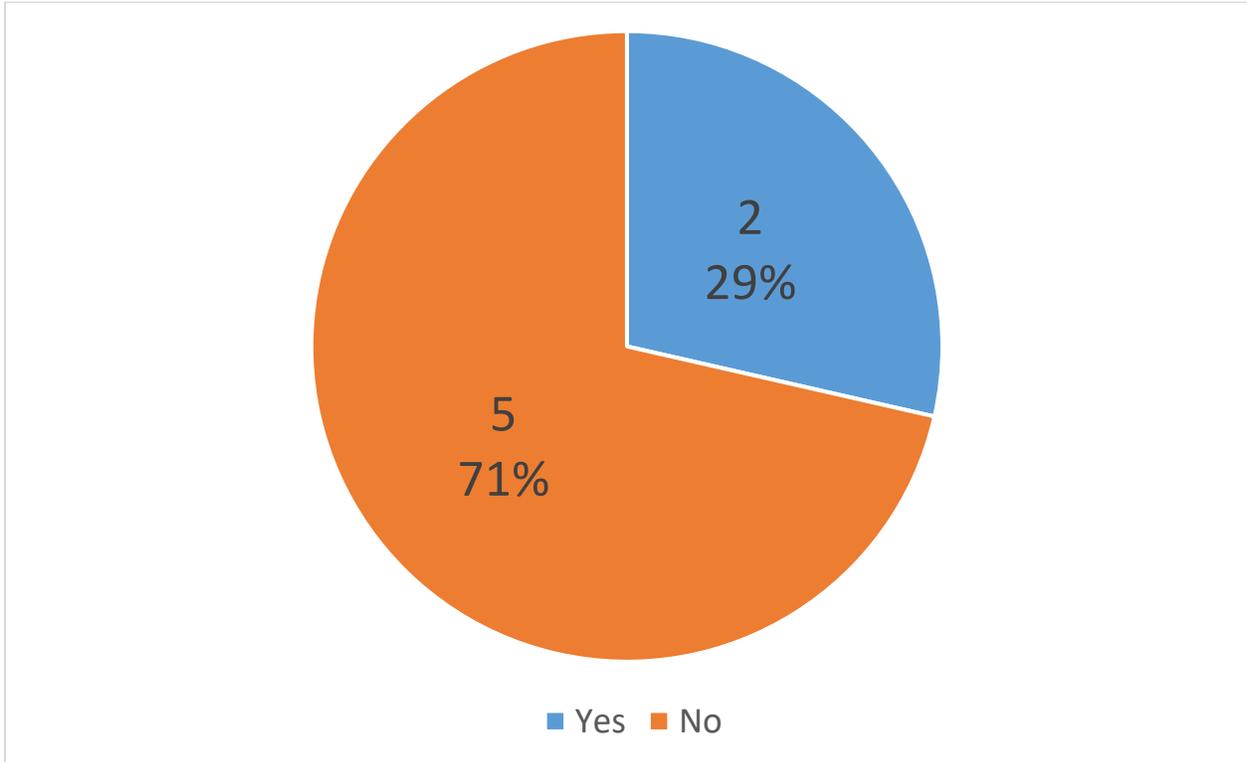
LEO = law enforcement officer.

QUESTION 35: If you answered yes to question 33, do parties transmit electronic evidence to the court at the time they are admitting it?

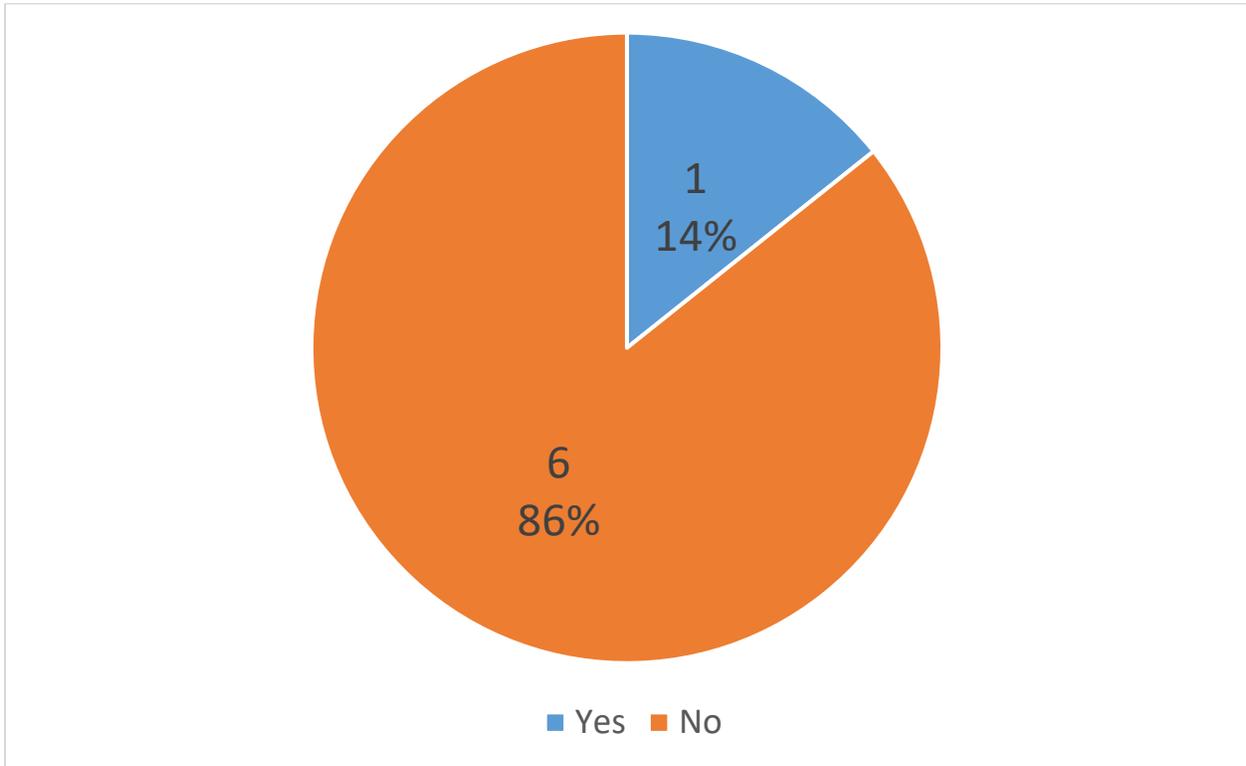
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Total
Yes	1	3	2	1	7
No	1	2	4	5	12
N/A or Unknown	1	3	1	0	5
Percentage of Yes Respondents	33%	38%	29%	17%	29%

California Appellate Court Digital Evidence Survey Results

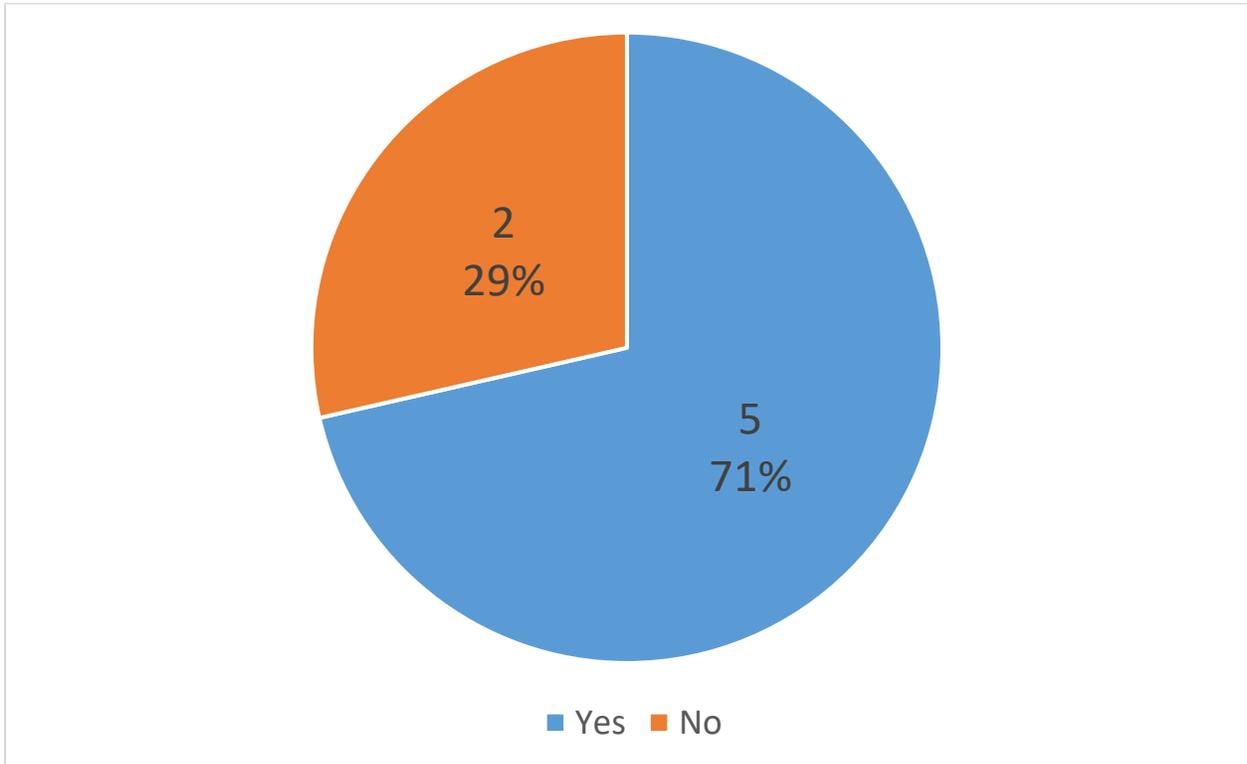
QUESTION 7: Do you anticipate needing or do you already need additional staff to manage electronic evidence?



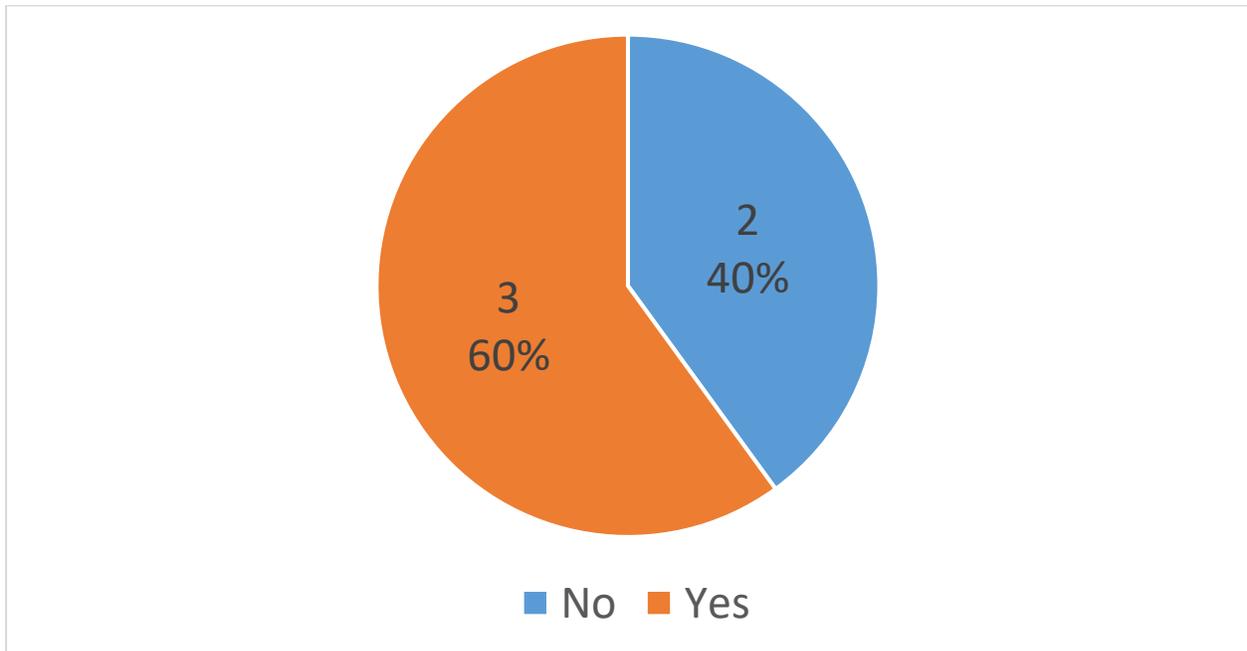
QUESTION 9: Has your court implemented a distinct solution to receive, store, manage and/or present electronic evidence?



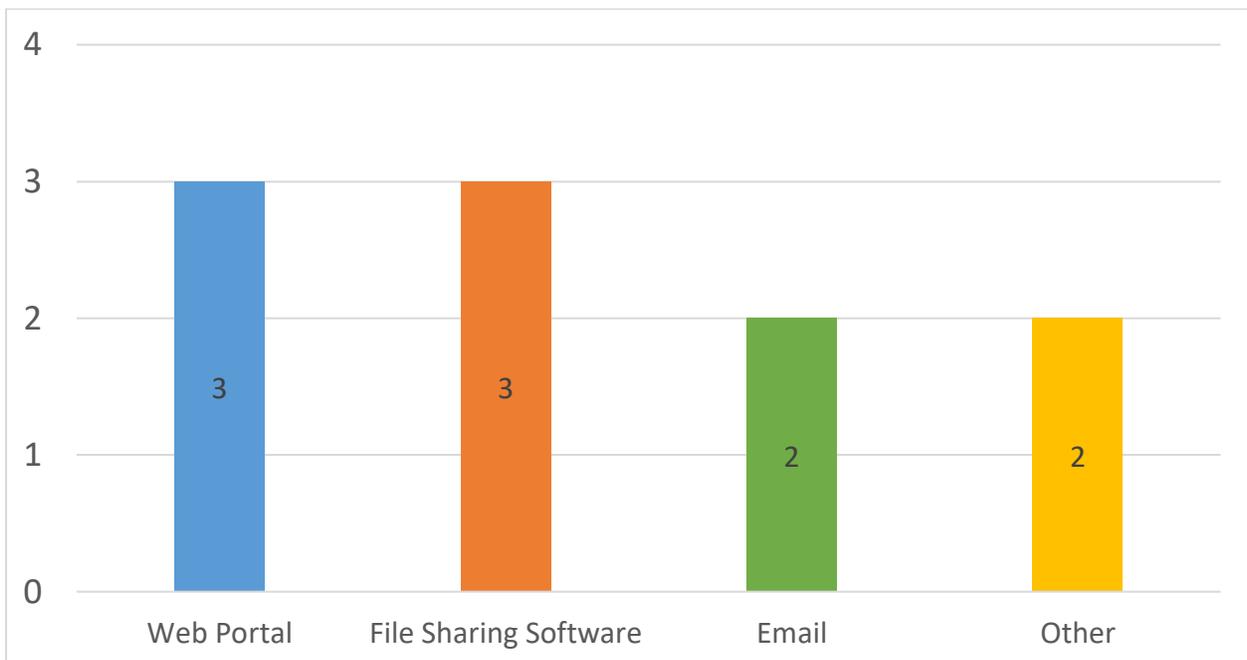
QUESTION 13: Does your court accept electronic evidence via electronic transmission? This is as opposed to requiring submission of a physical storage device such as a USB Drive, CD, or DVD.



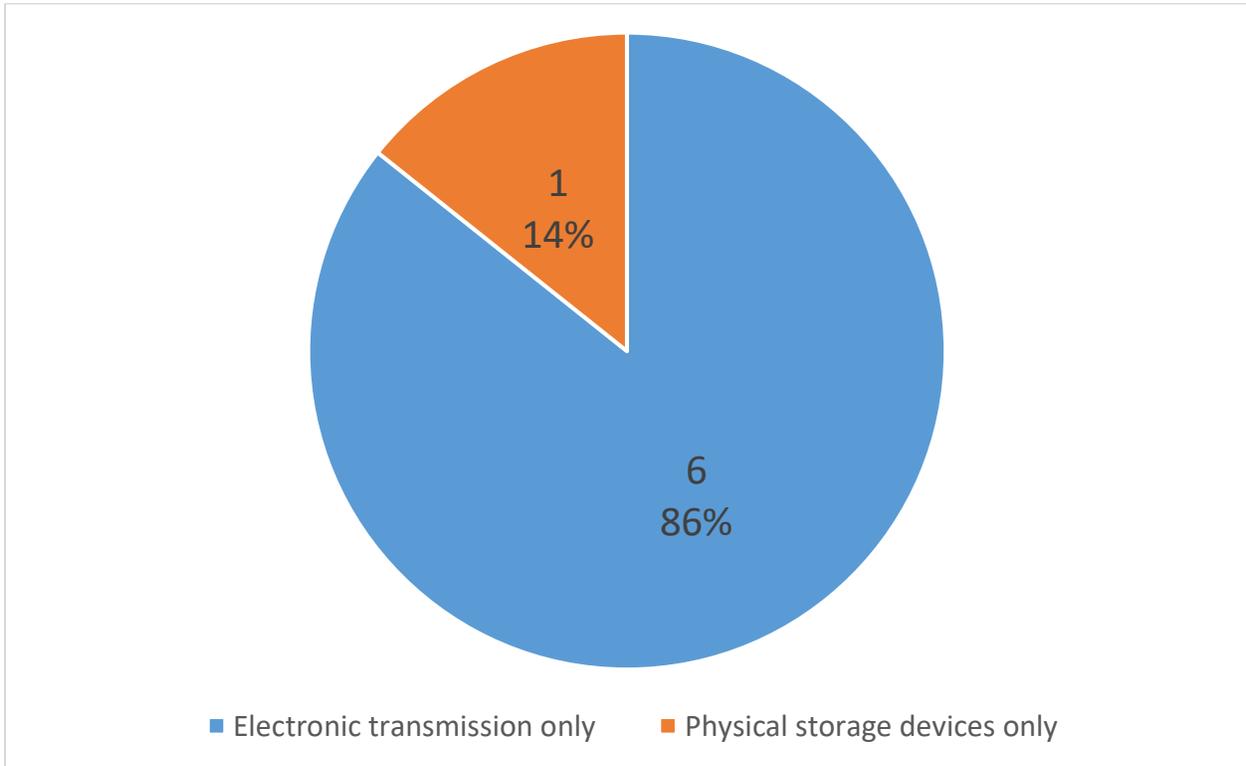
QUESTION 14: If you answered yes to question 13, does your court accept electronic evidence in its native electronic format/file type?



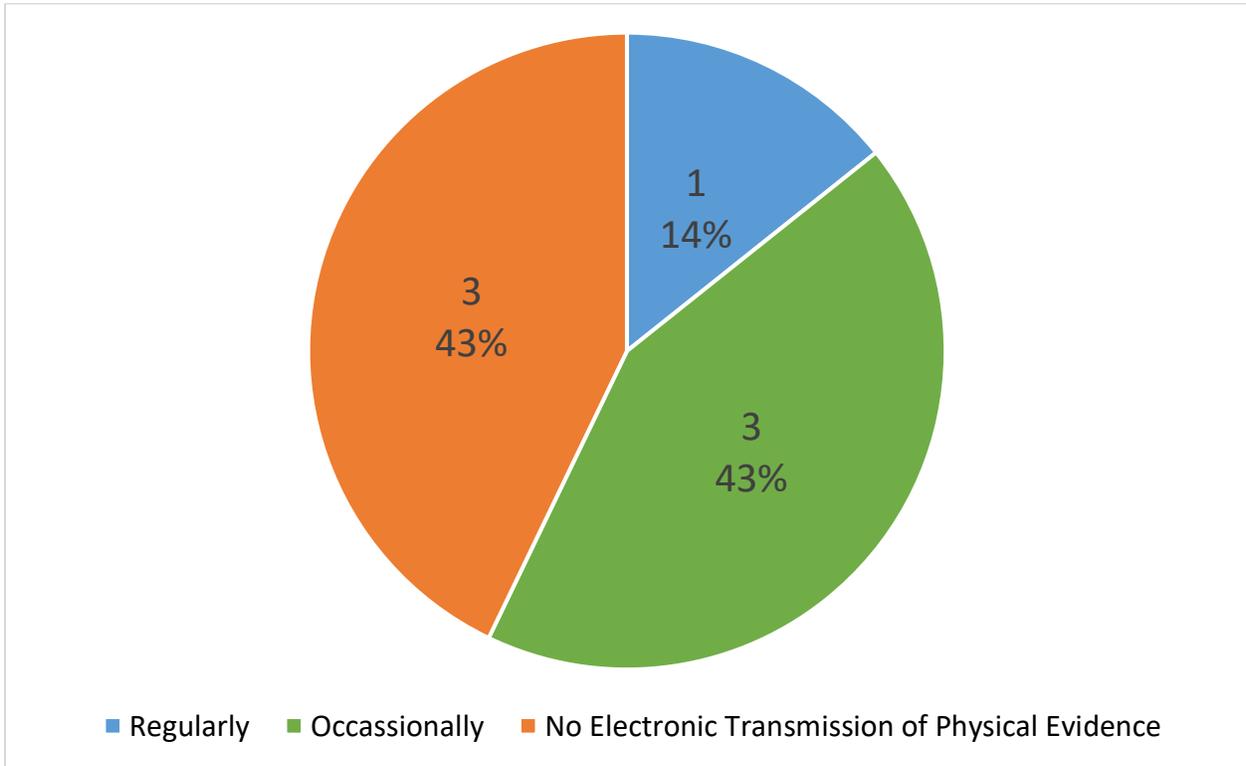
QUESTION 15: If you answered yes to question 13, by what transmission method does your court accept electronic evidence (choose all that apply)?



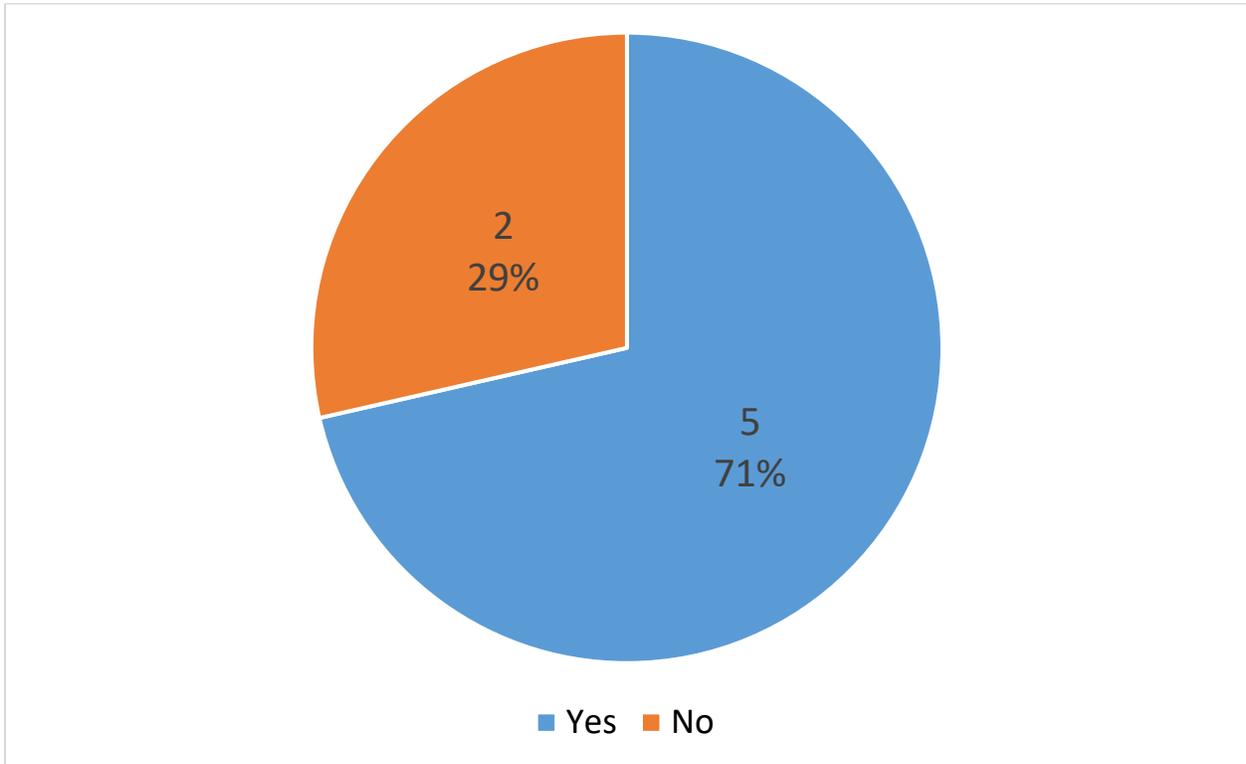
QUESTION 16: What would be your preferred future format for electronic evidence submitted to the court?



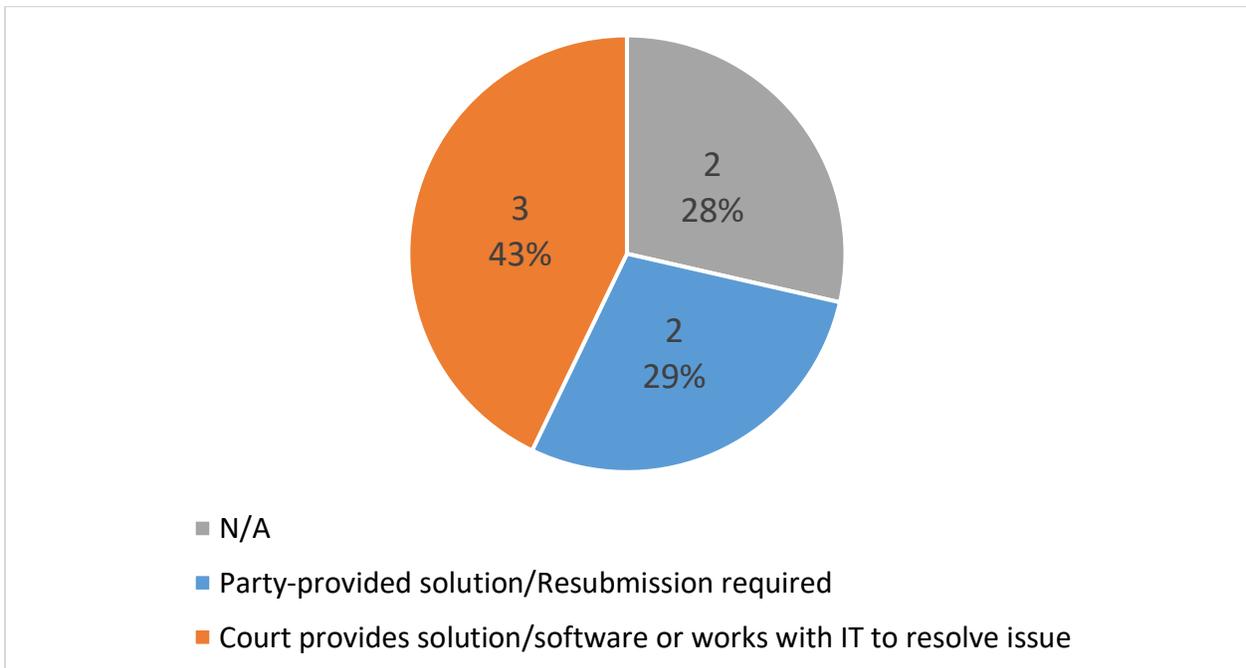
QUESTIONS 17 & 18: Is physical evidence ever scanned and transmitted to your court electronically? How often is scanned evidence submitted to your court?



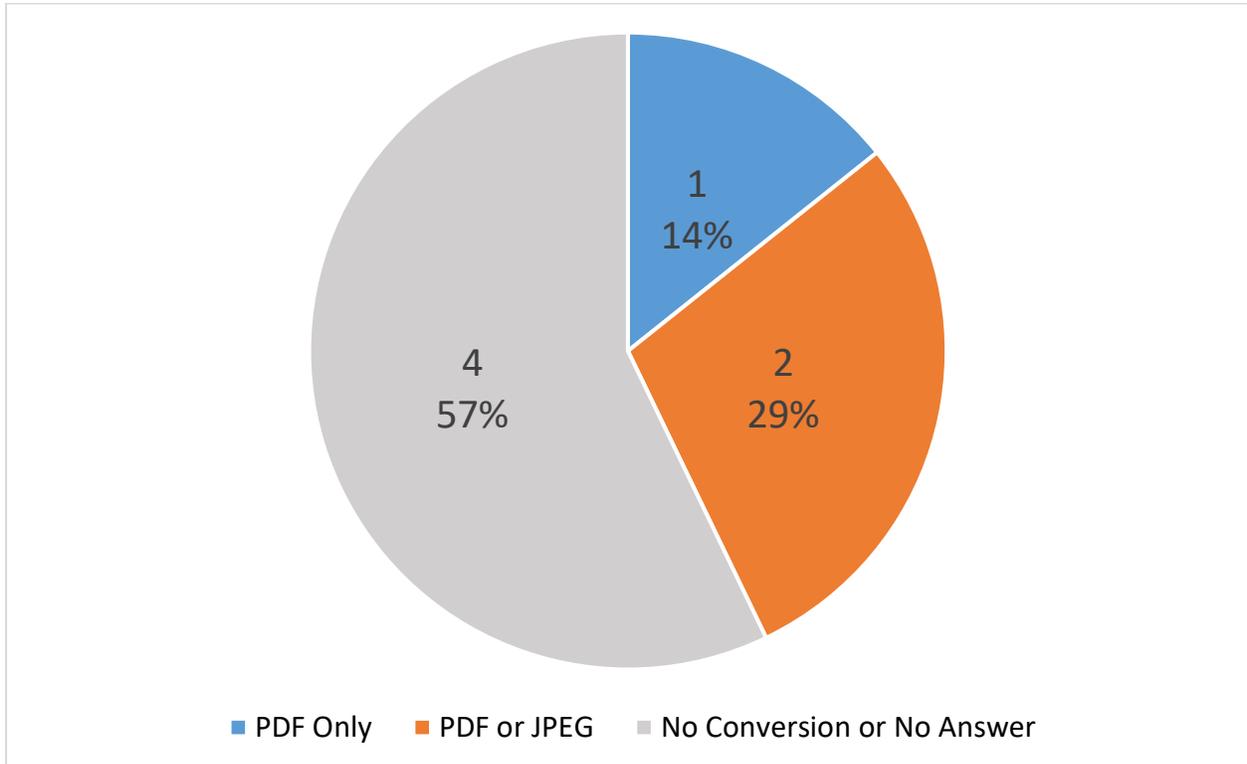
QUESTION 19: Has your court received evidence in proprietary file formats or viewing applications that were difficult to review?



QUESTION 20: If you answered yes to question 19, how did the court manage those issues?

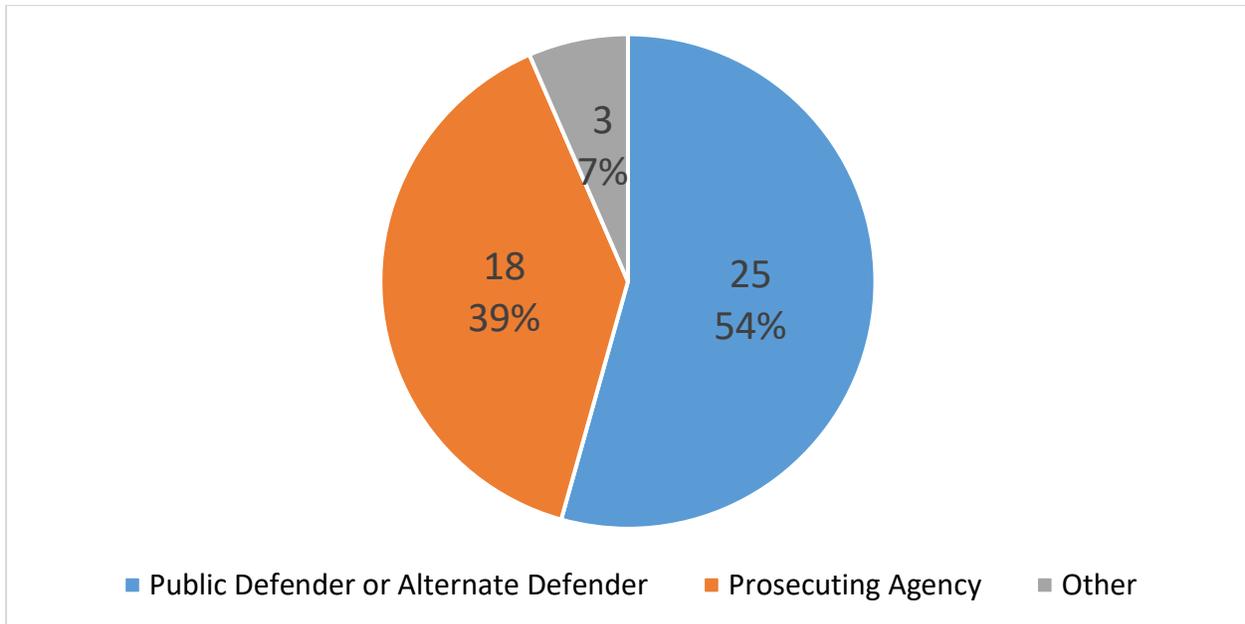


QUESTIONS 21 & 22: Has your court considered converting or is it currently converting printed physical evidence into an electronic format? What electronic format is used to convert printed physical evidence into an electronic format (i.e., PDF)?



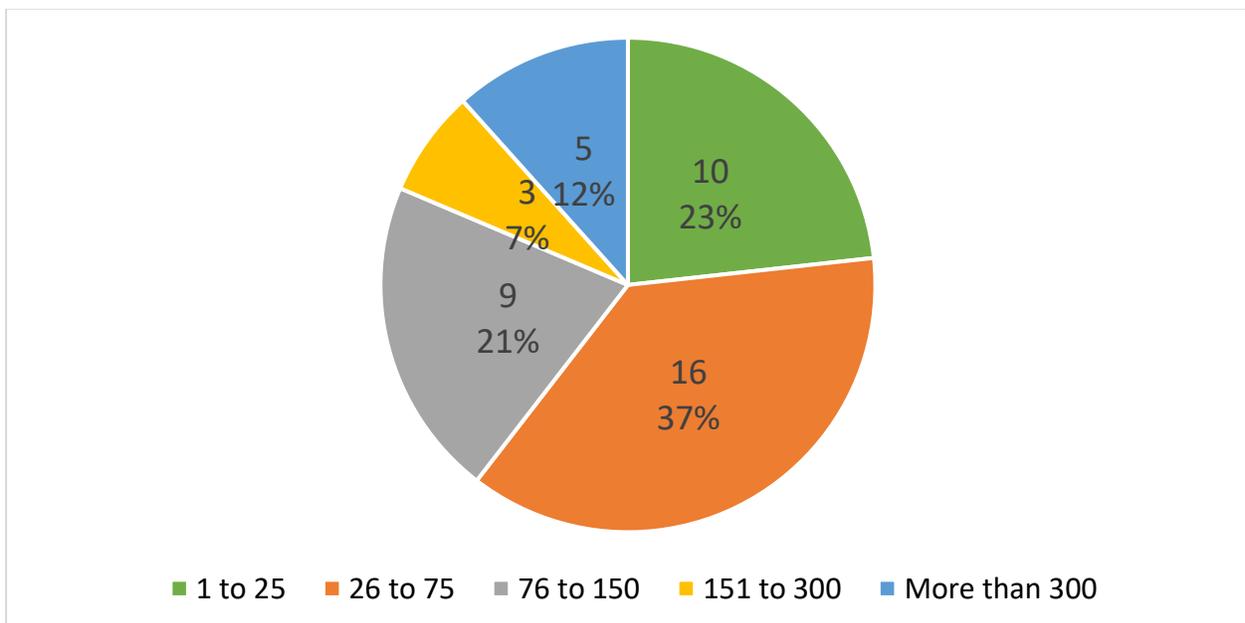
California Criminal Justice Partner Digital Evidence Survey Results

QUESTION 3: What type of organization do you represent?

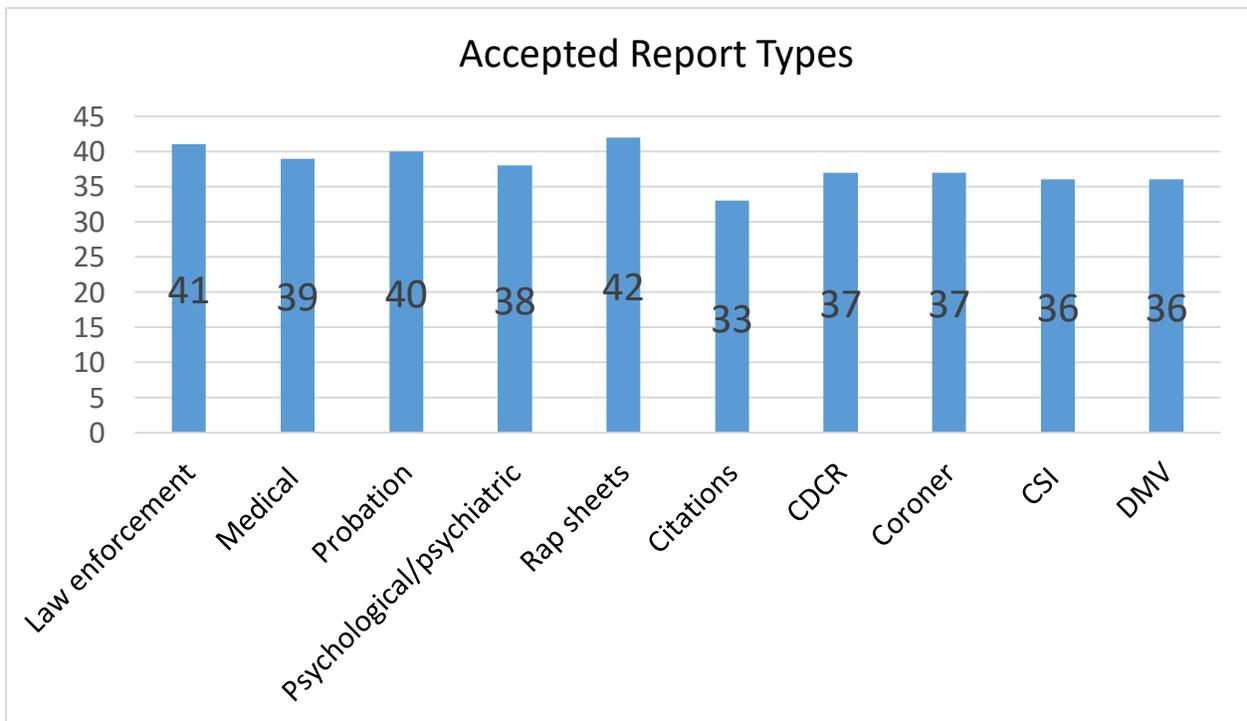
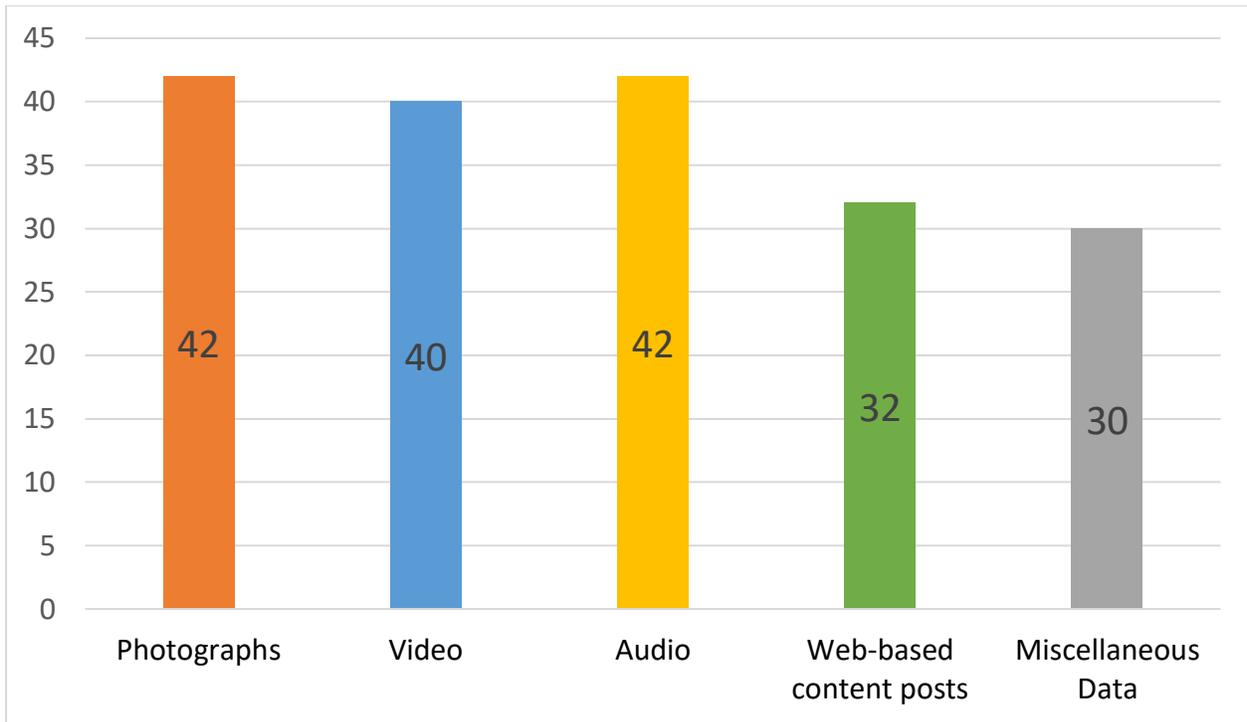


Note: The survey received three responses from agencies that were not prosecuting agencies, public defenders, or alternate defenders. They consisted of a nonprofit appellate defender, a project administrator for appointed appeals, and appointed council for juvenile dependency matters. To maintain report consistency, their responses have been omitted from the report.

QUESTION 4: What is the approximate number of staff in your organization?

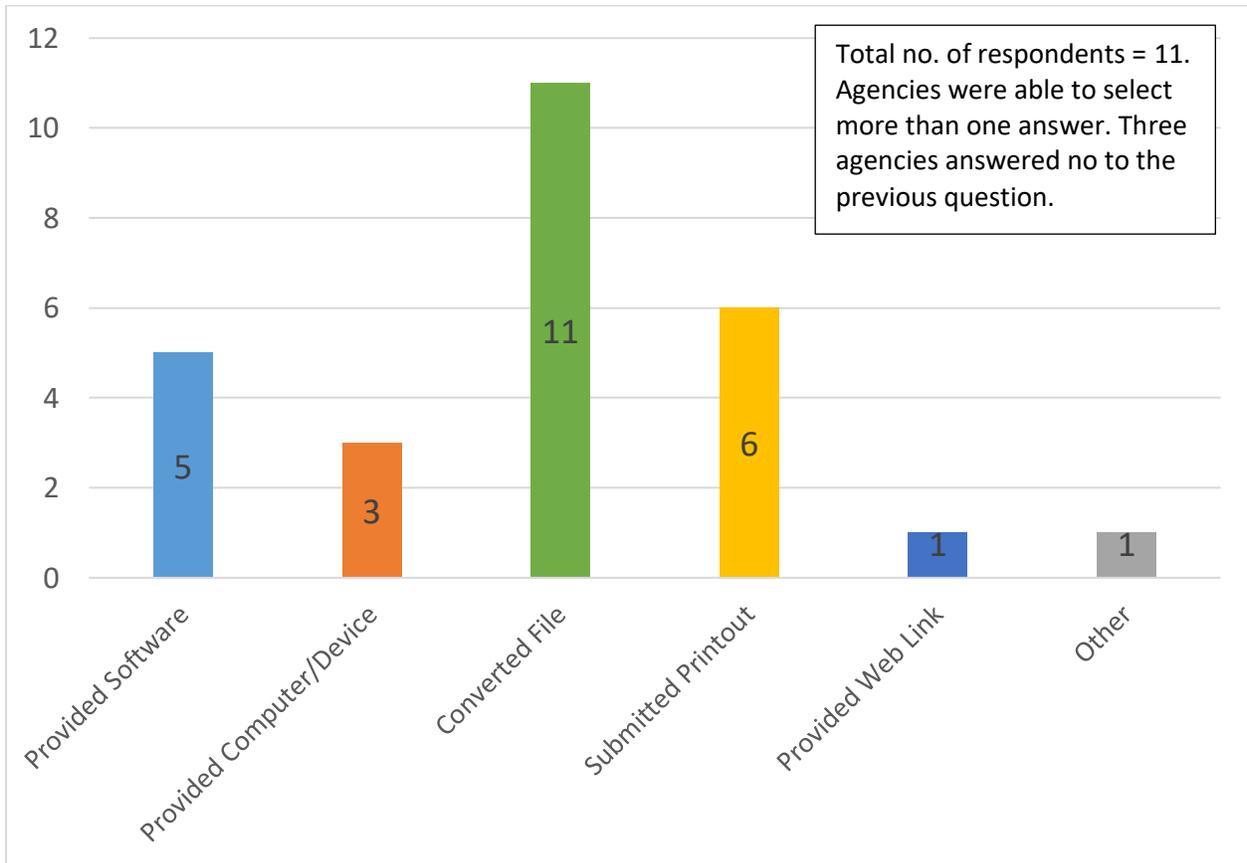


QUESTION 5: What type of evidence do you collect and store? (Choose all that apply)



CDCR = California Department of Corrections and Rehabilitation; CSI = crime scene investigator; DMV = Department of Motor Vehicles.

QUESTION 14: Identify how the evidence maintained in a proprietary file format was made accessible to the Superior Court (choose all that apply):



Summary of Judicial Council Information Technology office (JCIT) proposed updates / review of California Trial Court Facilities Standards (CTCFS) Chapters 1 - 16; 19 - 20

1 GENERAL PRINCIPLES			No comment
2 COURTHOUSE ORGANIZATION			
	2.C Area and Volume Definitions	2.6	Pg 2.17, Fig 2.6 - Consider adding power/data/conduit for A/V and VTC in conference and collaboration rooms
3 SITE DESIGN			No comment
4 COURTHOUSE SECURITY			
	4.1 Electronic Security Systems	4.2	Video Surveillance has AV components but "no comment" as purview of Security group.
5 COURT SET			
	5.A Objectives	5.2	The first bullet point applies to participants <u>in</u> the courtroom. A distinction can be made, regarding who can be seen, between in-person and remote participants. Also consider adding a bullet regarding access to remote participants.
	5.B Courtroom	5.3	No comment
	5.C Courtroom Accessibility	5.5	No comment
	5.D Courtroom Components	5.6	Pg 5.6, 5.D.1.b - Consider specifying space for two monitors and/or other control interfaces. (Also Pg 5.7, 5.D.1.g)
			Pg 5.8 , 5.D.2.c - Change audio controls to A/V controls
			Pg 5.10, 5.D.3.e - Include space for a 22"-27" permanent touch screen plus expert witness laptop.
			Pg 5.12, 5.D.6.a - Include description of video input and output devices for laptops and permanent monitors. Also in figure 5.11. Displays should not interfere with lines of sight to the jury, witness, or court officer.
			Pg 5.13
			5.D.6.b - For aesthetics, the lectern mic could be a permanently installed microphone with a wireless body pack transmitter placed in the lectern.
	5.D.6.c - Consider adding additional video input for laptop or other attorney provided device.		
	5.D.7 - Include the option of a display installed behind the witness. Include the requirement for backing or reinforcement in the walls at the two locations to support wall-mounted displays. Also include power and data pathways for future use.		
	5.E Courtroom Support Spaces	5.15	Pg 5.18, Identify multiple locations of (future) displays (see 5.E.7.c) for coordination of power, data, and video in each figure. Pg 5.20&21 - Consider identifying locations of optional displays behind witness and in front of gallery.
6 JURY FACILITIES AND COURT ADMINISTRATION			No comment
7 SPECIAL SERVICES			No comment
8 IN-CUSTODY DEFENDANT RECEIVING, HOLDING, AND TRANSPORT			No comment
9 PUBLIC SPACES			No comment
10 BUILDING SUPPORT SERVICES			No comment
11 ARCHITECTURAL CRITERIA			No comment
12 STRUCTURAL CRITERIA			No comment
13 MECHANICAL CRITERIA			No comment
14 BUILDING MANAGEMENT SYSTEM CRITERIA			No comment
15 ELECTRICAL CRITERIA			No comment
16 LIGHTING CRITERIA			
	16.C Lighting Strategies	16.6	Pg 16.8, 16.C.4.b - Consider removing the restriction to lighting control in the AV system control. As adoption of digital evidence and remote video participation increases (courtroom video acquisition), there is value in controlling lighting around displays. Also 16.D.1.b. alternatively, provide lighting control within arms reach of the clerk.
19 ACOUSTICAL CRITERIA			No comment
20 FIRE PROTECTION CRITERIA			No comment
TOOL 1: LIFE CYCLE COST ANALYSIS			No comment
TOOL 2: CATALOG OF COURTROOM LAYOUTS FOR CALIFORNIA TRIAL COURTS			No comment
TOOL 3: INTEGRATED NETWORK ARCHITECTURE			No comment
TOOL 4: GRAPHICAL USER INTERFACE TEMPLATE			
TOOL 5: IN-CUSTODY INTERVIEW ROOM GUIDELINES			No comment

17

DIVISION TWO: TECHNICAL CRITERIA

NETWORK AND COMMUNICATION SYSTEMS

SECTION	TOPIC	PAGE
17.A	General Overview.....	17.2
17.B	Minimum Point of Entry (MPOE).....	17.4
17.C	Distribution Pathways.....	17.11
17.D	Backbone Connectivity.....	17.14
17.E	Horizontal Connectivity.....	17.15
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Superior Court of California, County of Yolo
Woodland, CA
Fentress and Dreyfuss-Blackford

Effective technology systems are essential for daily courthouse operations. A technology program is required to be developed along with the architectural program. The designers, Judicial Council, and court advisory team shall determine what is to be provided throughout the court building.

17A GENERAL OVERVIEW

1. Introduction

This chapter covers the requirements for network communication system and other communication systems within courthouse buildings. Simply defined, a network communication system is the convergence of building technologies over a network architecture and shared physical layer that support the transport of Internet Protocol (IP)-based communications signals. This best practice has been made possible by ever-increasing bandwidths and numerous refinements in networking transmission techniques, allowing information to be transported using Ethernet interfaces and IP-based technologies.

The purpose of the network communications technology design is to provide a basis for the development of a structured cabling infrastructure that supports a physically converged, logically segregated IP network solution. Implementing a converged network solution offers several identifiable benefits. Commercial benefits include a lower capital expenditure and a reduction in the cost for maintenance and support. Considering the network, convergence provides increased network availability, scalability, and functionality. In addition, environmental benefits result from the reduction in materials and the need for building utility support, such as power and cooling.

A technology program is required to be developed along with the architectural program. The technology program shall be predicated on the extent and complexity of the technology embedded in a new court building. These factors will be the basis for decisions related to the implementation of a unified communication system, a converged IP network, and the structured cabling system.

This chapter contains standards, criteria, and recommendations related to the following:

- Communications rooms, including architectural, electrical, mechanical, grounding, and bonding guidelines required to support infrastructure and equipment deployment.
- Distribution pathways to support the intrabuilding infrastructure.
- Communications backbone and horizontal connectivity distribution and the performance rating of the cable used to support the building utility services throughout the facility.
- Administration and verification with identification and testing of the communications infrastructure and system components.

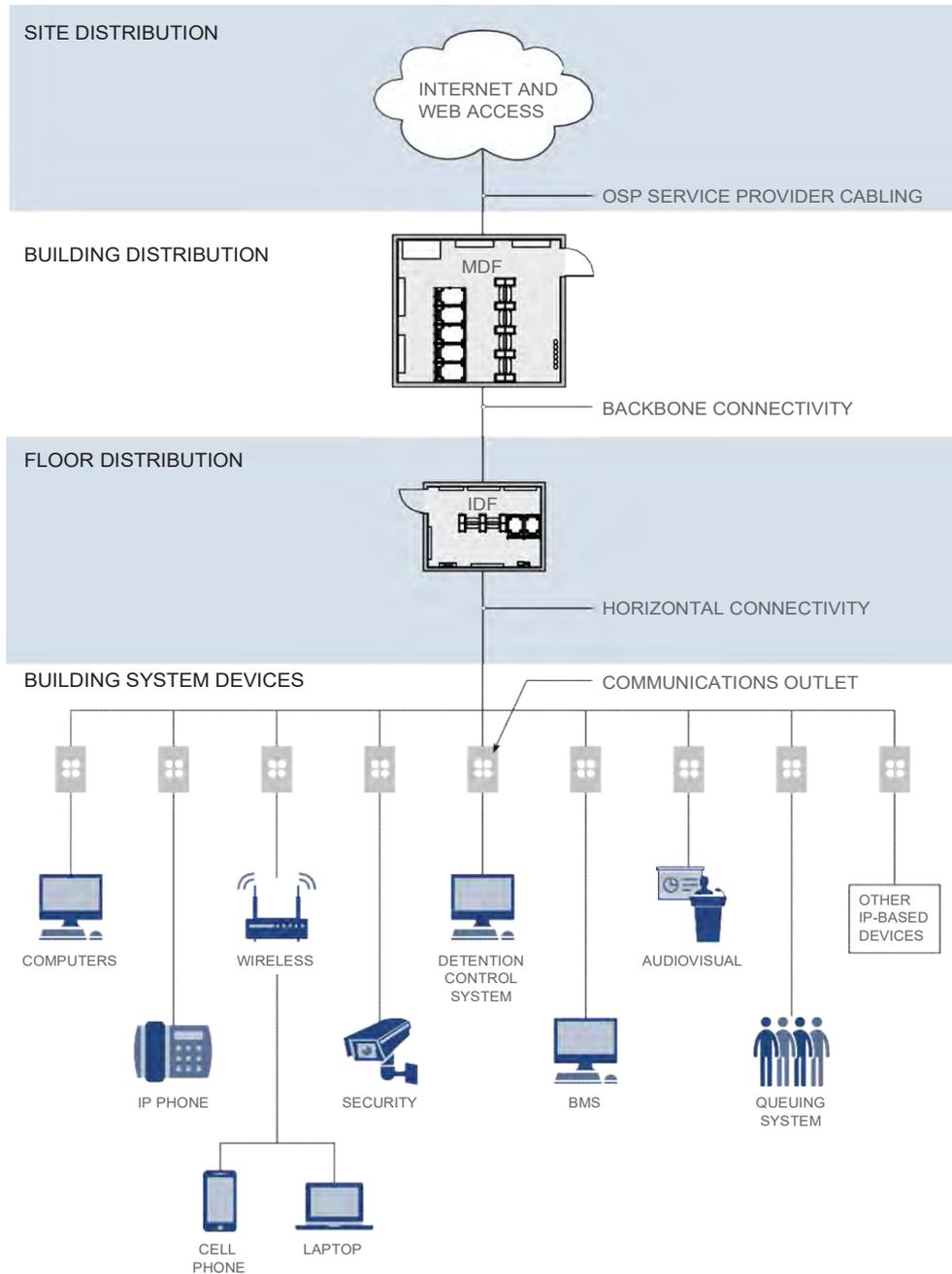
2. Structured Cabling

The structured cabling goal is to provide a robust physical layer that supports high reliability, bandwidth capacity, and future flexibility to extend current and future technology services to each courthouse facility.

3. Network Architecture

The Judicial Council standard is for all IP traffic to traverse a single integrated physical network that is segmented into multiple subnetworks. Network segmentation can be accomplished in various ways; the specific design for each courthouse shall be predicated on the extent and complexity of the technology embedded in a new court building. Figure 17.1 provides a high-level view of the physical architecture of a typical courthouse network, including telecommunications rooms, backbone and horizontal structured cabling, and end-point devices. Though not intended to convey each component or the logical network design, this illustration should give the reader a visual reference of the components and how they interconnect.

See tool 3, Integrated Network Architecture, for the integrated network architecture diagram that illustrates the expected intelligent building systems under the unified communication system.



MDF = main distribution frame.
 IDF = intermediate distribution frame.
 BMS = building management system.

Figure 17.1 Layout Diagram of Structured Cabling Topology That Includes Building Systems

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Alternative Considerations

Colocating an IDF inside the MDF is an acceptable design practice.

For larger buildings that contain data centers, dual service entrance facilities shall be included to house multiple service provider termination components and equipment. All service entrance facilities should adhere to the requirements set out by the service providers. The physical entrance doors to these spaces shall be from within the building, with no doors opening directly to the exterior.

Related Reading

Chapter 20, Fire Protection Criteria, for fire suppression requirements

17.B MINIMUM POINT OF ENTRY (MPOE)**1. Telecommunications and Server Equipment Room**

The telecommunications and server equipment room (main distribution frame (MDF) room) must have a minimum of one-hour resistive construction. All walls (four sides) shall terminate at the structure above so a sealed enclosure is created. No intermediate ceiling is required. Adjoining rooms should not be restrooms or electrical, uninterruptible power supply (UPS), fire pump, switch gear, transformer, generator, or other high-combustible or high-fire-risk rooms.

2. Service Entrance Facilities**2.1 General Guidelines**

- a. An independent space, described as the service entrance facility, will be required within each court building to house service provider termination components and equipment or to serve as a splice point for incoming services.
- b. The placement of the entrance facility should be evaluated on a case-by-case basis considering location of service provider networks “in the street,” overall building size, and location of other building communications rooms. Whenever possible, collocate the entrance facility within the main distribution frame. Doing so minimizes the need to develop a separate, dedicated space.
- c. The entrance facility size and type should be developed considering overall building design, square footage of the facility, quantity of incoming conduits, and types of services required. A dedicated space within the entrance facility should be allocated to “stub out” conduit pathways. At a minimum, a 48” wide × 12” deep floor-to-ceiling space should be allocated on one accessible wall to support up to six conduits.

2.2 Design Criteria

- a. To simplify incoming conduit pathways, consideration should be given to locating the entrance facility on the basement level (if applicable) or the ground level and close to a load-bearing wall.
- b. Provide adequate overhead space for conduit pathways that either enter the room from outside the building or extend connections to the main communications space within the building.
- c. To accommodate cable pulling and apparatus, adequate clearance shall be provided in front of the wall where the conduits terminate.
- d. Vertical cable runway sections shall be used to route cables from the floor and ceiling conduit penetrations to the overhead cable runway.

3. Main Distribution Frame

This section refers to the MDF as a single space for space planning only. In practice, the MDF will be subdivided between various operational units allocating space for termination fields, active components, equipment cabinets, and relay racks required to house building communication system control devices. In simple terms, the MDF room will function as the main hub, or headend, within each courthouse facility. The MDF room size is determined by the amount of headend equipment in a particular court building. See table 17.1 for MDF space considerations.

Table 17.1 MDF Space Considerations

BUILDING TECHNOLOGY SYSTEM	TYPICAL MOUNTING LOCATION
Service Provider Fiber	2-Post Relay Rack
Service Provider Copper	Wall
OSP/ISP Building Fiber	2-Post Relay Rack
OSP/ISP Building Fiber	2-Post Relay Rack
OSP/ISP Building Copper	Wall
Vertical Cable Management	Sides of Each Relay Rack
IP Network Hardware	2-Post Relay Rack
Court Information Technology Servers	Equipment Cabinet
Audiovisual Systems	Equipment Cabinet
Security Access Control Panels	Wall
Security Servers	Equipment Cabinet
DAS Connectivity	Wall
DAS Radio and Cellular Components	Equipment Cabinet
BMS Servers	Equipment Cabinet
BMS Control Panels	Wall
Detention System Servers	Equipment Cabinet
Technician Desk	Floor (min. 4' wide × 5' deep)
Electrical Distribution Panel	Wall
Entrance Facility Conduits	Floor and Wall
Expansion Capability	25% Future Rack Space

OSP/ISP = outside plant / inside plant.
 DAS = distributed antenna system.

3.1 General Guidelines

- a. Provide a minimum of one MDF room per courthouse building, located on a lower floor, with an accessible pathway to the loading dock or freight elevator. The MDF shall not be located on any building exterior walls or below the flood level.
- b. A well-designed MDF is imperative to the overall success of the IP network and the technology systems that function within a courthouse facility. Figure 17.2 presents, for a smaller courthouse facility, a typical MDF layout that provides space for five equipment cabinets and four relay racks. The cold aisle is lined with the front sides of the server racks housing the cold air intakes, and hot aisles are where the hot air exhausts are located. The cold aisle should face the air-conditioning supply ducts, and hot aisles should face air-conditioning return ducts. Minimum clearances are indicated because they are critical to the functionality of all unified communications rooms and should be factored into the layout.

3.2 Design Criteria

- a. Cabinets and relay racks shall be EIA/ECA-310, ANSI/TIA-569, or IEC 60297-3-100 compliant with a standard height of 42U (rack units).
- b. No restrooms, janitor closets, or piping with running water shall be located immediately above, next to, or in the MDF.

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Important References

An example of “active electronics” would be an information technology (IT) network switch used to connect local area network (LAN) segments.

Multiple courtrooms may be served from a single IDF; however, close coordination of the various technology systems space requirements is imperative when developing the overall size of an IDF supporting a courtroom space.

EIA/ECA = Electronic Industries Alliance Standards

ANSI = American National Standards Institute

TIA = Telecommunications Industry Association

IEC = International Electrotechnical Commission

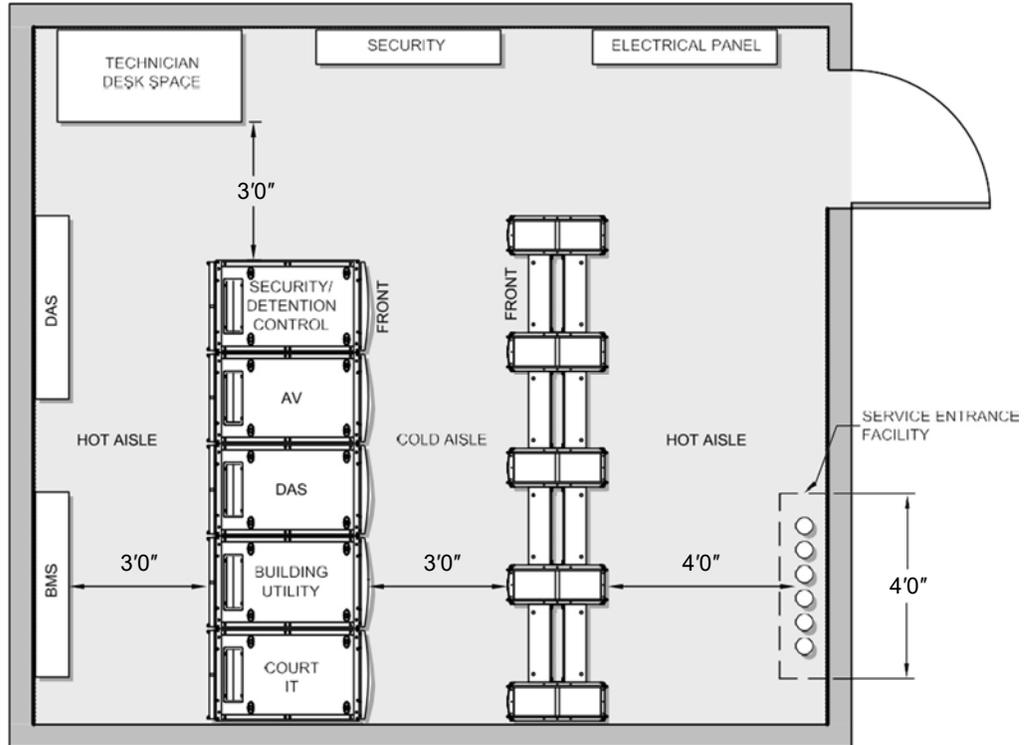


Figure 17.2 Typical Smaller Courthouse MDF Layout

- c. Internal wall surfaces should be covered with 3/4" fire-rated plywood. Sealed concrete is an acceptable finish on floors.
- d. Vertical cable runway sections should be used to route cables from the floor and ceiling conduit penetrations to the overhead cable runway.
- e. Outward swinging doors shall be provided and fitted with both a key and a card lock; the minimum door size should be 42" wide × 90" high.
- f. Floor loading should be factored at 200 pounds per square foot and confirmed on a case-by-case basis.
- g. A minimum of one relay rack should be reserved for the consolidation of service provider, county, and court wide area network (WAN) edge active equipment devices.
- h. At a minimum, use 10" × 17-1/2" double-sided vertical cable management between racks.
- i. Relay racks used for the termination of structured cabling should reserve 50 percent of the available rack unit space for active electronics.
- j. All equipment racks and cabinets shall be installed in compliance with California Building Code (CBC) seismic standards.
- k. Obtain typical power draw and National Electrical Manufacturers Association (NEMA) plug type for switches and UPS units. Include 208-volt outlets in the MDF/IDF (intermediate distribution frame) with 30 amp receptacles. Coordinate with site network requirements for additional power requirements.
- l. Develop the port count matrix early. Early involvement of the applicable provider is recommended.

- m. Calculate the estimated heat load of IDF/MDF for heating, ventilation, and air-conditioning (HVAC).
- n. Ensure the court data racks are next to the provider’s data racks in an appropriately sized IT room.
- o. Provide a room-ready checklist in contract documents.
- p. See chapter 20, Fire Protection Criteria, for fire protection requirements for IDF/MDF rooms.

4. Intermediate Distribution Frame

An IDF is typically an enclosed architectural space for housing communications equipment, cabling terminations, and any cross-connect cabling required to distribute communications signals throughout a localized area.

4.1 General Guidelines

- a. IDF spaces should be dedicated to communication systems and audiovisual (AV) equipment use, centrally located on every floor, and stacked vertically through the building to enable efficient pathway and cabling distribution within each serving zone.
- b. IDF serving zones must allow for each individual twisted pair copper cabling segment to fall within the Ethernet distance limitations of 295’. Additional IDF spaces should be considered when the serving area is greater than 10,000 SF or the interior building space plan restricts the size of a single IDF, limiting the available space for equipment.
- c. Typically, IDF room size recommendations are derived from the square footages of the area served, factoring one outlet per typical 100 SF of work area. However, these general guidelines do not take into account the quantity of technology systems that courtroom IDF rooms are required to support; therefore, the general industry rule-of-thumb numbers should not apply. IDF rooms should be sized on a case-by-case basis considering the minimum clearances to accommodate the active electronics and termination components that each room houses.
- d. Table 17.2 outlines the systems and typical mounting locations that should be considered when developing the IDF size and interior design.
- e. Figure 17.3 presents a typical IDF layout for a courthouse facility where two courtrooms are served from a single IDF. This IDF provides two audiovisual cabinets (one per courtroom) and two relay racks for housing active electronics and structured cabling termination components. Minimum clearances are critical to the room design and are indicated for reference.

4.2 Design Criteria

- a. Cabinets and relay racks shall be EIA/ECA-310 or IEC 60297-3-100 compliant with a standard height of 42U.
- b. No restrooms, janitor closets, or piping with running water shall be located immediately above, next to, or in the IDF.
- c. Internal wall surfaces should be covered with 3/4” fire-rated plywood.
- d. Sealed concrete is an acceptable finish on floors, and a finished ceiling should not be provided.

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Table 17.2 IDF Space Considerations

BUILDING TECHNOLOGY SYSTEM	TYPICAL MOUNTING LOCATION
Intrabuilding Fiber	2-Post Relay Rack
Intrabuilding Copper	Wall
Horizontal Cabling	2-Post Relay Rack
Vertical Cable Management	Sides of Each Relay Rack
IP Network Hardware	2-Post Relay Rack
Audiovisual Systems	Equipment Cabinet
Security Access Control Panels	Wall
Security Servers	Equipment Cabinet
DAS Connectivity	Wall
BMS Control Panels	Wall
Detention System Servers	Equipment Cabinet
Detention System Control Panels	Wall
Electrical Distribution Panel	Wall
Vertical Conduit Pathways	Floor and Wall

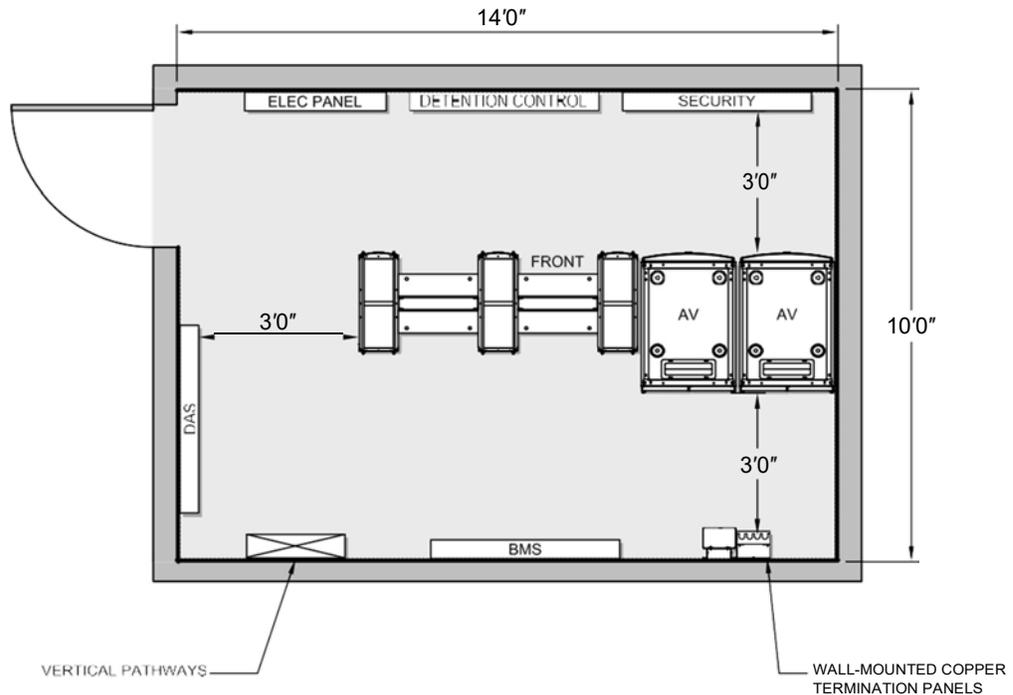


Figure 17.3 IDF Serving Two Courtrooms

- e. Vertical cable runway sections shall be used to route cables from the floor and ceiling penetrations to the overhead cable runway grid.
- f. A single outward swinging door should be provided and fitted with both a key and a card lock; minimum door size is 42" wide × 90" high.
- g. Adequate space and clearance should be provided for vertical conduit pathways.
- h. At a minimum, 10" double-sided vertical cable management between racks should be used.
- i. Relay racks used for the termination of structured cabling shall reserve 50 percent of the available rack unit space for active electronics.
- j. Equipment racks shall reserve 25 percent of the available space for additional equipment.
- k. All equipment racks and cabinets shall be installed in compliance with CBC seismic standards.

5. Electrical Systems

Although the main focus of this chapter is not the electrical system criteria, the technology systems located within MDF and IDF rooms have specific power requirements. Therefore, this section provides an overview of the specific MDF and IDF electrical needs that should be considered in the building-wide electrical design. Refer to chapter 15 for the full list of systems requiring backup generator power and independent UPS systems.

5.1 General Guidelines

- a. The full complement of technology-related systems housed inside MDF and IDF spaces should have adequate UPS power backup to support electrical interruptions for 90 minutes for non-life-safety equipment. The UPS shall not be connected to an emergency power system. A centralized UPS system is the preferred methodology for the distribution of short-term power when the main input power source fails. Among other things, this best practice provides benefits with increased space savings within the MDF and IDF rooms and reduces maintenance costs.
- b. All systems requiring generator power or dedicated UPS systems are defined in chapter 15. Refer to chapter 15 for details pertaining to fire-life-safety systems and non-life-safety systems and the specific requirements for each.
- c. During preliminary building design, load estimates are required to begin the electrical system design and for space planning. Although the actual electrical equipment loads are calculated once the final systems equipment is defined, general load estimates are provided as a basis for design. For detailed requirements of emergency and standby power systems, refer to chapter 15, Electrical Criteria.

5.2 Design Criteria

- a. Provide an overhead busway electrical distribution system within communications rooms. An electrical busway provides a more flexible power solution that accommodates a variety of receptacles and is more cost-effective over the life of the building.
- b. Provide a grounding circuit for communications equipment. Grounding and bonding shall be provided for all equipment and racks. A grounding bus bar shall be provided.

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Coordinate with local service providers to determine specific pathway requirements or best practices.

Satellite pathway should be designed considering each courthouse facility's specific requirements.

Important References

ASHRAE Environmental Guidelines for Datacom Equipment

BICSI Telecommunications Distribution Methods Manual (latest edition) for separation information from electromagnetic interference sources and for pull-box sizing guidelines

Related Readings

Chapter 13, Mechanical Criteria

Chapter 15, Electrical Criteria

Chapter 16, Lighting Criteria

Chapter 20, Fire Protection Criteria

- c. Provide, in aiseways parallel to rows of racks and cabinets, lighting that does not conflict with the cable management infrastructure inside the rooms.
- d. Provide that lighting fixtures are not powered from the same distribution panel as are the room's power outlets.
- e. In-rack power distribution units (PDUs) shall be provided with power sources provided through the UPS system. Specific requirements for PDU sizes and load requirements shall be coordinated based on equipment requirements for each site.

6. Mechanical Systems

Although the main focus of this chapter is not the mechanical system criteria, the technology systems located within MDF and IDF rooms have specific mechanical requirements. Therefore, this section provides an overview of the specific MDF and IDF mechanical needs that should be considered in the building-wide mechanical design. Refer to chapter 13 for the building-wide mechanical systems design criteria.

6.1 General Guidelines

- a. Mechanical system cooling units shall be dedicated to the operation of the MDF and IDF rooms they serve and be located inside the room. Multiple floors shall have discrete service—that is, not be ganged together—and capable of providing 24/7/365 operation, independent of the “base building” system. System selection shall be either packaged heat pumps (condenser water) or fan coils (chilled water), based on case-by-case project analysis. Supply and return ducting shall be directed at the respective cold and hot aisle layout within each MDF and IDF room requiring cooling. Hot and cold aisles shall be fully contained such that hot aisle air does not interact with cold aisle air.
- b. At a minimum, the mechanical systems shall be designed to meet the current American Society of Heating, Refrigerating and Air-Conditioning Engineers Technical Committee's ASHRAE TC 9.9 thermal guidelines for allowable temperature and humidity parameters. For reference, the TC9.9 ASHRAE standard provides the following system parameters:
 - Low-end temperature: 64.4°F (Fahrenheit; supply air to equipment)
 - High-end temperature: 80.6°F (supply air to equipment)
 - Low-end moisture: 41.9°F dew point
 - High-end moisture: 60 percent relative humidity and 59°F dew point

Note: These recommended temperatures and conditions are for inlet air measurement entering the equipment and not necessarily room temperature.

- c. During preliminary building design, the estimated MDF room cooling load Btu/hr (British thermal units per hour) should be based on a minimum electrical load of 75 watts per square foot. In each IDF, the estimated cooling load (Btu/hr) should be based on a minimum electrical load of 65 watts per square foot. These load estimates should be developed further as the building design moves forward. The load shall be confirmed as equipment is determined and must meet or exceed the equipment manufacturer's requirements.

6.2 Design Criteria

- a. Consideration of air-side free cooling should be made based on climatic conditions.

- b. The mechanical systems shall report to the building management system (BMS), building engineers, and IT support personnel, triggering alarms when set parameters are exceeded.
- c. In general, avoid routing plumbing or HVAC pipes (pressurized or unpressurized) to go through any communications space. Water-filled pipes shall route around communications rooms rather than through them, unless they serve components within the room, such as fire suppression systems.
- d. When water-filled pipes travel within a communications room, pipe isolation and drain pans shall be provided.
- e. Roof drains or other sources of water shall not be located above any communications rooms.

7. Grounding and Bonding

- a. A uniform telecommunications grounding and bonding system shall be provided between all communications rooms in accordance with TIA/EIA 607-D telecommunications grounding and bonding standards and Building Industry Consulting Services International (BICSI) guidelines. The building-wide grounding system that provides each communications space with a dedicated grounding busbar shall comply with California Electrical Code (CEC).
- b. Extended from the grounding busbar within each communications space, a common bonding network consisting of a series of insulated stranded conductors, no less than 6 AWG (American Wire Gauge), should bond all communications components requiring a ground connection to the grounding busbar. Components typically bonded to the grounding busbar include, but are not limited to, equipment cabinets, relay racks, communications equipment, protector blocks, cable runways, and communications conduits.

17.C DISTRIBUTION PATHWAYS

To meet the overall goal of physical convergence, communications pathways should be designed to support the distribution needs of all unified communication systems. Combining low-voltage cabling infrastructure in shared pathways provides a well-organized, functional approach to the distribution of connectivity, whether outside or inside a courthouse building. In turn, a unified pathway design that takes into consideration the cable needs of each IP-based building technology enhances the flexibility of the distribution system over time, allowing for simplified changes or upgrades.

1. Outside Plant Pathways

In addition to the entrance conduits required for service provider connectivity, OSP pathways provide a means to route communications cabling outside the building. For a courthouse facility, this may include media connections to a television network pedestal, security entry control and camera devices, and landscaping control equipment. The OSP pathway system needs to be carefully coordinated with all site utilities. Industry standard components such as conduits, maintenance holes, pull boxes, or handholes should be used to distribute connectivity in the OSP.

1.1 Dedicated MPOE Conduits

Pathways and pulling points shall be dedicated to incoming service provider networks and not shared with other technologies or utilities. Diverse paths into the building should be considered and coordinated with the service providers.

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Alternative Considerations

Large multifloor facilities may be better served using second-level backbone cabling distribution—that is, a central IDF serving as a termination point for backbone connectivity from other IDF spaces.

For each project, the designer shall consider all building utility systems and verify the need for horizontal optical fiber media.

1.2 Service Entrance Conduit Quantities

The quantity of service entrance conduits should be based on the size of the facility, with a minimum of four 4" conduits, the service provider circuits, and the level of redundancy required. ANSI/CEC codes shall be used to determine quantities. Table 17.3 shall be used for general guidance. Entrance conduit routing should be developed with site utilities and local service providers to ensure that the property-line conduit termination points have been successfully coordinated.

Table 17.3 Guidelines for Service Entrance Conduit Quantities

NUMBER OF COURTROOMS	CONDUIT QUANTITY
1–6	4
7–19	6
20+	8

2. Inside Plant (ISP) Pathways

A well-designed ISP distribution system must allow for day-one capacity as well as the high likelihood of future modifications to provide numerous efficiencies over the life cycle of a building. The ISP pathways provide a means to successfully route and support all IP and non-IP low-voltage connectivity, including larger conduit pathways for backbone connectivity between communications rooms, smaller conduit pathways for horizontal connectivity extended to wall and floor communications outlets, and connectivity for devices using Power over Ethernet.

2.1 Backbone Distribution System

- a. From the MPOE, dedicated ISP conduit pathways shall extend to the MDF. When the service entrance facility is colocated within the MDF, conduit pathways shall extend directly from the OSP to the entrance facility space. An OSP-to-MDF conduit pathway system should be designed considering standard practices of the various service providers delivering connections to the building.
- b. The design of backbone pathways between communications rooms should factor together the many variables associated with connecting technology spaces. The standard practice is to provide conduit pathways between the main communications rooms. In cases where IDF rooms are stacked, locating pathways in the same place within each IDF is the preferred vertical distribution methodology. Provide a functional and flexible backbone pathway design—including access and clearance, appropriate bend radii, and pull boxes—to allow for the successful distribution of communications backbone cabling.
- c. The number of conduits per pathway varies depending on the number of communications cables. Provide a minimum 25 percent for future growth when considering the total quantity of conduits required. Backbone conduit segments that are greater than 50' should have fabric duct separators installed for the length of the conduit run. A maximum fill rate of 40 percent should be factored for day-one conduit capacity.

2.2 Rooftop Communications Systems

To facilitate future installation of rooftop communication systems, provide an electrical subpanel and submeter on the rooftop. Provide conduit pathways to the rooftop from the electrical room with pull rope (not pull string) to allow for cable runs to be added for future installations.

2.3 Horizontal Distribution System

- a. Horizontal distribution pathways designed to accommodate low-voltage cabling systems can be grouped into two preferred methodologies: the primary conveyance system, which is a cable tray that extends above the main corridors from the serving communications room, and the secondary conveyance system, consisting of conduit pathways from the cable tray to the communications outlet location. Coordination of each communications outlet location throughout the facility is critical, especially within the courtroom.
- b. Basket or solid-rail-style cable trays are required for courtroom buildings because of their elevated capacities, increased robustness, and accessory components used for separation of the non-IP cable bundles such as BMS, AV, and security cabling. Accessibility and clearance requirements should be coordinated so that the overall functionality of the conveyance system is enhanced. At a minimum, cable tray clearances of 12" above, 24" to one side, and 3" clear vertical space above ceiling tiles and supports should be provided.
- c. Conduit pathways used for horizontal distribution shall be designed to accommodate the quantity of cables they are required to support. Coordinating final outlet locations and pathway design factoring millwork and other interior architectural parameters is critical within every courtroom. The current minimum conduit size for a standard communications outlet is 1-1/4". Wall-mounted electrical back boxes should have manufactured 1-1/4" knockouts to accommodate the conduit.
- d. To minimize the overall number of floor penetrations, combined power and communications floor boxes and poke-through devices are acceptable for floor-mounted outlets. Size floor boxes and poke-through devices according to the number of low-voltage communications and electrical outlets at each outlet location. Specific attention should be given to floor depths and fire ratings when specifying floor boxes and poke-through devices.
- e. In addition to the conveyance systems, reenterable UL (Underwriters Laboratories)-rated fire-stop assemblies are required for through penetrations in all rated walls and floors. At a minimum, size the assembly considering UL and the manufacturer's allowable fill rate. Provide a minimum 25 percent for future growth when considering the total quantity of assemblies required.

2.4 Design Criteria

- a. Install conduit runs in lieu of cable trays where access to the cable tray is restricted for more than 10'.
- b. Locate conduit pull boxes in easily accessible locations.
- c. Install ground distribution pathways according to telecommunications industry standards.
- d. Insert conduit pull cords within the pathway to allow for future expansion.
- e. Include the cable tray size, location, and mounting methods in the building information modeling.
- f. Consider acoustical transfer of hard wall connection.
- g. Coordinate rated wall penetrations.
- h. Do not install cable trays above hard lids when possible.
- i. Use basket-type trays in lieu of rail type.

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Important Reference

The communication system should comply with ANSI/TIA/EIA 606-A, Administration Standard for Commercial Telecommunications Infrastructure.

- j. Include seismic support for weight.
- k. Include expansion percentage in specifications.

17.D BACKBONE CONNECTIVITY

As technology systems converge onto the IP network, efficiencies increase when a common backbone is used to distribute communications signals. Optical fiber cables shall be used as the primary backbone medium because they provide higher bandwidth and can extend greater distances than their copper counterpart. Multipair copper cabling has become the auxiliary backbone medium used to extend analog or non-IP signal technology.

Coordinate the backbone and horizontal connectivity needs for community antenna television (CATV) distribution on a case-by-case basis.

1. Optical Fiber

The current design base for first-level backbone connectivity, from the MDF to each IDF, is to deploy single-mode fiber (SMF) and 50/125 micron, laser-optimized multimode fiber (LOMMF). The fiber cable performance characteristics described below are provided considering these two fiber types. As network design evolves to meet growing bandwidth needs, the strand quantities and types of optical fiber provided in the backbone segment should meet current project requirements, industry standards, and projected bandwidth benchmarks. Reference ANSI/TIA-568.3-D for fiber installation standards and the National Electrical Contractors Association and Fiber Optic Association's NECA/FOA-301.

1.1 Single Mode

For single-mode fiber, OS2 fiber is the recommended cable type. Backbone SMF cable should be capable of 40-gigabit Ethernet signal transmission to 10,000 meters in the 1,310 nanometer (nm) operating window. Maximum attenuation for an SMF cable shall be no greater than 0.7 decibel (dB) per kilometer (km) using 1,310 nm and 0.5 dB/km using 1,550 nm wavelengths, respectively. Fusion-spliced, factory-connectorized pigtails are the required termination practice for SMF cable. SMF cable between the MDF and each IDF shall have a minimum of 24 strands.

1.2 Laser-Optimized Multimode

For multimode fiber, OM4 is the recommended cable type. Laser-optimized multimode cables should be capable of 40-gigabit Ethernet signal transmission to 300 meters at 2,000 megahertz/km effective modal bandwidth. Maximum attenuation for LOMMF cable shall be no greater than 3.0 dB/km using 850 nm and 1.0 dB/km using 1,300 nm wavelengths, respectively. LOMMF cable between the MDF and each IDF shall have a minimum of 24 strands.

1.3 Cabling Criteria

- a. Provide a flexible, spirally wrapped interlocking armor over an individual jacketed and tight buffered cable.
- b. Terminate fiber cabling in fully enclosed fiber panels.
- c. Provide 25 percent spare termination capacity in the panel.
- d. Provide fiber connectors to be small-form-factor latched connector (LC) duplex.
- e. Provide connectivity to be rated per the installation environment.

2. Multipair Copper

2.1 General Requirements

Multipair copper cable should extend from the MDF to each IDF room. Select a voice-grade Category 5e unshielded twisted pair (UTP) ARMM (abrasion resistant millimeters) cable. Use a minimum of 25 pairs.

2.2 Cabling Criteria

- a. Terminate cabling onto a 110-type wall field.
- b. Provide 25 percent spare termination capacity.
- c. Connectivity shall be rated per the installation environment.

17.E HORIZONTAL CONNECTIVITY

Horizontal connectivity, from the floor serving IDF space to each communications outlet location, is required to extend service to various building system end devices that use the IP network. The transport medium most widely used in the “horizontal” is a twisted pair copper cable. Optical fiber cabling should be considered for outlet locations that are determined to be over distance.

Supplementing the hard-wired connections throughout the facility, a wireless local area network (WLAN) shall be included (when developing the technology program) to provide additional connectivity to court staff or court building users. An understanding of the connectivity requirements for each system should be realized at the earliest phases in the design process and include a site survey with heat maps to plan placement of WLAN access points to ensure even signal coverage and eliminate dead spots. WLAN connectivity shall be provided for all areas with computerized maintenance equipment, such as utility rooms in the basement and penthouse.

1. Four-Pair Copper

1.1 General Requirements

Provide an end-to-end solution based on ANSI/TIA-568.0-D or the highest performance standard ratified by ANSI/TIA/EIA for topologies, distances, installation, performance, and testing requirements for telecommunications structured cabling. The minimum standard for the horizontal permanent link cabling is 6A foiled, unshielded twisted pair (F/UTP) cable, otherwise known as augmented Category 6. A foil applied over unshielded twisted pairs shall be the minimum standard for jacketing of four-pair copper cables. As network bandwidth increases, the category performance rating of four-pair copper cable should be revised to meet current industry standards.

1.2 Cabling Criteria

- a. Each four-pair copper cable permanent link shall fall within the Ethernet distance limitation of 295’.
- b. The complete cable plant shall meet ANSI/TIA-1152, Level IIIe performance requirements for Category 6A cabling.
- c. In communications rooms, terminate the cabling in angled patch panels.
- d. The end-to-end, four-pair copper connectivity solution shall use shielded components, including faceplates, wall jacks, and patch cables.
- e. Connectivity shall be rated for the installation environment.

2. Wireless Local Area Network

Although the term wireless lends itself to the concept that hard-wired connections are not needed, a grid-type network of connection points dedicated to the wireless system is

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Related Requirements

Tool 3, Integrated Network Architecture: LAN/WAN Diagram (Integrated Architecture Network Diagram)

Judicial Council LAN/WAN Architecture and Standards Document for IP network design principles and specific hardware elements

preferred, subject to confirmation by the technology program. To achieve seamless 100 percent coverage, communications outlets are placed in accessible locations, typically above suspended ceilings. These dedicated wireless outlets are considered part of the structured cabling system and are passive wiring-only locations, intended for use by active wireless devices, known as wireless access points (WAPs). WAP placement shall be determined through independent analysis via specialized testing and survey techniques (such as heat map or site survey) and shall be developed alongside the active systems network architecture design.

3. Typical Outlet Configurations

Typical configurations can be applied to the quantity of cables per outlet and the location of outlets per room or device. This practice is utilized early in design, so that the designer can begin validating architectural space planning efforts and develop device outlet layouts that are consistent with previous court projects.

Shown in table 17.4 is a matrix of typical communications outlets expected in a courthouse facility. The matrix illustrates the typical quantity of horizontal four-pair copper cables for each communications outlet adjacent to the IP port activation strategy. The quantity of IP port activations is provided factoring the various building system devices that may be deployed.

The standard outlet housing or faceplate shall have a minimum of four ports. All unused ports shall have a blank insert. A wall-mount phone faceplate is an exception.

Figure 17.4 and figure 17.5 identify the typical wall, floor, and future outlet locations within a typical courtroom.

Table 17.4 Communications Outlet Matrix

OUTLET TYPE	FOUR-PAIR CABLES	ACTIVE IP PORTS
Typical Office	3	2
Typical Systems Furniture	3	2
Typical Copier/Printer/Fax	2	2
Wireless Local Area Network Access Point	2	2
Digital Display	2	1
Audiovisual Projector	2	2
Elevator Control	1 (per elevator)	0
Wall Phone	1	0
Audiovisual Control Panel	1	0
Security Control Panel	2	2
Security Camera	1	1
BMS Control Panel	2	1
Intercom	1	1
Lighting Control Panel	2	1
Judge Position	3	3
Clerk	3	2
Court Reporter Position	2	2
Witness Position	2	2
Counsel Table	2	2
Lectern	4	4
Interpreters	2	2

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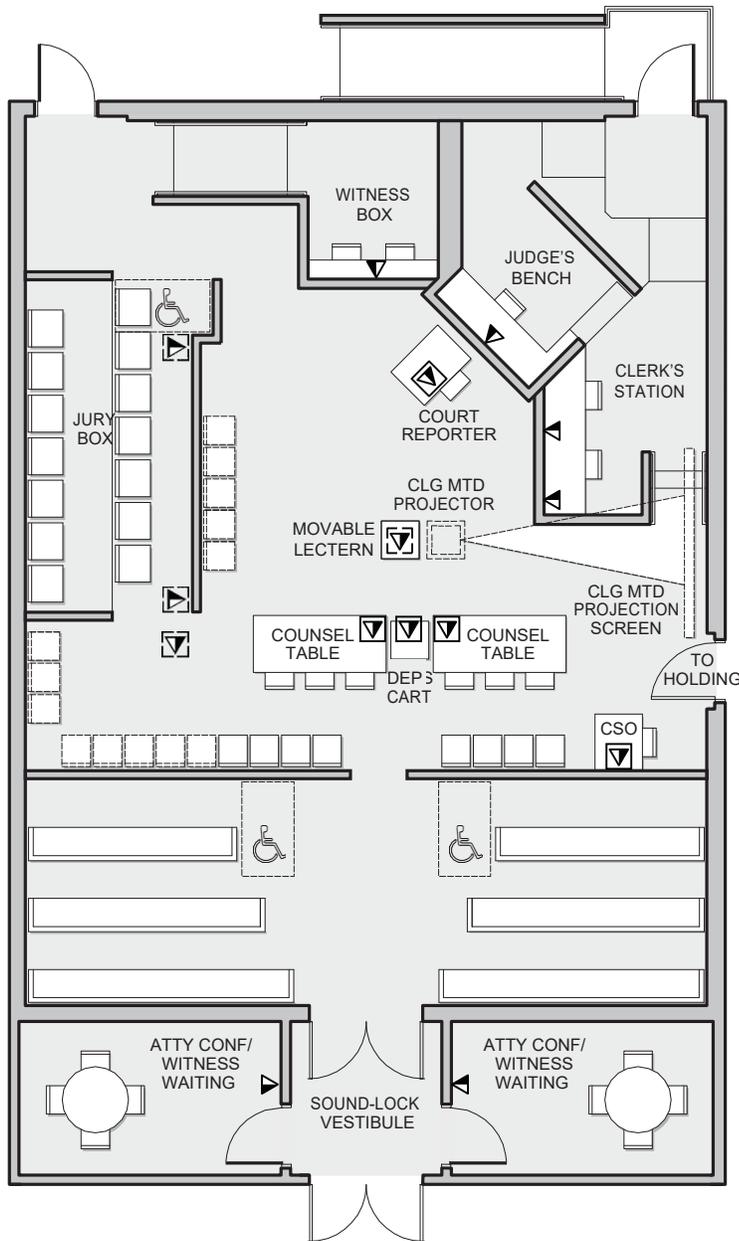
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- ▼ WALL COMMUNICATIONS OUTLET
- ▣ FLOOR COMMUNICATIONS OUTLET
- ▣ FUTURE OUTLETS; PATHWAY ONLY



ATTY CONF = attorney conference.
 CLG MTD = ceiling mounted.
 CSO = court security officer.
 DEPS CART = digital evidence presentation system cart.

Figure 17.4 Multipurpose Courtroom With Corner Bench Showing Outlets

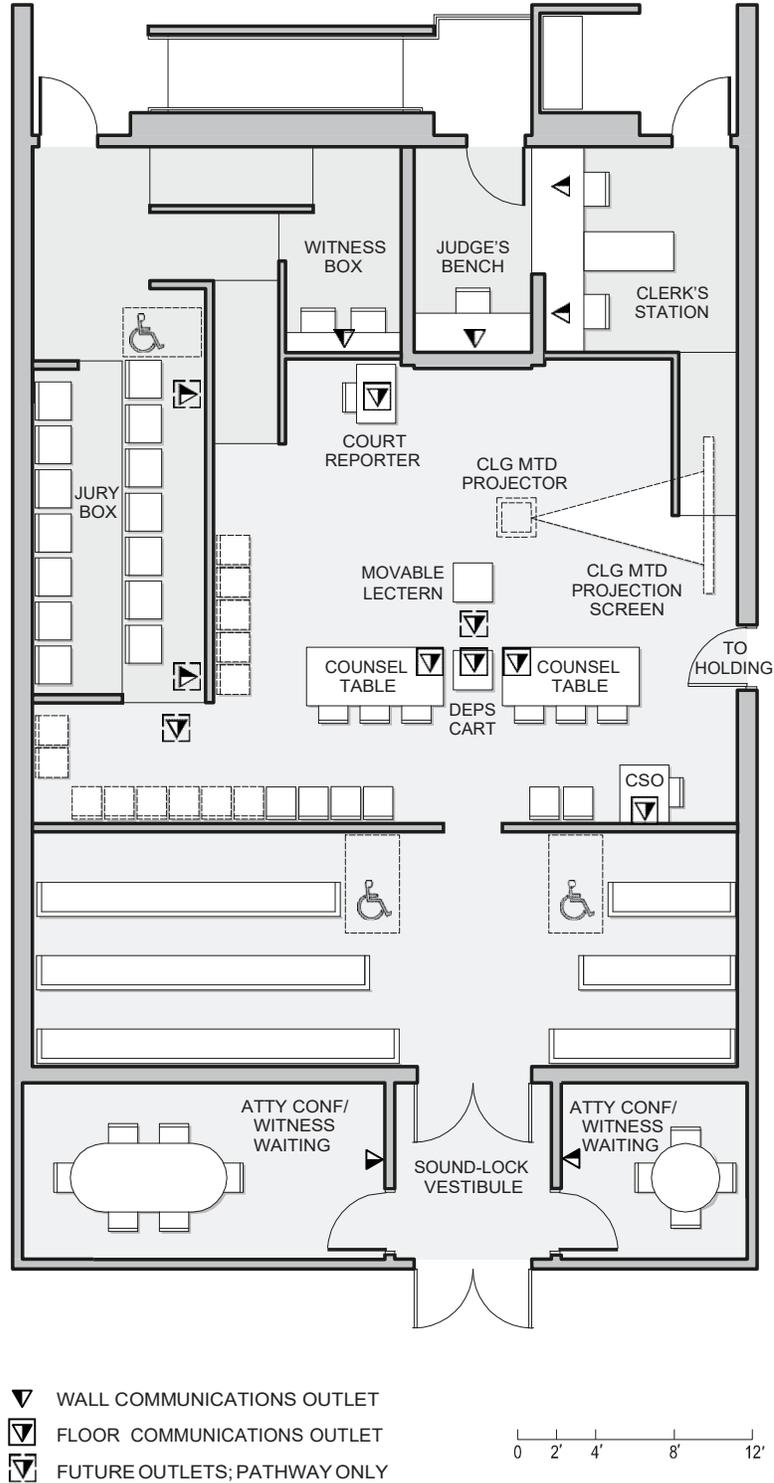


Figure 17.5 Multipurpose Courtroom With Center Bench Showing Outlets

17.F ADMINISTRATION AND VERIFICATION

Administration and verification of the structured cabling system are critical to the efficient functioning of a new courthouse facility through the design phase, construction build-out, and technology systems implementation either day-one or during the lifespan of the building.

Well-documented design processes—where detailed product information, shop drawings, and as-built drawings are submitted by the installing contractor—are project requirements and shall be strictly enforced. Project documentation of this type shall be reviewed in detail for accuracy and completeness.

The structured cabling connectivity solution shall be certified by the component manufacturers and provided with an extended minimum warranty period of 25 years.

1. Identification and Labeling

An identification system that complies with ANSI/TIA-606-C shall be implemented to uniquely identify the network infrastructure, including devices and cabling, installed in the facility. Provide a unique and consistent alphanumeric identification system to form the basis for the development of a communications administration system database to be approved before final design.

2. Connectivity Testing

A complete set of test results verifying the installed link and channel performance parameter results for all cable types shall be provided. Testing for copper cabling should be performed using, at a minimum, a level 4 testing device. For LOMMF cable, testing should be performed using fiber modules incorporating 850 nm vertical-cavity surface-emitting laser and 1,310 nm laser sources combined into a single output port. All testing should be performed in accordance with ANSI/TIA-1152 for copper testing and ANSI/TIA 568-C.0 and NECA/FOA-301 for fiber testing.

The test result documentation shall at a minimum contain testing, verification, and documentation of all performance specification parameters for the installed optical fiber and copper media. The documentation should be in both paper and electronic formats.

3. As-Built Documentation

As-built submittals should be developed in electronic format. At a minimum, the following documents should be provided (in addition to overall building as-built requirements):

- Project site plan of all OSP infrastructure with labeling and identification of each element
- Matrix of the communications cabling indicating type, location, splicing, physical routing, and quantities of all communications cabling
- Communications OSP cable plant test results
- Single-line diagrams showing connectivity throughout the OSP, including all splice and termination locations inside and outside the building
- Building floor plans showing communications outlet locations with identifiers for each cable
- Building floor plans showing communications outlet locations that indicate the quantity of active IP ports per location
- IP port activation matrix with per switch port to cable, to IP address, to virtual local area network (VLAN) identification

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- Building floor plans showing distributed antenna system (DAS) locations
- Enlarged plans of the communications rooms
- Heat maps for WLAN placement, with access point locations
- Building floor plans showing routing of communications pathways and pull-box locations
- Building floor plans showing locations and types of UL fire-stop systems
- Communications interior cable plant test results for copper and fiber
- Single-line diagrams of all components of the DAS, including infrastructure, connectivity, operating and safety devices, control panels, instrumentation, and annunciators

17.G NETWORK ARCHITECTURE

1. Design Principles

The converged IP network design's goal is to develop an intelligent, converged network that provides a responsive, effective, and supportive environment so the courts can achieve their communications network objectives.

A converged IP-based network provides an intelligent communications transport facility that is effective in increasing building performance, functionality, and environmental sustainability. Network convergence should allow the integration, automation, and optimization of all courthouse systems and equipment required to serve the building and its occupants.

Design principles that the integrated IP network should factor in include but are not limited to:

- Maximizing efficiency for occupants;
- Allowing effective resource management;
- Being responsive to user needs;
- The ability to adapt, integrate, and enhance new technologies;
- The ability to accommodate and react to organizational changes; and
- Ease of operation and maintenance.

2. Systems on the IP Network

The building systems communications goal is to employ IP devices so that they can be transported over the IP network. A converged IP network provides a single, logical transmission platform for all the IP devices within a facility.

Building systems connected to the IP network may require a temporary network for commissioning and testing purposes. Typically, the building IP network is one of the last systems to come online. For systems requiring commissioning and testing before network availability, the contractor shall provide a temporary network. Once the building IP network is live, a transfer to the permanent IP network can be made.

The following courthouse technology systems are typically supported by the facility's converged IP network:

- Data for office applications
- Judicial-specific applications
- Case management systems
- Internet/Web access
- IP telephony system
- WLAN communications (Wi-Fi)
- Network management and network control traffic
- Security and access control systems
- Security video media
- Building management system
- Lighting control system
- Digital signage system
- Video and streaming media
- Audiovisual system
- Queuing system
- HVAC system
- Landscaping irrigation system
- Public address system

The technology program, which examines individual project needs and requirements, will determine which of the courthouse technology systems are needed and to what extent they will use the converged IP network.

3. IP Network Segregation

Table 17.5 documents the baseline network usage groups expected on the converged IP network that should be taken into account when designing IP network segregation (e.g., IP addressing and VLAN schemes).

4. Network Availability

- The primary design considerations of a high-availability network begin with the accumulation of information related to strategic business and system functionality requirements. After the primary information has been gathered, recommendations to achieve the required availability should be developed considering the latest communications technologies and converged network design principles.
- The following design parameters shall guide the design process through implementation, commissioning, and testing:
 - Scalability: Include switch port density in the LAN access and core/distribution layer, incoming service interface ports for WAN routers, and voice gateways.
 - Resiliency: Design the network with fault tolerance and/or fail-over capabilities to prevent system downtime resulting from a single point of failure.
 - Redundancy: “Hot standby” redundancy (secondary paths) provides system resiliency by delivering the capability to handle all the traffic and services of the

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Table 17.5 Network Segregation

SYSTEMS	SUBNET SEGREGATION	DEVICES
Data	Data (general user data traffic)	
	Data (printer)	
	Data (application server traffic)	
Voice	Voice over Internet Protocol (VoIP)	
	VoIP End Devices (handsets, etc.)	
	VoIP Call Management	
BMS	BMS IP Controller	
	BMS Servers	
	BMS Monitor Workstations	
Security—SMS	Security Management System (SMS)	Security IP End Devices
	SMS	Monitoring & Badge Workstations
	SMS	Access Control Servers
Security—DLCS	Detention Lock Control System (DLCS)	Intercom & Programmable Logic Controller
	DLCS	Monitoring Terminals
	DLCS	Detention Control & Intercom Servers
Security	Video Media	Security IP Cameras
	Video Media	Monitoring Workstations
	Video Media	Media Video Recording Servers
Security—Duress	Duress Alarm System	Duress Alarm Controller
Audiovisual	AV Control & Monitoring	AV IP End Devices
	AV Control & Monitoring	AV Matrix
	Digital Signage, Queuing & Internet Protocol Television (IPTV)	Display Panels
	Digital Signage, Queuing & IPTV	Media Servers
Wireless LAN	WLAN Trusted	
	WLAN Guest	
	WLAN Controller	
LAN to LAN	Routing LAN Core to LAN Core	
WAN Edge	Routing Edge Public Subnets	
Extranet	Extranet Clients	
Intrusion Detection System	Intrusion Prevention System Monitoring	
DMZ	Demilitarized Zone (DMZ) Subnets	
FW to Core LAN	Routing Firewall (FW) to Core LAN	
Network Management	Network Management	

primary system with minimal or no effect on the user base.

- **Security:** The relationship between network security and network availability is important. A network that has been compromised may not be available to its regular user base or may not achieve the expected performance or availability levels. Careful consideration is required when designing an environment where access to resources is restricted to users based on access lists, filtering, and passwords.
- **Performance:** Design criteria shall ensure the delivery of client-server-based applications, including interfaces and link data rates, quality of services (queuing, loss, latency, and jitter), and application characteristics.
- **Manageability:** System design shall allow administrators to be proactive when dealing with day-to-day operations. Management areas include device activity, bandwidth management, and software and system upgrades.
- **Wireless:** Design a converged network system to provide the user base with logical connectivity without being physically connected to the LAN infrastructure.
- **Technology:** A design consideration should be the adoption of open architecture standards-based communications and networking models to allow interoperability between existing systems and future system enhancements.
- **Environmental:** With the implementation of a converged network system providing business-critical availability, the need to protect the physical equipment environment becomes increasingly important. Environmental considerations typically include power, air-conditioning, and secure access.

5. IP Network Hardware Design Elements

- At the baseline level, the IP network hardware elements in table 17.6 shall be included in the design and integration of the converged IP network and WAN.
- Determine the type and capacity of IP network hardware elements needed on a per-project basis because the size of facility and number of active IP ports will vary significantly between projects. At a minimum, provide 25 percent IP port and switching throughput expansion capability for all LAN core and LAN access switches.
- The IP network hardware elements must be capable of accommodating the IP packet data traffic and IP device port needs of all the project-relevant building systems.

17.H DISTRIBUTED ANTENNA SYSTEM

1. Objectives

A distributed antenna system (DAS) is a network of spatially separated antenna nodes,

Table 17.6 IP Network Hardware Elements

WIDE AREA NETWORK	LOCAL AREA NETWORK
WAN Edge Routers or Switches	LAN Core Switches
Public Zone	LAN Access Switches
Firewalls	
Extranet Security Zone	
Demilitarized Zone	

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Early determination and coordination of DAS requirements are required for MDF space planning and layout.

connected via a transport medium, that provides radio and cellular wireless service throughout the facility. Because of the complexity of design factors related to developing an effective DAS, the extent of this system must be defined in the overall technology program.

A detailed court-by-court analysis is required for each facility to understand which service providers should be supported by the cellular DAS. In addition, coordination for the approval of interconnection to all the required service provider macro networks is necessary. This coordination effort will also need to be extended to public safety entities to accommodate the various frequencies that the emergency responder radio communication system (ERRCS) will support for emergency services and first responders.

2. General Requirements

Provide ERRCS per California Fire Code (CFC) chapter 510; National Fire Protection Association (NFPA) 72, chapter 24; and NFPA 1221, section 9.6. The provision of cellular DAS shall be determined on a project-by-project basis.

3. Public Safety

At a minimum, the public safety entities that should be considered during the design phase are the sheriff or marshal, fire and rescue department, emergency medical services, and any other first responders. A list of all entities and their associated frequencies must be captured under the primary public safety requirements of the DAS. The DAS should be flexible enough to allow for jurisdiction changes and for additional system frequencies. The radio frequencies for the court security provider personnel shall be included for in-building two-way radio communication.

4. Coverage Areas

Radio coverage is the primary concern, followed by cellular coverage for a courthouse building. Detention areas shall be provided with 100 percent radio coverage. Spaces including the fire command center, security operations center, fire pump room, judicial chambers, exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler section valve locations, and all mechanical-room and communications spaces should have a minimum of 99 percent radio coverage.

Other general building area coverage should be within the allowable tolerance set by the Judicial Council and in compliance with CFC chapter 510; NFPA 72, chapter 24; and NFPA 1221, section 9.6 for ERRCS. It shall not fall below a minimum of 95 percent floor area radio coverage.

5. Space Requirements and Connectivity

If required, the DAS headend equipment, the base station, and other main components should be located within the MDF. If the MDF is used, then the space is required to be two-hour rated. There should be provisions within the MDF to support these components and space allocated for service-provider cabinets. Wall space should be dedicated within the MDF for DAS equipment panels and distribution equipment. All DAS equipment shall be placed in a NEMA 4 enclosure. Additionally, wall space in each IDF may need to be reserved to support DAS equipment and connectivity.

The DAS will use the building ISP fiber backbone. Any coaxial cable, splitters, or other DAS distribution media will need to be incorporated into the overall pathway and connectivity requirements. Where radio frequency-based technology requires the use of coaxial cable for horizontal connectivity, provide an RG-6 quad-shielded cable.

The ERRCS cabling shall meet code mandated survivability requirements.

6. Power

The power requirements for the DAS shall follow the CBC and CFC requirements. The DAS radio and cellular base station and other headend equipment must remain operational during a power outage. The source of uninterrupted power is project dependent and should be determined considering the independent needs of each courthouse facility. The ERRCS shall be provided with standby power per CFC 510.4.2.3 and 1203.2.3. Refer to chapter 15, Electrical Criteria, for detailed power requirements.

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Summary of Judicial Council Information Technology office (JCIT) proposed updates to California Trial Court Facilities Standards (CTCFS) Chapter 17 - Network and Communication Systems

Section	Comment/ Revision
17.E Horizontal Connectivity	Pg 17.17-17.18 - Include future outlets, pathway only, for displays at the gallery, behind the witness, and behind the projection screen.

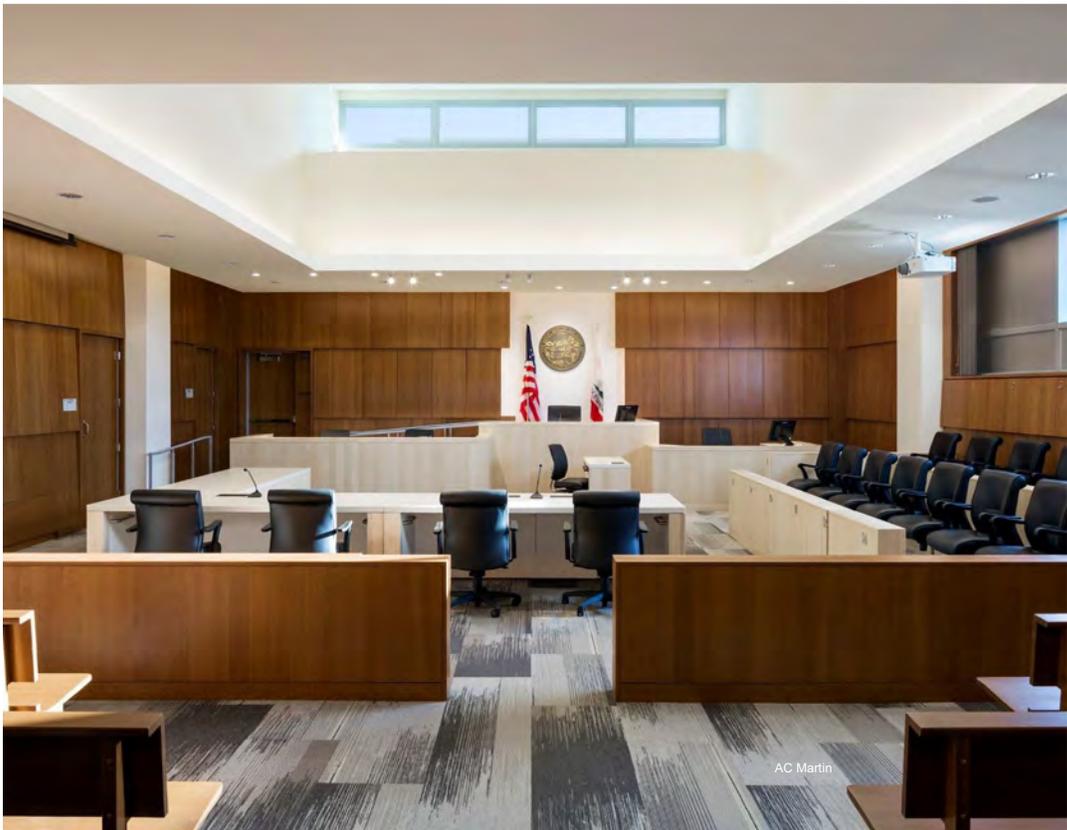
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DIVISION TWO: TECHNICAL CRITERIA

18 AUDIOVISUAL SYSTEMS

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SECTION	TOPIC	PAGE
18.A	Audiovisual Design.....	18.2
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18.E,18.F	Hybrid Courtroom and Video Conferencing Spaces	



AC Martin

Coordinate with network and communication systems, mechanical, and electrical disciplines to ensure that adequate power, cooling, and network bandwidth are provided for all audiovisual systems components to run concurrently and at peak performance.

For further information, see chapter 13, Mechanical Criteria; chapter 15, Electrical Criteria; and chapter 16, Lighting Criteria.

Various configurations in the layout of courtrooms are driven by the function or functions assigned to their operation. Refer to chapter 5, Court Set, for layout descriptions.

18.A AUDIOVISUAL DESIGN

Audiovisual (AV) systems are part of the technology program to be implemented in the planning of the courthouse as described in chapter 17, Network and Communication Systems.

The design shall provide an integrated, reliable, scalable, and sustainable audiovisual system to assist the courthouse with judicial proceedings and day-to-day administrative and training needs. Systems shall be easy to use and maintain, regardless of the size and location of the facility or the number of staff employed.

18.B AUDIOVISUAL CRITERIA

The following criteria shall be followed when designing the audiovisual systems.

1. Reliability and Serviceability

Systems with a high level of reliability and ease of maintenance shall be chosen by implementing industry standard technologies and installation practices, as well as using readily available components and materials. All equipment specified must be available from at least two vendors.

2. Integration

a. System components and infrastructure shall be fully integrated within the design of the courthouse. Equipment and cable management systems that allow for incorporation into the architectural elements, millwork, and furniture shall be selected. An effort shall be made to conceal equipment from plain sight.

b. Audiovisual systems shall be integrated with the telecommunications and information technology (IT) systems to gain efficiency within the building design. Whenever possible, AV and network spaces, pathways, components, and cabling shall be shared. Where applicable, the AV system shall also use the IT systems for the delivery and transmission of audio, video, and control signals.

b.c. Raised floor systems should be used in rooms where there is extensive use of technology and in-floor / distributed power needs such as hybrid courtrooms, video conference spaces and training rooms.

e.d. All nonuser-interface AV equipment shall be installed in dedicated equipment cabinets located in the facilities main distribution frame (MDF) and intermediate distribution frame (IDF) locations. Only user essential equipment shall be installed in individual rooms. See chapter 17, Network and Communication Systems, for specific equipment criteria.

3. Scalability

A system that is nonproprietary, standards based, and scalable to allow for the future addition of components and functionality shall be chosen. The system components and technical infrastructure shall provide for a minimum of 15 percent expansion capability.

4. Sustainability

The designer shall provide a system designed to use environmentally conscious technologies, installation approaches, and power management strategies to reduce the impact on the building's electrical and mechanical systems and to promote overall facility efficiency. Whenever possible, the designer shall specify Energy Star-compliant components.

Commented [PD1]: Please leave the track changes on for all proposed edits, comments, and additions.

Commented [BB2]: "use the IT systems for the delivery of audio, video and control signals, while maintaining Virtual Local Area Network (VLAN) separation from normal data network traffic.

Commented [BL3R2]: Suggest: use the IT systems for the delivery of audio, video and control signals. A/V traffic will use an independent Virtual Local Area Network (VLAN) to maintain separation from normal data network traffic.

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Commented [MB4]: Raised flooring will allow courtrooms and conference spaces to better adapt to the changing technology landscape.

Commented [BL5R4]: Consider adding this text to the sidebar.

18.C TECHNICAL INFRASTRUCTURE

Figures 18.1 and 18.2 illustrates the distribution of technology elements in the courtroom. Wherever possible, colocate audiovisual services with the network infrastructure. See chapter 17, Network and Communication Systems, for coordination information.

1. Equipment Cabinets

Unless otherwise noted, all nonuser-interface AV components shall be installed in dedicated equipment cabinets located in the facility's MDF and IDF locations. If AV equipment is located in rooms other than IDF or MDF rooms (i.e., conference room credenzas), provisions must be made to supply adequate cooling air to keep the temperature below the manufacturer's rating, even when the building-wide air-conditioning system is turned off on nights and weekends. Equipment racks must include all cable management, electrical power distribution, blanks panels, vent panels, and the like. See chapter 17, Network and Communication Systems, for specific equipment cabinet size criteria.

2. Cable Pathways

Where industry best practice allows, the audiovisual cabling shall use the telecommunications pathway infrastructure. Careful planning and design shall be observed to avoid signal cross-contamination. Where Ethernet cable is used, no horizontal AV pathway initiated at the MDF or IDF shall exceed the distance limitation of 295'.

18.D AUDIOVISUAL SYSTEMS DESCRIPTIONS

1. Speech and Audio Reinforcement System

- a. Wired microphones shall use shock and vibration isolation mounts, mute switches, and illuminated mute lights. Radio frequency (RF)-based wireless microphones shall use digital encryption.
- b. When RF-based microphones are used, the designer shall conduct radio frequency sweep tests to ensure that correct allocation and sufficient bandwidth are available.
- c. In courtroom applications, audio-processing systems with ~~4~~ **8 or more** recording outputs and 4 mix-minus speaker zone capabilities shall be provided. The systems shall also provide sound-masking capabilities, or pink noise, to impair the hearing of courtroom participants while confidential conversations are being held between an attorney and the judge at the judge's bench. The clerk's and court reporter's stations shall have mixed- audio output connections.
- d. Speech and audio reinforcement systems design and final commissioning shall follow the current release of the design standards established by AVIXA A102.01:2017, Audio Coverage Uniformity in Listener Area.

2. Assistive Listening

An assistive listening system shall provide secure transmission of both speech and program audio to participants or members of the public. When evaluating the types of assistive listening systems in the design as well as the quantities of headsets, refer to sections 11B-219 and 11B-706 of title 24 of the California Code of Regulations to ensure adequate provisioning.

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Commented [RR6]: Need language about future capacity for sound reinforcement. USB & future audio in/out connection.

Commented [RR7R6]: Complete. Added in sec 18.D.6

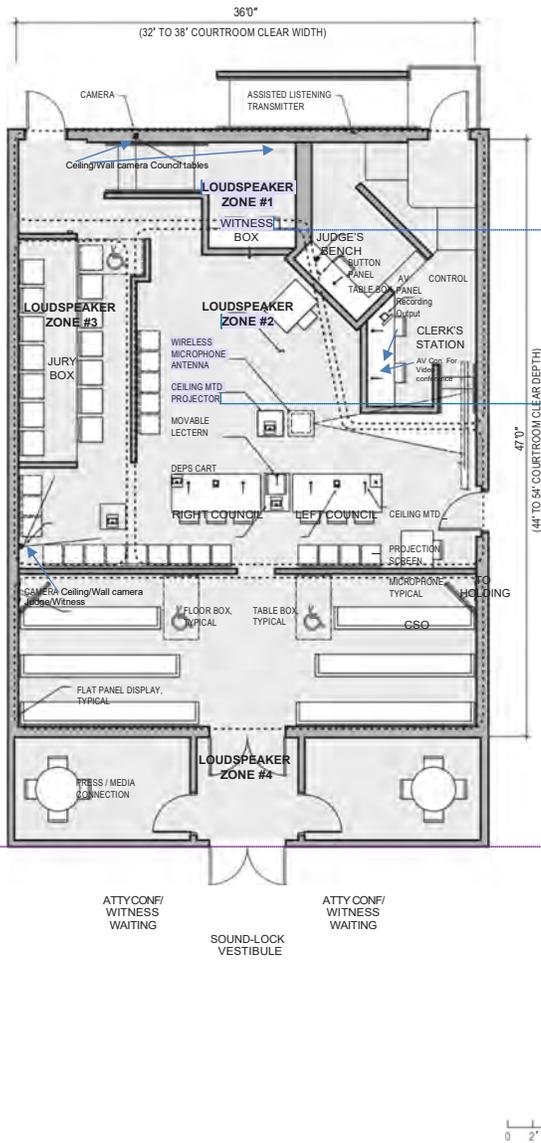
Refer to chapter 10, Building Support Services, for additional information.

MDFs and IDF's are integral parts of the audiovisual system's backbone. Close coordination with the network, mechanical, and electrical infrastructure systems is necessary to ensure successful audiovisual technology deployment. Refer to the corresponding chapters for more information.

Network pathways play a key role in the routing and

distribution of cables for

many of the building technology systems. The sharing of these pathways with audiovisual systems is encouraged. Refer to chapter 17, Network and Communication Systems, and chapter 15, Electrical Criteria, for standards and procedures.



Commented [AL8]: Use of monitors should be suggested as an alternative to projection screens. A monitor behind the witness should also be considered.

Commented [BL9R8]: These are addressed in 18.E.2.m, 18.E.2.p, 18.E.2.q and 18.E.2.w

Commented [AL10]: Wireless microphone and ceiling mounted projector notes seem to be pointing to incorrect items

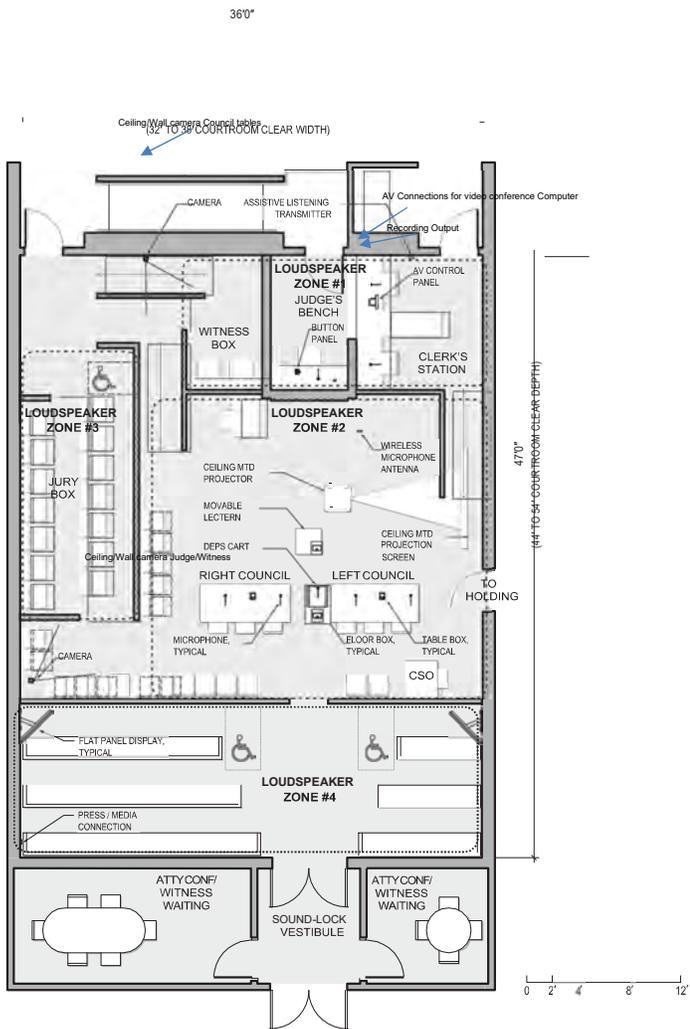
Commented [BL11R10]: The drawing was annotated inline within Word. To correct alignment issues, the diagram should be recreated with annotations embedded and the results posted in this document.

Commented [EM12R10]: I agree with Brian- the layout is a JPG image format but should have the annotations details embedded so they don't get misaligned on the final.

Commented [RR13]: Added equipment to support Video Conferencing.
 4 Fixed Cameras for Judge, Witness & Council table views.
 AV Connection points below the Clerks desks for video conference computer.
 Audio outputs at clerk desk for digital recording.
 Various converters for signal path for audio and video in the Courtroom/Wall plates.
 Equipment rack equipment addition of video and audio inputs and outputs.

Commented [PD14R13]: Gensler: Revise this diagram based on the markup sent separately.

Figure 18.1 Typical Courtroom, Corner Bench—AV Requirement



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Figure 18.2 Typical Courtroom, Center Bench—AV Requirement

Commented [PD15]: Gensler: update this diagram to match the equipment in the other diagram.

Speech and audio reinforcement systems shall amplify program audio and enhance the voice of the speaker to ensure that all participants can adequately hear the material being presented.

Speech reinforcement loudspeakers shall be ceiling mounted and zoned appropriately for the application. Loudspeakers shall be distributed to provide even coverage throughout the space.

Pink noise is the sound-masking criterion.

3. Language Access

The language access system shall work in conjunction with alternate channels of the assistive listening system to provide for live interpretation to participants and audience members in courtrooms. Language access may be provided in other spaces as required on a per-project basis.

4. Video Display

Video display systems that will ensure that all participants can adequately view presented material on a common display shall be provided. The display can be either a projector with a motorized screen or a flat panel.

5. Digital Evidence Presentation System (DEPS)

The DEPS is an additional input to the courtroom video display. It is located between or in front of the attorney’s tables, or in front or to the side of the courtroom clerk’s desk. It is a neutral location for the display of evidence, which can be used by either attorney. Source content may include audio and video playback devices, laptops, and document cameras. The system may be portable or dedicated, depending on courthouse needs.

6. Videoconferencing and Arraignment

The videoconferencing systems in the courthouse enable real-time communication between two or more locations, including locations of remote- interpreters, conference- rooms, training rooms, remote holding facilities, and remote witness locations.

In hybrid courtroom applications, the design shall include the use of a rack mounted PC/computer or NUC (Next Unit of Computing). The use of a PC/rack mounted computer or NUC will allow for the Courtroom to operate any web-based videoconferencing platform. Audio and video shall be connected to the PC/NUCrack mounted computer via USB connection.

Audio from the courtroom shall be routed through the DSP to the PC/NUCrack mounted computer via USB and any corresponding converting equipment required. Audio from the PC/NUCrack mounted computer shall be routed through the DSP to the Courtroom house speaker system.

The video feed shall be transmitted through the video control switcher to the PC/NUCrack mounted computer via USB and any required conversation equipment. Four Fixed PTZ Cameras shall be positioned to provide a clear view of the judge, litigants, and their attorneys, but not of the members of the jury. Multiple Cameras may and views will be needed depending on the size of any given Courtroom or space for all courtrooms. Camera control shall be on the touch panel with pre-set camera views for convenience, not to exclude manual zoom controls of the camera. In cases with multiple cameras, camera selection shall also reside on the touch panel. In addition multiple split camera views will be needed to feed a single video feed with all camera views into the Video Conference Platform.

The desktop view of the PC/NUCrack mounted computer shall be transmitted to the display and projector in the Courtroom (or multiple locations). Wireless Keyboard and mouse shall be provided to control the PC/NUC; rack mounted computer. USB extenders may be needed depending on the distance of the courtroom to the rack AV equipment (IDF room). Routing of the PC/NUCrack mounted computer to the courtroom display and projector shall be sourced at the touch panel.

Easy access mute controls shall be required on the touch panel, including mute control for all video and audio into the courtroom, mute control for audio out to the far-end, and mute control of incoming audio.

Commented [RR16]: Need to review current Remote Language access requirements and guidelines.

Commented [RR17R16]: Added in sec 18.D.11

Commented [PD18]: Gensler: why did you change this word to translation? Please don't make changes on your own. Revert back to the word interpretation, which is a technical term used in court operations.

Commented [RR19]: This section needs to be specific to videoconferencing Rooms. Will be adding a new section regarding the hybrid courtroom for remote participants.

Commented [RR20R19]: Added Complete.

Commented [BB21]: Suggest using generic term. Small form factor or Micro-form Factor PC.

Commented [BL22R21]: Agreed. NUC is a brand name. Also VTC appliances may be considered. Also, a rack mounted PC would be considerably more expensive, and not available from inventory. Better phrased as a PC mounted in the AV rack or at the Clerk’s location.

Commented [RR23]: Fixed Camera. No PTZ

Commented [BL24R23]: A “Fixed” camera will not provide the manual zoom control described in the following paragraphs and may not provide the focal length required to frame the participant properly. It is reasonable to consider fixed-focus cameras as well as PTZ cameras, depending on the needs of the courtroom.

Commented [RR25]: FOR CFAC WG DISCUSSION

JCIT Recommendation: Include 4 fixed cameras to capture Judge, Witness, and each Attorney table. **Facilities Recommendation:** Changed to include 4 fixed cameras to capture each requested view.

Note: On page 13 of the Hybrid Workstream final report, it shows a chart that lists multiple court participants as “on camera view.” Those views include the Bailiff, Clerk and Jury. However, if those independent views are required, that will need an additional 3 fixed cameras to support those views. In Facilities opinion, the Jury should not be on a camera view and the need for the Bailiff and Clerk to show on Camera is unnecessary. For those participants they can use the wireless mic and move in front of an existing camera view to capture themselves, if needed. Note that this chart on page 13 of JCIT conflicts with the information on Page 16 of the same report that lists only the Judge, Witness and Attorney camera views as a requirement.

Fixed camera cost: \$1995.00
Equipment cost only, does not include infrastructure cost i.e., mounting, cable, power, programming.

The designer shall coordinate the data rates and transmission technology specific to the videoconferencing systems between the court and other key facilities that require connectivity. Special lighting considerations and room finishes are typically required in spaces where videoconferencing sessions are held. See chapter 16, Lighting Criteria.

7. Control System

- a. Provide a control system for the management, monitoring, operation, and notification of local and facility-wide audiovisual equipment.
- b. The control system shall be designed to use the network infrastructure for the distribution of commands and data.
- c. Control systems provide simplified means of managing the functions of the audiovisual operations of the facility. All control system user-interface devices shall meet the requirements as stated in the Division of the State Architect (DSA) access compliance requirements of the California Building Code.

8. Control System Requirements

- a. Before starting the design of the touch panel graphical user interface (GUI), obtain the template for a typical courtroom design from the Judicial Council.
- b. Conduct a GUI coordination meeting with the court and the Judicial Council to determine if the court has a preferred approach, and select an approach.
- c. Based on the selected approach, customize the design to conform to the requirements of this project, and submit a set of screen shots for the most complex courtroom design. Explain if a single button performs multiple functions (e.g., partition sensors, teleconference in progress, fire alarm signal, shared resources being used).

Commented [RR26]: Need language to reflect the addition of the hybrid courtroom the control system integration.

Commented [RR27R26]: Added to Sec 18.D.6

Commented [AT28]: Is the videoconferencing system would be able to transmit to remote users displays done through projected screens, etc.

Commented [PD29R28]: Yes, videoconferencing allows the projection content to be simultaneously viewed by remote users.

- d. Once comments on the courtroom GUI have been incorporated, revise and resubmit the GUI to include the remaining spaces within the courthouse that use AV control systems.
 - e. Once the comments on the complete GUI design have been approved, write processor code to operate the GUI (but not the actual controlled devices). Load it into a processor on the internet, and submit the appropriate files necessary to simulate the actual operation of the touch panel on a computer using a mouse.
 - f. If the functioning GUI has been approved, proceed with the installation.
- 9. Touch Panel Design**
- a. See chapter 24, Graphical User Interface Template, for the touch panel template.
 - b. All panels are to have the time and date displayed in the same position on every page.
 - c. All pages are to have a title, indicating the piece of equipment and/or functionality being controlled.
 - d. Each individual room type shall be given the same user interface design and layout throughout the project, to the greatest extent practicable.
 - e. User interface design shall be as consistent as possible, taking into account the variations in system functionality from room type to room type, throughout the project.
 - f. Whenever the same button appears on more than one page, it must be in the same position on each page. This includes buttons that cause page-to-page flips.
 - g. Functions used during a general presentation shall be accessible with a minimal amount of button presses or page flips.
 - h. The sidebar and mute buttons from the judge's button panel shall also appear on every touch panel page.
 - i. Individual microphone volume controls should not be on the main control page but should be on a setup page, to reduce clutter.
 - j. Include the capability for automatically powering down all nonessential equipment supporting each individual room at a preset time (e.g., 6:00 p.m) each day. Provide that the time can be set by the user on the room page, with an override valid for one day and the automatic power down restarting the next day. Play an audible sound from the touch panel one minute before automatic power down occurs, and allow the operator to override this function.

10. Television (TV)

Infrastructure to feed TV signals to desired spaces within the courthouse shall be provided. TV is usually viewed in the jury assembly room, employee break rooms, and some conference rooms. If the court has a contract with cable or satellite TV companies, provide the cabling and infrastructure to support this service. If the court wishes to view free, over-the-air TV, provide a roof-mounted antenna and tuners at the desired locations.

11. Provisions for Video Remote Interpreting

Provide the infrastructure to support video remote interpreting in courtrooms (VRI) in courtrooms either through the court's videoconferencing system or through the use of third-party videoconferencing software platforms (e.g., Zoom, MS Teams, Cisco Webex) that can be hosted on the videoconferencing system. When conducting VRI, the equipment and technology must provide high-quality communications, regardless of the physical location of the participants, so that all participants can be seen and heard whenever possible. See [Recommended Guidelines and Minimum Specifications for Video Remote Interpreting \(VRI\) for Spoken Language-Interpreted Events](#) and the [Recommended Guidelines for Video Remote Interpreting \(VRI\) for ASL-Interpreted Events](#). VRI is generally preferred over telephonic interpreting, which does not provide visual cues. Several third-party videoconferencing platforms provide options for confidential conversations with the litigant, attorney, and interpreter. Also, these platforms may provide options for simultaneous interpretation, consecutive interpretation, and sight translation of documents. Some platforms, like Zoom and Webex, have a built-in simultaneous interpretation feature (i.e., separate audio channel).

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Commented [RR30]: Need to back check this section to VRI group.

Commented [RR31R30]: Language added from VRI working Group. Complete.

Commented [LE32]: Complete.

Commented [PD33R32]: Input from Center for Families, Children and the Courts

Commented [PD34]: Gensler: I agree with your insertion of links to these documents in typed form.

An MDF is a space in which the core technology of the facility is concentrated. An MDF serves as a central point for the distribution of various subsystems that are part of the overall technology of the facility. Refer to chapter 17, Network and Communication Systems, for additional information.

See chapter 11, Architectural Criteria, for rooftop equipment information.

12. Digital Signage and Customer Flow Management

The digital signage system consists of video displays and signal transport methods capable of accepting and displaying information from local or remotely generated video content sources and software. Digital signage is used for wayfinding, display of the court calendar, and other visual messaging as required by the facility.

Customer flow management (CFM) systems direct the flow of customers in waiting areas for a service provided at the facility. The system consists of customer intake, printing of queue tickets, sending of SMS (short message service) texts to court users' personal devices, and visual and audible announcements of the queuing process.

- a. In the waiting area, provide a minimum of one video display and speaker that are visually accessible to the public. Signal transport and system requirements shall be coordinated during the design phase.
- b. Video displays shall be integrated with the architecture of the building to allow for adequate technical infrastructure, cooling, ventilation, and future display hardware upgrades. See chapter 11, Architectural Criteria, for signage information. Digital signage systems may be interconnected to the court case management system and the CFM system to provide additional layers of information to the public specific to court proceedings, directories, and individual courtrooms.

18.E DESCRIPTION OF COURTHOUSE SPACES

1. Overview

Provide a turnkey audiovisual system—to include equipment and material, with associated labor, whether specifically mentioned herein or not—to ensure a complete working system that meets the needs of the court.

2. Typical Courtrooms

a. Add microphones at the Bailiff, Lectern and additional Wireless microphones.

a.b. Provide a sound reinforcement system with 15"–18" gooseneck microphones at the following locations.

- Judge's bench (one), clerk's workstation (zero to two, at the discretion of the court), and attorney tables (two on each table) on movable bases with a mute button and a mute light. At the attorney's tables, cabling shall be through separate grommets, not through the cable box used for power, video, and data.
- Witness station on a fixed threaded mount.
-

b.c. If a floor box is provided for a lectern or DEPS cart, provide a microphone on a fixed threaded mount. If the lectern does not have a dedicated location, provide a clip for a handheld microphone.

d. Install a video conferencing system based on the design criteria of section 18.D.6.

e.e. At the discretion of the court, provide a boundary microphone at the judge's location for use during a sidebar to record the sidebar and/or feed the court reporter's headphone jack.

d.f. Provide a minimum of one handheld wireless microphone for use by the jury and for general use by litigants and during voir dire. The antennas can be either remotely

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Commented [RR35]: FOR CFAC WG DISCUSSION

JCIT recommendation to add microphones at the Bailiff, Lectern and additional Wireless microphones. **Facilities recommends:** Microphone placements should remain the same as before. Bailiff does not require a specified microphone. If needed, the included wireless microphone can be used. The lectern is a mobile unit and the wireless microphone included is better suited to a mobile unit. One wireless microphone is included already, there is no need for two.

Gooseneck wired microphones cost: \$300-\$400.
Wireless Microphone Cost: \$1500.00
Does not include infrastructure cost for new cable pathway, floor box cost and programming.

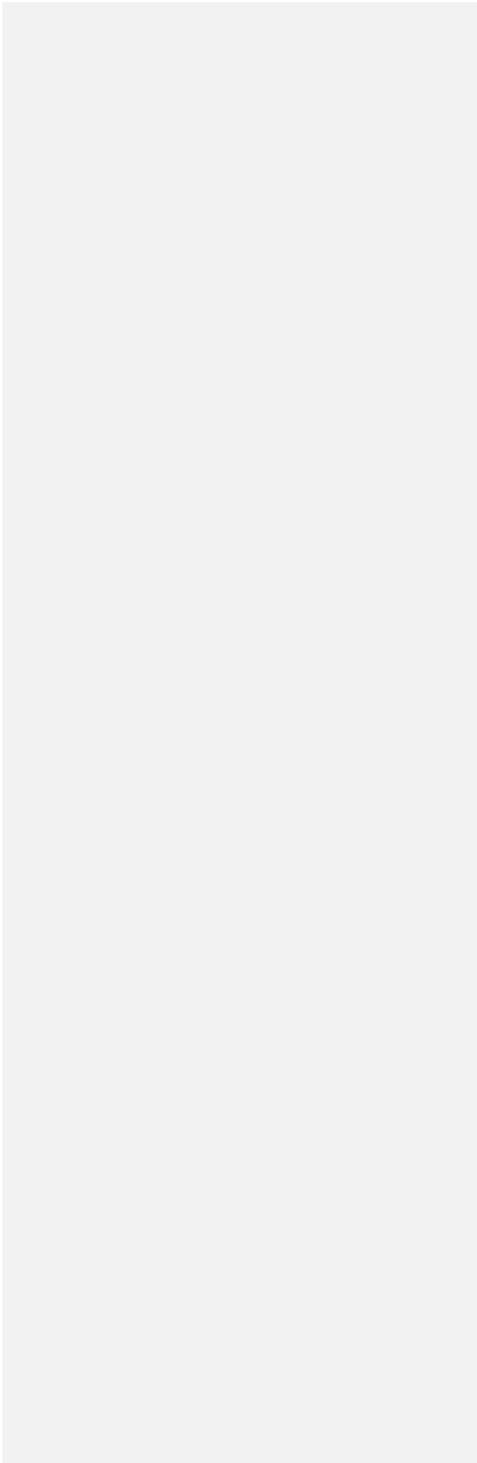
Commented [BB36R35]: Suggest microphone at the court reporter station for use during hybrid hearings.

Commented [BL37R35]: Agreed.

Also consider adding to the sidebar suggestions for microphone coverage patterns (omni-directional, cardioid, super-cardioid, hyper-cardioid) depending on the location and type of use.

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located in the courtroom or mounted on a receiver within the courtroom.



e.g. Provide a source of pink noise, enabled in all zones except the bench when the judge calls a sidebar. The court shall be able to set the volume or mute as needed from the touch panel.

f.h. Provide ceiling loudspeakers configured as a mix-minus system. In a mix-minus system, audio from microphones in a zone is not reproduced through loudspeakers within that zone. The ceiling loudspeakers shall be zoned as follows:

- Jury (if the individual courtroom has a jury box)
- Gallery
- Bench
- Well

g.i. At the discretion of the court, provide loudspeakers in the holding cells with on-off control from the touch panel. If holding cells are shared between adjoining courtrooms, provide a system to select and route audio from either courtroom.

h.j. Provide an 8 or 12-channel audio feed for recording court proceedings. The actual recording equipment shall be provided by the court. At the discretion of the court, the feeds shall terminate at the equipment rack or be brought to the clerk's station within the courtroom. Provide audio input to allow recordings to be played back within the courtroom. At the discretion of the court, the channels shall be assigned to the following:

- Judge and clerk (with optional sidebar)
- Witness
- Plaintiff/prosecution, wireless microphone, telephone receive, videoconference receive
- Defense, lectern

i.k. Provide line-level monitor outputs for the clerk and court reporter.

j.l. Provide a two-channel ADA/CBC (Americans with Disabilities Act/California Building Code) compliant infrared assistive listening system used to meet ADA/CBC requirements (channel 1) and language translation (channel 2). At the discretion of the court, more than two channels may be specified if the court has a need for multiple languages translated simultaneously.

k.m. Provide a single-line teleconference system for making telephone calls using microphones (wired and wireless) and ceiling loudspeakers, with acoustic echo canceling on every microphone input. The output shall be selectable either to feed the ceiling speakers (default) or channel 2 of the assistive listening system for use when the language translator is remote. Depending on the courthouse system, the telephone system may be either analog or Voice over Internet Protocol (VoIP).

n. Include large flat panel displays on wall in place of projector and screen. Provide a display for attorneys to display evidence and for judges to display jury instructions. All displays shall be placed so that the bottom of the image is a minimum of 48" above the finished floor. They may be either video projectors (~6,000-8,000 lumens) or flat panel displays (98" or larger). Display equipment shall have a minimum resolution of either 1,920 x 1,080 or 1,920 x 1,200 pixels. The projector shall be on a fixed mount on the courtroom ceiling with a lens selected to fill the projection screen. The screen monitor shall be located opposite the jury and behind witness. If monitor is not needed for day one, provide appropriate power and data behind the screen-the wall for future installation of a flat panel display.

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Commented [BB38]: The court shall be able to set the volume or mute as needed from the touch panel.

Commented [BL39R38]: This is covered in 18.D.8

Commented [AL40]: Lighting controls must be carefully considered if using a projection screen

Commented [BL41R40]: Or lighting placement where projection screens are installed. This would be addressed in a separate chapter. Lighting control is not part of the standard.

Commented [RR42]: FOR CFAC WG DISCUSSION

JCIT recommendation: To include large flat panel displays on wall in place of projector and screen. Facilities Recommends: Flat panel displays are included in the standards as an option between projector or flat panel. The projector screen gives a much larger area of view as compared to a display monitor and at much reduced cost. To provide the same area, you may need to provide a large display monitor. When displays are specified, often the displays get value engineered out of project as a cost saving method.

98 flat panel display cost: \$8K-\$9K
Over 100in displays to match 110in projection screen
Cost: upwards of 12k.
Does not include infrastructure cost i.e., backing, power, data, mounting and programming.

- ~~m.~~ If a projector is used, provide an electrically-operated projection screen with a contact-closure interface, concealed in the ceiling when not in use, sized so that the height is one-sixth the distance to the back row of the jury. Match the aspect ratio to the projector.
- ~~n.o.~~ Provide a multiformat routing switcher or network switch for source selection. In either case, the clerk or judge shall control access to the display.
- ~~o.p.~~ Provide an additional display for the judge and/or clerk, if sightlines prevent the judge and/or clerk from seeing the display directly. It can be connected to a dedicated monitor or a spare HDMI (High-Definition Multimedia Interface) or DVI (Digital Visual Interface) (not DisplayPort) input on a computer monitor supplied by the court.
- ~~p.q.~~ Provide access to the display from a computer on each counsel table and at the judge and clerk location. At the discretion of the court, provide access at the DEPS location.
- ~~q.r.~~ Provide a table box at each attorney's table to accommodate the computer inputs, along with power and data. Cutouts in the millwork shall be coordinated with the furniture provider.
- ~~r.s.~~ Provide only infrastructure to support a real-time transcription system between the court reporter and the judge, compatible with the systems used by the court.
- ~~s.t.~~ Provide document cameras for deployment in any each courtroom, a minimum of one per floor. They may be mounted on carts, for mobility.
- ~~t.u.~~ Provide an AV control system with one minimum one-7" desk-mounted wired touch panel (Power over Ethernet (PoE)) that can be connected via a network cable at either the judge, clerk, or (optionally) bailiff location.
- ~~u.v.~~ Provide a button panel with a minimum of two buttons, permanently mounted at the judge's bench, to control, at a minimum, the sidebar function and audio/video mute.
- ~~w.~~ Provide two flat panel gallery monitors on articulated mounts in all courtrooms.
- ~~v.~~ Provide infrastructure for two gallery monitors, consisting of power and data connections plus empty conduits for future signal connections. If not used on day one, wall boxes shall be behind the wall coverings, if possible.

3. High-Profile Courtroom

- a. Provide all the capabilities of the typical courtroom.
- b. Provide two flat panel gallery monitors on articulated mounts.
- c. Provide the capability for the judge to face forward during a videoconference rather than looking sideways at the projection screen, allowing the camera at the rear of the courtroom to pick up a full-face view of the judge, rather than a profile. It can be connected to a dedicated monitor or a spare HDMI or DVI (not DisplayPort) input on a computer monitor supplied by the court.
- d. Provide an installed videoconference system with three high-definition PTZ (pan-tilt-based on the design criteria of section 18.D.6. zoom) cameras, located as follows:
- ~~At the rear of the courtroom, pointed at the judge~~
 - ~~On the jury wall, pointed at the witness (so as not to pick up the jury)~~
 - ~~Behind the bench, pointed at the attorneys' tables~~
- e. At the discretion of the court, provide audio and video feeds from the cameras or multimedia sources, plus a mix of the audio from within the courtroom to an alternative location within the courthouse for overflow capabilities. This signal shall use the
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Commented [RR43]: FOR CFAC WG DISCUSSION

JCIT Recommendation: Included Document camera per Courtroom.

Facilities Recommendation: Document cameras were previously included as a shared unit per floor, not per a Courtroom. The unit is provided with the Digital Evidence Presentation Cart. This has been changed to per courtroom. To be confirmed with CFAC Work Group.

Document Camera Cost: \$3K - \$4K.

Infrastructure already included via the mobile cart included in design.

Commented [RR44]: FOR CFAC WG DISCUSSION

JCIT Recommendation: Provide two touch panels at the judge and clerk.

Facilities Recommendation: A single touch panel is all that is needed since there is push button control for audio and video controls at the Judge desk already included in design.

Touch panel Cost: \$3K-\$4K.

Does not include infrastructure cable run for new location.

Commented [RR45]: FOR CFAC WG DISCUSSION

JCIT Recommendation: To include audience monitors in all Courtrooms.

Facilities Recommendation: This is currently included in high profile Courtrooms only.

50in display cost: \$500.00 - \$1000.00

Does not include infrastructure cost i.e., Mounting, Power and programming.

Commented [RR46]: Will need to mod language based off new Hybrid Courtroom criteria.

Commented [RR47R46]: Complete.

Commented [RR48]: FOR CFAC WG DISCUSSION

JCIT Recommendation: To include audience monitors in all Courtrooms.

Facilities Recommendation: This is currently included in high profile Courtrooms only.

50in display cost: \$500.00 - \$1000.00

Does not include infrastructure cost i.e., Mounting, Power and programming.

Internet Protocol network for data transport. This feed must be separately enabled both in the courtroom and at the alternative location for security reasons.

- f. Provide a wall plate in the gallery on the same wall as is the jury for TV or radio stations feeding balanced analog audio (□ 2) and 3G-SDI (serial digital interface) video (□ 2) to a weatherproof media pedestal external to the building. Also include a balanced analog feed from the courtroom audio system and one 20 amp power circuit.

4. Courtrooms with Arraignment Dock

- a. Provide all capabilities of a typical or high-profile courtroom but without any accommodations for a jury.
- b. If the dock has floor-to-ceiling windows, provide a wall-mounted (not ceiling-mounted) tamper-resistant microphone, adjacent to or attached to the window overlooking the courtroom. If the dock does not have a full glass wall, no microphone may be needed, unless the voices of those in custody need to be recorded.
- c. Provide ceiling loudspeakers with appropriate security hardware within the dock area.
- d. Provide touch panel controls of the speakers and microphones in the dock area.
- d.e. Discuss with the court in detail the exact expected use of the dock, and provide equipment to meet the needs.

5. Jury Deliberation Rooms

On a per-project basis, the court may choose to use these spaces as conference or meeting rooms, and if they do, the minimum infrastructure requirements for these types of spaces shall also be included.

- a. Provide a minimum 75" flat panel for displaying evidence.
- b. Provide a floor box under the table for laptop inputs and a line-level output for the assistive listening system. This input will be used for connecting a laptop for displaying evidence saved electronically or for connecting a portable document camera.
- c. Provide a table box to accommodate the computer input, along with power, data, and audio output to feed the assistive listening system. Cutouts in the millwork shall be provided by the furniture providers.
- d. Provide a wall-mounted button panel for control of the AV system located at the video display.
- e. Provide a portable ADA-compliant encrypted RF assistive listening system with a microphone for voice pickup and input for multimedia audio at the table surface.

6. Jury Assembly Rooms

The jury assembly area consists of a single public space or multiple spaces that can be combined or separated to accommodate various functions and group sizes. The audiovisual systems in these spaces shall provide for speech reinforcement, paging, and the presentation of audiovisual materials to a group or groups of potential jurors. The public address system for emergency communication throughout the courthouse shall also serve the jury assembly areas. These areas may also be used by the court as multipurpose spaces for meetings, training, or multimedia presentations or for public events.

- a. Provide a sound system with overhead loudspeakers for voice amplification, television viewing, multimedia presentations, and juror orientation.
- b. Provide a ~~1080p~~ resolution video projector (~5,000–8,000 lumens) on a fixed mount with a lens selected to fill the projection and/or television screens.

**DIVISION TWO:
TECHNICAL CRITERIA**

- 11 Architectural Criteria
- 12 Structural Criteria
- 13 Mechanical Criteria
- 14 Building Management System Criteria
- 15 Electrical Criteria
- 16 Lighting Criteria
- 17 Network and Communication Systems
- 18 AUDIOVISUAL SYSTEMS**
- 18.A Audiovisual Design
- 18.B Audiovisual Criteria
- 18.C Technical Infrastructure
- 18.D Audiovisual Systems Descriptions
- 18.E Description of Courthouse Spaces
- 19 Acoustical Criteria
- 20 Fire Protection Criteria

Commented [RR49]: Will need language to reflect Hybrid Courtroom connections.

Commented [RR50R49]: Complete.

Commented [PD51]: Gensler: your version shows this bullet incorrectly as 6. It should be 5.

Commented [MB52]: Recommending that the minimum standard should be 4K.

Commented [BL53R52]: 4K resolution would be a requirement where 4K content is presented. 4K resolution can be a disadvantage when viewing text from a computer desktop or document because the text is 1/4 the size of the same image in a 1080 format. Keeping the standard at 1080 would not prevent selection of a 4k solution during the needs analysis of a new project.

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- c. Provide an electrically operated projection screen, concealed in the ceiling when not in use, sized as large as possible, taking into consideration ceiling height and the requirement that the bottom of the image shall be 48" above the floor. Match the aspect ratio to the projector.
- d. Provide a wireless handheld or clip-on microphone for ad hoc presentations.
- e. Provide a wired push-to-talk microphone for announcements.
- f. Provide a Blu-ray player for juror orientation.
- g. Provide a television tuner to entertain prospective jurors while they wait to be called. Depending on the data source of TV and desires of the individual court, this tuner may be owner furnished.
- h. Provide an audio-only miniplug input for a background music source.
- i. Provide a single-channel ADA-compliant assistive listening system used to meet ADA requirements.
- j. Provide a computer input at the staff counter.
- k. Provide a multiformat routing switcher or network switch for source selection.
- l. At the discretion of the court, provide an input for the audio and video feed from the high-profile courtroom. This feed must be enabled separately in both the courtroom and the jury assembly room.
- m. At the discretion of the court, provide a floor box for a lectern with laptop inputs along with a wired microphone input.
- n. Provide an AV control system with one 7" wired touch panel (PoE) that can be connected via a network cable at the staff counter to control all aspects of the audiovisual system.
- o. At the discretion of the court, provide an installed a videoconference system.

7. Training Room

- a. Provide a sound reinforcement system with overhead loudspeakers for voice amplification and multimedia presentations.
- b. Provide one or more large flat panel displays, appropriately sized for the room.
- c. Provide a single-channel ADA/CBC-compliant RF or infrared assistive listening system for use to meet these requirements.
- d. Provide a floor box for a lectern or desk with laptop input.
- e. At the discretion of the court, provide a wireless handheld or clip-on microphone system.
- f. Provide a multiformat routing switcher or network switch for source selection. If feasible, combine this device with the audiovisual control system.
- g. Provide one 7" wall-mounted wired touch panel (PoE) to control all aspects of the audiovisual system.
- h. At the discretion of the court, install a videoconference system.

8. Judicial Conference Room

- a. Provide one or more large flat panel wall-mounted displays, appropriately sized to the room, with separate side-mounted loudspeakers.

Or Projector

Commented [AL54]: Multiple monitors should be suggested as an alternative to projection screens.

Commented [BL55R54]: These are addressed in 18.E.2.m, 18.E.2.p, 18.E.2.q and 18.E.2.w

Commented [MB56]: Is this still needed? Modern video content is typically delivered via a digital recording or stream.

Commented [BL57R56]: Mark this as optional?

Commented [PD58]: Gensler: you missed this bullet.

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Commented [MB59]: Recommend the following in Judicial Conference rooms - If the space is big enough to support a projector, then it should have one. (should use the largest display that is appropriate for the space)

Provide a 4K resolution video projector (~5,000-8,000 lumens) on a fixed mount with a lens selected to fill the projection and/or television screens.

Provide an electrically operated projection screen, concealed in the ceiling when not in use, sized as large as possible, taking into consideration ceiling height and the requirement that the bottom of the image shall be 48" above the floor. Match the aspect ratio to the projector.

Commented [BL60R59]: Often, a display that is as large as possible, is too wide to be seen comfortably by everyone at the table. A display should be as large as practical.

A projector should be considered but not an automatic solution based solely on the size of the room.

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- b. Provide a portable or fixed ADA/CBC-compliant encrypted RF assistive listening system with a microphone for voice pickup and input for multimedia audio at the desk surface.

Commented [BL61]: RF, or IR,
(Security concerns may prevent an RF solution)

- c. Provide a floor box under the table with laptop inputs and a line-level output for the assistive listening system.
- d. Provide a table box to accommodate the computer input, along with power, data, and audio output to feed the assistive listening system. Cutouts in the millwork shall be provided by the furniture provider.
- e. Provide recording capabilities through the in-room AV system.
- e.f. Provide one 7" desk-mounted wired touch panel (PoE) to control all aspects of the audiovisual system.
- g. Provide a teleconference video conferencing system for making telephone calls with acoustic echo canceling on every input using microphones installed in the table and ceiling loudspeakers. Depending on the courthouse system, the telephone system may be either analog or VoIP. Provide a system that operates with multiple platforms, such as, Zoom, Teams, Bluejeans etc.
- f.h. Provide raised flooring to support flexible power and data needs.
- g. At the discretion of the court, provide an installed videoconference system.

**DIVISION TWO:
TECHNICAL CRITERIA**

- 11 Architectural Criteria
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9. Executive Conference Room

- a. Provide a sound reinforcement system with overhead loudspeakers for voice amplification (depending on the size of the room) and multimedia presentations.
- b. Provide one or more large flat panel wall-mounted displays with separate side-mounted loudspeakers or, soundbar, or integrated ceiling speakers.

OR Projector
- c. Provide a portable or fixed ADA/CBC-compliant encrypted RF assistive listening system with a microphone for voice pickup and input for multimedia audio at the desk surface.
- d. Provide a table box to accommodate input from a laptop, along with power and data. Cutouts in the millwork shall be provided by furniture providers.
- e. Provide a multifunction routing switcher or network switch for source selection and image processing. If feasible, combine this device with the audiovisual control system.
- f. Provide one 7" desk-mounted wired touch panel (PoE) to control all aspects of the audiovisual system.
- g. At the discretion of the court, provide an installed a videoconference system with omni directional voice activated camera(s) intergraded into the room AV system.

Commented [PD62]: Gensler: you missed this bullet.

Commented [PD63]: Gensler: you didn't pick these changes.

Commented [MB64]: Recommend raised floors in all hybrid or video conferencing spaces.

Commented [BL65R64]: 18.E.8.h Should be added to each Room Type section or be placed in a section that applies to all AV spaces.

Commented [PD66]: Gensler: this bullet was moved. You didn't delete it from here.

Commented [PD67]: Gensler: all these bullets need to remain as noted here. Your version is missing this content.

Commented [MB68]: Recommend the following in Executive Conference rooms - If the space is big enough to support a projector, then it should have one. (should use the largest display that is appropriate for the space)

Provide a 4K resolution video projector (~5,000–8,000 lumens) on a fixed mount with a lens selected to fill the projection and/or television screens.

Provide an electrically operated projection screen, concealed in the ceiling when not in use, sized as large as possible, taking into consideration ceiling height and the requirement that the bottom of the image shall be 48" above the floor. Match the aspect ratio to the projector.

Commented [BL69R68]: Often, a display that is as large as possible, is too wide to be seen comfortably by everyone at the table. A display should be as large as practical.

A projector should be considered but not an automatic solution based solely on the size of the room.

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Commented [BL70]: What is an omni directional voice activated camera?

There are several options for auto-framing conference room cameras. Few, if any, still rely on audio for aiming. This should be rewritten to describe the functional requirement and allow for selection from readily available technology.

Commented [PD71]: In the current market rate, the hybrid courtroom functionality being introduced in 2023 Standards on top of what was part of 2020 Standards will lead to a cost increase of \$25,000 per courtroom.

Commented [PD72R71]: CFAC WG decided not to include this section with diagrams.

18.F HYBRID COURTROOM AND VIDEO CONFERENCING SPACES

Provision for hybrid courtrooms and expanded video conferencing spaces within a courthouse can alter the design needs and space requirements for the facility. With increased technology in these spaces, it can reduce the building footprint for courtrooms and conferencing spaces. The combination of reduced square footage and advanced technology can lead to lower construction cost. Each new courthouse facility will need an independent case-by-case evaluation to determine if these practices can be used in its design and construction. The illustrative plans in figures 18.3-18.5 are conceptual design layouts for courtrooms and conference rooms that may be used as a guideline for future courthouse facilities.

- a. Figure 18.3 illustrates that with the inclusion of live streaming and remote proceedings, there is a potential to eliminate the public gallery seating in the courtroom and the attorney

~~client conference rooms. This will lead to a saving of approximately 500 SF per courtroom. This methodology may be implemented for all the courtrooms in a facility or a selected few to arrive at significant savings in square footage.~~

~~b. Figure 18.4 illustrates that non-jury proceedings can utilize a 700 SF large conference room with hybrid capabilities to conduct hearings. Depending on the case load for a certain facility, certain number of courtrooms may be designed in this manner when jury trials are not needed.~~

~~e. Figure 18.5 illustrates an adjudication conference room that utilizes a 300 SF space for judicial officer and clerical staff to participate in a remote proceeding with everyone else participating remotely. This space can be used in a fully remote setup depending on the operational changes at a court facility. The spaces can be added to a project in lieu of courtrooms to achieve significant savings in building square footage and construction cost.~~

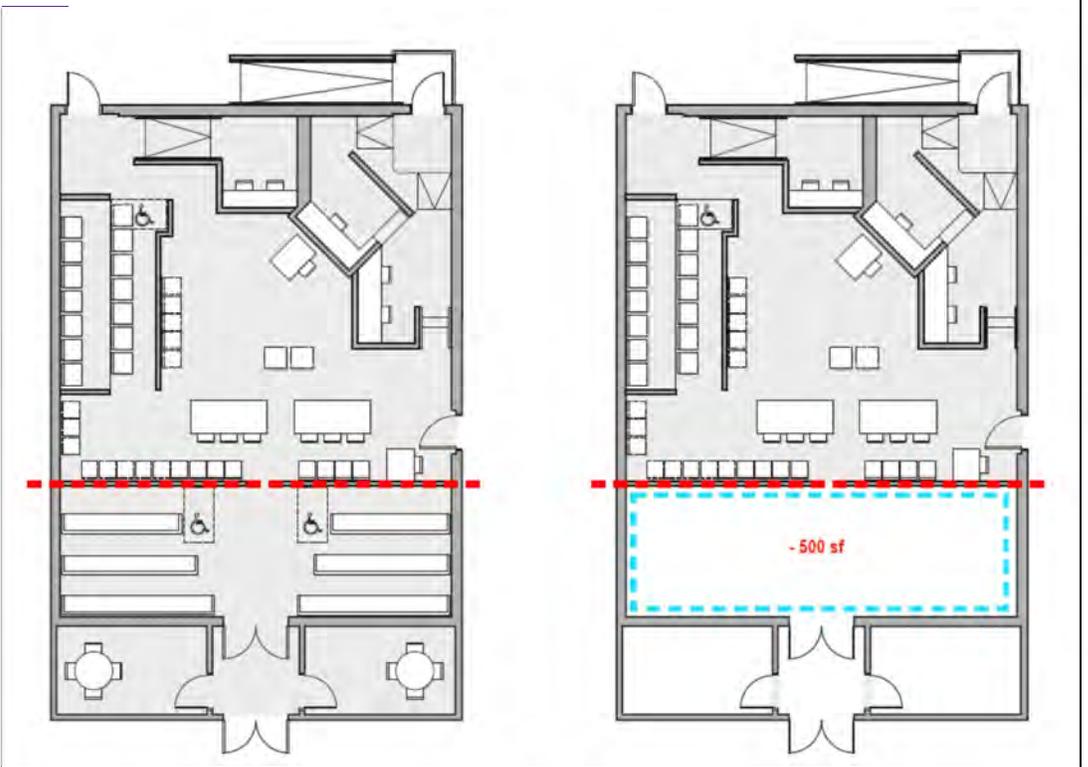


Figure 18.3 Elimination of public gallery seating and attorney conference rooms

Commented [PD73]: Gensler: Do not include these figures.

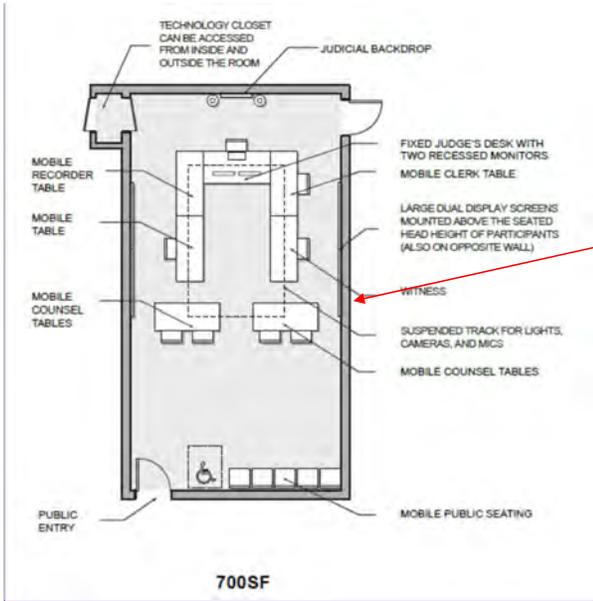


Figure 18.4 Elimination of public gallery seating, attorney conference rooms and jury box

Commented [PD74]: Gensler: Do not include these figures.

Commented [PD75]: Add a door here for in-custody.

Commented [PD76R75]: Ignore this comment since we are not adding this diagram.

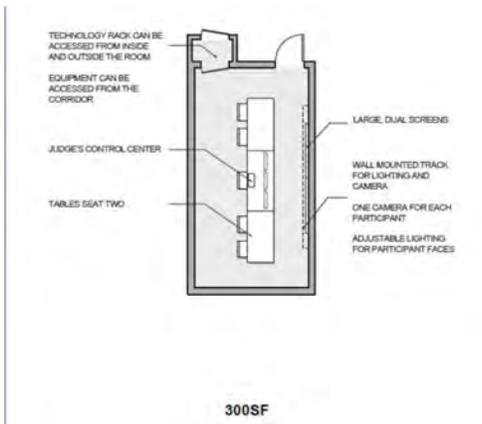


Figure 18.5 Adjudication Conference Room

Commented [PD77]: Gensler: Do not include these figures.

Summary of Hybrid Courtroom Workstream & JCIT CTCFS Chapter 18 Redlines

The review of Chapter 18 was conducted in this manner:

- 1) JCIT made initial revisions to the 2020 CTCFS Chapter 18 to reflect the *Report of the Advancing the Hybrid Courtroom Workstream: Findings and Recommendations*, which summarizes the workstream's work and sets forth a framework for courtrooms that are optimized for proceedings involving any number of physical or remote participants.
- 2) Next, Facilities Services (FS) reviewed JCIT's updates and provided comments.
- 3) Finally, the Advancing the Hybrid Courtroom Workstream (HC WS) provided further comments and recommendations.

Text in **blue** indicates addition, text in **red** indicates deletion. Text in black indicates existing verbiage and/ or comments.

Section	Comment/ Revision Source	Comment/ Revision
18.B.2.b	HC WS	Use the IT systems for the delivery of audio, video and control signals. A/V traffic will use an independent Virtual Local Area Network (VLAN) to maintain separation from normal data network traffic.
18.B.2.c	HC WS	Raised floor systems should be used in rooms where there is extensive use of technology and in-floor / distributed power needs such as hybrid courtrooms, video conference spaces and training rooms.
	HC WS	Raised flooring will allow courtrooms and conference spaces to better adapt to the changing technology landscape.
	JCIT	Consider adding this text to the sidebar.
18.D.1.c	JCIT	In courtroom applications, audio-processing systems with 8 or more recording outputs
18.D.1.d	FS	Speech and audio reinforcement systems design and final commissioning shall follow the current release of the design standards established by AVIXA A102.01:2017, Audio Coverage Uniformity in Listener Area.
Fig 18.1	HC WS	Use of monitors should be suggested as an alternative to projection screens. A monitor behind the witness should also be considered.
	HC WS	Wireless microphone and ceiling mounted projector notes seem to be pointing to incorrect items.
	JCIT	The drawing was annotated inline within Word. To correct alignment issues, the diagram should be recreated with annotations embedded and the results posted in this document.
18.D.6	HC WS	Suggest using generic term [in lieu of "NUC"]. Small form factor or Micro-form Factor PC.
	JCIT	NUC is a brand name. Also VTC appliances may be considered. Also, a rack mounted PC would be considerably more expensive, and not available from inventory. Better phrased as a PC mounted in the AV rack or at the Clerk's location.
	JCIT	JCIT Recommendation: Include 4 fixed cameras to capture Judge, Witness, and each Attorney table.
	FS	In addition multiple split camera views will be needed to feed a single video feed with all camera views into the Video Conference Platform.
18.E.2.a	JCIT	JCIT recommendation: to add microphones at the Bailiff, Lectern and additional Wireless microphones.
	HC WS	Suggest microphone at the court reporter station for use during hybrid hearings.
	JCIT	Also consider adding to the sidebar suggestions for microphone coverage patterns (omni-directional, cardioid, super-cardioid, hyper-cardioid) depending on the location and type of use.
18.E.2.c	FS	Install a video conferencing system based on the design criteria of section 18.D.6.
18.E.2.f	HC WS	The court shall be able to set the volume or mute as needed from the touch panel.
18.E.2.i	FS	Provide an 8 to 12-channel audio feed for recording court proceedings.
18.E.2.m	JCIT	JCIT Recommendation: To include large flat panel displays on wall in place of projector and screen.
18.E.2.t	JCIT	JCIT Recommendation: Included Document camera per Courtroom.
18.E.2.u-v	JCIT	JCIT Recommendation: Provide two touch panels at the judge and clerk.
18.E.2.w	JCIT	JCIT Recommendation: To include audience monitors in all Courtrooms.
18.E.3.b	JCIT	JCIT Recommendation: To include audience monitors in all Courtrooms.
18.E.3.d	FS	Provide an installed videoconference system with three high-definition PTZ (pan-tilt-based on the design criteria of section 18.D.6.
18.E.4.d	FS	Provide control of the speakers and microphones in the dock area on the touch panel.
18.E.6.b	HC WS	Provide a 1080p resolution video projector (~5,000–8,000 lumens) on a fixed mount with a lens selected to fill the projection and/or television screens.

	HC WS	AHC WS Recommending that the minimum standard should be 4K.
	JCIT	JCIT Recommendation: 4K resolution would be a requirement where 4K content is presented. 4K resolution can be a disadvantage when viewing text from a computer desktop or document because the text is 1/4 the size of the same image in a 1080 format. Keeping the standard at 1080 would not prevent selection of a 4k solution during the needs analysis of a new project.
18.E.6.f		Provide a Blu-ray player for juror orientation.
	HC WS	Is this still needed? Modern video content is typically delivered via a digital recording or stream.
	JCIT	Mark this as optional?
18.E.6.o	FS	At the discretion of the court, install a videoconference system.
18.E.7.h	FS	At the discretion of the court, install a videoconference system.
18.E.8.a	HC WS	Flat panel Or projector
	HC WS	<p>Recommend the following in Judicial Conference rooms - If the space is big enough to support a projector, then it should have one. (should use the largest display that is appropriate for the space)</p> <p>Provide a 4K resolution video projector (~5,000–8,000 lumens) on a fixed mount with a lens selected to fill the projection and/or television screens.</p> <p>Provide an electrically operated projection screen, concealed in the ceiling when not in use, sized as large as possible, taking into consideration ceiling height and the requirement that the bottom of the image shall be 48" above the floor. Match the aspect ratio to the projector.</p>
	JCIT	<p>Often, a display that is as large as possible, is too wide to be seen comfortably by everyone at the table. A display should be as large as practical.</p> <p>A projector should be considered but not an automatic solution based solely on the size of the room.</p>
18.E.8.b	FS	Provide a portable or fixed ADA/CBC-compliant encrypted RF assistive listening system
	JCIT	RF, or IR, (Security concerns may prevent an RF solution)
18.E.8.e	FS	Provide recording capabilities through the in-room AV system.
18.E.8.g	FS	Provide a video conferencing system with acoustic echo canceling on every input using microphones installed in the table and ceiling loudspeakers. Depending on the courthouse usage provide a system that operates with multiple platforms, such as, Zoom, Teams, Bluejeans etc.
18.E.8.h	HC WS	Provide raised flooring to support flexible power and data needs.
18.E.9.b	FS	Provide one or more large flat panel wall-mounted displays with separate side-mounted loudspeakers or, soundbar, or integrated ceiling speakers.
	HC WS	Flat panel Or projector
	HC WS	Recommend the following in Executive Conference rooms - If the space is big enough to support a projector, then it should have one. (should use the largest display that is appropriate for the space)
	JCIT	Often, a display that is as large as possible, is too wide to be seen comfortably by everyone at the table. A display should be as large as practical.
18.E.9.g	HC WS	At the discretion of the court, provide an installed a videoconference system. with omni directional voice activated camera(s) integrated into the room AV system.
	JCIT	What is an omni directional voice activated camera? There are several options for auto-framing conference room cameras. Few, if any, still rely on audio for aiming. This should be rewritten to describe the functional requirement and allow for selection from readily available technology.
18.F	FS	HYBRID COURTROOM AND VIDEO CONFERENCING SPACES
	FS	CFAC WG decided not to include this section with diagrams.