California Public Utilities Commission

REMOTE ACCESS PARTICIPATION IN CPUC PUBLIC EVENTS

CURRENT USES AND RECOMMENDATIONS

CPUC NEWS & OUTREACH OFFICE
Summer 2019

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Executive Summary

Background

The CPUC News & Outreach team helps stakeholders, customers, and members of the public engage with the California Public Utilities Commission (CPUC) through proceedings, workshops, and other events. As the CPUC portfolio grows in breadth and sophistication, our stakeholder participation efforts must grow accordingly.

This report assesses the CPUC's currently available technologies, and how staff are utilizing these technologies for external engagement. In Spring 2019, we surveyed 16 CPUC staff in total from all five Commissioners' offices and seven Divisions, as well as 16 staff representing seven different California state agencies that have similar stakeholder needs. We summarize results here.

Current CPUC Remote Access Capabilities and Usage

Technology
The remote access options we currently use or have access to are the following:

- Skype
- Cisco WebEx Meeting
- ShoreTel Phones
- Verizon Conference Lines
- Tandberg
- AdminMonitor
- Verizon Facilitated conference line.

A table summarizing the costs, capabilities, and usage of each of these technologies is below. For access to proceedings, workshops, and other Commission events AdminMonitor streaming and audio availability limits some access.

Staff reported that they are satisfied with the functionality of WebEx for limited public participation events such as workshops, but they find its technical set-up to be a deterrent to using it. Skype, by contrast, is a readily available software on the workstation desktop and has a user-friendly interface. CPUC IT has recognized staffs' unfamiliarity with Cisco WebEx Meeting and is taking steps to make software readily available and developing training and staff orientation materials such as Quick Start Guides. Conference lines are heavily used for audio conferencing of meetings through several systems, such as ShoreTel and Verizon.

Additionally, CPUC's IT team is currently actively engaged in efforts to modernize the Audio-Visual capabilities for video teleconferencing and collaboration and integration of current technologies for remote access and participation in all the CPUC proceedings, workshops, hearings, and other events.

Table 1. Summary of Currently Available Remote Access Options

	Skype	Cisco WebEx Meeting	ShoreTel	Conference Lines	Tandberg	Admin Monitor	Facilitated conference lines
1-way audio		x		x	x	x	x
2-way audio	x	x	x	x	x		x
1-way video	x	x			x	x	
2-way video	x	x			x		
Screen sharing	x	x			x		
Presentation	x	x			x	x	
Moderated chat	x	x					
Moderated Q&A		x					x
Password protection/ ability to restrict access	x	x	x	x	x		x
Accessible from a mobile device	x	x		x		x	x
Accessible from any location with reliable bandwidth	x	x		x		x	x
Accessible at any public facility	x	x		x			x
Compatible with Tandberg	x	x			x		
Cost per minute	none	none	none	$0.0225	none	none	$0.3236
Average monthly cost	$13,500	$10,600	$3,100	$5,400	none	$10,000	$1,590
Staffing burden on IT	low	low	very low	none	medium	medium	medium
Staffing required for operation	low	low	very low	very low	high	high	low
Utilization Level	low	medium	low	high	medium	medium	very low

Usage

We found that the most common reasons that remote access options are not utilized are organizational barriers such as high costs or limited staff time. For example, a staff member might not offer WebEx because they are unable to book an appropriate conference room or because a loaner laptop is unavailable. This partly explains why remote access options are not deployed consistently across Divisions or meeting types within the CPUC.

Remote Access at Other California State Agencies

We selected seven other California state agencies to learn what they are doing in terms of remote access capabilities and best practices.

We chose the following agencies because of their similarities with the CPUC in terms of types and frequency of on-site and off-site meetings, and because these agencies seek to engage a stakeholder pool similar to that which we are trying to better serve.

- California Independent System Operator (CAISO)
- California Energy Commission (CEC),
- California Air Resources Board (CARB)
- California Environmental Protection Agency (CalEPA)
- CalRecycle
- California State Water Resources Control Board
- California Public Employees Retirement System (CalPERS)

Results
Each of these agencies shares the struggle of trying to find the right technology solutions that fit their time and financial budget constraints while meeting their stakeholders' preferences. No agency acknowledged that they had the one perfect system or solution. Instead, they spoke of myriad solutions they each assemble into a suite of options for their staff.

Three major themes, or best practices, emerge from our interviews, which all successful remote access systems include. These are:

- Dedicated staff with clearly delineated roles: Everyone knows who is responsible for what at public meetings and events. Expectations are clear and all staff know how much time is necessary to dedicate to tasks.
- Dedicated equipment that staff are familiar with and can rely on: Staff have been trained to use systems confidently and have access to support when needed. For offsite meetings, a best practice is to bring your own equipment to ensure reliability and compatibility. This includes everything from cords and microphones to WiFi hotspots.
- Dedicated time to test systems, platforms, and equipment functionality and compatibility before each event

Additionally, these sister agencies identified a number of issues to consider before choosing a technology option for procurement or use:

- Low cost vs. low hassle: different service levels are available
- Digital accessibility and ADA compliance
- Ability/ease of archiving

- Demand on staff time (setup and operation)
- How to manage public input via audio or chat

Remote Access Recommendations

We make recommendations of remote access technology options to use for each CPUC meeting type. The meeting types we consider are the following:

- Prehearing Conference
- All-Party Meeting
- Evidentiary Mearing

- Public Participation Hearing
- Public/Community Meeting

- Workshop
- En Banc
- Voting Meeting

Remote access recommendations take into consideration the desired outcome and target audiences of each meeting type. Accordingly, we consolidated these meeting types into three broad categories that reflect distinct goals of a) increasing stakeholder access to proceedings, b) expanding ratepayer engagement, and c) ensuring CPUC transparency.

Furthermore, recommendations are based on the level of stakeholder interest, either high or low. Each meeting organizer needs to assess for themselves the perceived level of stakeholder interest. Recognizing the intended outcome and target audience of each meeting type, along with the level of stakeholder interest, allows meeting organizers to determine the most appropriate choice of remote access for their event.

We provide three recommendations to improve remote access to CPUC events: 1) IT would offer training for the event staff, provide consultation, and/or practice runs before scheduled events; 2) News and Outreach could disseminate a best practices guidance document for helping event planners to choose an appropriate remote access option; 3) meeting organizers should involve IT and the News and Outreach Office as early as possible in their planning process—two week notice to IT for onsite meetings, and 45 day notice to the News and Outreach Office, IT, and other groups for off-site meetings.

Introduction

The CPUC is taking steps to broaden access to its meetings and events by providing more remote participation options. Such action meets the goals of Strategic Directive 9 "Communication and Engagement" and Strategic Directive 10 "Decision-Making Process" by increasing public participation across the board while improving equity among participants (i.e., individuals who lack the time and resources to attend the meeting in person).

A glance at the Daily Calendar on any given day shows that most external meetings, hearings, and workshops offer no remote access options at all. The second most frequent scenario is that remote access is available through call-in or webinar, but this is often through listen-only settings, thus providing one-way communication only, from presenter to remote participant. In either scenario, meaningful participation within the event is limited to only individuals who are physically present, usually in San Francisco or Sacramento.

The lack of remote access options offered at events is in some measure the result of a lack of adequate audio/visual resources, but this is not always the case. In fact, a significant finding of this report is that it is more common that the lack of remote access options offered at an event is more often a result of organizational constraints like staffing or costs, rather than the availability of resources. Further, this investigation reveals that CPUC staff have access to a wide range of technologies with many highly underutilized functions. Simply getting staff up to speed on how to take full advantage of current systems will require some time but it will be time well spent.

In Section 1 of this report. we examine the audio/visual technological capabilities of currently available remote access options and assess their functionality and challenges. We then examine staff practices and habits, and how remote access decisions are made when planning meetings and workshops.

Section 2 of this report offers a comparative study of the remote access technologies and best practices currently used by other state agencies, including the California Energy Commission (CEC), California Air Resources Board (CARB), California Independent System Operator (CAISO), and more. We analyze information gathered from other state agencies through interviews with staff of these agencies in both their offices of External Affairs/Communication and IT. Based on responses from these agencies, we present the remote access options not currently used but available to the CPUC.

Finally, in Section 3 we present our recommendations.

Section 1. Current CPUC Capabilities and Usage

## 1.1 Available Remote Access Options

The remote access options we use or have access to are the following:

- Skype
- Cisco WebEx Meeting
- ShoreTel Phones

- Verizon Conference Lines
- Tandberg
- AdminMonitor

- Verizon Facilitated conference lines

Below, we examine and compare each technology in turn to describe their capabilities, barriers, costs, and staffing needs, as applicable. Table 2 summarizes the capabilities of each remote access option.

Table 2. Summary of Currently Available Remote Access Options

	Skype	Cisco Meeting	ShoreTel	Conference Lines	Tandberg	Admin Monitor	Facilitated conference lines
1-way audio		x		x	x	x	x
2-way audio	x	x	x	x	x		x
1-way video	x	x			x	x	
2-way video*	x	x			x		
Screen sharing	x	x			x		
Presentation	x	x			x	x	
Moderated chat	x	x					
Moderated Q&A		x					x
Password protection/ ability to restrict access	x	x	x	x	x		x
Accessible from a mobile device	x	x		x		x	x
Accessible from any location with reliable bandwidth	x	x		x		x	x
Accessible at any public facility	x	x		x			x
Compatible with Tandberg	x	x			x		
Cost per minute	none	none	none	$0.0225	none	none	$0.3236
Average monthly cost	$13,500	$10,600	$3,100	$5,400	none	$10,000	$1,590
Staffing burden on	low	low	very low	none	medium	none	medium
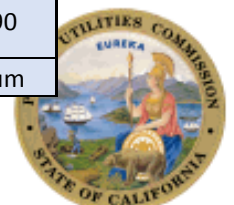
IT**							
Staffing required for operation	low	low	very low	very low	high	none	low
Utilization Level	low	medium	low	high	medium	medium	very low

* "2-way" refers to the direction of communication and may include more than two sources of video.
** "very low" and "low" refers to one staff and two staff, respectively; "medium" refers to 3 or 4 staff; "high" refers to 5 or more staff

1.1.1 Skype

Capabilities

- 2-way audio
- 1-way video
- 2-way video
- Screen sharing
- Presentations
- Ability to restrict access

- Accessible from a mobile device
- Accessible from any location with reliable bandwidth
- Accessible at any public facility

- Compatible with Cisco (previously known as Tandberg)*
- Supports conference number / phone call back for audio**

*Currently, CPUC's Skype system cannot directly contact the Cisco Device (Tandberg) system; however, it is possible to do this with an integration add-on.

**There is an option to add conference number/phone callback audio functionality to Skype, which would enable a caller from any telephone to call into a Skype meeting or provide a number to have Skype call them back to connect to the meeting audio. There is an additional cost of $550,000 per year to provide this audio functionality CPUC-wide, which IT is considering. This would expand the audiences that could be reached with this method.

Current Usage
Some staff use Skype frequently for informal communications and for working groups; yet other staff have expressed that they are not comfortable with the platform. However, based on consistent staff feedback from interviews, whatever tool(s) the CPUC chooses to use, deployment should be standardized across the organization such that all staff are trained in how to use it comfortably. This will be true for any technology choice.

Costs
The cost for basic Skype for business is bundled with our current Microsoft Office 365 package; however, to add full functionality as described in Table 2 requires purchase and implementation of additional modules, as described above.

Staffing needs

There are no current baseline staffing needs for Skype. Once trained, the meeting organizer can initiate and operate skype without IT support, as long as all parties are joining the session via Skype for Business. Otherwise, some IT support may be needed, such as use of Tandberg devices.

1.1.2 Cisco WebEx Meeting

Capabilities

- 1-way audio
- 2-way audio
- 1-way video
- 2-way video
- Screen sharing
- Presentation
- Moderated chat

- Moderated Q&A
- Password protection/ ability to restrict access
- Accessible from a mobile device
- Accessible at any public facility
- Accessible from any location with reliable bandwidth

- Compatible with Cisco (previously known as Tandberg)*
- Supports conference number / phone call back for audio**

Every desktop at CPUC has Cisco Meeting currently installed. Cisco Meeting also has video calling capabilities, which are currently compatible with Cisco devices (Tandberg). Cisco Meeting is web-based so users at home need only to open a browser without installing additional software. Users can also login to a web address and use Cisco web meeting to contact Cisco Devices, thus making it possible to connect to a Tandberg device from home.

Current Usage
Current usage of Cisco WebEx Meeting is low due to the lack of end user education and difficulty finding the application on the desktop. The CPUC IT is in the process of rolling out a new client that will provide WebEx application features in every Microsoft product on the desktop and allow users to start a WebEx meeting at any time using this feature. Additionally, the Cisco WebEx meeting information can be added to any meeting invitation so that attendees can join the meeting by clicking the button in the invitation. IT is also preparing user education material and Quick Start guides to assist the CPUC staff with using WebEx technology.

Costs
There is no additional cost to acquire this technology, as CPUC staff already have access to it. Annual licensing costs is currently $10,608.

Staffing needs
There are no current major staffing demands on IT for Cisco WebEx Meeting. WebEx meeting will support up to 200 connections to the meeting. If the attendance to a WebEx meeting is projected to be

very high, staff may want to have a team member dedicated to moderating the meeting for comments, questions, etc.

1.1.3 ShoreTel Phones

Capabilities
- 2-way audio
- Audio Conferencing for a small group

ShoreTel Phones, currently on every desk at the CPUC, have some conferencing capabilities.

ShoreTel conference lines have a maximum of 20 to 25 connections, so the best application is for smaller audio-only meetings. There is also a cap of how many conference lines can be created throughout the organization, such that each division cannot be using a 25-person call simultaneously.

Usage
Other than standard telephone operation, ShoreTel is not currently being used for group meetings at the CPUC. ShoreTel phone conference lines duplicate some of the functionality we currently have in Skype and Cisco. Generally, staff use Verizon conference lines for this application (see below).

Costs
Currently there are fixed monthly costs of $3,100 for the ShoreTel system.

Staffing
Outside of initial staff training, there are no significant staffing demands.

1.1.4 Conference Line Numbers

Capabilities
- 2-way audio
- Password protection/ ability to restrict access
- Accessible from a mobile device
- Accessible from any location with reliable bandwidth
- Accessible at any public facility

Usage
Conference line numbers are used widely throughout the CPUC for audio teleconferencing. IT manages these phone numbers and accounts with Verizon. Many staff teams across the agency have their own

conference lines available to them 24/7, with leader and participant codes. A conference line supports a maximum of 100 users including the leader.

Costs

The cost to use conference lines are billed by usage, and costs $0.0225 per minute per attendee. In an average month, the Executive Division spends approximately $600 on conference lines; Energy Division's costs is closer to $1,500.

Over the most recent 12-month period (April 2018 – March 2019), the CPUC spent approximately $65,000 on conference lines.

Staffing

There are no significant staffing demands for conference lines.

1.1.5 Cisco (Tandberg)

Capabilities

- 1-way audio
- 2-way audio
- 1-way video

- 2-way video
- Screen sharing
- Presentation

- Password protection/ ability to restrict access

Tandberg devices include hardware, software, and displays with screens attached to our network with a pad to dial other Cisco/Tandberg devices.

One underutilized functionality is the ability to connect to other Cisco systems such as Cisco Meeting (see Section 1.1.2 above). It is currently possible to contact Tandberg via a Cisco device; an add-on to the Skype platform would allow some connectivity there as well.

The CPUC IT is in the process of replacing Tandberg devices with updated Cisco WebEx devices, including personal, small room and large room devices that offer Cisco WebEx as the foundation for video teleconferencing and collaboration and ease of use to the end users.

Usage

These are often used for meetings with a large number of participants such as "All-Hands" meetings or large multi-office staff trainings. The ability to restrict access in such meetings is one benefit of using Cisco/Tanberg devices. One limitation of Cisco/Tanberg devices is that there are relatively few of them across the CPUC, and moreover, the room capacities in which some of the devices are in are usually also limited.

Costs

There is a fixed recurring annual cost of about $70,000 to maintain the devices.

Staffing
The Tandberg system is highly staff-intensive. IT staff time is required before, during, and after any meeting using the Tandberg system.

1.1.6 Admin Monitor

Capabilities
- 1-way audio
- 1-way video
- Presentations
- Accessible from a mobile device
- Accessible from any location with reliable bandwidth

Usage
AdminMonitor is a service that is currently used to broadcast public events of wide interest from the San Francisco Auditorium and Hearing Room A, including voting meetings and workshops.

Costs
The CPUC has a contract in place that runs through July 2019 and is currently being renewed at a cost of approximately $10,000 per month.

Staffing
AdminMonitor consultants provide the streaming service and an equipment operator during the event. Several other CPUC IT team members are also present to provide additional support and, in case of issues, trouble-shooting as necessary.

1.1.7 Facilitated/Moderated phone lines

Capabilities
- 1-way audio
- 2-way audio
- Moderated Q&A
- Password protection/ ability to restrict access
- Accessible from a mobile device
- Accessible from any location with reliable bandwidth
- Accessible at any public facility

The Verizon-facilitated telephone lines are a useful option for providing moderated/controlled input from a large group of participants in an audio-only environment. When participants call in, they hear from an operator who gives them directions on how the system works, including what to do if they would like to speak. The operator can turn various sound inputs on and off, eliminating pitfalls like a

participant's line streaming hold music and distracting background noises like typing. At a designated time, the operator facilitates participant input by creating a queue and unmuting speakers one at a time.

Usage
This option is rarely used by staff. The News & Outreach team has used this option for press phone calls. A moderated conference line supports 100 users including the leader.

Costs
Operator-moderated phone calls are billed per usage, and costs $0.3236 per minute per attendee. In an average month the CPUC spends $1,590 on operator-moderated costs.

Staffing
There are staffing demands for moderated conference lines from IT staff members to setup, configure, and monitor the conference lines.

1.2 CPUC Staff Uses and Needs

The News & Outreach team interviewed CPUC representatives from all areas within the CPUC to document their current uses of, and desires to expand deployment of, remote access options of public-facing events. The questionnaire used for the internal staff interviews is included in Appendix 1. In total, we interviewed and surveyed 16 CPUC staff members, including representatives from each of the five Commissioners' offices as well as each of the seven industry Division groups as indicated below.

- President Picker's Office
- Commissioner Randolph's Office
- Commissioner Guzman Aceves' Office
- Commissioner Rechtschaffen's Office
- Commissioner Shiroma's Office
- Executive Division

- Safety and Enforcement
- Administrative Law Judge
- Water
- Energy
- Communications
- Transportation

1.2.1 Lessons Learned

In general, all staff interviewed indicated one or more of the following:
1. They are not making remote access choices for public-facing events based on strategy or desired outcomes, but rather organizational constraints like cost, staffing needs, or facility restrictions

2. They would like to have a guidance document for reference to help them choose the appropriate remote access options for their purpose, and a resource for information on best practices for managing input when hosting various types of meetings and workshops
3. They want to expand functionality for conducting day-to-day business from offsite locations with user-friendly software platforms that do not require heavy IT support

Current technologies and their usage
External stakeholders and associates are increasingly relying on remote access technologies to conduct day-to-day business. For large public meetings or workshops, staff tend to prefer the functionality of WebEx, though they find it generally staff-intensive. Teams generally want to expand use of WebEx.

Groups across the CPUC have a wide variety of habits and practices. We found groups who use technology consistently, whether that technology is sophisticated or not, are more comfortable using the technology. Staff also indicate that demands from external stakeholders vary across Divisions, and this might drive remote access choices. Many staff reported that their teams mostly make remote access choices based on personal comfort with the technology, which currently varies greatly.

Training and resources are key
Training is the key to successful deployment of new technology and will remediate the demands on IT staff. Consistently staff expressed a desire for (1) proactive training for staff to learn systems and platforms, and (2) guidance documents or internal resources to help guide staff members through the meeting development process, including how to choose the right remote access option for their desired outcome and how to manage public comments and input on each platform.

Barriers to remote access deployment
CPUC staff would like to offer remote access options for stakeholders and the public. We asked staff to rank their barriers to remote access usage; their responses are listed below in order of importance:

1. Lack of staffing resources to facilitate the technology (dedicated phone moderator, or having someone monitor the WebEx questions or chat)
2. Lack of understanding of options available; you don't know what's out there
3. Lack of training or confidence in how to use the available systems
4. The information being shared is highly sensitive and I do not trust the security of the remote options
5. Because I want my event to be private or limit input to a specific group of participants
6. Just didn't think about it; no reason
7. Costs too high
8. Staffing challenges, restrictions on number of connections/using right size technology for each application

Additional barriers identified as "other" include:
9. Sometimes the voice quality is so poor that it is a pain to have large audio meetings. Fear of this leads to just having an in-person meeting most of the time
10. Receiving more public input would increase strain on staff time to process incoming information
11. When audio lines have too many users, it is very challenging to manage their input

12. Timing is an issue – sometimes when a meeting needs to be organized quickly, properly equipped conference rooms are not available or IT is unavailable to assist with technology setup or operation

What are staff asking for?

- Flexible personal technology and hardware to enable staff mobility while retaining functionality (laptops, headsets)
- ADA Compliance
- Secure options that can be trusted with sensitive information
- Consistent equipment or systems in each conference or hearing room, so that meeting rooms are equally useful
- Guidance document geared toward the public on the best way to engage at Public Participation Hearings; what is useful input to a Public Participation Hearing, to help participants provide input that is more valuable
- New policy for paying for technologies outside of Division budgets

Section 2. External Agency Capabilities and Usage

This section examines remote access resources and best practices used by other California state agencies. We then describe capabilities and costs of technologies and platforms that are not currently used but available to the CPUC.

2.1 Inter-Agency Assessment of Remote Access Resources & Uses

The News & Outreach Office and IT staff set out to learn which platforms and protocols other state agencies are using to reach geographically distributed stakeholders, how they themselves value their capabilities and understand their barriers, and how satisfied their stakeholders are with the access available. We met with 15 staff from seven external state agencies, including:

- California Independent System Operator (CAISO)
- California Energy Commission (CEC),
- California Air Resources Board (CARB)
- California Environmental Protection Agency (CalEPA)
- CalRecycle
- California State Water Resources Control Board
- California Public Employees Retirement System (CalPERS)

We selected these agencies because of their similarities with the CPUC in terms of types and frequency of on-site and off-site meetings, and because these agencies seek to engage the exact same stakeholder pool that we are trying to better serve.

We conducted structured interviews with these agencies' External Affairs/Communications and IT staff on issues of remote access best practices and capabilities. Appendix 2 is the questionnaire we used in our external agency interviews.

Best practices
Each of these agencies shared the struggle of trying to find the right technology solutions that fit their time and financial budget constraints while meeting their stakeholders' preferences. No agency acknowledged that they had the one perfect system or solution. Instead, they spoke of a myriad of solutions which this report distills as their most successful and viable ideas and practices currently in use.

Three major themes, or best practices, emerged from our interviews, which all successful remote access systems include. These are:

1. *Dedicated staff with clearly delineated roles*
   The type of staff who are dedicated varied between vendor staff, agency IT staff, and program staff who hosted events. In all successful cases, staff who are responsible for setting up, operating, and/or archiving meetings and events were fully aware of their role before the meeting, had

adequate time to learn and/or test equipment and systems, and received specialized training from in-house IT staff or vendors.

2. *Dedicated equipment that staff are familiar with and can rely on*
Anyone using the equipment successfully must be familiar with it, either through dedicated training or consistent use, preferably, both.

3. *Dedicated time to test audio and video streaming systems, software platforms, and equipment compatibility*

There are several complicating factors and extenuating circumstances, which we explore below, that should be considered in achieving any of these best practices. These are:

Low cost vs. low hassle: different service levels are available from most vendors
Of the agencies we surveyed, we found that a few different levels of service are available from audio/visual service vendors, depending on what agencies are willing to pay. Many vendors are available to serve state agency clients with full-service type packages. Similar to the AdminMonitor system we use today at the CPUC, the vendor uses their own equipment, staff, and online servers and websites to film, broadcast, and web-host meetings. These full-service packages are very pricey. This is an example of a low-hassle but high-cost option.

Ability/ease of archiving
Different technologies and platforms have various strengths and weaknesses related to recording meetings and archiving. For example, WebEx can record whole meetings including chat activity, but the file type is very large and cumbersome, and thus difficult to share widely or download by most users. Alternatively, YouTube is a platform most agencies currently rely on to archive recordings and users are familiar with it.

Some stakeholders and practitioners expect these events to be archived, especially for high profile events or meetings, so it is important to understand the nuances of the video archiving process when choosing the webcast software platform.

Digital accessibility
The goal of increasing remote access options for CPUC stakeholders must also include increasing access for persons who have hearing disabilities. Many of the agencies we interviewed indicated that digital accessibility was a consideration when choosing their software systems.

This can apply to video captioning and transcription, document font sizes, language options, and more. Any investment into additional capabilities should consider the accessibility aspect of those products.

Demand on staff time
The CPUC may consider hiring additional staff if it is to expand its remote access successfully. We found that in all cases, State agencies strived to have teams of staff dedicated to equipment setup and operation during public meetings and events. The number of dedicated staff range from one person to seven persons per event.

Training

In our interviews with industry Division staff, we found that CPUC staff are not aware of the full suite of options available to them. Some were surprised to learn about Skype's screen sharing functions as well as about moderated phone lines and other options. If the CPUC is to invest significant funds into new technologies, it must also provide staff with enough resources to learn and use the new systems.

Internal interview feedback also suggested that any solution should be user-friendly such that they can be intuitively standardized with a consistent protocol so that anyone can walk into any room and know right away how to use the equipment. They were even amenable to being provided a document on how to use a given technology and/or a check-list style user's guide to ensure consistent use organization-wide.

Additional best practices and equipment mentioned

Finally, the agencies shared several additional good ideas in terms of best practices and equipment, which were:

- A "Go-Bag," which holds backup laptops, cords, and other equipment, helps avoid surprises when traveling and using offsite facilities, and ensures all necessary A/V equipment to host an offsite meeting
- Consistent application of specific remote access technologies for specific meeting types keeps the process simple and transparent
- Consistent use of preferred software or technology platforms also means stakeholders are familiar with the remote access systems and their technology requirements
- All chat functions should be moderated in real time by a dedicated staff member
- Reliable, dedicated WiFi "hotspots" or Mi-Fis provide private bandwidth anywhere with a good 4G signal. These are important even if the facility has strong internet capabilities; the hotspot eliminates the competition for bandwidth with other users or attendees.
- Good microphones for rooms are a worthwhile investment

2.2 Remote Access Options Not Currently Used but Available to the CPUC

The CPUC IT Department is currently engaged in as assessment project to determine the current audio visual capabilities of the CPUC. Using the results of this assessment, IT plans to formulate a plan to modernize the audio/visual capabilities for the CPUC. IT is also currently in the process of pilot testing new technology for video conferencing and collaboration hardware and software to provide modern platforms to conduct business across the geographically separated enterprise.

2.2.1 YouTube

The use of YouTube as an official video live streaming and archiving platform is strong and growing among California state agencies, including with the CEC and CalPERS. It is a relatively uncomplicated, universal platform that stakeholders are familiar with and can be accessed from almost anywhere, making it an attractive choice for large public meetings or events with a high expected attendance or interest.

CEC uses YouTube for live streaming and archiving videos of their monthly Business Meetings. They cite one of the greatest things about YouTube is that it is free and includes a closed captioning option for uploaded videos. As a best practice, the CEC suggests allowing users to comment on videos in YouTube, but the CEC does not reply to comments or engage with users' comments on the YouTube platform.

2.2.2 Granicus

Some California state agencies use Granicus, a vendor who specializes in communications tools for governments. However, none of the agencies we interviewed have a current contract with them. The CPUC has used them in the past for audio streaming, but now they offer more capabilities such as video streaming and contact management tools.

2.2.3 Skype Audio Functionality

Every staff computer at the CPUC currently has Skype for Business.

Skype has additional capabilities currently not in use by the CPUC, that would offer the ability to connect with any phone seamlessly by calling a phone number to enter the skype call, as well as calling any phone number through Skype. Our current Skype license does not have this capability.

The cost for adding audio functionality, which would support more than 250 users for Skype for Business Meeting, is calculated per user. To provide this functionality to all staff would require about 1,550 licenses at about $30 each per month, or about $550,000 annually for the whole organization.

3. Remote Access Recommendations by Meeting Type

3.1 Meeting Types and Capabilities Considered

The CPUC engages daily with stakeholders and members of the public through various meeting types, including proceedings, workshops, community meetings, and other types of public-facing events.* Each meeting type has distinct goals and involves stakeholders that participate differently based on the goals of the meeting type. This section presents recommended remote access technologies for each meeting type based on meeting goals and targeted audience and discusses implementation considerations such as costs, staffing needs, and timeline of implementation.

*For more information and details about the Commission's various types of meetings and outreach, please reference the News & Outreach Office's Meeting Toolkit.

Meeting types

We provide remote access recommendations for the following meeting types:

- Prehearing conference
- All party meeting
- Evidentiary hearing
- Public participation hearing
- Public/community meeting
- Workshop
- En Banc
- Voting meeting

We consolidate these meeting types into three broad categories according to their general goals. These broader categories include the goals of a) increasing stakeholder access to proceedings, b) expanding ratepayer engagement, and c) ensuring CPUC transparency.

Additionally, we provide recommendations below based on whether the perceived level of stakeholder interest is high or low. Each meeting organizer needs to assess for themselves the perceived level of stakeholder interest. Stakeholder interest is important for remote access because, on the one hand, a high-profile proceeding on wildfire safety may draw interest from local leaders across California, members of the Legislature, and even stakeholders outside of the state, and therefore a Prehearing Conference (PHC) on this issue might warrant an internet live stream and even a recording to be watched later. On the other hand, a standard rate-setting issue may not be of broad public interest, and therefore a PHC on this issue might not warrant investment in remote access. Recognizing these differences allows meeting organizers to determine what is the most appropriate level of remote access for their event.

Capabilities and technologies considered

Table 3 presents the remote access capabilities that we examined in our analysis along with the available technology that exemplifies the respective capability.

Table 3. Capabilities considered and currently available technology platforms

Capability	Currently Available Technology Platform
1-way audio	Conference Lines, WebEx
2-way audio (Conference Lines)	Conference Lines, WebEx
1-way video	AdminMonitor, WebEx, YouTube
2-way video	Skype, WebEx
Screen sharing / Presentation or Document view	Skype, WebEx
Moderated chat	YouTube, WebEx
Operator Moderated Q&A	Operated assisted phone lines, staff-managed conference lines
Accessible from a mobile device	Conference Lines, Skype, WebEx
Accessible from any location with reliable bandwidth	All
Public live stream	AdminMonitor, YouTube
Recorded	AdminMonitor, YouTube, Skype, WebEx

3.2 Remote Access Recommendations

Table 4 presents a summary matrix of remote access recommendations for all meeting types. The following three tables present remote access recommendations in three broad categories of goals related to engaging stakeholders, respectively.

Table 4. Summary of remote access recommendations for all meeting types

Capability	Stakeholder Access to Proceedings						Ratepayer Engagement						Commission Transparency			
	PREHEARING CONFERENCE*		ALL PARTY MEETING		EVIDENTIARY HEARING*		PUBLIC PARTICIPATION HEARING		PUBLIC/COMMUNITY MEETING		WORKSHOP		EN BANC		VOTING MEETING	
Public Interest	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1-way audio	x	x			x	x	x	x	x	x	x	x	x	x	x	x
2-way audio (Conference Lines)		x	x	x		x	x	x		x	x	x		x		x
1-way video		x		x		x		x		x		x	x	x	x	x
2-way video		x		x		x		x								
Screen sharing / Presentation or Document view				x		x		x	x	x	x	x		x		x
Moderated chat								x		x		x				
Operator Moderated Q&A								x	x	x	x	x		x		x
Accessible from a mobile device								x		x		x		x		x
Accessible from any location with reliable bandwidth				x				x		x		x				x
Public live stream		x				x	x	x	x			x	x	x	x	x
Recorded		x		x		x	x	x	x	x	x	x	x	x	x	x
Staffing burden on IT	Low	Medium	None	Low	None	Medium	None	High	Low	Medium	Low	High	High	High	High	High
Staffing required for operation	Low	Medium	Low	Medium	Low	Low	Low	High	Low	High	Medium	High	High	High	High	High
Recommended Platform	Conference Lines	YouTube	Conference Lines	Skype	None	Skype	Conference Lines	YouTube	Conference Lines	YouTube	Conference Lines	WebEx	Admin Monitor	YouTube	Admin Monitor	YouTube

*Accommodation for two-way communication can be made only by prior arrangement with the ALJ

3.2.1 Recommendations by Meeting Type

Increasing stakeholder access to proceedings

Currently many stakeholders expend scarce resources to participate in CPUC proceedings and hearings in person, usually at CPUC headquarters in San Francisco. Stakeholders report that participation is often time- or cost-prohibitive and therefore do not participate in proceedings as much as they would like. Offering remote participation options where appropriate can help broaden the pool of participants and input, and support robust decision making at the CPUC.

Table 5. Remote access options to increase stakeholder access to proceedings

Capability	PREHEARING CONFERENCE*		ALL PARTY MEETING		EVIDENTIARY HEARING*		Currently Available Technology Platform
Public Interest	Low	High	Low	High	Low	High	
1-way audio	x	x			x	x	Conference Lines, WebEx
2-way audio (Conference Lines)		x	x	x		x	Conference Lines, WebEx
1-way video		x		x		x	AdminMonitor, YouTube
2-way video		x		x		x	Skype, WebEx
Screen sharing / Presentation or Document view				x		x	Skype, WebEx
Moderated chat							YouTube, WebEx
Operator Moderated Q&A							Operated assisted phone lines or staff-managed conference lines
Accessible from a mobile device							Conference Lines, Skype, WebEx
Accessible from any location with reliable bandwidth				x			All
Public live stream		x				x	AdminMonitor, YouTube
Recorded		x		x		x	AdminMonitor, YouTube, Skype, WebEx
Staffing burden on IT	Low	Medium	None	Low	None	Low	
Staffing required for operation	Low	Medium	Low	Medium	Low	Low	
Recommended Platform	Conference Lines	YouTube	Conference Lines	WebEx	None	WebEx	

*Accommodation for two-way communication can be made only by prior arrangement with the ALJ

Expanding ratepayer engagement

These meeting types are intended to receive input directly from utility ratepayers and the stakeholders that represent them.

Table 6. Remote access options to expand ratepayer engagement

Capability	PUBLIC PARTICIPATION HEARING		PUBLIC/COMMUNITY MEETING		WORKSHOP		Currently Available Technology Platform
Public Interest	Low	High	Low	High	Low	High	
1-way audio	x	x	x	x	x	x	Conference Lines, WebEx
2-way audio (Conference Lines)	x	x		x	x	x	Conference Lines, WebEx
1-way video		x		x		x	AdminMonitor, YouTube
2-way video		x					Skype, WebEx
Screen sharing / Presentation or Document view		x		x	x	x	Skype, WebEx
Moderated chat		x		x		x	YouTube, WebEx
Operator Moderated Q&A		x		x	x	x	Operated assisted phone lines or staff-managed conference lines
Accessible from a mobile device		x		x		x	Conference Lines, Skype, WebEx
Accessible from any location with reliable bandwidth		x		x		x	All
Public live stream		x	x	x		x	AdminMonitor, YouTube
Recorded		x	x	x	x	x	AdminMonitor, YouTube, Skype, WebEx
Staffing burden on IT	None	High	Low	Medium	Low	High	
Staffing required for operation	Low	High	Low	High	Medium	High	
Recommended Platform	Conference Lines	YouTube	Conference Lines	YouTube	Conference Lines	WebEx	

Ensuring Commission transparency

It is important for stakeholders, ratepayers, and members of the public to have access to regular meetings of the CPUC Commissioners, including Voting Meetings and En Bancs. The CPUC should use remote access technologies to broadcast these events far and wide.

Table 7. Remote access options to ensure Commission transparency

Capability	EN BANC		VOTING MEETING		Currently Available Technology Platform
Public Interest	Low	High	Low	High	
1-way audio	x	x	x	x	Conference Lines, WebEx
2-way audio (Conference Lines)		x		x	Conference Lines, WebEx
1-way video	x	x	x	x	AdminMonitor, YouTube
2-way video					Skype, WebEx
Screen sharing / Presentation or Document view		x		x	Skype, WebEx
Moderated chat					YouTube, WebEx
Operator Moderated Q&A		x		x	Operated assisted phone lines or staff-managed conference lines
Accessible from a mobile device		x		x	Conference Lines, Skype, WebEx
Accessible from any location with reliable bandwidth		x		x	All
Public live stream	x	x	x	x	AdminMonitor, YouTube
Recorded	x	x	x	x	AdminMonitor, YouTube, Skype, WebEx
Staffing burden on IT	High	High	High	High	
Staffing required for operation	High	High	High	High	
Recommended Platform	Admin Monitor	YouTube	AdminMonitor	YouTube	

3.3 Costs and Staffing

Many of the technology types and platforms we use do not carry per-use costs, but rather are available via annual licensing or maintenance fees, including Skype, Cisco WebEx Meeting, Tanberg, and AdminMonitor. Conference lines do have a per-use cost that is generally low, around $100 for a large number of callers for a meeting that lasts a few hours. WebEx, on the other hand, carries a very high per-use cost that is currently paid out of each division's budget.

Staffing required to use each technology varies, and it is important to consider staff demands on IT and program staff separately, because technologies may require complex IT setup, as well as various levels of resources for program staff to operate. For example, WebEx can be easily setup by staff or with support from IT and may also require a dedicated staff member to monitor public input or manage the chat function throughout a meeting. Staffing needs for each technology will also vary by the goal of the meeting with respect to engaging stakeholders as well as by level of public interest.

Table 8 presents a summary of costs and staffing needs for each technology below.

Table 8. Costs to use and staffing needs for each technology

	Skype	Cisco WebEx Meeting	ShoreTel	Conference Lines	Tandberg	Admin Monitor	Facilitated conference lines	YouTube
Cost per minute	none	none	none	$0.0225	none	none	$0.3236	none
Staffing burden on IT	low	low	very low	none	high	none	medium	medium
Staffing required for operation	low	low	very low	very low	high	none	low	low

3.4 Implementation Timeline

Based on our interviews with industry Division staff, implementation should start with IT training staff on how to use the technologies noted above. Trainings on each recommended technology can start immediately, either in the classroom or by offering consultation or practice runs before scheduled events.

When planning a specific meeting or event that will require remote access, staff should involve IT and/or the News & Outreach Office as early as possible in the planning process. If the meeting will be held onsite at a CPUC location and requires IT's help, providing 2 week's notice to IT is a good guideline. If the meeting will be held offsite, remotely, or requires the use of specific meeting or hearing rooms, staff should be prepared to give at least 45 days' notice to the News and Outreach Office, IT, and other groups who will be involved. Please reference the News & Outreach office's Meeting Toolkit for more information about remote or offsite meeting planning processes and requirements.

Finally, as of Summer 2019, IT is currently researching additional technology solutions to expand and enhance the CPUC's remote access capabilities. Future assessments of remote access options should incorporate the results of IT's assessment currently underway.

Appendix 1. Internal Staff Questionnaire

1. Do you use any types of remote access technologies for the below types of meetings? If so, what types?
   a. Workshops
      i. At SF HQ
      ii. Onsite at a CPUC facility
      iii. Offsite at a non-CPUC facility
   b. Hearings
   c. Internal meetings between staff in different office locations
   d. Internal meetings that include staff on travel, telework, in the field, or otherwise located outside of CPUC offices
   e. Private meetings with external parties such as utility staff
   f. Meetings with staff at other state agencies or organizations

2. Do you use these remote access options consistently, or is the decision usually made ad hoc or based on personal preference of the organizer?

3. Do you want to expand participation in your public meetings and activities? Do you think your current stakeholders would benefit from expanding remote participation options?

4. Does your group have a protocol, decision tree, or other type of reference or guidance document covering when to offer remote access options? If not, do you think that would be helpful and utilized?

5. Do you see any pitfalls, downsides, or other deterrents to offering more remote participation options?

6. Please rank the following reasons for NOT offering remote participation options, from MOST to least relevant:
   a. Lack of staffing resources to facilitate the technology (dedicated phone moderator, or having someone monitor the WebEx questions or chat)
   b. Lack of understanding of options available; you don't know what's out there
   c. Lack of training or confidence in how to use the available systems
   d. Costs too high
   e. Just didn't think about it; no reason
   f. The information being shared is highly sensitive and I do not trust the security of the remote options
   g. Because I want my event to be private or limit input to a specific group of participants

Appendix 2. External Agency Questionnaire

1) Did you utilize a vendor to design your system?

2) What hardware and software solutions do you have in place?

3) Do you have any staff dedicated to supporting/maintaining your system? If so how many and what level?

4) How satisfied are you with your current system? Any specific issues?

5) What features/capabilities would you like to see added to your system?

6) What are some of the best features/capabilities of your current system?

7) Did you need to implement any specific networking/wireless infrastructure or configuration changes to support your system?

8) If you had to implement again would you use your existing system / implementation vendor?

9) At your public events, who runs the remote access equipment (i.e., IT/facilities staff or communication office staff)?

10) Do your events typically have one-way remote access (i.e., listen-only) or two-way (i.e., viewers/callers can make comment and/or ask questions)?

11) If your events typically have two-way communication, how does your system allow for questions (i.e., are the viewers/callers queued up in any way, is there an "operator" who assists, is it written comments/questions only, etc.)?

12) How successful are you in the solutions you provide for public events according to your external stakeholders/users of information (i.e., what feedback do they provide and are additional capabilities requested)?