

# QCTV PROGRAM REPORT

Council Chambers Presentation Audiovisual Systems

Member Cities: Andover, Anoka, Champlin, and Ramsey

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## Executive Summary

QCTV has retained Alpha Video & Audio, Inc to provide this report and supporting documentation to assist in providing direction for audiovisual system upgrades for its member cities Andover, Anoka, Champlin, and Ramsey council chambers. This is the result of multiple consultations and interviews with representatives from QCTV’s production staff and member cities Andover, Anoka, Champlin, and Ramsey. The following are included in this report:

- System description
- Infrastructure Requirements
- Budgetary pricing estimates
- Additional Costs
- Operational Staff Expertise Level
- Maintenance Budget Requirements and Life Cycle Expectations

Additional documentation and drawings will be provided for coordination once the program has been modified and/or approved. In addition, the documentation with the exception of the Program Report can be included in a “Request for Proposal” (RFP) developed and distributed by the member cities that includes all pertinent details for the installation of an operational facility with audiovisual technologies.

## Systems Descriptions

System descriptions are split up by each City. However, even though the system descriptions have been split the core functionality remains relatively the same between cities and consistency in the design, operation, and execution should remain relatively the same. Below is a typical list audio visual sources and destinations used when assembling the basis of design.

### *Video Sources*

- Room PC
- User Laptop
- Document Camera
- Wireless Presentation System

### *Video Destinations*

- Broadcast Feed
- Overflow Monitor
- Dais Monitors
- Staff Presentation Table Monitor
- Touch Screens
- Public screens in chambers

### *Audio Sources*

- Dais Microphones
- Room PC
- User Laptop
- Wireless Microphone

### *Audio Destinations*

- Broadcast Feed
- Distributed Audio System
- Local Audio at Dais
- Audio Recorder
- Hearing Assist System

Special focus is put on ensuring the system operates with intuitive interfaces and allows for users to operate the room with minimal training. The audiovisual system should be able to operate independently of the broadcast system but allow for the production staff to assist in the operation of the audiovisual system if needed. The audiovisual system should not be the focus of the spaces, it should help enhance the meeting by providing additional audio and visual support when needed.

## City of Andover

The City of Andover utilize their City Council Chambers for a variety of different types of meetings. Some meeting types include: City Council, Park and Recreation, and Planning and Commissioning. While the meetings may be different there are a lot of similarities in the needs of the users for participation, presentation, and distribution of content. This description provides information on the various system components and functionality for Andover.

### *Video Presentation Displays*

The existing projector and screen will be replaced with an 80" interactive display on a fix mount. While this display can be used to present content, the primary purpose is not for the public or council members to rely on it for viewing presentation content instead those individuals will utilize 22" local monitors at the dais or the monitors located on the side walls in the space.

Four additional 55" displays mounted on roll-around style carts for portability and flexibility will provide the public with monitors to view presentation content. These roll around carts could be used for meetings outside of the chambers when needed and will have local inputs on them and utilize an IR remote control for power and source selection when not connected to the council chambers system. A single 55" display will be mounted in the lobby of City Hall just outside the chambers for overflow.

All displays within the space associated with the system will be in the HD aspect ratio of 16:9 with a native resolution of 1920x1080. Additional 4K capability may be possible on the displays depending on the equipment selected, however a multi format distribution and switching system is not recommended.

### *Wireless Presentation*

A wireless presentation and collaboration device will allow provide BYOD connectivity within the room without needing to have adaptor cables. It will provide iOS mirroring for MacBooks, iPads, and iPhone, as well as native mirroring for Chromebook, Android, and Windows Phones. The Wireless presentation device may require additional software to be loaded on the end user's device to display content. Software will be available via the manufacturer's website, iTunes, and Google Play store.

### *Annotation Capability*

When located on the staff presentation area, presenters will have additional flexibility of choosing to use an annotation feature that allows for real-time annotation over any material being presented. Annotation will be done using a touch screen monitor located at the staff presentation area. The touch screen monitor will utilize built in software of the wireless presentation system for all annotation features. The 80" interactive display will also provide annotation capability.

### *Document Camera*

A HD document camera ceiling mounted above the staff presentation area will allow the capability to display paper documents such as maps, diagrams, photo's, and other paper documents via the audiovisual system. Zoom and focus controls will be provided at the staff presentation area to ensure clarity of the content.

### *Video Switching and Distribution*

Video distribution will utilize twisted pair cabling reducing the need to run multiple audio, video, and control cabling to each source and destinations within the room. The switching matrix system will a card based frame that will allow various input cards and output cards to be installed. The system will 4k ready and utilize all 4k input and output cards along with 4k input transmitters and receivers. While 4k capable the system will be configured for HD 1920x1080 format but allow full 4k switching in the future.

### *Video Conferencing Systems*

The device providing wireless presentation capabilities will also serve as the rooms video conferencing interface. Soft codecs such as Skype, Bluejeans, WebEx, etc. can be utilized with the system. The soft codecs and the services are not part of the system design but are to be provided by each city if the use of video conferencing is needed. The use of subscription services can also provide bridges to traditional video conference codecs from manufactures like Polycom, Cisco, and Lifesize.

### *Audio System*

A flexible digital signal processing (DSP) system will provide all the audio mixing, routing, and processing needed to support 16 microphones, line inputs, and provide enough outputs for proper zoning and audio distribution to the broadcast feed. The system will have defined presets for typical meetings as well as an audio shutoff to broadcast for when closed sessions need to happen within the space. Basic volume control will be provided for in room use by end users. More in-depth control will be provided to the city's technical staff should the need arise to make larger changes than just volume up and down.

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### *Emerging Technology – AVB & DANTE Networking Protocols*

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### *Speech and Program Loudspeakers*

70 Volt ceiling speakers will be installed to provide even coverage in the room. Mix minus audio routing will be used to make sure that audio can't feedback. Speakers located near the microphones will provide audio minus the local microphones sound source. This is an industry standard technique to eliminate feedback due to speaker and microphone placement. Each member location at the dais will also receive a small localized speaker to help reinforce the audio. The local speaker will have a limited volume control available to the individual sitting at that position.

### *Wireless Microphones*

A wireless microphone system complying with the latest FCC rules will be provided. The microphone system will have both a body pack transmitter and lavalier microphone and a hand-held microphone. Only one microphone can be used at a time and they will be both configured to the same frequency channel.

### *Hearing Assist System*

The hearing assist system will be FM based and allow for users within the council chambers the ability to have additional personal sound reinforcement when participating and observing meetings. The body packs will have a standard 3.5mm audio connection to allow users to either use city provided headphones, personal headphones, or city provided neck loops. The number of body packs, headphones, and neck loops will comply with ADA regulations based on the occupancy of the council chambers. An FM transmitter antenna will be located within the chambers to provide even coverage.

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### *Emerging Technology – WIFI Hotspot Technology with BYOD & Public WIFI*

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### *Audio Recorder*

The digital audio recorder will allow for recording directly to a SD card or USB stick. The recorder will have the capability to provide an automatic network file transfer of audio files or manual transfer of audio files to a shared network location. Controls for the audio recording will be extended to a staff position to allow that staff member to manually hit record when needed. A visual indicator on the record button will provide confidence that the recorder is recording.

### *Control System*

A control system with multiple locations of control will allow users to control audiovisual system. A button panel located at the staff presentation area will allow users to switch between the Room PC, Laptop PC, Document Camera, or wireless presentation system as well as zoom in and out for the document camera. All buttons physical button with a visual light indicator letting the users know which source is selected.

An ancillary touch panel at a staff position will give users access to advanced controls provide control for on and off as well as volume control. An additional control panel will be in the broadcast production control room will allow the broadcast production staff the ability to assist with switching of presentation sources within room if needed. Room will have a room only mode for presentation use when not broadcasting.

## City of Anoka

The City of Anoka utilize their City Council Chambers for a variety of different types of meetings. Some meeting types include: City Council, Heritage Preservation, Housing & Redevelopment Authority, Planning Commission, Anoka-Champlin Fire Board, and Economic Development Commission. While the meetings may be different there are a lot of similarities in the needs of the users for participation, presentation, and distribution of content. This description provides information on the various system components and functionality for Anoka.

### *Video Presentation*

The existing projector and screen will be removed. Two 55" displays will be installed from the ceiling near the public seating area. These displays will allow the public to view presentation content. The displays will be installed to meet ADA regulations. Dais displays will be replaced with 22" – 24" LCD monitors with speakers. Additional displays will be added for members that currently do not have monitors. A single 55" display will be ceiling mounted in the adjacent conference room for overflow.

All displays within the space associated with the system will be in the HD aspect ratio of 16:9 with a native resolution of 1920x1080. Additional 4K capability may be possible on the displays depending on the equipment selected, however a multi format distribution and switching system is not recommended.

### *Wireless Presentation*

A wireless presentation and collaboration device will allow provide BYOD connectivity within the room without needing to have adaptor cables. It will provide iOS mirroring for MacBooks, iPads, and iPhones, as well as native mirroring for Chromebook, Android, and Windows Phones. The Wireless presentation device may require additional software to be loaded on the end user's device to display content. Software will be available via the manufacturer's website, iTunes, and Google Play store.

### *Annotation Capability*

When located on the staff presentation area, presenters will have additional flexibility of choosing to use an annotation feature that allows for real-time annotation over any material being presented. Annotation will be done using a touch screen monitor located at the staff presentation area. The touch screen monitor will utilize built in software of the wireless presentation system for all annotation features.

### *Document Camera*

A HD document camera ceiling mounted above the staff presentation area will allow the capability to display paper documents such as maps, diagrams, photo's, and other paper documents via the audiovisual system. Zoom and focus controls will be provided at the staff presentation area to ensure clarity of the content.

### *Video Switching and Distribution*

Video distribution will utilize twisted pair cabling reducing the need to run multiple audio, video, and control cabling to each source and destinations within the room. The switching matrix system will a card based frame that will allow various input cards and output cards to be installed. The system will 4k ready and utilize all 4k input and output cards along with 4k input transmitters and receivers. While 4k capable the system will be configured for HD 1920x1080 format but allow full 4k switching in the future.

### *Video Conferencing Systems*

The device providing wireless presentation capabilities will also serve as the rooms video conferencing interface. Soft codecs such as Skype, Bluejeans, Webex, etc. can be utilized with the system. The soft codecs and the services are not part of the system design but are to be provided by each city if the use of video conferencing is needed. The use of subscription services can also provide bridges to traditional video conference codecs from manufactures like Polycom, Cisco, and Lifesize.

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### *Emerging Technology – Video Conferencing for Public Meetings*

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### *Audio System*

A flexible digital signal processing (DSP) system will provide all the audio mixing, routing, and processing needed to support 19 microphones, line inputs, and provide enough outputs for proper zoning and audio distribution to the broadcast feed. The system will have defined presets for typical meetings as well as an audio shutoff to broadcast for when closed sessions need to happen within the space. Basic volume control will be provided for in room use by end users. More in-depth control will be provided to the cities technical staff should the need arise to make larger changes than just volume up and down.

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### *Emerging Technology – AVB & DANTE Networking Protocols*

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#### *Speech and Program Loudspeakers*

70 Volt ceiling speakers will be installed to provide even coverage in the room. Mix minus audio routing will be used to make sure that audio can't feedback. Speakers located near the microphones will provide audio minus the local microphones sound source. This is an industry standard technique to eliminate feedback due to speaker and microphone placement. Each member location at the dais will also receive a small localized speaker to help reinforce the audio. The local speaker will have a limited volume control available to the individual sitting at that position.

#### *Wireless Microphones*

A wireless microphone system complying with the latest FCC rules will be provided. The microphone system will have both a body pack transmitter and lavalier microphone and a hand-held microphone. Only one microphone can be used at a time and they will be both configured to the same frequency channel.

#### *Hearing Assist System*

The hearing assist system will be FM based and allow for users within the council chambers the ability to have additional personal sound reinforcement when participating and observing meetings. The body packs will have a standard 3.5mm audio connection to allow users to either use city provided headphones, personal headphones, or city provided neck loops. The number of body packs, headphones, and neck loops will comply with ADA regulations based on the occupancy of the council chambers. An FM transmitter antenna will be located within the chambers to provide even coverage.

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### *Emerging Technology – WIFI Hotspot Technology with BYOD & Public WIFI*

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#### *Audio Recorder*

The digital audio recorder will allow for recording directly to a SD card or USB stick. The recorder will have the capability to provide an automatic network file transfer of audio files or manual transfer of audio files to a shared network location. Controls for the audio recording will be extended to a staff position to allow that staff member to manually hit recorded when needed. A visual indicator on the record button will provide confidence that the recorder is recording.

#### *Control System*

A control system with multiple locations of control will allow users to control audiovisual system. A button panel located at the staff presentation area will allow users to switch between the Room PC, Laptop PC, Document Camera, or wireless presentation system as well as zoom in and out for the document camera. All buttons physical button with a visual light indicator letting the users know which source is selected.

An ancillary touch panel will give users access to advanced controls provide control for on and off as well as volume control. An additional control panel will be in the broadcast production control room will allow the broadcast production staff the ability to assist with switching of presentation sources within room if needed.

## City of Champlin

The City of Champlin utilize their City Council Chambers for a variety of different types of meetings. Some meeting types include: City Council, Park and Recreation, Planning Commission, Economic Development Authority, Environmental Resources Commission, and Anoka-Champlin Fire Board Meeting. While the meetings may be different there are a lot of similarities in the needs of the users for participation, presentation, and distribution of content. This description provides information on the various system components and functionality for Champlin.

### *Video Presentation*

The existing projector and screen will be removed and replaced with a 65" display mounted from the ceiling. The existing ceiling mounted TV will also be replaced with a matching 65" display. Screens will be installed to meet ADA regulations. All the dais monitors will be replaced with new 22" – 24" LCD monitors with speakers.

All displays within the space associated with the system will be in the HD aspect ratio of 16:9 with a native resolution of 1920x1080. Additional 4K capability may be possible on the displays depending on the equipment selected, however a multi format distribution and switching system is not recommended.

### *Wireless Presentation*

A wireless presentation and collaboration device will allow provide BYOD connectivity within the room without needing to have adaptor cables. It will provide iOS mirroring for Macbooks, iPads, and iPhones, as well as native mirroring for Chromebook, Android, and Windows Phones. The Wireless presentation device may require additional software to be loaded on the end user's device to display content. Software will be available via the manufacturer's website, iTunes, and Google Play store.

### *Annotation Capability*

When located on the staff presentation area, presenters will have additional flexibility of choosing to use an annotation feature that allows for real-time annotation over any material being presented. Annotation will be done using a touch screen monitor located at the staff presentation area. The touch screen monitor will utilize built in software of the wireless presentation system for all annotation features.

### *Document Camera*

A HD document camera ceiling mounted above the staff presentation area will allow the capability to display paper documents such as maps, diagrams, photo's, and other paper documents via the audiovisual system. Zoom and focus controls will be provided at the staff presentation area to ensure clarity of the content.

### *Video Switching and Distribution*

Video distribution will utilize twisted pair cabling reducing the need to run multiple audio, video, and control cabling to each source and destinations within the room. The switching matrix system will a card based frame that will allow various input cards and output cards to be installed. The system will 4k ready and utilize all 4k input and output cards along with 4k input transmitters and receivers. While 4k capable the system will be configured for HD 1920x1080 format but allow full 4k switching in the future.

### *Video Conferencing Systems*

The device providing wireless presentation capabilities will also serve as the rooms video conferencing interface. Soft codecs such as Skype, Bluejeans, Webex, etc. can be utilized with the system. The soft codecs and the services are not part of the system design but are to be provided by each city if the use of video conferencing is needed. The use of subscription services can also provide bridges to traditional video conference codecs from manufactures like Polycom, Cisco, and Lifesize.

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### *Emerging Technology – Video Conferencing for Public Meetings*

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### *Audio System*

A flexible digital signal processing (DSP) system will provide all the audio mixing, routing, and processing needed to support 13 of microphones, line inputs, and provide enough outputs for proper zoning and audio distribution to the broadcast feed. The system will have defined presets for typical meetings as well as an audio shutoff to broadcast for when closed sessions need to happen within the space. Basic volume control will be provided for in room use by end users. More in-depth control will be provided to the cities technical staff should the need arise to make larger changes than just volume up and down. Existing microphones and mute switches will remain in place and be re-integrated with the new system.

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### *Emerging Technology – AVB & DANTE Networking Protocols*

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#### *Speech and Program Loudspeakers*

70 Volt ceiling speakers will be installed to provide even coverage in the room. Mix minus audio routing will be used to make sure that audio can't feedback. Speakers located near the microphones will provide audio minus the local microphones sound source. This is an industry standard technique to eliminate feedback due to speaker and microphone placement. Each member location at the dais will also receive a small localized speaker to help reinforce the audio. The local speaker will have a limited volume control available to the individual sitting at that position.

#### *Wireless Microphones*

A wireless microphone system complying with the latest FCC rules will be provided. The microphone system will have both a body pack transmitter and lavalier microphone and a hand-held microphone. Only one microphone can be used at a time and they will be both configured to the same frequency channel.

#### *Hearing Assist System*

The hearing assist system will be FM based and allow for users within the council chambers the ability to have additional personal sound reinforcement when participating and observing meetings. The body packs will have a standard 3.5mm audio connection to allow users to either use city provided headphones, personal headphones, or city provided neck loops. The number of body packs, headphones, and neck loops will comply with ADA regulations based on the occupancy of the council chambers. An FM transmitter antenna will be located within the chambers to provide even coverage.

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### *Emerging Technology – WIFI Hotspot Technology with BYOD & Public WIFI*

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#### *Audio Recorder*

The digital audio recorder will allow for recording directly to a SD card or USB stick. The recorder will have the capability to provide an automatic network file transfer of audio files or manual transfer of audio files to a shared network location. Controls for the audio recording will be extended to a staff position to allow that staff member to manually hit recorded when needed. A visual indicator on the record button will provide confidence that the recorder is recording.

#### *Control System*

A control system with multiple locations of control will allow users to control audiovisual system. A button panel located at the staff presentation area will allow users to switch between the Room PC, Laptop PC, Document Camera, or wireless presentation system as well as zoom in and out for the document camera. All buttons physical button with a visual light indicator letting the users know which source is selected.

An ancillary touch panel will give users access to advanced controls provide control for on and off as well as volume control. An additional control panel will be in the broadcast production control room will allow the broadcast production staff the ability to assist with switching of presentation sources within room if needed.

## City of Ramsey

The City of Ramsey utilize their City Council Chambers for a variety of different types of meetings. Some meeting types include: City Council, Planning Commission, and Park and Recreation. While the meetings may be different there are a lot of similarities in the needs of the users for participation, presentation, and distribution of content. This description provides information on the various system components and functionality for Ramsey.

### *Video Presentation*

The existing projector and screen will be replaced with new HD 16x9 screen and projector. The projector and screen's main purpose is to provide the public the ability to view presentation content. A second HD 16x9 screen and projector will mirror the original to provide better viewable angles for the public. All the dais monitors will be replaced with new 22" – 24" LCD monitors with speakers.

All displays within the space associated with the system will be in the HD aspect ratio of 16:9 with a native resolution of 1920x1080. Additional 4K capability may be possible on the displays depending on the equipment selected, however a multi format distribution and switching system is not recommended.

### *Wireless Presentation*

A wireless presentation and collaboration device will allow provide BYOD connectivity within the room without needing to have adaptor cables. It will provide iOS mirroring for Macbooks, iPad's, and iPhones, as well as native mirroring for Chromebook, Android, and Windows Phones. The Wireless presentation device may require additional software to be loaded on the end user's device to display content. Software will be available via the manufacturer's website, iTunes, and Google Play store.

### *Annotation Capability*

When located on the staff presentation area, presenters will have additional flexibility of choosing to use an annotation feature that allows for real-time annotation over any material being presented. Annotation will be done using a touch screen monitor located at the staff presentation area. The touch screen monitor will utilize built in software of the wireless presentation system for all annotation features.

### *Document Camera*

A HD document camera ceiling mounted above the staff presentation area will allow the capability to display paper documents such as maps, diagrams, photo's, and other paper documents via the audiovisual system. Zoom and focus controls will be provided at the staff presentation area to ensure clarity of the content.

### *Video Switching and Distribution*

Video distribution will utilize twisted pair cabling reducing the need to run multiple audio, video, and control cabling to each source and destinations within the room. The switching matrix system will a card based frame that will allow various input cards and output cards to be installed. The system will 4k ready and utilize all 4k input and output cards along with 4k input transmitters and receivers. While 4k capable the system will be configured for HD 1920x1080 format but allow full 4k switching in the future.

### *Video Conferencing Systems*

The device providing wireless presentation capabilities will also serve as the rooms video conferencing interface. Soft codecs such as Skype, Bluejeans, WebEx, etc. can be utilized with the system. The soft codecs and the services are not part of the system design but are to be provided by each city if the use of video conferencing is needed. The use of subscription services can also provide bridges to traditional video conference codecs from manufactures like Polycom, Cisco, and Lifesize.

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### *Emerging Technology – Video Conferencing for Public Meetings*

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### *Audio System*

A flexible digital signal processing (DSP) system will provide all the audio mixing, routing, and processing needed to support 16 microphones, line inputs, and provide enough outputs for proper zoning and audio distribution to the broadcast feed. The system will have defined presets for typical meetings as well as an audio shutoff to broadcast for when closed sessions need to happen within the space. Basic volume control will be provided for in room use by end users. More in-depth control will be provided to the cities technical staff should the need arise to make larger changes than just volume up and down. All existing Audio-Technica microphones and shock mounts will be re-integrated with the new system.

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### *Emerging Technology – AVB & DANTE Networking Protocols*

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#### *Speech and Program Loudspeakers*

The existing line array system will stay in place. Mix minus audio routing will be used to make sure that audio can't feedback. Speakers located near the microphones will provide audio minus the local microphones sound source. This is an industry standard technique to eliminate feedback due to speaker and microphone placement. Each member location at the dais will also receive a small localized speaker to help reinforce the audio. The local speaker will have a limited volume control available to the individual sitting at that position. Two additional speakers will be installed outside the chambers providing overflow audio into the lobby of City Hall.

#### *Wireless Microphones*

A wireless microphone system complying with the latest FCC rules will be provided. The microphone system will have both a body pack transmitter and lavalier microphone and a hand-held microphone. Only one microphone can be used at a time and they will be both configured to the same frequency channel.

#### *Hearing Assist System*

The hearing assist system will be FM based and allow for users within the council chambers the ability to have additional personal sound reinforcement when participating and observing meetings. The body packs will have a standard 3.5mm audio connection to allow users to either use city provided headphones, personal headphones, or city provided neck loops. The number of body packs, headphones, and neck loops will comply with ADA regulations based on the occupancy of the council chambers. An FM transmitter antenna will be located within the chambers to provide even coverage.

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### *Emerging Technology – WIFI Hotspot Technology with BYOD & Public WIFI*

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#### *Audio Recorder*

The digital audio recorder will allow for recording directly to a SD card or USB stick. The recorder will have the capability to provide an automatic network file transfer of audio files or manual transfer of audio files to a shared network location. Controls for the audio recording will be extended to a staff position to allow that staff member to manually hit recorded when needed. A visual indicator on the record button will provide confidence that the recorder is recording.

#### *Control System*

A control system with multiple locations of control will allow users to control audiovisual system. A button panel located at the staff presentation area will allow users to switch between the Room PC, Laptop PC, Document Camera, or wireless presentation system as well as zoom in and out for the document camera. All buttons physical button with a visual light indicator letting the users know which source is selected.

An ancillary touch panel located near the clerk will give users access to advanced controls provide control for on and off as well as volume control. An additional control panel will be in the broadcast production control room will allow the broadcast production staff the ability to assist with switching of presentation sources within room if needed.

## Infrastructure Considerations - Andover

Existing power circuits should be able to be reused for equipment located in the control rooms. Additional circuits and outlet locations will be needed for the portable monitor carts to ensure that long extension cords are not needed. Additional outlets also may be needed under the dais for monitors and distribution equipment.

Estimated power consumption for audiovisual equipment:

- Control Room Equipment: 1500 Watts
- Portable carts: 852 Watts
- Council Chambers Equipment: 1250 Watts

Estimated heat load for the audiovisual equipment:

- Control Room Equipment: 5118 BTU/hr.
- Portable carts: 726 BTU/hr.
- Council Chambers Equipment: 4265 BTU/hr.

### *Broadcast Lighting*

Broadcast and video conferencing applications require special lighting which should include even illumination on meeting participants. Lighting level should be 70 ft. candles, vertical, with a color temperature of 4000 degrees Kelvin. There should be minimum contrast between all and furniture colors. Matte colors are recommended. Busy patterns, weaves, and wood-grains should not be used. Lighting should be controlled by the Control Room operator during televised and recorded meetings.

### *Chambers Acoustics*

The City of Andover had the most acoustical challenges out of all the member cities. While upgraded audio processing, amplification, and microphones and improve audio within the spaces, special consideration needs to be taken for acoustically treating the spaces. A Noise Criteria rating of between NC-30 and NC-40 is recommended for typical council chamber spaces. Its recommended the City of Andover retain an Acoustical consultant to help address specific issues with the council chambers space.

### *Control Room*

Aesthetics such as paint should be refreshed within the space and separate HVAC should be considered for the room. Separate HVAC should be provided to ensure equipment is maintained at a consistent temperature to ensure temperature doesn't contribute to shortening the equipment lifespan. Room temperature should range from 70 to 72 degrees Fahrenheit, with a relative humidity from 40 to 65 percent. Air movement should not exceed 4 to 6 inches per second.

Additionally, the city should look at the placement of the current control room and look to move it closer to the chambers. The current distance presents challenges when dealing with technical issues as they arise during preparation of the broadcast and during the actual broadcast. It's recommended that the conference room adjacent to the chambers be repurposed for a control room.

### *Miscellaneous Items*

The recommendation does not include provisions for LAN, Wi-Fi, voice networks or similar systems. Architectural considerations for each space such as wall and floor treatments, seating, lighting, acoustics etc. should be coordinated with an interior design team.

## Infrastructure Considerations - Anoka

Existing power circuits should be able to be reused for equipment located in the control room. Additional circuits and outlet locations will be needed for the ceiling mounted displays. Additional outlets also may be needed under the dais for monitors and distribution equipment.

Estimated power consumption for audiovisual equipment:

- Control Room Equipment: 1500 Watts
- Ceiling Displays: 330 Watts
- Council Chambers Equipment: 1250 Watts

Estimated heat load for the audiovisual equipment:

- Control Room Equipment: 5118 BTU/hr.
- Ceiling Displays: 1126 BTU/hr.
- Council Chambers Equipment: 4265 BTU/hr.

### *Broadcast Lighting*

Broadcast and video conferencing applications require special lighting which should include even illumination on meeting participants. Lighting level should be 70 ft. candles, vertical, with a color temperature of 4000 degrees Kelvin. There should be minimum contrast between all and furniture colors. Matte colors are recommended. Busy patterns, weaves, and wood-grains should not be used. Lighting should be controlled by the Control Room operator during televised and recorded meetings.

### *Control Room*

Aesthetics such as paint should be refreshed within the space and separate HVAC should be considered for the room. Separate HVAC should be provided to ensure equipment is maintained at a consistent temperature to ensure temperature doesn't contribute to shortening the equipment lifespan. Room temperature should range from 70 to 72 degrees Fahrenheit, with a relative humidity from 40 to 65 percent. Air movement should not exceed 4 to 6 inches per second.

### *Window Treatments*

Separating the Council Chambers and a conference room is a large window wall. Its recommended to install window treatments that can be drawn when meetings are taking place in each of the rooms. The shades can remain open when only a single meeting is taking place. Manual shades are cost effective and are easy to install and require no additional electrical infrastructure.

### *Miscellaneous Items*

The recommendation does not include provisions for LAN, Wi-Fi, voice networks or similar systems. Architectural considerations for each space such as wall and floor treatments, seating, lighting, acoustics etc. should be coordinated with an interior design team.

## Infrastructure Considerations - Champlin

Existing power circuits should be able to be reused for equipment located in the control room. Additional circuits and outlet locations will be needed for the ceiling mounted displays. Additional outlets also may be needed under the dais for monitors and distribution equipment.

Estimated power consumption for audiovisual equipment:

- Control Room Equipment: 1500 Watts
- Ceiling Displays: 330 Watts
- Council Chambers Equipment: 1250 Watts

Estimated heat load for the audiovisual equipment:

- Control Room Equipment: 5118 BTU/hr.
- Ceiling Displays: 1126 BTU/hr.
- Council Chambers Equipment: 4265 BTU/hr.

### *Broadcast Lighting*

Broadcast and video conferencing applications require special lighting which should include even illumination on meeting participants. Lighting level should be 70 ft. candles, vertical, with a color temperature of 4000 degrees Kelvin. There should be minimum contrast between all and furniture colors. Matte colors are recommended. Busy patterns, weaves, and wood-grains should not be used. Lighting should be controlled by the Control Room operator during televised and recorded meetings.

### *Control Room*

The control room hasn't been updated in some time. Aesthetics such as paint should be refreshed within the space and separate HVAC should be considered for the room. Separate HVAC should be provided to ensure equipment is maintained at a consistent temperature to ensure temperature doesn't contribute to shortening the equipment lifespan. Room temperature should range from 70 to 72 degrees Fahrenheit, with a relative humidity from 40 to 65 percent. Air movement should not exceed 4 to 6 inches per second.

### *Sound Treatment*

With the control room directly adjacent to the council chambers sound from the chambers or control room travels through to the other space easily. Sound from the control room can disrupt the meeting and control room operators must wear headphones while operating the equipment during a televised or recorded meeting. The use of headphones is not ideal in a production environment. Noise levels in control room should meet or exceed the Noise Criterion level of NC-25.

### *Council Chambers Ambient Noise*

Above the public area in the chambers near the movable wall is a mechanical unit that is causing significant issues meeting speech intelligibility requirements of the public space. Ambient noise levels within the chambers should meet or exceed the Noise Criterion level of NC-25. It is recommended that a mechanical engineer provide options for moving or reducing the noise of the unit.

### *Miscellaneous Items*

The recommendation does not include provisions for LAN, Wi-Fi, voice networks or similar systems. Architectural considerations for each space such as wall and floor treatments, seating, lighting, acoustics etc. should be coordinated with an interior design team.

## Infrastructure Considerations - Ramsey

Existing power circuits should be able to be reused for equipment located in the control room. Additional circuits and outlet locations will be needed for the additional projector. Additional outlets also may be needed under the dais for monitors and distribution equipment.

Estimated power consumption for audiovisual equipment:

- Control Room Equipment: 1500 Watts
- Projectors: 1700 Watts
- Council Chambers Equipment: 1250 Watts

Estimated heat load for the audiovisual equipment:

- Control Room Equipment: 5118 BTU/hr.
- Projectors: 5797 BTU/hr.
- Council Chambers Equipment: 4265 BTU/hr.

### *Control Room*

The control room shares a space with storage and an IDF serving a portion of the building. Its recommended that the control room portion of the room be partitioned off for security and comfort within the space. The control room should noise criteria level should meet or exceed NC-25. Room temperature should range from 70 to 72 degrees Fahrenheit, with a relative humidity from 40 to 65 percent. Air movement should not exceed 4 to 6 inches per second.

### *Miscellaneous Items*

The recommendation does not include provisions for LAN, Wi-Fi, voice networks or similar systems. Architectural considerations for each space such as wall and floor treatments, seating, lighting, acoustics etc. should be coordinated with an interior design team.

## Special Issues

Topics included in the section should require further review and attention by QCTV and its member cities when moving forward with the audiovisual project. Items pertain to quality of service, accessibility, and policy with various items proposed for the use and operation of the audiovisual systems.

### Bring Your Own Device (BYOD)

Wireless presentation systems allow the use of bring your own devices (BYOD); however, since the devices are not provided by the City it becomes difficult to guarantee the level of service quality. Different operating systems, wireless chipsets, security features, all contribute to the overall performance of the device and the system it interacts with.

### Closed Captioning

Closed Captioning is not a requirement for city council meetings typically, however providing this service would provide enhanced accessibility to content for its city residence. Currently QCTV falls under the FCC's Self-Implementing exemption rules because it produces revenues of under \$3,000,000. Closed captioning requires the purchase of a close caption encoder and the use of a 3<sup>rd</sup> party service for live captioning. Each system design has a VOIP card for the DSP unit providing remote connectivity and clear audio monitoring for the captioning service.

### Wireless Network

The wireless presentation system depends on the Cities' wireless network infrastructure, routing, and policies. The wireless access points within the council chambers spaces should be IEEE 802.11ac compliant to provide sufficient bandwidth to the devices. All devices connecting to the access points and utilize the wireless presentation system solution should also be IEEE 802.11ac compliant. WIFI should be provided by each city within the chambers spaces.

### Video Conferencing

The system provides the options for video conferencing but there are policies and laws that are individual to each city and local that need to be referred to before the technology can be used for meetings. This report does not create or modify policy and is provided at the discretion of each City.