

The proposed software license agreement allows for up to 100 simultaneous connections to the City's streaming video server from the Internet. (See below #6)

The system would receive an analog signal from the cameras already installed in Sullivan Chambers. This signal must be converted into a digital format by the video capture board. A 'signal splitting' device must be installed in the line from the cameras to ensure that video and audio signal are sent to the City's streaming video system and to Channel 8's broadcast facility.

- 2) Cost. The cost of hardware, software and related electronics is approximately \$20,000 for the initial purchase of equipment and software and approximately \$3500/year for maintenance, repair and software support services. This does not include the cost of technical staff to install the equipment and to operate it after installation. (See below #4).
- 3) Bandwidth. The City currently has two T-1 lines connected to the Internet. Current bandwidth is adequate to carry the video and audio content to the Internet for approximately 100 simultaneous connections to the City's video server. However, during the City's business hours, additional demand on the T-1s to carry city business to and from the Internet will probably result in decrease in the quality of the video program due to network congestion.
- 4) Support/Ongoing Management. After installation, technical support will be required to "produce" programs for eventual broadcast. This consists of setting parameters in the software prior to the broadcast, making sure the electronics and connections are correct, and arranging for archiving of the broadcast materials. Other support tasks include regular system administration of the server and PC, regular backup of archives and software, addition of new programming, and troubleshooting of system and other problems. A support technician would be needed about six days a month assuming the Monday Evening's City Council meeting is the only program produced. Camera angles, close-up, sound capture and balancing, and other activities are already provided by the City's Cable TV technicians.
- 5) Quality of Service. The quality of the video picture seen by citizens and others on their PCs can vary. While the technology has improved dramatically in the last 3 years, the picture is not as high in quality as television—and it may be greatly inferior. Poor quality video streaming may look blurred, 'herky jerky' characterized by stops and starts or halts in the picture, loss of audio signal, and speaker's lip movements and sound may not be synchronized. Usually, however, the audio signal is less affected. Some of the factors which can cause the quality of program to deteriorate include

> inadequate bandwidth available to connect the City's video servers to the Internet

> slow personal computers

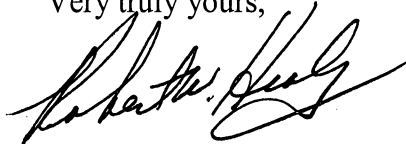
> congestion on the internet,

> slow network connection to the viewing system—this can be particularly true when modem/telephone connections are used

- 6) Potential Growth of Service. The proposed design could handle 50% growth by upgrading the software license, server memory and hard-disk storage. An additional 100 users would cost approximately \$14,000 and another \$3,500 a year in maintenance and software support. Growth beyond 150 users would require installation of expanded bandwidth to the Internet. For every hundred users, the cost of bandwidth would increase by approximately \$25,000 per year in yearly Internet Service Provider and circuit fees. If the City Council broadcasts are successful, other clients within the City government may wish to use this service as well for hearings, speeches of interest to the public, educational programming and panel discussions. This would require increasing the amount of technical support. As the programming became more popular with the general public, the cost of providing more connections increases.

- 7) Cable TV (Channel 8). Calvin Lindsay, Director of the City's Cable TV Office, is commencing a study of the technologies and infrastructure currently used to broadcast City Council and will be making recommendations for technology enhancements. The goal of the study is to determine the viability of the current analog video system and to review the possibility of including the costs of any recommended upgrades and enhancements to the City's broadcast facilities. The study will make a recommendation on costs and technology infrastructure.

Very truly yours,



Robert W. Healy
City Manager



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CITY OF CAMBRIDGE • EXECUTIVE DEPARTMENT

Robert W. Healy, City Manager Richard C. Rossi, Deputy City Manager

February 5, 2001

To The Honorable, The City Council:

In response to Awaiting Report Item No. 00-137, regarding a report on the feasibility of broadcasting City Council meetings and other major municipal events over the Cambridge municipal website through streaming video, MIS Director Thomas Makofske reports the following:

The regular broadcast of live City Council Meetings on the City's Website is feasible. The following factors should be considered in making the determination on whether to implement this service.

- 1) Design
 - 2) Cost
 - 3) Bandwidth
 - 4) Support/Ongoing Management
 - 5) Quality of Service
 - 6) Potential Growth of Service
 - 7) Cable Television (Channel 8)
- 1) Design. "Live Streaming Video" requires installation of computers, software, and network connections. (Cameras and microphones are already installed in Sullivan Chambers. However, See #7 below). The technologies required are working reliably in many public and private settings. For example, to see a demonstration of a live streaming video broadcast over the web, point a web browser to WWW.CSPAN.ORG and select one of the three channels available. Note that both audio and video media are available if the correct 'player' is installed. The most common "player" is available free over the internet, often, it is already installed on most personal computers. It is called RealPlayer G2.

The system proposed for the City consists of a high end PC with video capture card, a server scaled for an additional 50% growth, and the RealNetworks, Inc., suite of software products specifically designed for this application: Real Producer/EncoderG2, RealServerG2. These products would need to be purchased. The City already has cameras, microphones, cabling, Web systems, and a high speed connection to the Internet. The proposed design allows for the archiving of some programs as files that can be broadcast at later dates and times.



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Consent Agenda #9

Awaiting Report Item

Number 00-137, regarding a report on the feasibility of broadcasting City Council meetings and other major municipal events over the Cambridge municipal website through streaming video.

In City Council February 5, 2001

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