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March 16, 2011

*Via Electronic Mail*

Ms. Barbara Popovic  
Executive Director  
Chicago Access Network Television (CAN TV)  
322 S. Green St.  
Chicago, IL 60607  
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**Subject: HDTV Capacity**

Dear Barbara:

In response to your question about the digital video capacity of a standard 6 MHz spectrum block, the typical capacity allocated by cable operators is two to three high-definition television (HDTV) channels or 11 to 12 standard-definition television (SDTV) channels.

The capacity depends on the modulation of the signals in the system and the technology used to depict the digital video. Modulation is the means by which the digital “1” and “0” signals are written and read. Most cable operators are using 256-QAM modulation, which transports approximately 38.8 Mbps in a 6 MHz spectrum block.

Cable operators are typically using Motion Picture Experts Group-2 (MPEG-2) technology, which presents HDTV in 19.2 Mbps and SDTV in 3.5 Mbps at optimum quality. This provides space for up to two HDTV channels at optimum quality and up to 11 SDTV channels at optimum quality.

In our experience, many cable operators are compressing video to use less capacity. For example, one operator in the Washington, D.C. area compresses HDTV to approximately 12.8 Mbps. This enables the cable operator to place three HDTV channels in one 6 MHz spectrum block. This was done with CNN and TNT but not with network affiliates, premium movie channels, or ESPN. This is presumably because of concern by the programmer or the operator over potentially deteriorated picture quality (diminished picture or color sharpness relative to a 19.2 Mbps stream, for example).

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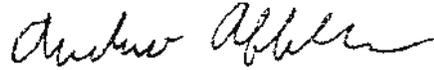
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In the near future cable operators may adopt MPEG-4 equipment, which has the capability to provide the highest picture quality while using less capacity. At that time, the number of channels typically inserted by a cable operator per 6 MHz spectrum block may increase further.

I hope this is useful. Please let me know if you have further questions.

Best regards,

A handwritten signature in black ink, appearing to read "Andrew Afflerbach". The signature is fluid and cursive, with a long horizontal stroke at the end.

Andrew Afflerbach, P.E., Ph.D.  
CEO/Director of Engineering