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**REPORT ON
CABLE-RELATED NEEDS AND INTERESTS
WITHIN
THE CITY OF MINNEAPOLIS, MN**

By

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EXECUTIVE SUMMARY

CBG Communications, Inc. (CBG) in association with Dr. Constance Book, Ph.D. of the Telecommunications Research Corporation, and Carson Hamlin, video engineer, at the behest of the Minneapolis Telecommunications Network (MTN) and the City of Minneapolis (City), has conducted a comprehensive review of Community Needs and Interests related to cable communications in Minneapolis. This Ascertainment was conducted as part of cable franchise renewal proceedings with the local cable television provider, Time Warner Cable (“TWC” or “Time Warner”).

Thomas G. Robinson, CBG’s Executive Vice President, managed the project with support from CBG’s Senior Engineer, Dick Nielsen. Dr. Book provided support related to study methodology, information gathering, and statistical analysis. Mr. Hamlin provided video engineering expertise related to Public, Educational and Governmental (PEG) Access review and analysis tasks.

The results of the Needs and Interests Ascertainment are presented in the following report and provide a wealth of information for MTN and the City regarding issues of significance to Minneapolis citizens related to cable communications, and correspondingly, the ability of the cable system and the operator, TWC, to meet demonstrated needs and interests.

The key recommendations and observations discussed herein are based on an extensive data collection including, but not limited to, the following:

- ? A review of a significant amount of existing data related to Minneapolis needs and interests provided by PEG Access and Institutional Network (I-Net) User Organizations.
- ? A statistically valid residential telephone survey, randomly administered to both subscribers and non-subscribers in Minneapolis.
- ? Interviews and on-site visits to the MTN Access Center.
- ? A workshop and focused discussion with current Access users.
- ? An analysis of written survey information from over 100 Access producers.

- ? Long interviews and focused discussions with representatives from City Government, including the Office of Telecommunications and Media Services, Business Information Services (BIS), and others.
- ? Long interviews and focused discussions with, and written surveys from, local educators concerning educational access programming and networking needs.
- ? Long interviews and focused discussions with prior, current and potential City and Minneapolis Public Schools Users of the existing I-Net and a potential upgraded and expanded I-Net.

The analysis of this data enabled CBG and its team partners to focus on three major elements of the Community Needs Ascertainment. First, CBG assessed the needs of the residential community related to traditional and new cable services. Second, CBG and its team partners determined the needs and interests of all the assessed communities related to PEG Access. Third, CBG and its team partners were able to determine the needs and interests of especially the Government and Educational entities assessed related to use of an Institutional Network in Minneapolis.

Our findings are incorporated in the following Report, as well as Conclusions and Recommendations separated for the three main areas of assessment. The Conclusions and Recommendations that follow at the end of each of the large sections (A, B, and C) in our report provide a strong and sound basis for the City and MTN to go forward in franchise renewal proceedings and help ensure that Community Needs and Interests are met in any renewed franchise with Time Warner.

SECTION A

**REVIEW OF RESIDENTIAL COMMUNITY NEEDS
AND INTERESTS
WITHIN THE CITY OF MINNEAPOLIS
FRANCHISE AREA**

RESIDENTIAL COMMUNITY NEEDS ASSESSMENT

Summary

As part of local cable franchise renewal proceedings, a consumer needs and interests ascertainment related to cable television was conducted in the Minneapolis, Minnesota franchise area. This needs assessment included a telephone survey of randomly selected Minneapolis residents.

Based on the findings of that survey, we recommend the following issues, among others, be given consideration and addressed in franchise renewal:

1. Reviewing ways to meet the needs expressed by non-subscribers (such that they would consider subscribership in the future) including: increasing programming variety, improving customer service, and enabling non-subscribers to make a better price/value comparison.
2. Increasing satisfaction of existing subscribers by improving picture quality and system reliability, providing more variety in programming and package options, and, similar to the needs of non-subscribers, enhancing the price/value comparison going forward.
3. Resolving technical issues expressed by subscribers specifically related to picture quality problems concerning the local network affiliates.
4. Resolving customer service concerns, including installation problems, telephone-answering issues such as busy signals and call answering delays; more regular, established communication regarding rate and programming changes; and lengthy service response and resolution timeframes.
5. Enhancing programming choices, especially in the area of sports programming and international and foreign language programming.
6. Maintaining and enhancing a local Minneapolis access television presence, including improvement in picture and sound quality of the channels, increasing opportunities for participation, increasing the availability and quality of the tools used by access producers to create programming, as well

as provisions to facilitate development of greater amounts of Minneapolis-centric programming.

These findings are one component of the factors for the City to consider as efforts are made to address local community needs and interests during franchise renewal proceedings for the Minneapolis franchise area.

Introduction

As part of cable television franchise renewal proceedings for the Minneapolis, MN franchise area, a survey of Minneapolis residents was conducted among cable television subscribers and non-subscribers to document needs and interests related to cable television service. The following narrative summary reports on the findings and conclusions of that field research.

The findings are based on telephone interviews conducted with a random sampling of 603¹ franchise area residents during March 2004. Of those interviewed, 400 were cable subscribers and 203 were not. Statisticians have created a confidence rating in field survey research based on sample size. A sample size of 603 residents provides for a margin of error of ?4 percent. In other words, if this study were to be replicated among another random sample of franchise area residents, the City can feel confident that these same findings would be repeated within ?4 percent of the scores reported in this study.

The random sampling of homes was effective in that in a majority of cases respondents' demographics were similar to those reported in the latest census by ± 5 points, the established margin of error. Demographics of respondents were consistent in the areas of gender, age and race. Homeownership was slightly higher among respondents in this study than in the census, with 64% owning a home where as the census reports 51% owning a home. This is not atypical in cable television-related studies. Homeowners typically are more likely to be willing to respond to surveys related to such local issues.

Additionally, the incidence of respondents' telephoned that reported subscribing to cable television service was slightly higher than the actual penetration reported by the cable company. Sixty-four percent (64%) reported subscribing to cable television; however the company reports penetration at just over 50%. This phenomenon is likely driven by the topic of the survey. While the introduction did indicate that we were interested in hearing

¹ A symbol of N will be used periodically throughout this report to denote total responses.

from subscribers and non-subscribers, we suspect that cable subscribers are more interested in talking about their cable service.

Also important to note during the reading of this narrative is that numbers were rounded off to the whole. As a result, when considering the total percentages related to any given response the numbers reported will fall between 99-101%.

Interviews with cable subscribers lasted, on average, twenty-one minutes. The instruments used during field research were specifically designed to examine several areas of cable television service. These included, but are not limited to:

- ? Respondents' familiarity and experiences with Time Warner.
- ? Reasons non-subscribers do not now subscribe to cable service (left Time Warner) or have never subscribed.
- ? Amount of the average monthly cable bill.
- ? Type of cable package subscribed to by respondents.
- ? Respondents' sources of information about cable programming.
- ? General level of satisfaction with Time Warner.
- ? Suggestions on how to improve the services provided by Time Warner.
- ? Quality of specific service features provided by Time Warner.
- ? List of specific channels with poor picture quality or poor audio quality.
- ? Consumer ratings of installation procedures.
- ? Consumer ratings of communication experiences with Time Warner, including both telephone and office experiences.
- ? Consumer attitudes toward resolution of problems with Time Warner.
- ? The number of cable outages and consumer experiences with restoration of services.
- ? Types of programming and services of interest to consumers.
- ? Consumer opinions of government, education and public access programming currently offered.

- ? Quality of the picture and sound of access programming and evaluation of the programming's educational, informational and entertainment value.
- ? Consumer interest and experiences with access programming opportunities.
- ? Consumer technology activity in other arenas and the amount and type of on-line use.
- ? Non-subscribers' reasons for never or currently not subscribing to Time Warner.

Research Methodology

A contracted telemarketing firm, Issues and Answers, Inc., of Virginia Beach, VA conducted telephone interviews. Issues and Answers has over 40 years of combined experience in social science research using telephone survey methodology. Calls were placed during a variety of times of day, during weekdays and weekends to ensure that all sets of lifestyles were represented in the data collected. Issues and Answers utilized trained interviewers and a call back procedure to protect the reliability and validity of the data collected. Telephone numbers were selected using a random selection technique from Minneapolis area phone numbers. Continuous callbacks were made to numbers without answers and to numbers with answering machines or voicemail so that these numbers were not removed from the pool of potential respondents.

The survey instrument was designed by CBG Communications with consultation, assistance and approval of representatives from the City and the local access authority, MTN.

Subscriber And Non-Subscriber Study Findings

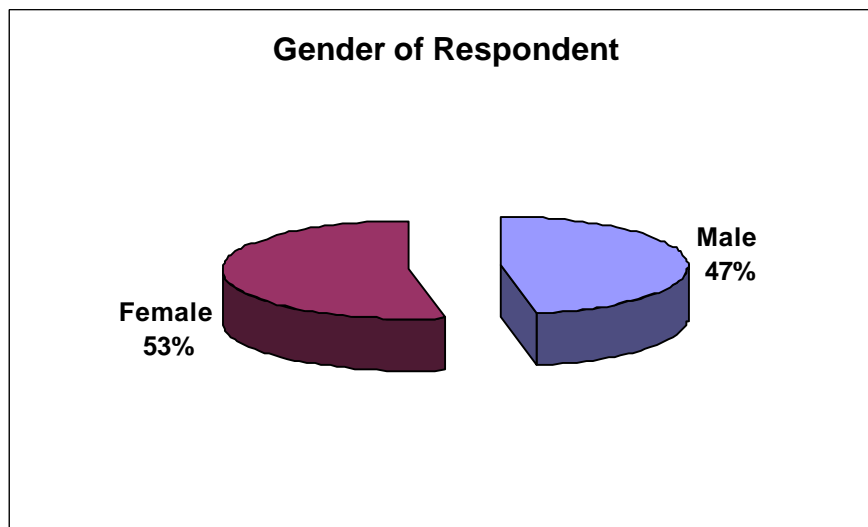
Sample Description

The sample consisted of 603 randomly selected Minneapolis franchise area residents. A screening question was used to ensure respondents only included those who made the

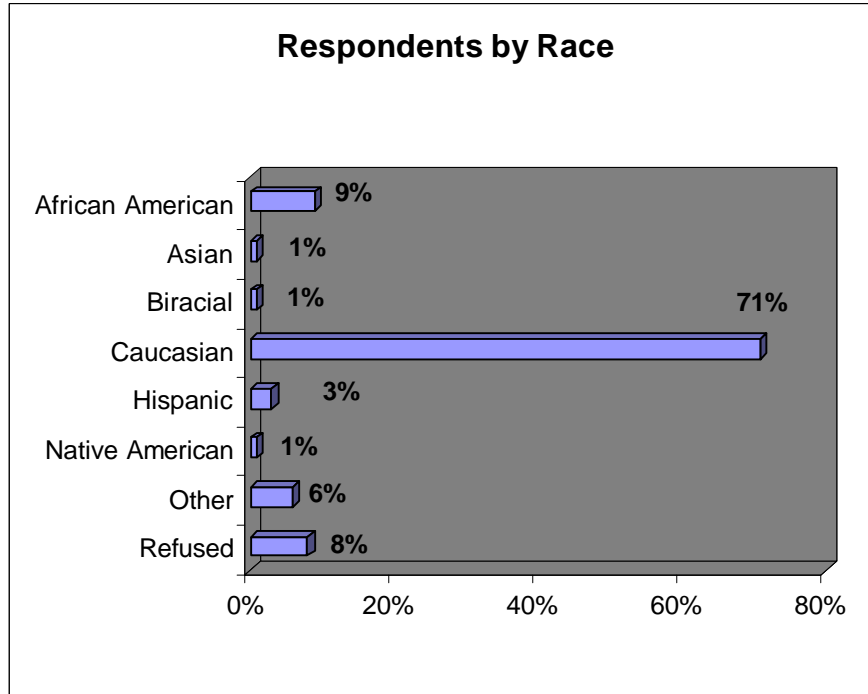
decision as to whether the household subscribed to cable television service or shared equally in that decision. All respondents were also required to be 18 years or older.

The surveyed population was comprised of only residents of the City of Minneapolis franchise area.

The sample was not specifically controlled for gender, but the final results were only slightly weighted toward women. Forty-seven percent (47%) of the responding sample was male and fifty-three percent (53%) was female.

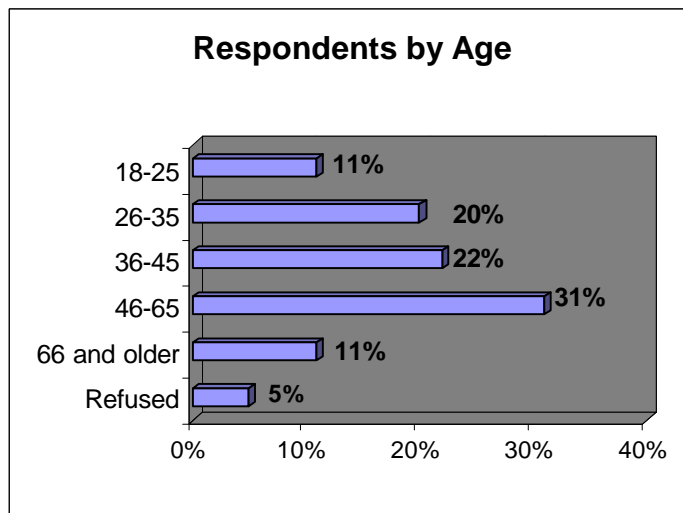


The majority of the respondents were Caucasian (71%). African Americans made up 9% of the sample. Three percent (3%) were Hispanic. Asians and Native Americans each accounted for one percent (1%). Seven percent (7%) identified themselves as biracial or other.



A majority of respondents own their home (64%) and a quarter (25%) of the respondents have children under the age of 18 living in their home.

The sample represented a wide range of ages. The largest reported age category (31%) of the sample fell in the mid-age range of 46-65. Younger and older respondents, however, were also well represented. Eleven percent (11%) of the sample was 25 or under; 20% were between 26 and 35, 22% between 36 and 45 years old and 11% were over 66.



The sample represented a diverse range of annual income levels. Twenty-seven percent (27%) indicated earning an annual income of \$35,000 or less. Nine percent (9%) of the sample had an income of above \$100,000. Eighteen percent (18%) had an income between \$35,000 and \$50,000. Eight percent (8%) reported an annual income between \$50,000 and \$75,000. Twenty-one percent (21%) of respondents refused to report their income.

A significant number of survey respondents (73%) owned a computer.² Of these, the average respondent owned 1.6 computers, with a range extending from one to twelve. The most frequent response was that the respondent had one computer in the home.

When considering computer owners as a whole (N=438), the majority (54%) subscribed to an on-line service. Internet service was accessed from the home using a cable modem by 30% of cable subscribers³.

Respondents with on-line service reported spending an average of 2.37 hours on-line each day. The most common response (the mode) was 1 hour of on-line activity per day.⁴

When considering online activity as a whole, respondents indicated that 32% of their time online was spent “recreationally.” Thirty percent (30%) of time online was described as “working” and 19% “educationally.” Nine percent (9%) of time online was spent “shopping.”

Significantly, 21% of Minneapolis residents with Internet access indicated that they browsed the web and watch television at the same time on a daily basis. An additional 7% indicated that they engaged in this activity on a weekly basis. Twenty-one percent (21%) described themselves as occasional simultaneous multimedia users, while 51% indicated that they never engaged in this activity. This new dimension of dual media

² PC ownership levels in the area are slightly higher than the national average. National penetration of PC's is at 64% (www.ce.org, 2003).

³ The National Cable and Telecommunications Association (September 2003) reports cable modem penetration at 15 million homes, or 16% of all US households and 23% of homes subscribing to cable television services. www.ncta.com.

⁴ The mode use of the Internet is congruent with national data that most users are on-line one hour a day (www.pewinternet.org).

activity raises specific considerations for the content produced by local access programmers, as well as hardware and support software for such activity.

Non-subscribers to Time Warner's Service

Non-subscribers (N=203) were divided into those who had never subscribed to television services and those who had subscribed at one time, but no longer subscribed. Fifty-four percent (54%) of non-subscribers said they had never subscribed to cable television services in the community.

Those who had **never** subscribed to cable television (N=110) in the community indicated the primary reasons for never subscribing were because of cost (36%) and because they “Don’t want/Don’t watch television” (35%). Another 8% said that they didn’t have the time to watch television. Four percent (4%) indicated that they had never subscribed because when they called the service wasn’t available.

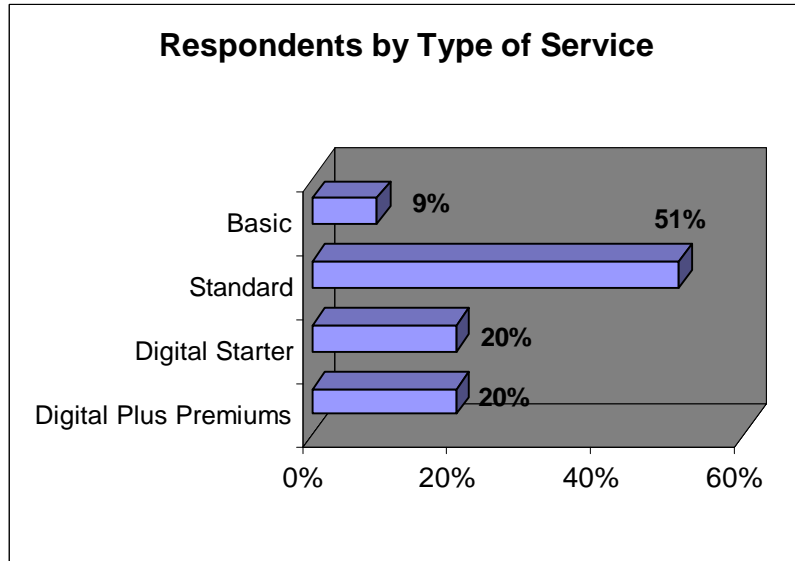
Those who had previously subscribed to cable television services (N=93), but were not currently subscribing were most likely to say (top 3 responses) that they discontinued service because of “cost” (51%), followed by programming issues (9%), or they moved (9%).

Subscribers to Time Warner Cable Service

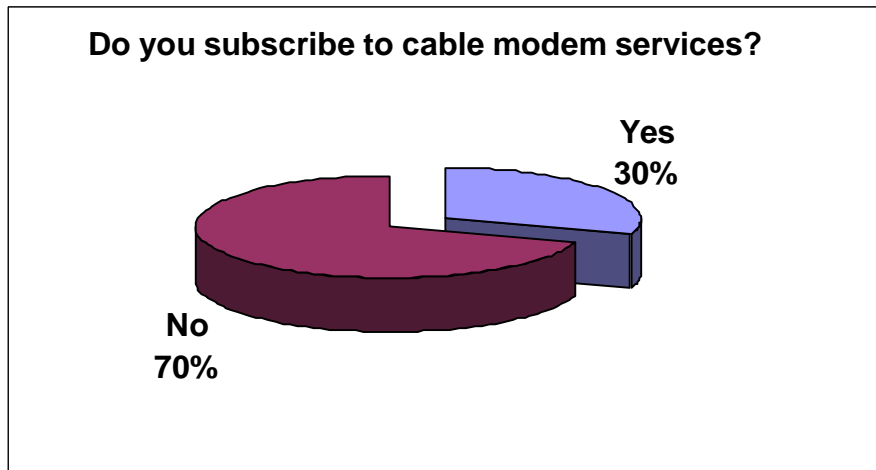
The subscribing sample (N=400) had subscribed to cable television in Minneapolis for an average of 7.27 years. The range of reported responses was from 1-30, with the most common response being 10 years.

The most popular cable service package subscribed to by respondents was the “Standard plus Basic Cable” package. Over half (51%) of subscribers have this package, which offers basic service and another tier of popular cable channels. Twenty percent (20%) indicated they subscribed to the “Digital Cable plus Basic and Standard” package, which

incorporates both analog and digital channels. Twenty percent (20%) subscribe to the “Digital plus Premiums” package which includes additional premium channels.



As indicated earlier, 30% of respondents indicated subscribing to cable modem services.⁵



The average monthly cable bill is \$59.74. The most commonly reported cable bill (the mode) was \$59 a month, with cable bills ranging from \$11 to \$150 a month.⁶

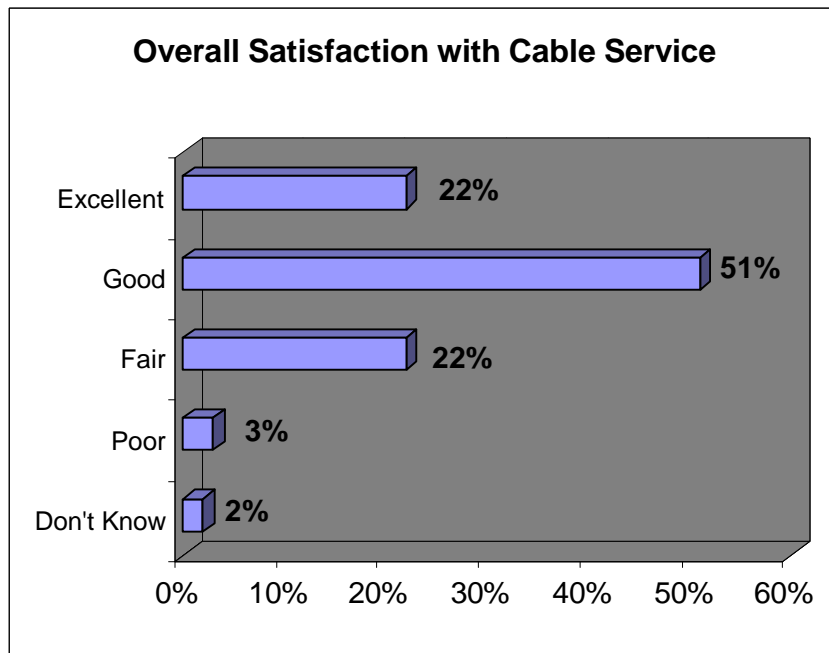
⁵ A 30% penetration on cable modem services is 7% higher than the national average reported by the National Cable & Telecommunications Association (www.ncta.com).

⁶ This figure includes all services: cable television and cable modem.

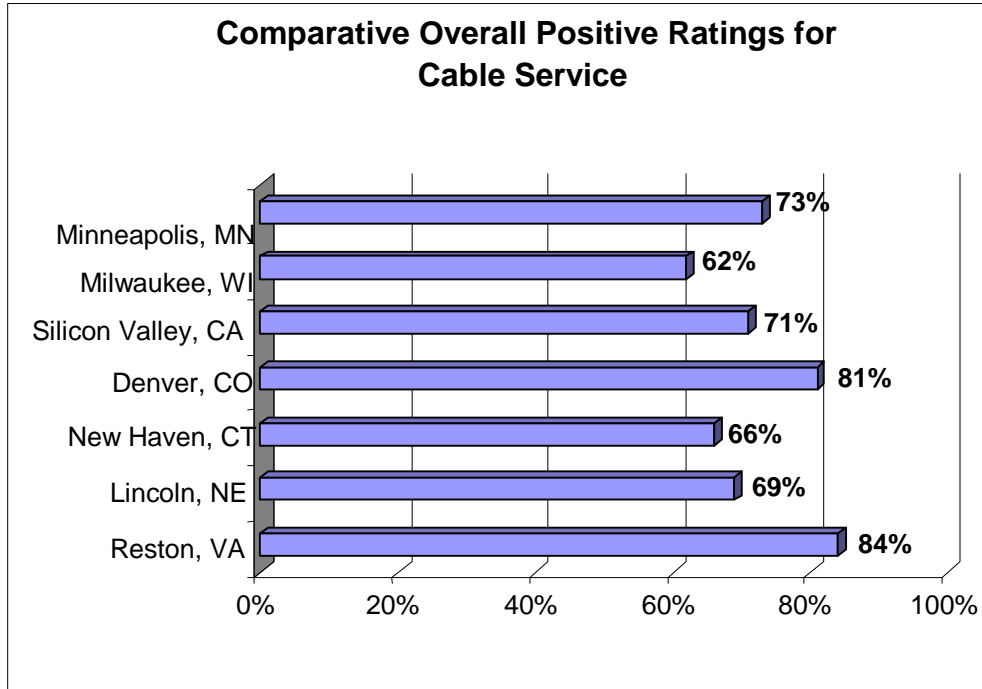
Most respondents had only one television set connected to cable in their homes (42%), although a significant amount (35%) had two television sets connected to cable. The range of responses regarding the number of television sets connected to cable in the home was from 1 to as many as 14 television sets, with the most common response being one.

Overall Satisfaction

Almost one-fourth (22%) of Time Warner subscribers rated their cable service as “excellent;” and another 51% described it as “good;” 22% indicated that cable service was “fair;” and 3% described it as “poor.” The following graph demonstrates the overall customer service rating.



To offer a comparison of the Time Warner’s ratings with other communities, the following chart demonstrates findings among selected communities⁷ in recent franchise renewals.



Respondents who did not rate Time Warner service as “excellent” were asked if there was anything the company could do to improve their rating. Most often subscribers said the company's overall rating could be improved if rates were lowered (39%). They also suggested the company offer better picture quality (9%) and have fewer outages (5%). These same issues were echoed in “other” responses as cable subscribers reported negative experiences with cable services, billing information and installation issues.

⁷ While not all similarly sized communities to Minneapolis, the comparative data in this chart are other geographically diverse communities where the authors of this study conducted the survey research regarding cable television service. A comparison of positive ratings is used.

Service Features

Subscribers were asked to rate specific features of Time Warner’s service. They were asked about the picture and sound quality, the number of channels available, the variety of programming available, the price of cable subscription, the accuracy of their monthly cable bill and the ability to easily understand the cable bill.

The following chart details their responses to each of these questions on a scale from “Excellent” to “Poor”:

<u>Tested Characteristic</u>	Excellent	Good	Fair	Poor	Don’t Know
The picture quality	32%	48%	15%	3%	1%
The sound quality	34%	53%	10%	1%	2%
The number of channels available	30%	44%	14%	5%	6%
The variety of programming available	26%	46%	20%	6%	2%
The price of your cable subscription	7%	22%	36%	32%	3%
The accuracy of your monthly cable bill	35%	45%	10%	3%	7%
Your ability to easily understand your cable bill.	31%	47%	12%	4%	5%

Eighty percent (80%) of interviewed cable subscribers indicated that picture quality was “excellent” or “good”.

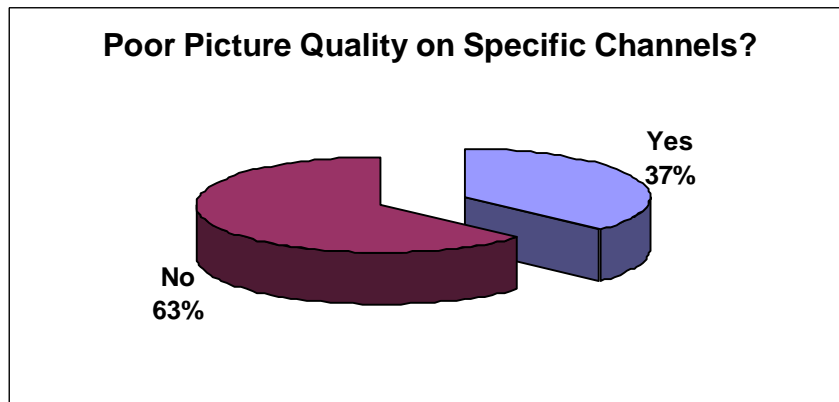
Eighty-seven percent (87%) of cable subscribers indicated sound quality as “excellent” or “good”.

Seventy-four percent (74%) indicated the number of channels as “excellent” or “good”.⁸ Seventy-two percent (72%) of respondents indicated that the variety of programming was “excellent” or “good”.

There was a great amount of dissatisfaction concerning the price of cable subscription, with 68% of respondents expressing some level of dissatisfaction.

Accuracy of the cable bill was rated positively by 80%, but 13% indicated levels of dissatisfaction. The ability to easily understand the cable bill was also rated positively at 78%.

Cable subscribers were asked if they had experienced “poor” picture quality or reception difficulty. Thirty-seven percent (37%) responded “yes.”



Specific channels where respondents had experienced difficulties were also explored. The following were the top channels mentioned: Channels 4, 2, 11 and 20. All of these responses speak to problems with the cable company’s pass through of the over-the-air networks available to the residents of Minneapolis.

⁸ The availability and significant penetration of digital cable services in Minneapolis (40%) is more than likely responsible for high satisfaction rates with the number of channels and programming variety. Nationally, digital cable penetration (which can provide up to 280 channels of programming) rests at 19%. (www.ncta.com) However, the aggressive marketing of that service, and the movement of desirable channels to the more expensive digital tier, is perhaps the reason some subscribers are indicating widespread dissatisfaction with the cost of cable television. As these desirable channels move from expanded basic to the digital tier, those customers with expanded cable experience a defacto rate increase.

Fifteen percent (15%) of subscribers indicated that they had experienced poor audio quality and audio reception difficulties. The top three channels mentioned as having audio difficulties were channels 7, 2 and 4.

Installation Issues

Respondents who indicated that they had subscribed to cable television services at their current address within the last two years, or had adopted digital cable, were asked about the cable installation and service they received when cable company representatives visited their home (N=218 or 44% of the sample). Subscribers were asked about the available times for installation or service, the arrival time of the technician, the ability of the technician to explain and demonstrate subscribing options, and the professionalism of the technician.

Cable television subscribers reported consistent levels of satisfaction across all areas of installation. Three tested areas are worth noting as receiving slightly lower scores. Eighteen (18%) of respondents were less than satisfied with the arrival time of the service technician.

Satisfaction with available times for installation was also lower than other tested areas with almost 19% of respondents indicating that available times were only “fair” or “poor.”

The ability of the technician to complete requests during their first visit received a less satisfactory score of 14% who rated the technicians’ ability to complete the work “fair” or “poor.”

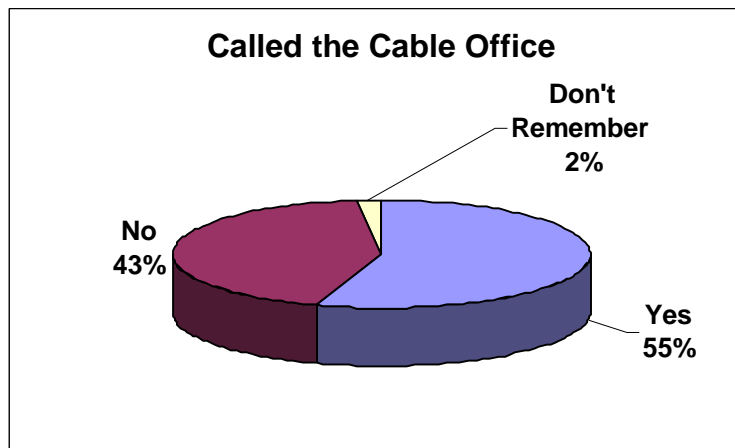
Communication with Cable Subscribers

Respondents were asked about how satisfied they were with how Time Warner communicated with them in specific service areas. The company scored highest on the helpfulness of Time Warner employees (66% “excellent” or “good”) and weakest on the ability to inform customers regarding rate changes, with 40% indicating some level of dissatisfaction.

Two additional areas in which respondents expressed some dissatisfaction were the ability of the cable company to inform subscribers regarding programming changes (34% “fair” or “poor”) and the ability of the Time Warner employee to resolve problems (24% “fair” or “poor”).

Calls to Time Warner

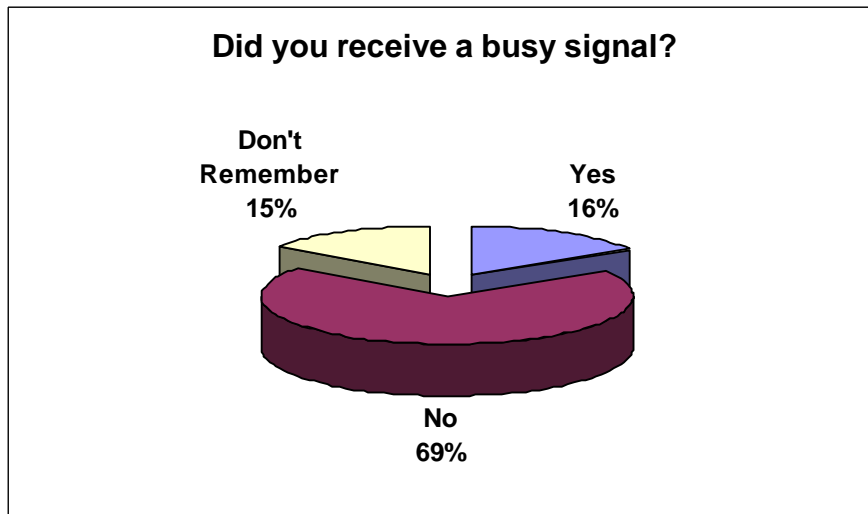
Customers were then asked if they had called Time Warner in the past two years. Fifty-five percent (55%) said they had called Time Warner.



These respondents were asked the reason for their call. The most common reason for calling the cable company was to report a cable outage or loss of signal (27%). Another

19% had called to report signal quality problems, followed by 17% calling regarding a billing question.

Sixty-nine (69%) of those who had called Time Warner in the past two years said they did not receive a busy signal. Sixteen (16%) said they had received a busy signal, and fifteen percent (15%) said they could not remember.



The FCC customer service standards related to busy signals indicate that callers should not receive a busy signal “under normal operating conditions” greater than 3% of the time. While our findings indicate that Time Warner is potentially non-compliant in this area, it is important to note that 27% of the calls placed were during “an outage.” In fact, 46% of cable subscribers have experienced service outages in the last two years. The most common frequency of outages reported by respondents was 3 during that period.

Cable subscribers who had called the cable office were also asked if customer service representatives answered their calls within 30 seconds, including the time left on hold, and 42% indicated that they had not.

According to the data collected in this study, Time Warner scores below the FCC benchmark in regard to hold and transfer time, which stipulates that a hold time of less than 30 seconds and an additional 30 second transfer time be met with 90% efficiency.

When callers reached a customer service representative (CSR), they said that the representative was generally helpful, but was not necessarily able to resolve the problem they had. Seventy-five (75%) of callers reported being satisfied with the helpfulness of the representative. The ability of the CSR to satisfactorily address the reason for the call received a slightly lower satisfaction rating, with 27% of callers considering that ability “fair” or “poor.”

Survey respondents were asked how soon after they called to report a problem did the cable company begin to correct the problem. Forty-five percent (45%) of respondents said the cable company began working on their problem “the day it was reported.” Fifteen percent (15%) said the cable company began working on the problem “the next business day.” Twenty percent (20%) reported that the cable company began working on the problem “days later.” Four percent (4%) indicated it was “about a week” and one percent (1%) said it was “about a month.” Four percent (4%) said the problem was “never resolved.”

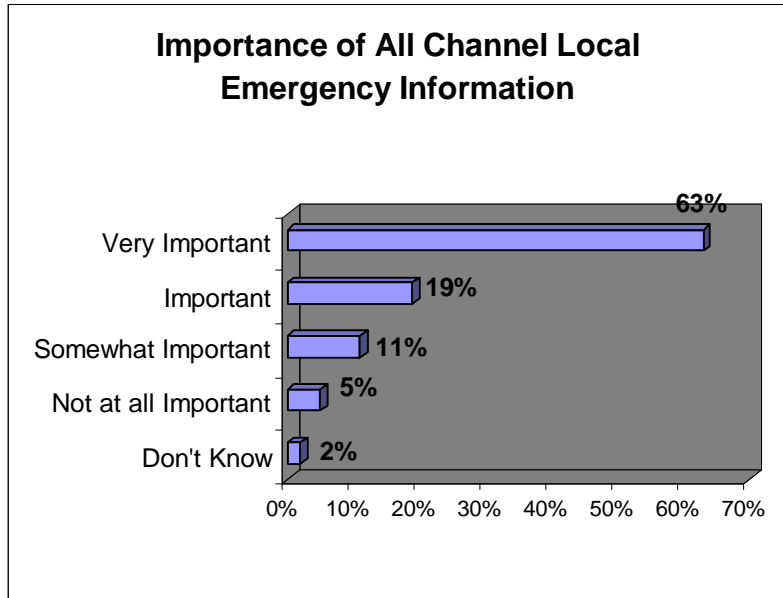
The FCC benchmarks for customer service stipulate that the cable company must begin working on outages within 24 hours of problem notification and must begin service on other problems “the next business day after learning of them.”

Subscribers said that if they were not satisfied with the service provided by Time Warner, and were unable to work out a resolution they would most likely disconnect service (46%). This was followed by “subscribe to a satellite television service” (12%). Nineteen percent (19%) said they don’t know what they would do.

Categories of Service

Cable subscribers were asked about whether several types of services and programming provided by cable companies were important to them. Tested categories included: local access programming, local emergency information, local broadcast programming, HDTV programming and telephone service. The majority of cable subscribers identified all of

the areas except for telephone service, as being at least somewhat important. Specifically, when considering ratings of “very important”, “important”, and “somewhat important”, local broadcast channels were noted by 93% of subscribers; 93% indicated local emergency information; 65% indicated local access programming; 54% indicated that high definition programs were important; and 29% thought there was some level of importance for Time Warner to begin to offer telephone services in the Minneapolis area.



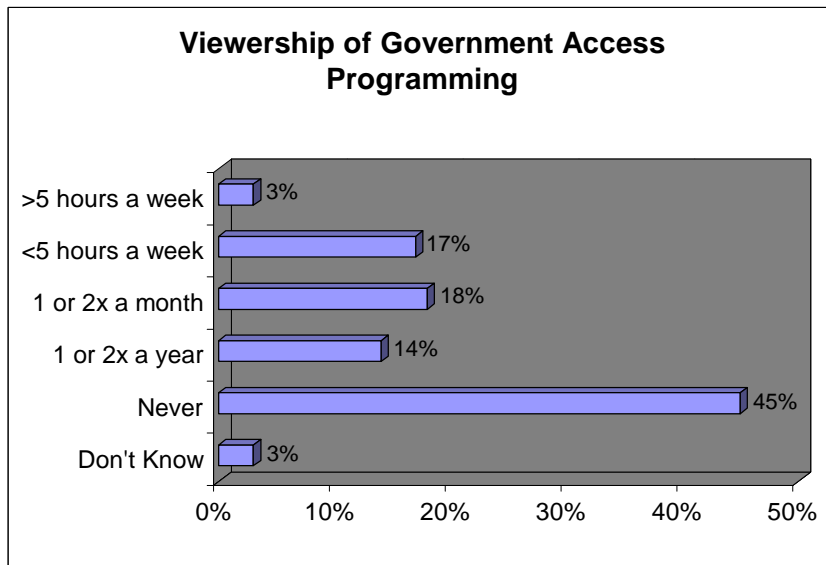
Thirty-two percent (32%) of subscribers indicated that there were additional types of video programming that they would like to see added to their cable package. The top five mentions included: Victory Sports Channel, international programming, independent film channels, SpeedVision and Christian programming.

Public, Education and Government Access Programming

Respondents were asked about their viewership and experience with local access programming appearing on the cable system.

Government Access

Local government access programming appears on Channels 14 and 79 and is viewed by 52% of cable subscribers in Minneapolis. When measuring how frequently the programming is viewed, 3% of respondents reported that they watched more than five hours a week, and another 17% described themselves as weekly viewers who watched less than five hours a week. Eighteen percent (18%) reported watching the channel a couple of times a month, and 14% indicated that they watched the channel a couple of times a year. Forty-five percent (45%) of subscribers reported that they never watched government access programming.



These numbers indicate a significant level of viewership for government access programming. For example, by comparison, the Nickelodeon cable network is continually ranked as the top overall cable network with a primetime average rating of 1.8% of households. During one of the weeks that this study was conducted in Minneapolis, Nickelodeon’s popular “Sponge Bob” program was the highest rated cable network program, with a viewership of 3.8% of households⁹. Local government access

⁹ Basic Cable Weekly Ratings. www.allyourtv.com and www.medialifemagazine.com

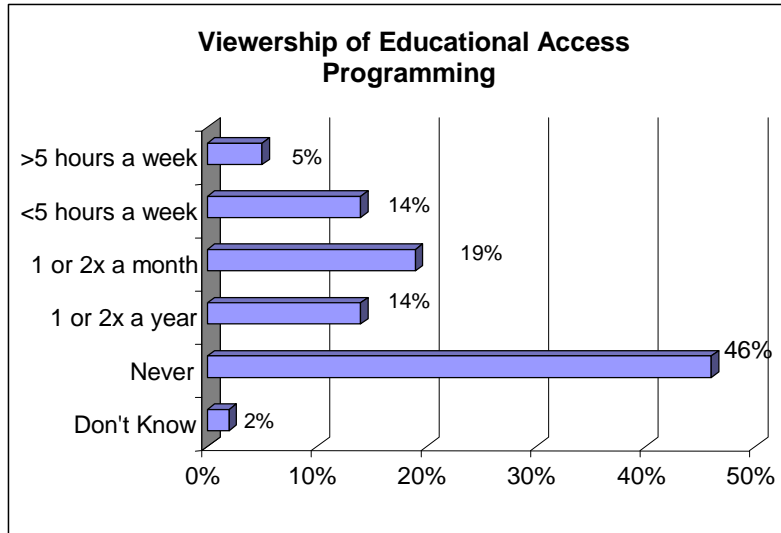
programming, by comparison, attracts a healthy number of viewers with 3% of the cable households in the tested franchise area watching more than five hours a week.

Those subscribers who watched government access programming were asked a series of questions related to picture, sound and programming quality. Sixty-seven percent (67%) described picture quality as “excellent” or “good,” with 25% describing it as “fair,” and 4% said it was poor.

The sound quality scored similarly with 62% describing it as “excellent” or “good” and 30% describing it as “fair.” The informational value of government access programming received high scores with 79% rating it “excellent” or “good;” just 13% described it as “fair” and 1% as “poor.”

Educational Access

Local educational access programming appears on channels 15 and 76 thru 78. It is also viewed by 52% of cable subscribers in Minneapolis. When measuring how frequently the programming is viewed, 5% of respondents reported that they watched more than five hours a week; another 14% described themselves as weekly viewers who watched less than five hours a week. Nineteen percent (19%) reported watching the channel a couple of times a month, and 14% indicated that they watched the channel a couple of times a year. Forty-six percent (46%) of subscribers reported that they never watched educational access programming.



Those subscribers who watched educational access programming were asked a series of questions related to picture, sound and programming quality. Sixty-seven percent (67%) described picture quality as “excellent” or “good,” with 19% describing it as “fair” and 3% as poor.

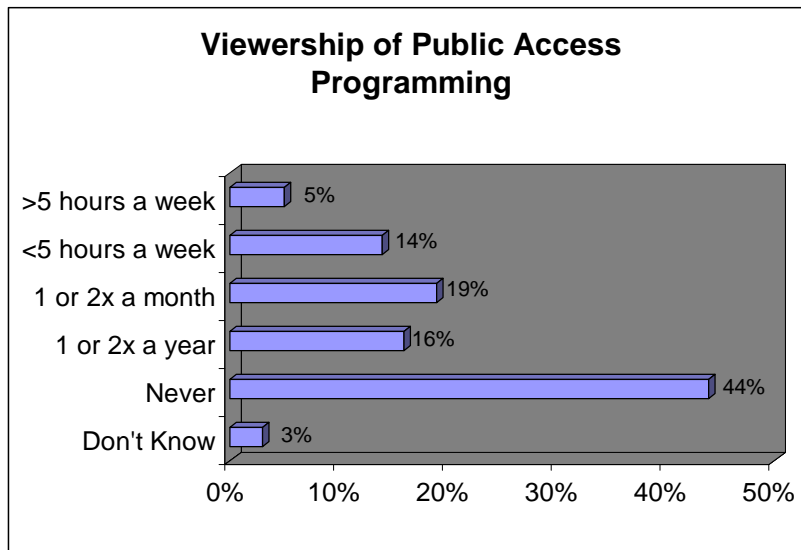
The sound quality scored similarly with 62% describing it as “excellent” or “good” and 25% describing it as “fair.” The informational value of educational access programming received high scores with 74% rating it “excellent” or “good;” just 17% described it as “fair,” and no viewers describing it as “poor.”

The educational value of the programming received the highest marks, with 75% indicating “excellent” or “good.” 15% indicating “fair” and only 1% indicating “poor.” The remaining respondents indicated “don’t know.”

Public/Community Access

The local public/community access organization, Minneapolis Telecommunications Network (MTN), has developed an awareness of its services among 51% of cable subscribers.

Local public access programming appears on channels 16, 17 and 75 and is viewed by 51% of cable subscribers in Minneapolis. When measuring how frequently the programming is viewed, 3% of respondents reported that they watched more than five hours a week, and another 14% described themselves as weekly viewers who watched less than five hours a week. Nineteen percent (19%) reported watching the channel a couple of times a month, and 16% indicated that they watched the channel a couple of times a year. Forty-four percent (44%) of subscribers reported that they never watched public access programming.



These numbers indicate a significant level of viewership for public access programming. As cited in previous examples, even the most popular cable network rarely receives a rating above 3% of the audience. Local public access programming in Minneapolis, by comparison, is attracting a significant number of viewers with 3% of the cable households in the tested franchise area watching more than five hours per week. This finding, coupled with the important role of providing residents an outlet to speak electronically and increase the diversity of opinion and information presented over the cable system, creates a successful public access scenario in Minneapolis.

Those subscribers who watch public access programming were asked a series of questions related to picture, sound and programming quality. Sixty-two percent (62%)

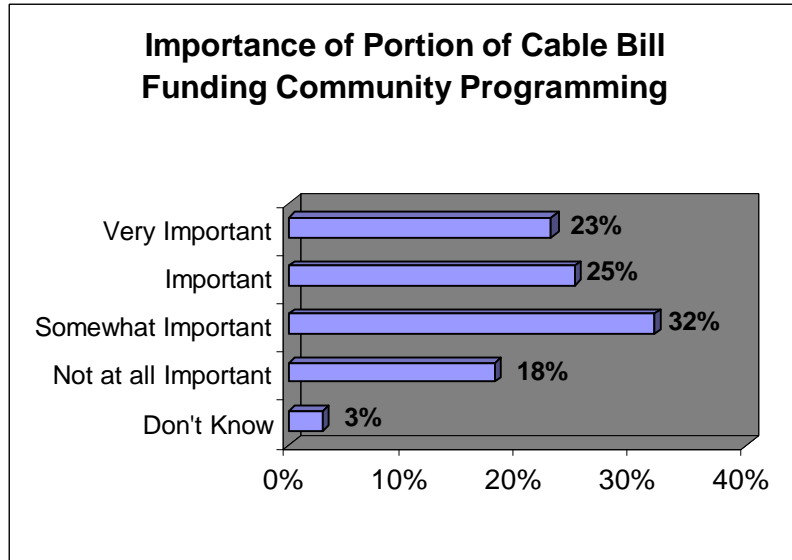
described picture quality as “excellent” or “good,” with 25% describing it as “fair” and 4% as “poor.” These numbers are slightly lower than those reported for the other access channels.

The sound quality scored similarly, with 58% describing it as “excellent” or “good” and 29% describing it as “fair.” The informational value of public access programming received high scores with 67% rating it “excellent” or “good”, 22% describing it as “fair” and 1% as “poor.”

Public Access entertainment value was rated as “excellent” or “good” by 57% of viewers, with 29% describing it as “fair” and 4% as “poor.”

When asked about potential access programming enhancement, Minneapolis residents were most interested in expanding educational programming, community/neighborhood news, local arts/cultural programming, ethnic oriented programming and programming by and for youth in the area. On the flip side, 21% of respondents indicated that there was too much “religious” programming. Important to note is that the majority of subscribers’ gave very low ratings to the category that the community had “too much of” any type of local programming. This suggests a significant level of interest in current and enhanced local programming.

Eighty percent (80%) of residents indicated it was at least somewhat important to fund local access programming as part of their monthly cable payment. Twenty-three percent (23%) indicated such funding was “very important”, while 18% indicated it was “not at all important.”



Five percent (5%) of residents had used MTN’s public access facilities, while another 11% indicated they might be interested in doing so in the future. These findings are consistent with other recent studies conducted related to interest in participating in local access programming.¹⁰

The 5% of respondents who had utilized the access facilities (N=29) were asked a series of questions about the services and equipment provided by MTN. Rarely did a respondent indicate a response of “poor.” However, a number of areas received “fair” marks and have direct implications related to capital and operational support for access programming. These “fair” scores include: the opportunity for video training (38%), the hours the facility is open (31%), the availability of equipment for check-out (31%), studio availability (31%), quality of the video instruction (31%) and the availability of editing equipment (28%). While the sample size of access users is small in this random sampling of residents, it is important to note that when directly surveying public access users using the participant lists provided by MTN, similar issues were reported (See Section B of this Report).

¹⁰ Residents in Reston, VA and the southern portion of Montgomery County, MD, for example.

The 11% who indicated they would like to participate in access programming were asked to explain how they would like to participate. Twenty-five percent (25%) indicated that they would like to produce programming, while others stated they would like to anchor a program (20%) or work as a crew member (12%). In the “other” category, respondents indicated several ideas, such as giving lectures, providing real estate information and participating in the audience.

Access viewers were also asked if there was any other type of local programming they had an interest in seeing (N=24). The most frequent responses were international and cultural programming, community activities and events, local government issues-oriented shows and local community news.

Significant Relationships Between Subscribers’ Overall Cable Satisfaction and other Service Characteristics

An analysis of the variance between subscribers' reported overall satisfaction with their cable television service and other measured features of cable television service was conducted.

The analysis of variance, commonly called ANOVA, allows researchers to examine whether a variable is significantly related to other variables. In this study, overall satisfaction was identified as the dependent variable. Then, a number of independent variables were tested against overall satisfaction to determine if their relationship accounted for systematic variance within the study at a rate determined to be significant. Significance is typically considered at three levels: .01*** (99% confidence), .05** (95% confidence) and .1* (90% confidence). In other words, only those relationships that occurred with 90% confidence or greater are considered to be statistically significant and as such are presented in this sub-section.

Knowing the areas that most affect the overall performance rating of cable television service can help point the City and Time Warner toward improvements that can be made that will subsequently have a great impact on the cable consumer's overall rating.

Significantly Related to Overall Cable Television Service Rating

Issue
1. Type of Service (Digital Cable subscribers most satisfied subscribers, followed by very basic.)*
2. The reported picture quality (better rating, more satisfied)***
3. The reported sound quality. (better rating, more satisfied)***
4. The number of available channels. (better rating, more satisfied)***
5. Installation features: Scheduling options***, arrival time of installer*, professionalism* and the ability to complete the tasks on the first visit. (better rating, more satisfied)*
6. Communications regarding rate and programming changes.***
7. Importance of the cable company passing through HDTV offered by local broadcasters.**
8. Viewership of local educational* and public access* programming, as well as the picture and sound quality of those channels.* (better rating, more satisfied)
9. Interest in participating in local access programming.*
10. Homeowners less satisfied than renters.**
11. PC owners rate service lower than non-PC owners.*
12. The more the respondent watches television*, the higher the service rating.

In order to better understand the identified significant relationships, cross tabulations were examined. In many cases, the direction of the relationship was as might be expected. For example, subscribers who were less satisfied with picture quality were also less satisfied with overall cable service. Additionally, digital subscribers were significantly more likely to be satisfied with their cable service than the Expanded Basic cable subscribers. The digital subscriber was also significantly more likely to call the cable office and report an unsatisfactory experience with the cable installer visiting their home. For this reason, the cable company’s performance in these areas becomes more crucial to overall satisfaction. The data finds that the lower these areas were rated, the lower overall satisfaction with cable television service was rated.

The relationship between viewership of local access programming and overall higher ratings of cable services speaks to the consumer’s awareness that this very local programming is a genre of programming unique to their cable service. As enhancements are made to these very local channels, the overall rating of cable television service is likely to rise.

Individuals who expressed interest in participating in local access were also significantly more likely to report higher levels of overall satisfaction. This finding suggests that as enhancements are made to local access facilities and programming in Minneapolis, higher levels of satisfaction will be generated among subscribers.

While homeowners were less satisfied overall with cable service than renters, both groups reported high levels of overall satisfaction with cable television.

Final Comments

When respondents were given a final opportunity to add any additional thoughts about their cable television service, a majority opted not to respond (71%). Among those who did respond, the four most frequent responses included: comments again emphasizing that cable costs too much; expressions that Time Warner was doing a good job; encouraging cable competition in the marketplace; and a need for more channel package or ala carte options.

Conclusions and Recommendations

As the City continues its review regarding the Minneapolis franchise area renewal, based on the findings of this comprehensive needs and interests' ascertainment among residents in the area, we recommend that the following issues be given consideration:

1. **Non-Subscribership** – Non-subscribership to Time Warner's cable service stemmed primarily from the cost of service. This was true among those who had never subscribed to cable television service, as well as those respondents who had disconnected their cable television service. While some (10%) subscribed to a competing satellite service, the majority did not. This finding suggests that as Time Warner may move into a renewed franchise, it would need to offer more variety and better programming to enhance the price/value comparison, and look at offering lower rates to attract non-subscribers. Some non-subscribers also indicated that Time Warner customer service would need to improve.
2. **Subscriber Satisfaction** – Subscribers are generally satisfied with Time Warner cable service, with 7 out of 10 indicating that the service was "excellent" or "good." Those who rated cable service more moderately (22% describing service as "fair") indicated a variety of reasons for their lower rating. Thirty-nine percent (39%) of those subscribers describing service as less than "excellent" indicated that they would have a higher rating if Time Warner offered lower rates. This also suggests a need to enhance the price/value comparison for subscribers if rates are not lowered. An additional fourteen percent (14%) indicated that improvements in picture quality and system reliability would increase their satisfaction level. This need is explored in more detail below.
3. **Computer Ownership and Cable Modem Use** – Computer ownership is slightly higher than the national average, with 30% of cable subscribers also subscribing to cable modem services. This is higher than the average subscription penetration reported by the National Cable & Telecommunications Association (NCTA).

With a significant number of cable subscribers also being computer users and cable modem users, to the extent that the City is able to focus on cable modem services as part of franchise renewal, it will be important to ensure that their needs and interests are represented. It will also be important for the City and Time Warner to focus on the interrelationship between the two. This could include, for example, developing access services that have both a television and a web component; ensuring that access programming promotion efforts and citizen/subscriber outreach are done through both the cable system and the internet; etc.

4. **Technical Issues** – While a high number of cable subscribers (8 out of 10) indicated picture quality was “excellent” or “good”, nearly thirty-seven percent (37%) also indicated that they had experienced poor picture quality and reception difficulty with specific channels and others indicated problems with outages. The correction of these problems was reported by some cable subscribers as a solution for increasing their overall rating of cable television service. The majority of these subscribers indicated specific channel difficulties with local network affiliates, specifically Channels 4, 2, 11 and 20. Since these channels are local broadcast affiliates it is our recommendation that the City review, as part of franchise renewal activities, Time Warner’s means of acquiring and distributing programming from the local broadcasters to see whether technical difficulties referenced by subscribers can be resolved.

5. **Customer Service** – While cable subscribers generally are satisfied with Time Warner’s service, there are certain areas that need enhancement, especially where subscriber’s responses potentially indicate non-compliance with City and Federal Communications Commission (FCC) Customer Service Standards. These are:
 - a. Telephone Answering Standards – Sixteen percent (16%) of subscribers indicated that they had received a busy signal when calling the company, which is greater than the three percent (3%) level

specified by the FCC. Additionally, forty-two percent (42%) indicated that their call had not been answered within thirty (30) seconds, including the time left on hold, which would be significantly greater than the tolerance allowed under the FCC Customer Service Standards.

- b. Installation – Nearly 2 in 10 rated tested areas concerning service installation as “fair” or “poor”, especially arrival time of the technician and the available times for installation.
- c. Service Response – Nearly 1/4th of those who had called to report a problem with service indicated that the cable company did not begin working on the problem until at least days later, with an additional 4% indicating that the problem was never resolved. This is inconsistent with FCC Customer Service benchmarks, which stipulate that, depending upon the problem, the company must begin working on it within 24 hours of notification or the next business day.

All of these are areas that we recommend that the City focus on with Time Warner in franchise renewal to see what improvements can be made to resolve the concerns indicated by subscribers and to establish a means of monitoring these issues for compliance during the next franchise term.

- 6. **Enhanced Programming Choices** – Nearly 1/3rd of the respondents indicated that there were additional types of programming that they would like to see added to the cable service. The top category mentioned was additional sports programming, the Victory Sports Channel. Others indicated an interest in international channels and independent film programming. SpeedVision and Christian programming were also requested. Additionally, the perceived importance of the retransmission of over-the-air network’s HDTV programming was significantly related to the overall service rating of the cable company.

We recommend that the City review Time Warner's existing offerings and determine whether additional broad categories of programming should be specified in a renewed franchise.

7. **Access Channels and Viewership** – Nearly 6 out of 10 subscribers indicate that they watch local public, education and government (PEG) access programming, with three to five percent (3-5%) watching for more than five (5) hours a week and an additional 14-17% watching on a weekly basis. While these percentages may at first appear low, it is important to keep in mind that cable television provides such a wide variety of services that individual channels are inherently designed to appeal to niche audiences. As an example, the top overall cable network, Nickelodeon, achieved a rating of only 1.8% during prime time (meaning that, at any given moment in prime time 1.8% of the total national audience is watching Nickelodeon). Other networks characterized as popular, such as ESPN, have a prime time average of less than one percent (1%) of total viewers. By comparison, then, three percent (3%) of the viewing audience on a regular basis should be seen as viable and healthy cable television viewership.

Access programming generally earns high marks for its information value and lower marks concerning picture and sound quality. Additionally, viewership of educational and public access programming was significantly related to the respondent's overall positive rating of cable television service.

There was significant interest in seeing a greater amount of a variety of types of programming on the local access channels. The top five responses, with at least one out of three respondents indicating a need and interest in seeing more of these types of programming, included:

- ? Educational programming,
- ? Arts and Culturally focused programming,
- ? Minneapolis Community or Neighborhood News, and
- ? Ethnic programming.

Overall, the survey results show a high level of interest in PEG access programming, indicating that the City should have a strong focus on the continuation and enhancement of such channels in any renewed franchise. Such enhancements should occur in a variety of areas, most specifically in ways to improve the picture and sound quality and enable the generation of greater amounts of programming in the categories specified.

8. **Local Minneapolis Access Participation** - Five percent (5%) of the responding sample indicated that they had participated in local public access programming. An additional eleven percent (11%) of residents indicated that they would be interested in taking part in an access program. Finally, forty-eight percent (48%) of cable subscribers indicated that it was “very important” or “important” (80% when including “somewhat important”) that a portion of their cable bill was used to support community programming. These numbers indicate significant interest in continuing the availability of and support for PEG access facilities in Minneapolis.

Regarding the viability of these facilities, characteristics of the MTN facility generally received moderate to good scores. The biggest areas cited for improvements were related to the availability and quality of training; availability of the studio, editing equipment and equipment for checkout; and the facility’s hours of operation. These features should be areas of significant focus during franchise renewal proceedings in relation to the continuation and enhancement of a local Minneapolis access facility.

9. **Factors Significantly Related to Overall Satisfaction** – An examination of the key issues impacting overall cable satisfaction in the Minneapolis area suggests that subscribers, while currently generally satisfied with cable television service, desire improvement. The key areas cited as significantly related to the overall satisfaction rating can be addressed for immediate improvements. For example,

ensuring competent, helpful and efficient customer service, installation and communication, as well as improved picture clarity, and enhancements to local access facilities and opportunities to participate in local access programming are just some of the things cable subscribers in Minneapolis need from the cable company going forward.

These findings are one component of several factors for the City to consider as efforts are made to address local cable needs and interests during franchise renewal proceedings.

SECTION B

**REVIEW OF PUBLIC, EDUCATIONAL AND
GOVERNMENTAL (PEG) NEEDS AND INTERESTS
WITHIN THE CITY OF MINNEAPOLIS
FRANCHISE AREA**

PEG ACCESS NEEDS ASSESSMENT

PUBLIC ACCESS PRODUCERS' NEEDS

Introduction

In an effort to determine the needs and interests related to public and community access television in Minneapolis, CBG Communications, Inc. (CBG), in conjunction with MTN, conducted a written survey among present and former access producers that utilize the MTN facility and services. Using the current access participant rolls available from MTN, 460 surveys were mailed in December 2003. Of those, 110 were returned which represents a significant return rate. This strong response rate suggests considerable interest among access producers and the services provided via MTN. Additionally, several users that have a significant history with the organization and utilize the facility to a great extent completed a written survey instrument with additional questions. Eight of these longer surveys were also completed and returned.

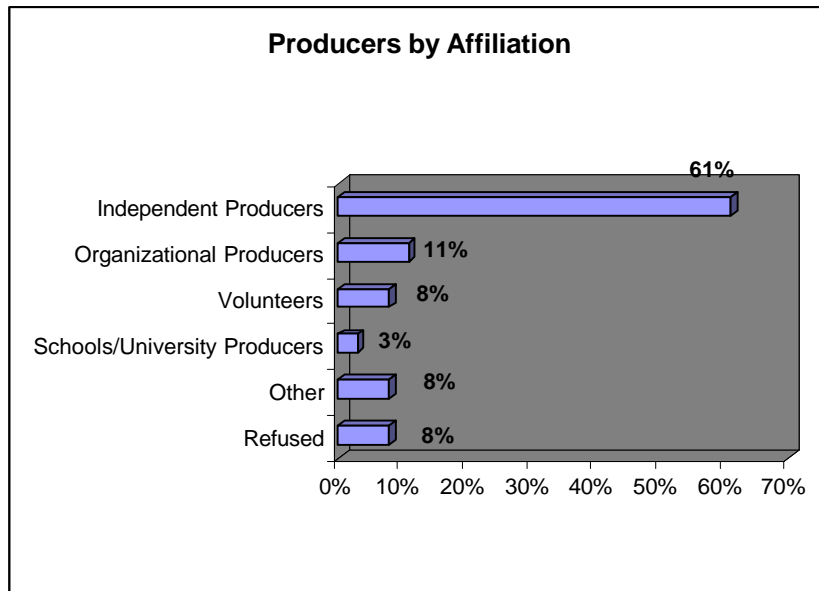
Additionally, a focused discussion was held with key Access Producers representing both long-time users of the MTN facilities, as well as a diversity of ethnic, cultural and other programming interests. The discussion centered on the initial conclusions of the study and the participant's response and reaction to them.

Findings

Access Producers Characteristics

Access producers responding to the written survey represented organizations across a broad spectrum. These organizations included, but were not limited to, religious organizations, ethnic/cultural groups, educational organizations and hobbies/crafts. Many of the respondents indicated that they were "independent" producers and not affiliated with any single organization. When assessing affiliation, 61% indicated that they were "independent producers", 11% organization producers, 8% volunteers, and 3% indicated being a school or university producer. Eight percent (8%) indicated "other" and

when describing this choice, offered that they had taken a course, utilized the facility for their church, or that they were students.



By gender, 71% of respondents were male and 39% were female. Access producers reported spending between 0 and 148 hours a month at the facility. The most common response was 10 hours a month and the average was 20 hours a month. By age, 66% were between 18 and 50 years old. Two percent were teenagers and 30% were 51 and older.

Most indicated utilizing the main MTN facility. A few producers indicated they only utilized MTN for the playback of their programs and that the video programming was actually produced at a remote location.

The range of years producers were associated with MTN ranged from less than one to 23 years. The average length of affiliation was over 5 years.

Programming Focus

When asked what the goal of their organizational or their personal use of the facility was, 35% indicated producing programming that helped with public outreach. Several

examples were provided by access users, such as featuring volunteering opportunities, art and cultural displays, local history, religious outreach and local political commentary.

One access producer wrote, “My goal is to inform, educate, enlarge peoples’ horizons through using video to tell people’s stories.”

Forty-three percent (43%) of access producers also utilized the access resources to cover community events. Several producers mentioned videotaping parades, festivals and pageants that were related to their organization’s mission, as well as church services, musical performances and guest lectures.

Additionally, 41% indicated that their programming provided public empowerment. How-to videos, training, voter education and lifestyle programming were mentioned as providing opportunities for public empowerment.

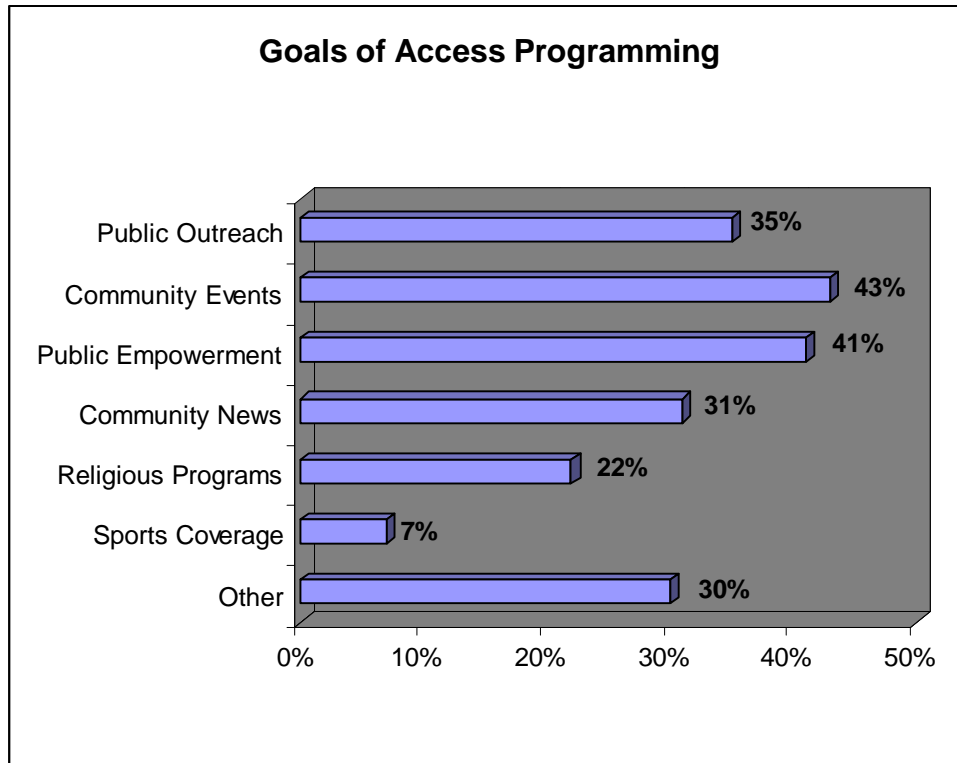
Thirty-one percent (31%) indicated that their access program includes the coverage of local news and events. Several examples were provided such as coverage of: the Dr. Laura protest; local issues concerning teenage prostitution and crime; news briefs on the subject matter of their programs, such as knitting news; and local events pertinent to their programs.

Religious outreach was indicated as a focus by 22% of respondents. Examples of religious programming included Islamic programs, spiritual empowerment, traditional religious ceremonies, rituals for the homebound, and reading the bible. Atheist users also indicated that they “challenged” religious zealots.

Sports programming was noted as a category of use by 7% of respondents. Local sports coverage included women’s basketball from the University of Minnesota, local tournament sports and high school athletic events.

The “other” program type was indicated by 30% of respondents. Most frequently when describing the goal of these respondents’ programming, “entertainment” was the key

phrase offered by respondents. In other words, the programming produced on the channel by them is designed to primarily entertain their peers. These programs generally focused on local artists.



MTN Operations, Facilities and Equipment

Respondents were asked to evaluate the training, facilities and services provided by MTN.

Ninety percent (90%) indicated that the video instruction and training on Access equipment was effective. Just 4% indicated the training was not effective, and no respondents provided ways in which training could be improved.

When considering which facilities were used most frequently, the following ranking was provided under “weekly” use:

1. Playback of Programming 26%

2. Editing Suites	23%
3. Studio and Control Room	21%
4. Field Equipment	17%

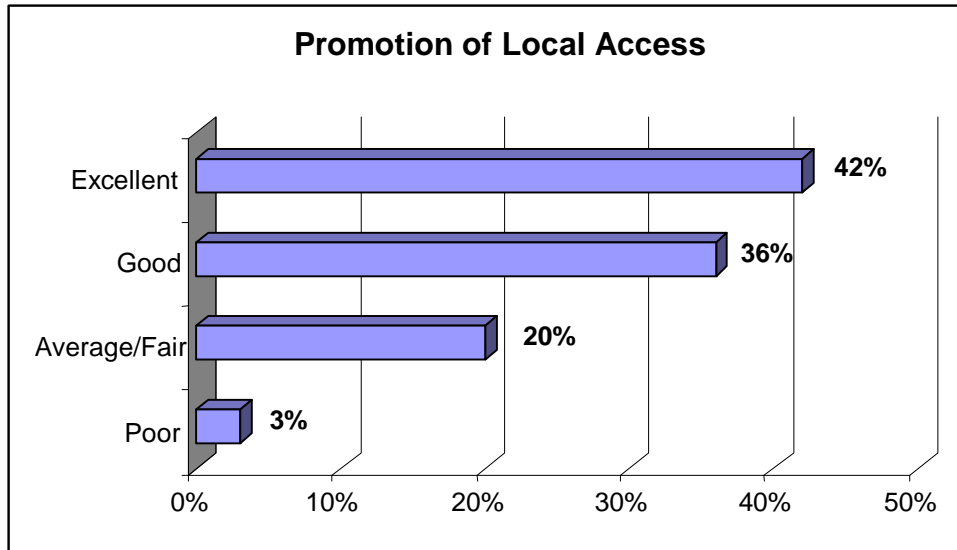
The mobile production unit was not indicated as in use on a weekly basis.

Playback of programming received the highest marks with 90% describing the service positively. The studio received the next highest rating with 85% describing it positively. The mobile van and the editing equipment received the lowest marks with negative remarks given 12% of the time.

A majority (51%) of respondents indicated that they utilized equipment outside of that provided by MTN. Most frequently this was the access producers own equipment, such as editing software via their own personal computer or utilizing their own cameras, tripods and audio equipment. Several respondents indicated that they utilized another access facility. Specifically mentioned were the access facilities in St. Paul and Roseville, and at NWCT, Town Square Television and St. Croix Cable.

Utilizing a 5-point scale from excellent to poor, respondents were asked to rate each of the services and equipment provided by MTN. Scores were very positive with the majority of respondents describing the training, playback, staff and location of the studio as “excellent” or “good.”

The lowest scoring area was “promotion of access opportunities.” This service was described negatively by 10% of respondents with another 13% describing promotion as only “average”. Scoring of the mobile production van availability and editing suite availability while still positive, did receive overall lower marks than most of the other tested areas.



Eighteen percent (18%) of respondents indicated that they had encountered some type of availability/scheduling problem. When asked to describe the unavailability, most indicated editing was time intensive and frequently booked which slowed down their production process. Several suggested establishing a few more suites. One respondent indicated that there was too much of a time lapse from when a tape was dropped off to when it was played back. Another respondent indicated that more duplication tape decks were needed.

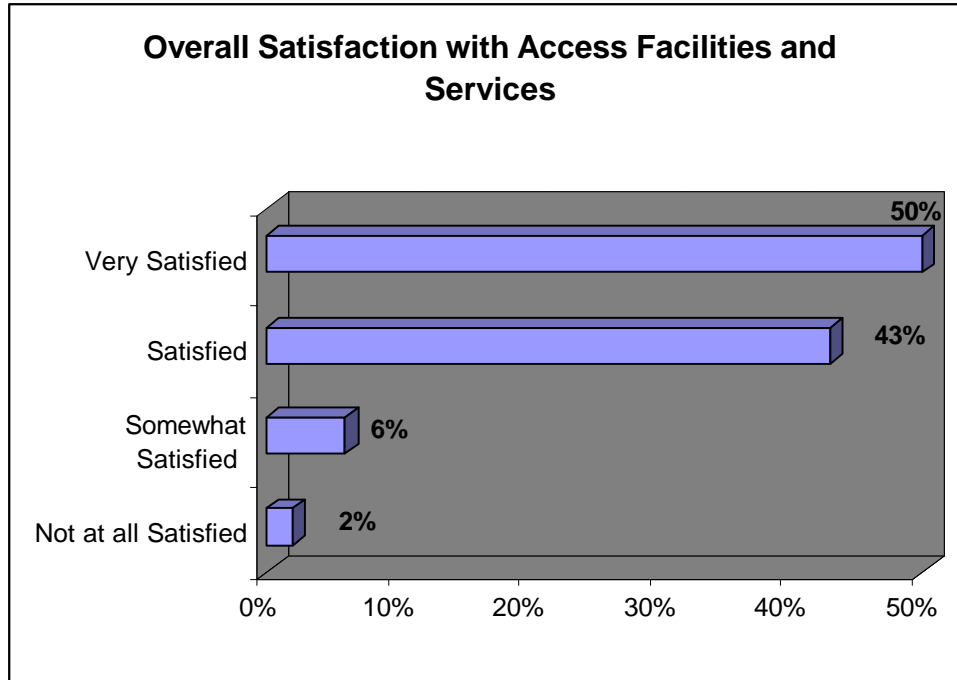
When asked what additional services, equipment or facilities respondents needed, the access producers generated a long list. This included such items as more editing suites, more loose equipment for check out, more editing classes, and hard drive space so that programs could be stored more efficiently between editing. More staff that was eager to help, DVD playback mechanisms and a work space area for scripting, researching and meeting with show participants was also requested.

When asked if they encountered problems with the playback process, 5% indicated that they had. When describing the problems, most indicated that the “good” times were gone and they had to wait until a time slot they liked opened up.

When asked about the adequacy of promotion of access programming, 38% indicated that current promotion was not adequate. When describing what could be done differently several suggestions were offered, such as: streaming all programming on the Internet (Tucson, AZ's public access center was cited as an organization that did this); the preparation of 30 second spots to promote individual programs; airing productions across access channels; a desire for local programs to be listed on Time Warner's electronic program guide (EPG); billboards; bus signs; and a video festival and best of show annually. Bulletin board posters in coffee shops, YMCA's and local churches were also mentioned as a possible promotional method by several respondents.

Overall Satisfaction

Lastly, respondents were asked to describe their overall satisfaction with the access facility and services. 50% were very satisfied, 43% were satisfied, 6% somewhat satisfied and 2% were not at all satisfied. During a final opportunity for open comments, several respondents took the time to indicate that they thought public access was a very important part of the community, that the staff at the facility was great and that they appreciated the opportunities provided by access. Others noted that more and updated equipment was needed to continue to provide quality access programming, and that a larger budget and more diverse staff were needed.



Access Producers Focused Discussion

A focused discussion was held with Access Producers that were either long-time users of the MTN facility or represented a diversity of ethnic, cultural, and other programming interests. The discussion was designed to elicit responses to the initial conclusions of the study and determine whether a consensus existed within this group of Access Producers for such conclusions.

Overall, the group agreed with the findings and conclusions of the study. The group also made a number of reinforcing comments, such as:

- ? Participants believed strongly that such channels are appreciated by the larger community because at their heart they give a voice to everyone in the franchise area,
- ? Participants expressed a need to interconnect with other Access organizations in the region to both provide and receive programming that would be of benefit to subscribers within and beyond Minneapolis’s borders,
- ? Group members indicated that Public Access programming serves as a key source of information for multicultural communities within the City, such as the Somalis,

- ? The group indicated that the current MTN location was very accessible to all.
- ? Participants stated that the current Access environment was very conducive to a wide range of programming, that is both reflective of the diversity of the Minneapolis Community, as well as educational to viewers about different segments and viewpoints of the City's population,
- ? Participants agreed with a need to place greater emphasis on training and facilitation, including a potential implementation of afternoon and lunch time training classes as well as smaller class sizes, and
- ? Discussion group participants noted that local Access provides the ultimate in truly local television, the coverage of local current events and reality television. They felt strongly that the going forward Access climate should continue to foster and enhance the provision of Access.

Conclusion

Based on the comments made by public access producers, the following needs and interests were determined:

- ? Complete conversion to all digital field equipment and digital editing systems and purchase additional equipment. The current 30 day lead time on checkout creates hardship on producers.
- ? A digital upgrade of the control room is needed.
- ? The studio space needs to be checked for proper acoustics and enhancements made as needed.
- ? More versatile set materials are needed, as well as an available budget to purchase set materials as required.
- ? The installation of a virtual set option is needed in the studio and control room.
- ? Establish a dedicated server for storage of programming so that editing can occur during separate visits.
- ? Establish a portable editing and hard drive structure, so that users can check out a laptop with Final Cut Pro or something non-linear installed, along with a portable hard drive so that editing can happen in a 24/7 environment. The facility then

could establish more advanced post production processes, and the access producer could arrive with hard drive in hand rather than working from a tape environment. This type of portable editing suite could also create a “lab on a cart” environment, whereby training could occur in any location.

- ? Establish an additional stand-alone editing suite.
- ? Evaluate the duplication environment to determine if enhancements are needed.
- ? Work toward establishing a “film festival” of sorts so that outstanding programming can be recognized and used as a teaching tool with younger producers.
- ? Establish a workspace for producers that includes a meeting area for organizations, as well as computer access and Internet access.
- ? Begin a grassroots promotional campaign that utilizes other media, such as bus signs and posters at coffee houses and local nonprofits.
- ? Begin webstreaming programming so that it can be viewed in multiple platforms.
- ? Work with Time Warner to establish a presence on the electronic program guide (EPG) and the TV Guide Channel.
- ? Monitor diversity of staffing to ensure that all groups feel welcome and can receive training.
- ? Work toward a timely playback schedule of programming with dedicated “good” slots for new programming to be showcased.
- ? Create a sense of community among producers so that self governance can occur. Producers may have a way of working out some issues on their own.
- ? Additional channel capacity may be needed over the course of the next franchise to meet growing demand among access producers for quality time slots.

PUBLIC/COMMUNITY ACCESS

Introduction

At the request of the City and MTN, CBG has performed an in-depth and extensive review of the Minneapolis public/community access facilities and equipment. The purpose of our review was to determine the needs of the Minneapolis populations that use the facilities, produce PEG programming, and view PEG programming. Once assessed, CBG also moved to determine what types of equipment would be needed in order to meet the needs throughout the life of any renewed cable franchise with Time Warner, which is currently the subject of review and discussions.

As part of CBG's overall review, an initial visit was made to the MTN public access facility in December, 2003. At that time interviews were conducted with the staff and a workshop/discussion was held with public access producers. All of the functional areas in the facility were toured and documented. The production equipment inventory was verified and evaluated for condition and usefulness. Additionally, the overall state of the facility was analyzed for efficiency, ability to meet its purpose, and technical capabilities. Further, many items of documentation were reviewed and taken into account, such as the MTN operating budget and production statistics. Written surveys completed by public access producers and focus group results were also analyzed.

Similar site visits also focused on the government and educational access operations, facilities and equipment. Government and educational access origination sites were documented and checked for equipment functionality and signal quality. Our findings for these sites are addressed in separate subsections of this Report.

This subsection provides a review, discussion points and recommendations for each functional area within the MTN public access facility, and the accompanying spreadsheet in Attachment 1 embodies a detailed equipment matrix with recommendations for specific equipment upgrades and replacement.

Findings

Overview

Public access producers have the benefit of a robust and well-developed production environment. There are three public access channels available: the MTN Community Events and Public Access channel (16), the MTN Public Access channel (17), and the MTN Arts and Religious Programming channel (75). Programming on these channels runs nightly from 5:00 p.m. to 12:00 a.m., seven days a week. Taped repeats of programming also run daily. These public channels were greatly utilized. In 2003, there were 500 active member producers, creating 250 individual programs and 170 series programs (with regular weekly time slots).¹¹ A broad spectrum of programming has been created for these channels, including shows about music, comedy, religion, cooking, animals, sports, and business, among others. Of special note are Somalian cultural programming and MTN's support of training the area's youth in television production.

The Access Producers' Needs section of this report indicated significant involvement of producers at MTN. Specifically, on average, public access producers spent 20 hours per month at the facility and have been affiliated with the program for five years.

Local producers have the choice of creating content within one of two facility studios, or remotely through checkout of field equipment and use of a remote production vehicle. Evening and weekend hours are available. Camera equipment is generally segmented into units for beginning and advanced users. With advance training and notice, MTN also offers the option of live feeds from remote locations when feasible. In addition, thirteen edit suites are available to public access producers. These offer both linear and non-linear technologies. Some editing equipment (such as a portable switcher) is also available for checkout.

¹¹ MTN 2003 Annual Report.

General Technology Upgrades

It is necessary to assess the overall quality of the MTN public access equipment not only in terms of current functionality, but also in terms of how well it meets the needs of the producers over the projected life of a new franchise agreement. In order to address these needs, some general technology improvements are necessary.

Use of Open Systems

In every functional area of the public access facility where computers are used, such as edit suites and studio control areas, we recommend that the computers make use of open systems architecture. The use of open systems, meaning to have the ability to import and export graphics and files from other computer systems via a network, would be highly beneficial. For example, public access producers could import a trademarked program logo (one that has to appear the same with every use), then use the graphics system computer to retrieve the logo file directly via the open systems network and place it onto the video program. This approach is efficient because, with good network file management, it assures that only the most current version of the logo file is provided. It also saves edit time by eliminating the need to acquire and store the logo on media such as a floppy disc and then convert it to a file format acceptable to the editing system. When considering that the MTN Handbook for Public Access requires items such as copyright clearances and messages advising viewer discretion when appropriate¹² and strongly encourages a format for underwriting credits¹³, having the ability to provide standard templates across computer systems is very beneficial. Open systems would help eliminate the duplication of work, and all users would benefit from the ability to share information.

There are other reasons open systems would be beneficial as well. When well-coordinated and managed, the open system architecture can be designed and used to enhance the flow of communication between producers, administrators, and other

¹² MTN Handbook for Public Access, Page 13.

¹³ MTN Handbook for Public Access, Page 14.

facilitators, such as technologists and production assistants. Weekly reports, equipment and studio reservations, memos, and training materials could be made available. Metrics and web content could more easily be created. This would help increase efficiency, consistency, and compatibility between systems (so that items such as jpeg or bitmap images, for example, are readily and reliably available).

Tape Formats

A variety of tape formats is currently in use at the MTN public access facility. For the most part, producers working within the facility choose between S-VHS and DV formats (such as DVCam). MTN will accept VHS, S-VHS, DVCam, Mini-DV, and 3/4" formats for playback. While it is important to keep a variety of formats in place for duplication and playback purposes, the accompanying equipment matrix proposes the replacement of all S-VHS equipment in the edit and studio functional areas with DV, Mini-DV, and DVD technology. Based on our experience and a review of industry trends, we have concluded that the DV tape format (Mini-DV, DVCam, DVCPPro, DVD) is far superior to that of analog VHS and S-VHS formats. Tests done by video engineers and published in the past few years state that the quality of DV formats in critical criteria such as signal to noise ratio, luminance and chrominance outputs are from 50% to 82% better than the S-VHS tape format.

These studies also indicate that the DV tape format is much more robust and holds up much better over multi-generational use than S-VHS. The DV studies also conclude that 3/4 inch and S-VHS formats both produce video with significantly impaired image quality compared with DV formats.

Functional Areas

Each specific area of the MTN access facility was analyzed for appropriate equipment, usefulness over the life of the franchise, and the ability to meet the user's needs.

Studios

There are two public access television production studios. Studio A is 950 square feet, with an 170 square foot control room and 72 square feet of set storage space. Studio B is 635 square feet, with an 100 square foot control room and no set storage space. The amount of space in these studios has been of adequate size and we believe that such studio space will continue to fit their needs. We have not recommended any changes in the square footage at this time.

Although the lighting system in the studios is functional, because of its age and because of changes in current lighting technology, we are recommending that the lighting system be replaced in both studios. Along with replacement of the lighting system, we are recommending a modern list of equipment that includes a dimming board and dimming packs for the reasons stated below. To avoid resetting individual lights repeatedly as individual scenes change, automation of lighting schemes is important. This is called transitioning from one scene to another. For example, it could be necessary to transition from a lighting scheme appropriate for a lecture program to a lighting scheme appropriate for a discussion panel. A proper dimming board and lights are required in order to automatically transition the lighting without having to reset the lights manually every time. This saves valuable time and effort. By having the lighting fixtures connected to a dimmer board, the producers would have the ability to have complex lighting schemes and control over the brightness of individual lighting fixtures. Dimming also gives the ability to create programmed lighting scenes. This allows studio users to have lighting scheme configurations automatically set up, such as a scheme for a permanent set. If additional lighting schemes are established, such as for a panel discussion, they would allow studio users, with the touch of one button, to transition from one scheme to the other with all the lighting levels already set. This is very valuable in live or fast paced productions. It is time-saving because it can take hours to set up a specific lighting scheme, and this system will save hours by being able to store that scheme and then recall it from a dimmer board.

In order to meet the high visual quality of today's television standards, the lighting fixtures themselves should be varied, enabling different types of lighting and effects to occur. It is important to have different kinds of lights to give the ability to illuminate different parts of the set, from narrow areas such as faces to entire backgrounds such as curtains. For example, bright 1,000-watt fixtures should be included to flood large spaces in the studios with light. The studios should also have smaller 650-watt fixtures to provide the ability to light specific areas of a set and the lighting of people's faces. There should also be some cyclorama lights capable of lighting backdrops and curtains.

A key purpose for the studios is having the ability to have dynamic productions that are interesting, informative, creative, and keep the viewer's attention. The studios provide a controlled setting in which the public access producers can create a variety of sets and equipment configurations for their productions. In accordance with the written survey results¹⁴, new and more versatile sets and props, as well as virtual sets, have been recommended in the accompanying equipment matrix. Along with physical sets, new technology gives producers the ability to have what are called "virtual sets", meaning that the backgrounds are actually graphic as opposed to real sets. There are numerous companies that are now supplying this technology at increasingly reasonable costs. With the ability of simple chromakeying, which we have specified in the recommended new switcher, virtual sets could be accomplished at reasonable costs. A separate computer and specialized software will be needed to accomplish virtual set production, which we have also included in the equipment matrix.

The set storage area should have proper space to store sets and props, including high ceiling space and large bay doors accessible to the projected studio areas to accommodate large props such as set curtains. For security reasons, the bay doors should be lockable or there should be lockable cages for set storage.

We also observed that the curtains are old and should be replaced. This is addressed in the equipment matrix.

¹⁴ See Access Producers' Needs Subsection.

Current studio control utilizes Amiga computers running Toaster software. This technology is outdated. Although Video Toaster technology is still in the marketplace, the Amiga platform that this system is running on is no longer in existence and not supported. We are recommending replacing all Amigas throughout the facility with current graphics systems that support open system architecture.

In the equipment matrix, a complete video/audio routing system has also been recommended. A routing system provides the ability to send a video/audio signal from one source in the facility to any other source in the facility. For example, there could be video footage or a graphic that is created in one of the edit suites that is needed for a production in the control room. With a routing system, a producer could simply designate what source he or she wants the signal from and obtain it electronically from that source for use in the studio control room. The alternative to a routing system would be to manually save the desired work to tape and physically take it to the desired location, where it will be re-loaded into the production system. This causes undue time, effort, and loss of quality with each subsequent tape made. Therefore, we believe there is a need for a comprehensive routing system throughout the facility for both video and audio.

Checkout

Some of the beginner level field cameras are currently of the S-VHS tape format, which we have already identified as obsolete in a shift to Mini-DV technology. According to the written survey results, more than half of the survey respondents chose to use other equipment, including their own equipment, such as cameras, tripods, and microphones. This practice can lead to substandard audio and video quality issues. Home equipment is often not of the "prosumer" quality, and typically uses such things as consumer-grade video tape. The professional quality equipment that we have included in the equipment matrix, including Mini-DV, DVCam, and DVCPPro, incorporates many advanced features and accessories such as XLR audio jacks or larger viewfinders to ensure integrity of the audio/video data and create broadcast quality content. Along with the professional quality equipment mentioned, we have included newer technology items such as portable hard drive recorders to be used on location as an alternative to recording to videotape.

These small and reliable hard drive recorders can record and play DV video captured from a DV camcorder. These devices can store up to 4.5 hours of "edit-ready" digital footage that can be transferred directly to a computer with faster than real-time speeds. These recorders also have an open-format recording file system that is compatible with both Mac and PC based non-linear editing systems.

All of the items we have detailed in the accompanying equipment matrix are of prosumer or better quality.

Another category addressed in the checkout area is the replacement of the light kits. Light kits on the market today offer better technology to deal with harsh conditions, such as more durable lamps, hardware, cords, and other accessories that can better withstand the varied working conditions associated with public and community access field shoots and productions. Newer kits are also more flexible. For example, added capabilities that come with current light kits include the ability to handle very bright lighting when needed, or very soft and subtle lighting effects, which occur frequently during outside field shoots. These advances in utility are due to new features, such as dimmable lights for effects and additional hardware such as gels to create shadow effects and color effects. Current lighting kits also offer many different wattage capabilities to greatly enhance the quality of the shoot.

Not only do current lighting kits outperform older light kits, they also better facilitate the use of digital technology, where more emphasis has to be put on lighting to achieve professional-looking images. For example, digital cameras have a very difficult time shooting an image above 95 IRE (IRE is a unit of measurement of video brightness levels, where 7.5 IRE represents Picture Black and 100 IRE represents Picture White). As a result, images may look "washed out" and not of broadcast quality if improper lighting is used. Light kits currently on the market offer many more flexible lighting techniques so that a producer is not flooding the scene with light, but is able to control the light, only putting it where he or she needs it.

Based on the above, it is our recommendation that new light kits be purchased immediately. Even though the older light kits could be repaired, they would still be inferior to many of the present day lighting kits and would not meet the needs of digital videotaping that will become imperative with the shift to Mini-DV and DV camcorders.

Along with other equipment mentioned, we are also recommending the replacement of field microphone systems with ones incorporating current technology, specifically utilizing the UHF frequency band. This will eliminate many problems inherent with older VHF wireless technology, including audio dropouts, interference, and general poor reception. We are also recommending that two, instead of the current multiple, main brands of audio systems be used. This will eliminate the problems of not being able to swap parts when needed. It will also ensure conformity and consistent audio quality throughout all of the uses, without, though, creating manufacturer dependency by only using one brand. Training will also be minimized for users.

Mobile Production Truck

Most of the equipment in the mobile production truck is listed as in "Poor" condition. Much of the equipment used in the truck, including items like the production switcher, is out-dated. This means that the manufacturer no longer makes the equipment /specific model or offers any support. If equipment like the switcher malfunctions, it would be very hard to find parts or a service center willing to do the repairs. We are recommending that the cameras be replaced with similar cameras that will be used in the studio. This will increase the versatility by being able to swap out cameras from the van or the studio if needed and also offer a consistent quality of picture between programs shot from the truck and programs shot in the studio. Along with newer DV VTR's, there are older VTR's used in the truck that are out-dated and should be replaced. We are recommending these older VTR's be upgraded to the DV format. This will enable an easy transfer of tape footage between the truck and other areas of the facility such as

editing or replay. The vehicle itself is listed as in "Poor" condition, and should also be replaced immediately.

Edit Suites

Of the thirteen designated edit suites, all of them have been recommended to be non-linear except one. Non-linear editing technology has become standard and is taught throughout most school systems. This technology is widely accepted within the professional video industry. Although only one edit suite (Pluto) has been left as a linear (tape-to-tape) edit facility, linear editing is also available in the studio control area and mobile production van. The pricing estimates for the various non-linear editing systems reflect the differences in beginning and advanced software. Beginning non-linear editing would include more cuts-only editing with limited effects. The advanced non-linear suites would incorporate much more versatile compositing and sophisticated editing capabilities. We have also recommended a check-out laptop capable of low-end non-linear editing with removable hard drives. This will add versatility to meet the producer's needs.

Duplication

The duplication area should include various formats needed for versatility. The existing equipment list has a significant variety of formats for this purpose. We have, for the most part, recommended the continuation of these formats. The format we felt should be added is the DVD player/recorder format. Many households now have DVD players and this trend will continue to grow.

Master Control/Playback

Creating a beneficial, long-range plan for enhancing current playback equipment is an important consideration. Because equipment failures and process breakdowns can directly reflect on channel quality, extra care must be taken to ensure that the playback area is as reliable as possible. Consistent with a growing trend in the Access Community, there is an interest in providing programming continuously, 24 hours a day, seven days a

week. As channel programming increases, the manual process of sorting and handling tapes and the heavy use of tape decks will begin to become error-prone. Employees or volunteers will continue to need to be available for loading tapes into playback decks, even during overnight hours. The tape decks themselves will receive heavier use and thus be more prone to equipment failure and increased service. Therefore, we recommend that the optimum migration path for playback over the system would be to use a digital video server. A video server would not only take the place of many videotape players, but would also vastly reduce, over time, the need for the manual handling of videotapes in the playback area. Further, it would reduce the service dollars needed to repair and replace conventional video tape players.

Many public and government access facilities have turned to turnkey video server technologies to handle playback and master control functions. They are flexible enough to operate 24 hours a day, 7 days a week. They are cost effective, provide proficient router switch control and event scheduling for playback, and offer video program catalog software, security for multiple users, and error pager notification. They also offer upgrade paths that could become desirable in the future, such as webcasting possibilities. The server should also be networkable. This would enable production staff to input video files directly over an area network into the server, keeping them in a digital format.

We are further recommending that the entire facility be equipped with "house sync". This is the technical term for facility phasing of all video and audio equipment. By having the same sync signal sent throughout the facility, all equipment can be synchronized together and checked for consistency and errors. Requirements indicate that public access producers provide color bars, tone, and countdown, and black at the beginning of each program produced¹⁵. This is much more easily accomplished by using the same reference of color bars, tone, and black.

¹⁵ MTN Handbook for Public Access, Page 11.

MTN Facility

As touched on above, current functional space at the MTN facility at St. Anthony Main is performing well for the intended purposes, and producers generally give it high marks. There is some excess space, but it is in the process of being repurposed. For example, a current open area is being readied to accept relocation of playback operations from the current Plymouth Headend location to the St. Anthony Main facility. We agree with moving playback onto MTN's site and using this space for that activity.

We understand that MTN has recently agreed on lease terms to remain in the St. Anthony Main facility. If MTN is ever relocated, at least 10,000 square feet should be dedicated for use by public and community access. This would be consistent with current repurposed space allocations and with the needs of staff and producers determined during our ascertainment.

MTN Operations/Staff

A review of the equipment evaluation and associated replacement matrix indicates that a significant amount of capital funding is needed to update, upgrade and provide for proper equipment replacement at MTN, both in the near and longer term. Regarding operations, the picture is a little less clear. MTN employs eight full-time community television staff, including an Executive Director, Chief Engineer, Senior Production Manager, Production Coordinator/Assistant Engineer, Check-Out Manager/Instructor, Program Manager, Production Specialist/Instructor, and Studio Access Coordinator/Production Specialist. MTN also employs six part-time positions at approximately ¼ FTE each (for a total addition of 1.5 FTE to the 8 FTE described above). The part-time personnel include a Bookkeeper, Master Control Operator, Class Instructor, Studio Access/Master Control Technician, Freelancer/Instructor, and an additional Master Control Technician. Access Producers, though, indicate that they would like to see additional staff at the MTN facility, especially in the areas of production facilitation and promotion and outreach. MTN staff also indicates that they feel stretched thin, based on the variety of demands that are placed on them as the main focus of public and community access.

After review, we believe that the interest of all parties could be best served if staffing was maintained at current levels, but efficiencies were sought such that facilitation and outreach services could be enhanced. Based on our review, this indicates maintaining a staff budget of at least current levels, with increases at least at the rate of inflation and in step with median professional salary ranges for the positions currently established at MTN.

Regarding other portions of the operating budget, they appear in line with what is generally found for a large city, full service Access center.

Channel Capacity

MTN currently programs the three channels profiled earlier in this subsection. Our review indicates that, at a minimum, these channels should be maintained, with one additional analog assignment held in reserve for expansion, especially if a lengthy renewed franchise term is proposed.

Expansions beyond this initial and reserved capacity could be provided through additional channels gained when analog services are converted to digital offerings. For this reason, we recommend that MTN be continuously allocated a portion of the spectrum pertaining to the three initial and one reserved public access channels (24 MHz), that could then be utilized to provide a significantly increased number of public access channels as the spectrum may be converted to digital carriage (i.e., one analog public access channel equals potentially eight digital public access channels). If the use of such capacity is combined with video-on-demand, interactive television and other new technologies, MTN should be able to meet a wide range of targeted subscriber interests in public access content, both now and in the future.

Access Origination

As indicated in the equipment matrix, we have recommended that MTN have a direct link to Time Warner's headend using an uncompressed, digitally encoded, optical transport

technology (such as 10-bit encoding) from the relocated playback area at its main center. Beyond this, one, or a combination, of three transport scenarios could be provided by Time Warner and utilized by MTN to provide access origination from sites throughout the City. First, any institutional network site, as described in Section C of this report, should have the capability to enable MTN to originate access video from that location. If the I-Net sites do not duplicate all current sites available through upstream transmission on the residential subscriber network, then provision should be maintained for MTN to originate upstream video from any point in the subscriber system. Additionally, in the accompanying equipment matrix, we have proposed implementation of a video microwave system, with a transmitter installed in the production truck and a telescoping antenna mounted on top of the truck, with a companion receiver and antenna at the MTN facility. This could be supplemented by an intermediary transceiver available to be placed on top of an appropriate building in downtown Minneapolis so that access origination could be enabled from any remote point in the City. The ultimate combination chosen should be the most beneficial at the best cost for enabling the widest possible origination of access programming by MTN.

Conclusion

In summary, the recommendations for equipment and facility upgrades, additions, enhancements and modifications, combined with the replacement schedule shown in the accompanying equipment matrix, should provide for a highly satisfactory production facility environment to meet the public access needs of MTN now and well into the future.

EDUCATIONAL ACCESS

Introduction

At the request of the City and MTN, CBG has also performed an in-depth and extensive review of the Minneapolis educational access Facilities and equipment. The purpose of our review was to determine what types of PEG equipment and facilities would be needed in order to satisfactorily produce viable, high-quality educational access programming throughout the life of any renewal franchise awarded to Time Warner.

As part of CBG's overall review, an initial visit was made to the Minneapolis Public Schools ("MPS" or "School District"). At that time interviews were conducted with the staff. The functional areas in the facilities were toured and documented. The production equipment inventory was verified and evaluated for condition and usefulness.

Documentation was gathered including facility floor plans, inventories and copies of applications for grant funding for digital video equipment upgrades. Written survey and other survey information was also used in preparing this subsection of our Report.

This report provides a review, discussion points and recommendations for each functional area within the School District's educational access facility, and the accompanying spreadsheet embodies a detailed equipment matrix with recommendations for specific equipment upgrades and replacement.

Findings

Educational Access Overview

In the past, the School District's programming on Channel 15 consisted of School Board meetings, staff in-service and professional development programs, and K-12 student-focused programs, such as concerts, literacy programs, and sports programs. Currently, the School District's programming consists of electronic bulletin board messages, School Board meetings, occasional special events, and imported programming such as the German life-oriented PRISMA.

The educational access channel airs scheduled content from 5:00 p.m. to 10:00 p.m. daily, plus School Board meetings at 4:00 p.m. two times per month. This programming is then repeated in five-hour loops to cover the remaining blocks of time over the day, with the bulletin board running as well.

Currently, the School District has two main functional areas used for video/television production. These are North High School and the MPS District Office.

District Office

After physical walkthrough of all educational facilities, many issues regarding equipment age and condition were identified. The MPS studio located at the District Office is currently used mostly for storage. The lighting system in it utilizes technology which is outdated and should be replaced. The studio itself, which is mainly used for storage, is not currently being used as it was intended. We are recommending that it be converted back to a fully functional studio to facilitate educational programming needs. There are two older Panasonic WVS-200 CLE cameras in the studio that are outdated and need to be replaced. Please see the accompanying equipment matrix in Attachment 1 for more replacement details.

The Board Room equipment consists of five small Panasonic cameras which are more ideally suited for surveillance activities than television broadcasts. Some pieces of the control room equipment are very outdated. The control room equipment has technology gaps which we have addressed in the accompanying equipment matrix. This equipment includes items such as signal test equipment to verify NTSC standards for television signals and a new character generator that incorporates the use of open standards for file import and export and networkable capabilities. The School District has two non-linear edit stations, both running Apple Final Cut Pro editing software. We are recommending some equipment to be added to these systems to make them more functional and increase their overall quality. This equipment includes items such as video test equipment, DV VTRs, upgrades to the software, and new program/preview monitors.

North High School

The technology used at the North High School studio and production areas is in need of major upgrades in several areas. Some of the equipment we found to be outdated includes 3/4" U-Matic VTRs. The 3/4" format was at one time an accepted industry standard. However, this format is no longer manufactured or supported by Sony Corporation. Parts are increasingly hard to find and soon will be completely unavailable.

With respect to the S-VHS format which is also being used, as indicated earlier, industry research shows that the DV tape format (Mini DV, DVCam, DVCPro) is far superior to that of both analog VHS and S-VHS formats¹⁶. In fact, tests performed in the last several years by video engineers show that the quality of DV formats in critical criteria such as bandwidth, luminance, and chrominance outputs are better than the S-VHS tape format. For example, the S-VHS tape format has 400 lines of resolution whereas the DV format has 500 lines of resolution, resulting in an image that has more definition. The DV format also has a greater bandwidth, 6.3 MHz as opposed to 5.0 MHz for S-VHS, resulting in greater richness in color, improved accuracy of the image, and a wider spectrum of available colors. Studies also indicated that the DV tape format was much more robust and held up much better over multi-generational use than S-VHS. The cost of these digital video technologies has been greatly reduced in recent years and ease of use makes them more accessible to beginner users. Therefore, we have concluded that DV, or digital video, tape formats would be the best choice for Minneapolis educational access equipment upgrades.

Field Production

The School District will want to record content at schools other than North High School (elementary school programs, for example). This will require taking a camera and other necessary equipment, such as a tripod and microphones, to the event. The educational access producers will also have the need to create content in classrooms or meeting rooms. Having field production equipment, in addition to the studio equipment explained

¹⁶ <http://www.epanorama.net/links/videostorage.html>

above, will enable the School District to create more on-site programming. For example, if students wished to create a year-end school video, they could use the field equipment throughout the year to videotape school projects, events and other items of interest. These could then be compiled together in a post-production environment to create the finished piece. The Field Production package is also an ideal equipment setup for interviews with one or two people, where the production truck described below would be too large to use.

For redundancy and to avoid scheduling conflicts, the field production equipment should include two complete field packages. This will enable simultaneous use of the equipment during peak school times. Another advantage of having two complete packages is the ability to have one available as a backup in case of equipment failure. The attached spreadsheet for Educational Access includes all the necessary audio, video, and support equipment needed for complete field production packages.

Suitcase Studio

Further, a suitcase-type studio would be a good addition to the portable field equipment inventory. It includes three cameras and the ability for live switching, audio mixing, and limited character generation so that the finished program is created as it is being shot. In many cases there will be no further need for editing.

This suitcase setup could be easily transported to remote locations and could be used for both live-to-tape and live programming over the cable system. If configured for proper portability, capability, and user-friendliness, a suitcase studio can successfully expand coverage of classroom, auditorium, theatrical, sporting and other events with as little as two or three-person crews by enabling a more flexible, fast, and convenient production approach. Additional benefits include reducing simultaneous demand for the use of the other field equipment, offering a less technically complicated setup for entry-level users than a full studio setup provides, and service as an excellent backup production resource for the studio in an emergency or during periods of high demand for studio use.

Mobile Production Truck

There is currently one production vehicle available to all PEG users, including the educational and government producers. The equipment analysis and inventory replacement schedule for the current mobile production truck are addressed in the attached public access equipment matrix and narrative analysis subsection. In addition to the portable production equipment that can be used for small on-site shoots, we are also recommending a separate mobile production truck be purchased for use as a shared resource throughout the entire School District. This will enable the educational access producers to create multi-camera, on-location shoots, which will improve the diversity and content quality of the programming cablecasted on the educational access channel. Whereas the remote production equipment will allow educational access producers to capture content and bring it back to the production facilities, the remote production vehicle will have studio-quality equipment for multi-camera field shoots with switching, test, and character graphics equipment, thus avoiding the need to edit the production at a later time. The possibility of providing for live feeds using the remote truck should also be developed by enabling access origination feed capabilities from each MPS facility. These origination points for live programming can be established if Time Warner can provide viable return feeds on the cable system.

This vehicle should be fully equipped with all of the studio functionality listed above, but designed for mobile use. It should also include a gas-powered generating system so that it is not limited to being close to an A/C power supply, allowing it to be used in places such as campuses, athletic fields, and other areas. The vehicle should be garaged when not in use. Taking into consideration both the climate of the area and the total worth of both the vehicle and the equipment inside, a garage would provide several benefits. As a shelter, the garage would protect the exterior from severe weather elements, and less engine wear and tear would result during startups on cold winter mornings or hot summer afternoons. As a security measure, the garage would deter vandalism or theft to the several hundred thousand dollars worth of equipment inside the vehicle. If a garage is provided, it should have bay doors to accommodate the moving of equipment.

Headend

We are recommending that there be one primary functional area for the MPS headend and delivery of MPS educational access programming over the Time Warner cable system. This headend facility should be located at the District Office. The equipment located there should include automated playback, scheduling, signal test equipment, and a variety of playback capabilities. The tape format in the headend area should include DV technology because this is the format that content will be created in within the School District. It is, however, necessary to maintain VHS and S-VHS players in the Headend and Edit Suite areas because content will continue to be submitted in these formats for a period of time. This technology is still very prevalent in households and individual schools. The capability to play back programming using a combination of Mini-DV, VHS, DVD, and video server technology is therefore essential.

This Headend facility should also be capable of receiving a fiber optic feed from North High School. This would enable the transfer of programming from North High directly to the MPS headend for scheduled playback over the School District's channels.

In addition, there should be two other fiber connections, one from the main headend at the District Office (this would supplant the current FM fiber feed), and one from North High as a backup headend facility (this would supplement the current coaxial feed from North High to the Plymouth I-Net Headend), to be used to transmit programming to the Time Warner system for cablecast over the educational access channels. The connections between the MPS Headend at the District Office as well as the North High backup facility and the Time Warner cable system should be of very high quality. A dedicated fiber connection should be used, possibly incorporating 10-bit digital technology for transfer so that the educational access channels consist of high-quality, lossless video feeds which match the quality that Time Warner Cable is producing on the commercial channels within their system. It is also very critical that the signal not be compressed for transport. Compression methods used in cable networks can degrade the channel quality and make it look substandard to other channels on the system.

It is of utmost importance to keep the educational channels on the air with program content running, even during times of maintenance or repair. Therefore, redundancy should be built into the Headend system. This is why there should be a backup Headend facility located at North High School, designed for use in emergency situations and as a backup for the main Headend facility during maintenance or other outages. This should include a computer running a character graphics system, which will provide a bulletin board to ensure that information can be displayed at all times on the educational access channel. It should also include playback capability consisting of at least two decks, the minimum number needed to play back continuous program content over the educational access channel.

The proper test equipment should be implemented, because it allows for the verification and validation of the entire system, including all points of input, such as a signal feed from a playback unit or a transmission link. Additional audio monitoring equipment is also recommended to verify audio quality for the same reasons. It is necessary to have proper test equipment such as a waveform monitor and vectorscope to evaluate the output of each source for correct video levels. Using calibrated waveform monitors and vectorscopes to verify video levels will eliminate guesswork and increase reliability. Test and signal processing equipment such as an audio/video limiter/compressor should be installed to keep all signals within standard specifications. Playback sources should include built-in controls to adjust video and sync levels to ensure the generated signals are within acceptable standards, such as RS-170 specifications.

Facilities

Our review indicates that while current equipment is in significant need of upgrading, updating and enhancement, and that certain of the facilities are not being utilized fully for the purposes intended, if the space available for educational access is fully purposed for that use, then the space at both the District Office and North High School can be efficiently and effectively utilized going forward in tandem with the recommended new equipment to facilitate a wealth of educational access production. Additionally, as remote equipment is implemented, as recommended herein, this will allow additional

space at remote facilities to be utilized for off-site productions. Accordingly, no new educational access space for MPS is recommended at this time.

Operations/Staff

This is one of the areas of greatest need related to educational access. Currently, there is no one assigned full-time at MPS to facilitate educational access. The current staff who are able to devote part of their job responsibilities to educational access programming are accomplished and are providing a product that is seen as valuable by viewers. However, even with the equipment upgrades and enhancements that we've recommended, participation by others throughout the school system utilizing the remote equipment that's been forecast, and continued selection of viable imported programming, we believe dedicated personnel or a combination of personnel with other job responsibilities to the level of at least two FTE will be required to meet the need for development of the expanded educational access programming (which constituted the highest need concerning future local programming indicated by existing cable subscribers). Accordingly, we believe that it is important for MTN and the City to work with Time Warner and MPS to determine how this staffing level might be accomplished.

Channel Capacity

Concerning channel capacity, MPS provides its primary educational access services on Channel 15, other services, such as NASA programming, on Channel 77, and other types of programs on Channel 78. Channel 76 is currently used for MinnDOT live traffic, which is seen as a valuable service by subscribers. Based on current projections, we believe that the current channel allocation is sufficient and will allow for growth in educational access programming over time, including potentially higher education programming. Similar to public access, it will be important for this full complement of 24 MHz (four 6 MHz channels) to be maintained in the new franchise, even as analog channels may be converted to digital services. This will allow for the development of a number of targeted digital educational access channels, which can be used in conjunction with technologies such as video-on-demand and interactive television to provide a wide range of educational access services.

Access Origination

As indicated herein, MPS should have the capability to originate from any MPS location. For this to occur, similar to public access, it will most likely need a combination of a continuation of upstream capabilities on the residential subscriber network, as well as optical origination capability from MPS sites that would also be I-Net sites, as well as the potential use of microwave transmission (in this vein, we have not recommended a second microwave system for MPS, since all of MPS' facilities are tied into the residentail subscriber network, and some have current fiber optic capabilities from the existing C Cable I-Net. If, however, current upstream capabilities were not maintained and enhanced going into a renewed franchise, then it would be prudent to also provide microwave transmission capabilities for the School District's remote origination equipment.

Conclusion

In summary, the recommendations given above for equipment and facility enhancements, combined with the replacement schedule shown in the accompanying equipment matrix, should provide for highly satisfactory production facility environments to meet the educational access needs now and during the term of any renewed franchise.

GOVERNMENT ACCESS

Introduction

At the request of the City and MTN, CBG has further performed an in-depth and extensive review of the Minneapolis government access facilities and equipment. The purpose of our review was to determine the needs of the Minneapolis City employees that use the facilities and produce PEG programming, as well as all City residents who view PEG programming. Once assessed, CBG also moved to determine what types of facilities and equipment would be needed in order to meet the needs throughout the life of a cable franchise with Time Warner that is currently the subject of renewal discussions.

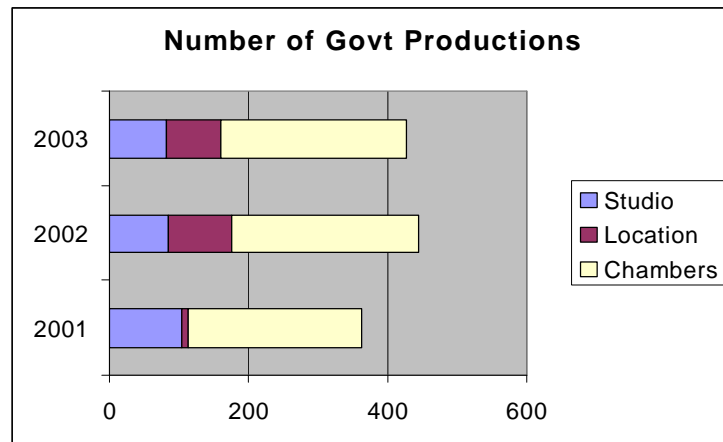
As part of CBG's overall review, an initial visit was made to the Minneapolis government access facilities within City Hall in December, 2003. At that time, interviews were conducted with the staff. All of the functional areas in the facility were toured and documented. The production equipment inventory was verified and evaluated for condition and usefulness. Additionally, the overall state of the facilities was analyzed for efficiency, ability to meet its purpose, and technical capabilities. Further, many items of documentation were reviewed and taken into account, such as the Media Services productions documents. Written surveys completed by staff were also analyzed.

This subsection of the report provides a review, discussion points and recommendations for each functional area within the Minneapolis government access facilities at City Hall, and the accompanying spreadsheet embodies a detailed equipment matrix with recommendations for specific equipment upgrades and replacement.

Findings

Overview

The Office of Telecommunications and Media Services is the division of the City of Minneapolis government that provides, along with other duties, video services and video production for the City. This office creates the programming for Channel 14, the government information channel, and Channel 79, the government meeting channel. In addition to City Council, Council Committee meetings and Public Hearings, the government access channels create programs such as "MPD COPS", "A Public Health Journal", "Access Minneapolis", and "Discover the City". There were 402 total productions created in 2003¹⁷, combined with replays and a City bulletin board to provide programming 24 hours a day, seven days a week on both channels.



The production crew consists of the Media Services Manager, two full-time video specialists, 4-5 volunteers, and an administrative assistant. The studio is in Room 123 of City Hall and is listed as such in the accompanying equipment matrix. There is also an adjacent control room as well as a small edit room and a storage vault.

¹⁷ Office of Media Services, 2001 - 2003 Productions documents.

Equipment and Technology Upgrades

Council Chambers

The Council Chambers (Room 321 in the equipment matrix) incorporates four main digital studio cameras that are robotically controlled with a remote camera operating system. A video projection system also exists for public presentations. Most of the equipment in the Council Chambers has been purchased in the last 2-3 years and is in good condition. There is also an adjoining room (still part of Room 321) that is used as the control room for the Council Chambers. It houses all of the equipment needed for cablecasting and recording meetings from the Council Chambers.

Studio/Studio Control/Field Production

The Studio and Studio Control areas (Room 123) of City Hall include a variety of equipment for program production. Although small, the studio houses three digital studio-quality cameras that are also robotically controlled with a remote camera operating system. For location shoots, there are two digital camcorders. However, although there are some digital and DVD recorders, the majority of recorders are of the 3/4" and S-VHS formats. The 3/4" format was at one time an accepted industry standard. However, as indicated earlier, this format is no longer manufactured or supported by Sony Corporation. Parts are increasingly hard to find and soon will be completely unavailable. We have recommended that these units be replaced with DV VTRs as soon as possible.

With respect to the S-VHS format, as discussed earlier, industry research indicates that the DV tape format (Mini DV, DVCam, DVCPro) is far superior to that of both analog VHS and S-VHS formats. For this reason, we have concluded that DV, or digital video, tape formats would also be the best choice for government access equipment going forward.

Edit Suite

An older Avid non-linear edit system is used for post-production activities. We estimate that it allows between 1 and 1 1/2 hours of programs to be stored (depending upon the number of rendering files that are required). It appears to be a composite analog system, which will not support the transfer of data from digital field cameras, such as Sony DVCams, through the use of the IEEE-1394 protocol, more commonly known as "firewire". Firewire allows for the lossless transfer of information, and consequently, ensures that the quality of the data is not compromised. However, the older Avid non-linear edit system does not support firewire technology, and there is no way to transfer video and audio signals using this newer technology. Conversely, newer equipment no longer supports the transfer of analog information. As we move into the future, video equipment will be less likely to ever use analog technology for the transfer of video/audio information. There are already cameras on the market today that only support digital output, or IEEE-1394 firewire, for example, and all Apple Macintosh computers have come with the IEEE-1394 port built-in since 2001. Thus the older Avid system should be upgraded to accommodate digital interfaces, including firewire. This will increase the quality level significantly.

We recommend that the non-linear editing system be networked with other types of open systems to share files, providing an efficient and enhanced editing environment. As stipulated earlier in this report, the use of open systems, meaning to have the ability to import and export graphics and images from other computer systems, is highly beneficial. It helps eliminate the duplication of work, and all users benefit from the ability to share information.

Mobile Production Truck

There is currently one production vehicle, the MTN production truck, available to all PEG users, including the government producers. The equipment analysis and inventory replacement schedule for the mobile production truck are addressed in the public access equipment matrix and narrative analysis documents.

Playback

Although the government operation is currently using a small video server for replays, we are recommending implementation of a larger capacity server that incorporates newer technology found in video servers today. This includes the ability to have finished video programs transferred directly from edit suites to the server in a “file format,” instead of dropping the program to tape and then re-digesting the program into the server. Other improvements include larger file capacity. This will help with projected capacity limitations and will reduce staff time devoted to loading and unloading files.

Many government access facilities have turned to turnkey video server technologies to handle playback and master control functions. As indicated previously, these systems are flexible enough to operate 24 hours a day, 7 days a week. They are cost effective, provide proficient router switch control and event scheduling for playback, and offer video program catalog software, security for multiple users, and error pager notification.

Government Access Facility

The existing government access facility is spacious in some areas and limited in others. Specifically, the facility in Room 321, related to the Council Chambers and associated control room, provides a significant amount of space for all necessary activities, and we see no enhancements needed for that space at this time.

However, the facilities housed in Room 123 are somewhat cramped and should be expanded if possible, especially in the studio and studio control area by approximately 300-400 square feet. Depending upon where and how such space is located, it could cost as much as \$150 per square foot to renovate the existing facility to provide additional space for video production; and that is assuming that the renovations can be collocated with existing space. If not, the existing studio space may have to be entirely relocated in order to find a space that’s large enough to accommodate both the existing and the necessary additional space. At a minimum, if development of only the additional 300-

400 square feet is required, at the maximum projected renovation cost, this would result in the need for approximately \$60,000 in capital facility renovation cost.

Operations/Staff

A review of the current video services staff and operational support provided by the City for government access operations shows a level consistent with the level found in other large cities. If the City, over time, wishes to increase production, especially at remote locations, it would need to add commensurate staff to support an increased number of production hours.

Channel Capacity

The City's current two channels, as described earlier, that provide government information and government meeting coverage for Minneapolis citizens are seen as valuable by subscribers. Knowing that a significant amount of programming is already available, we believe that it is necessary to initially establish another government access channel in reserve going forward.

Once this is accomplished, additional government access services could be facilitated through maintaining the same spectrum capacity (18MHz) as analog services are converted to digital channels. This again would provide for anywhere from eight to ten times the current number of government access channels, which would allow for a variety of targeted, video-on-demand, interactive and other niche government access program services to be developed.

Access Origination

The government access origination requirements are similar to those for public access, except that they focus on government and allied (such as Park, Library, MPHA, etc.) facilities to serve as remote origination locations. Accordingly, it will be important to provide government access programmers with a combination of I-Net, upstream

residential network and microwave capabilities going forward in order to provide the maximum possible coverage of the City by the City's own access programmers.

Conclusion

In summary, the recommendations for equipment and facility additions, enhancements and modifications, combined with the replacement schedule shown in the accompanying equipment matrix, should provide for a highly satisfactory production facility environment to meet the government access needs of Minneapolis now and well into the future.

WRNB

WRNB is a cable FM station that provides locally originated cultural audio programming, as well as community news events and services. It is currently broadcast on Time Warner's FM radio service above 88 MHz.

According to WRNB's management, it has been on the air nearly 20 years beginning with the original Rogers cable system through all subsequent operator iterations, and is currently on the Time Warner system. WRNB documents reviewed indicate that Time Warner has, in the past, reached a tentative agreement to continue carriage, as well as provide operational support for the WRNB service, but that such an agreement has not yet reached full fruition.

Our review indicates that WRNB provides arts, culturally-focused, ethnic and community news programming of the type that is seen as valuable by subscribers, and accordingly should be continued into any renewed franchise. At a minimum, WRNB should also be provided capital equipment and facility support for continuing to provide its community radio audio service to Time Warner Cable for the benefit of its subscribers. WRNB has previously estimated its annual needs as averaging approximately \$1,600 per month, which would result in a grant of approximately \$20,000 per year needed to support WRNB's programming production and distribution. Additionally, Time Warner should maintain full connectivity to its headend for WRNB's signal and provide all headend electronics to facilitate use of the FM channel capacity.

Overall PEG Access Conclusions and Recommendations

Based on CBG's review and analysis of all the information and materials gathered, the following conclusions and recommendations are made concerning overall PEG Access Needs and Interests in Minneapolis:

Channel Capacity

1. Subscribers and PEG Programmers find existing PEG Channels valuable. Accordingly, the 9 current services should remain.
2. There should also be reserved analog capacity for expansion of additional public and governmental services in the future, especially if a lengthy franchise is granted.
3. Space should be allocated for digital offerings as well. This includes capacity for: migration of existing services from analog to digital, as such may occur for the basic tier in the future; additional narrowcast, targeted PEG services; as well as video-on-demand and interactive television services.

This means that the existing and planned spectrum capacity needs to be maintained so that many more digital channels can be provided in the future in lieu of the channels used to provide analog services.

Regarding use of cable based video-on-demand, interactive television services, and other technologies, it will be important for not only the spectrum capacity, but also the associated operational, capital, technical and technology support, to be available from Time Warner in the Minneapolis system to support such new PEG initiatives going forward.

Access Facilities

4. At a minimum, existing PEG Access facilities should be maintained, with the exception that \$60,000 in facility renovation costs should be additionally provided for government access space expansion. If public access space is ultimately

relocated from the current MTN facility to another location, then CBG believes a minimum of 10,000 square feet needs to be allocated for public access purposes.

Equipment

5. The PEG Access equipment surveyed, exhibits a wide variety of ages and conditions. While some equipment was recently purchased, a significant amount of the PEG equipment, especially that for educational access, was very outdated and in great need of upgrade and replacement.

CBG's review noted that many facets of current PEG operations needed enhancement, including: digital upgrades for current analog equipment; developing additional remote equipment and upgrading existing remote capabilities; upgrading edit and post-production capabilities; upgrading and expanding playback systems; upgrading character generation and digital effects equipment; expanding lighting capabilities; and providing additional access origination, including microwave, capabilities for sites that need live transmission.

Overall this upgraded and enhanced equipment will result in a number of benefits:

- a. The manufacturer no longer supports the existing equipment, in some cases. The new equipment will be longer lasting and more maintainable.
- b. The new equipment will be more consumer friendly.
- c. The new equipment will be more easily upgraded, and ultimately provide a higher cost/benefit.
- d. The use of upgraded and enhanced equipment will significantly enhance production signal quality.
- e. The new equipment will better enable efficient use of staff resources.
- f. The new production technology will be more consistent with what is currently available to, and thus more easily used by students, advanced home users, etc.

6. Based on our review, we have developed a piece-by-piece equipment upgrade matrix for Public, Educational, and Governmental Access to facilitate the necessary enhancements.

From our projections, regarding Public Access at MTN:

- a. Immediate upgrades needed upon inception of the franchise total approximately \$ 1,585,893.
- b. By year five, an additional \$ 496,800 is needed for a variety of Public Access upgrades and replacement pieces.
- c. By year fifteen, including all necessary replacement costs, the total for Public Access equipment needs assessed is \$ 5,891,009 in capital equipment costs.

For Educational Access, provided by MPS:

- d. Immediate upgrades needed upon inception of the franchise total approximately \$ 1,752,300.
- e. By year five, an additional \$ 4,400 is needed for a variety of Educational Access upgrades and replacement pieces.
- f. By year fifteen, including all necessary replacement costs, the total for equipment needs assessed for Educational Access is \$ 5,045,700 in capital equipment costs.

Regarding Government Access, provided by the City:

- g. Immediate upgrades needed upon inception of the franchise total approximately \$ 275,300.
- h. By year five, an additional \$ 299,200 is needed for a variety of Governmental Access upgrades and replacement pieces.
- i. By year fifteen, including all necessary replacement costs, the total for Governmental Access equipment needs assessed is \$ 1,902,800 in capital equipment costs.

Accordingly, these needs result, over a potential fifteen year franchise, in a total PEG capital equipment requirement of \$ 12,839,509.

Operational Considerations

7. At a minimum, existing staffing levels should be maintained for Governmental and Public Access, with efficiencies pursued to provide greater Public Access facilitation and outreach services. It is our estimation that the incorporation of new technology into MTN's operations will enable some efficiencies to be gained in staff time allocation (such as a repurposing of some staff time related to playback operations, if a sophisticated, automated video server is implemented).
8. To meet subscribers local educational programming needs and interests, as well as the programmers' goals for Educational Access, it will be important to provide a staff complement of sufficient expertise that equates to a minimum of two full time equivalents (FTE). The City and MTN should work with MPS and Time Warner to determine how such staff support might be best implemented. We anticipate that this would increase the existing operational costs for educational access by approximately \$100,000 per year.
9. Regarding other operational considerations, to support the needs expressed by Public Access producers, MTN's operational budget will need to be maintained at existing levels plus the rate of inflation, plus salary increases commensurate with the median levels for the same or similar professional categories in Minneapolis compared with those of the existing MTN staff.

Access Origination

10. As described herein, it will be important for each access channel programmer to have the greatest possible number and variety of access origination points so that there can be wide spread coverage of educational, governmental, and community events all throughout the City. Depending upon the ultimate configuration of the institutional network, this will most likely be a combination of I-Net connections, upstream feeds over the residential subscriber network, and use of remote truck-based microwave communications. In this vein, it will be important for: the I-Net connections to incorporate digital, optical transport (such as 10 bit encoding; this may also include fiber optic upgrades to current C-cable connections); a “clean” pathway to be available upstream from every Public, Educational, and Government facility receiving the residential subscriber network; and a microwave system to be implemented that includes intermediary repeaters so that line of site video communications can be facilitated from MTN’s central location to any point in the City. This also includes the need for primary digital, optical feeds from City Hall for governmental access, the MPS District Office and North High School for educational access, and MTN’s central facility for Public Access to Time Warner’s system input point (Headend or Hub) to facilitate as seamless as possible transport of the main access channel feeds.

WRNB

11. WRNB is seen as an important service by its programmer and provides the type of content that subscribers have expressed a need and interest in. Accordingly, the WRNB service should be continued and should be supported by a cable company grant of approximately \$20,000 annually for facilities and equipment enhancements and upgrades, as well as implementation of all necessary transport equipment from the WRNB studios to the input into the Time Warner system.

SECTION C

**REVIEW OF INSTITUTIONAL NETWORK NEEDS
AND INTERESTS
WITHIN THE CITY OF MINNEAPOLIS
FRANCHISE AREA**

INSTITUTIONAL NETWORK (I-NET) NEEDS ASSESSMENT

Introduction

CBG has been working with the City and other public entities over a number of months to determine the needs for and interest in a modern Institutional Network (I-Net). Early on in the process it was evident that such entities were seeking to significantly enhance and expand the existing I-Net infrastructure in a way that enables each City Department facility, public facilities maintained by City agencies and Boards, and the facilities of other public entities such as Minneapolis Public Schools (MPS), to expand their video, voice and data communications, over time, in a scalable and cost-effective manner.

Connectivity Through an I-Net

For City Department facilities necessary connectivity was initially categorized in four major areas. These are:

Access From Remote Facilities To Centralized (Core) City Data Center

Centralized databases are currently available at the Data Center in City Hall. The network would need to be flexible in order to adapt to potential movement of core data centers in the future. Within City Hall and within the City's current downtown, fiber-connected campus, access to centralized databases would continue to be accomplished through the internal (LAN-based) enterprise network.

Access To Departmental Data Centers By Remote Departmental Facilities

Some databases are central only to certain departments (approximately four or five). In these cases, necessary connectivity would mimic that described above, except that the hub point of such services are core data centers within these departments.

Access to the Internet

All City facilities will have an increasing need to access the Internet, which currently occurs through a central server connection. Such increased access will be for both internal operations, as well as to enable greater public access to the Internet at some governmental facilities. Additionally, the increased load will require the City to significantly enhance the connection between its central server and its ISP (Internet Service Provider).

Peer-to-Peer (desktop-to-desktop) communications

Although at this time, these types of communications may place the least load on I-Net infrastructure (primarily for E-mail communications either through an Intranet, switched centrally, or through the Internet), as requirements increase for applications like desktop videoconferencing or digital voice communications such as Voice over Internet Protocol (VoIP), such peer-to-peer communications will place an increasing load on an I-Net .

It was also determined that City agencies and Boards, the Public Libraries and MPS have the same types of connectivity requirements.

Overall, Applications/Services provided through an I-Net must be able to facilitate the following services, including initially sustaining current levels of service, with the ability to rapidly enable higher capabilities and capacities:

Data:

Major data communications applications that the network must facilitate include:

- ? Access by remote facilities to central databases.
- ? Access by departmental facilities to departmental servers and server clusters. Four or five such key City departmental data centers are currently in place and are anticipated to remain in place.
- ? Hot stand-by/disaster recovery, high-capacity links for each of the primary data centers to back-up data centers.
- ? Seamless, high-speed access by every desktop to the Internet.

- ? Very high-speed access by each entity's central Internet server to an ISP (which may vary over time). Current capacity expectations can be placed in the 45 to 155 Megabits per second (Mbps) range.
- ? Seamless access to Intranet applications.
- ? Access to GIS information from every City desktop. Capacity requirements will vary based on the type of access required (i.e., web-based access versus connections for real time updates of GIS layers).
- ? Access to digital archives. Capacity requirements will be such that desktops can access records in a digital imaging form instantaneously.
- ? High speed gateways to Hennepin County Data Centers.
- ? Connections to State of Minnesota databases. It is expected that the State will primarily dictate the method of connectivity to these databases (i.e., Internet connections, dedicated lines, etc.).
- ? Automatic fail-over connections to other network-based links (such as leased line or wireless backups) for critical circuits.
- ? Interfaces to wireless connections. It was determined that some types of connections will be most likely facilitated by wireless data services that will need to be interfaced with a high-capacity wireline I-Net .Such connections would include:
 - o Mobile computing, virtual office and tele-computing links, that are anticipated to become more common and increasingly required over time.
 - o High speed wireless communications for public safety operations.
 - o Wireless connections to some facilities outside the City limits.
 - o Wireless connections to facilities that are temporarily (6 months or under) relocated. Leased lines may also be an option for these facilities.
 - o Wireless connections to temporary project-specific locations (such as Public Works field sites).
 - o Wireless connections for very remote facilities, that are a significant distance from other facilities or from anticipated backbone and lateral infrastructure, to enable such services as low speed telemetry operations for pumping stations, lift stations, etc.

- Wireless connections for previously uninhabited facilities, such as storage buildings, that in the future require personnel to be on site.

Voice Communications:

The City and other entities currently have a variety of systems and linkages to facilitate voice connectivity. This includes centralized and stand-alone PBXs, some key systems and some Centrex service. Connectivity between the City-owned voice communications equipment occurs over T-1s, OPX lines, and some City-owned copper and fiber facilities.

It was determined that an I-Net would be integral to current and future voice communications, to the extent that I-Net connections can replace existing leased lines, and voice communications can migrate to VoIP and similar applications. At that time, the capacity of the network would need to be such that it can handle integrated voice and data communications.

Video:

A variety of video applications need to be facilitated by an I-Net including:

- ? Video Streaming -This would include access to non-real time, video archive and video-on-demand services from the desktop level.
- ? Video Conferencing -This would need to be enabled down to the desktop level.
- ? Video Training -This type of video application could occur in real time, and should be enabled in both a one-way and interactive fashion, and in either a room-to-room, desktop-to-desktop or multicast (many-to-many) conference. This would enable a wide range of video training, video roll call, etc. applications.
- ? Surveillance Video -This type of video would not necessarily need to achieve full motion or broadcast quality, but would need to be enabled from a variety of facilities including parking ramps and garages, the impound lot, the Convention Center, Skyway monitoring locations, a large number of remote facilities, etc.

- ? Video Program Origination -The City and other entities must be able to originate video from City Hall and other key sites for distribution on the Access channels of Multichannel Video Programming Distributors (such as Time Warner Cable, etc.).

Network Objectives

Overall, after significant review and analysis of the above, we believe that an I-Net is needed and must meet several key network objectives:

- ? The network must be extremely scalable.
- ? Each site must be capable of achieving the maximum lateral capacity on the network simply through changes of equipment.
- ? The backbone capacity of the network must be scalable, such that if each site reaches the maximum lateral capacity then the backbone capacity can be adjusted accordingly based simply on a change in equipment.
- ? Initial capacity for wireline connections to City and allied agencies' facilities would range from 256 Kbps to 100 Mbps with a fiber optic backbone capable of 1 Gbps. Specific initial bandwidth requirements, except for MPS facilities, can be found in Attachment 4.
- ? The network must be standards-based.
- ? Wireline connections should be standard for public facilities across the City for the best service integration and interoperability. This means that:
 - o Many network connections should be fiber-optic based, in either a ring topology or utilizing between 2 and 6 lateral strands per facility in order to enable the scalability, capability and capacity requirements detailed in this document. Other connections could utilize lower capacity systems such as a cable-modem based network, that would still meet scalability, capability and capacity requirements for these lower capacity sites.
 - o Connections into facilities should be standardized for ease of maintenance.
 - o The transport methodology must be standards-based for ease of service integration, system interoperability, network scalability and establishment of appropriate Quality of Service (QoS) parameters.

- ? Wireless connections to Low Capacity and other types of remote sites should be similarly standards-based using scalable, high capacity, wireless equipment infrastructure and protocols.
- ? Regarding service levels, for most facilities on an I-Net, this would be their primary service connection for video, data and, eventually, voice communications connectivity. Accordingly, the network should achieve the highest network availability that a reasonable cost will allow. For some services, such as Emergency Services, completely redundant service levels would need to be achieved with an effective network availability of 100%, even if this involves redundant services on a different provider's network.

Conclusions and Recommendations

As the City continues its review regarding the Minneapolis franchise area renewal, based on the I-Net-related needs of the institutions within the community and how these needs might be fulfilled, we recommend that the following issues be given consideration:

1. Any network that is built and activated for the institutional entities in the City must be scalable with the least additional new infrastructure and added or replaced equipment, and thus provided at the lowest cost. Perhaps the most difficult consideration when designing a network are the future needs that the network must support. Although we know bandwidth needs will grow throughout the network, it is difficult to know exactly how quickly these needs will grow and what parts of the network may be affected most. For this reason, the I-Net should have an overall infrastructure capable of supporting new and upgraded applications at minimal cost.
2. A final I-Net design should offer flexibility. The network must be easily adapted to accommodate all relocations of City facilities, including core locations.

3. A modern I-Net must be versatile in its capability to transport various forms of voice, video and data services. Consideration should be given to connection of wireless equipment to be used for temporary or permanent connections, especially for lower capacity and more remote sites.
4. The need to access the Internet will continue to increase and the necessary throughput or bandwidth between the City's central server and the ISP (Internet Service Provider) will continually increase as well. The connection to the ISP must be capable of handling this increase today and into the future.
5. A highly reliable network is extremely important. In some cases, such as for Emergency Services, effective network availability of 100% is critical.
6. At a minimum, the facility bandwidth requirements as described in Attachment 4 must be satisfied initially, and an I-Net must provide for the future scalability of each facility's connection as mentioned above.

ATTACHMENT 1

**PEG ACCESS EQUIPMENT
UPGRADE/REPLACEMENT SCHEDULES**

Attachment 1

Equipment and Facility Upgrade/Replacement Matrix

The following matrix provides a detailed equipment replacement and upgrade path for the PEG Access facilities over the span of a fifteen-year franchise period, in the event a 15-year franchise is ultimately awarded to Time Warner Cable. This matrix should not be interpreted to mean that Time Warner Cable is entitled to a 15-year franchise or that a 15-year franchise is warranted, given the cost of meeting cable-related needs and interests.

The matrix was created from facility inventories as well as physical walkthroughs. Additional information was obtained through interviews with staff. The condition of equipment, which is listed as “Excellent” “Good”, “Fair”, “Poor”, or “Obsolete”, prioritizes the need for replacement. Additional items that are recommended to complete each facility’s upgrades, as discussed in this report and to meet identified cable-related needs and interests, are listed as “New”.

A replacement schedule was constructed based on the nature, condition and use of equipment. Items listed as "Poor" are typically recommended to be replaced immediately. Items listed as "Fair" are typically to be replaced in three years. Items listed in "Good" condition are typically to be replaced in five years, while items listed in “Excellent” condition are typically to be replaced in seven years. For “New” items, an appropriate purchase year was provided based on need. All equipment was given a useful lifespan, based on usage and other factors, which is seven years for most equipment. This caused some items to be replaced more than one time during any fifteen-year franchise. The exact number of times each piece is projected to be replaced is included in the matrix.

It should be noted that technology tends to change quickly and that actual usage and replacement costs may vary from year to year. The replacement schedule will need to be periodically updated so that the each Access facility will stay current with technology.

All prices included in this matrix are 2004 full list prices. On average, a 10% reduction in cost can be expected if the items are put out for bid.

ATTACHMENT 2

RESIDENTIAL SURVEY INSTRUMENT MARK-UP

ATTACHMENT 3

**ACCESS PRODUCERS SURVEY INSTRUMENT
MARK-UP**

ATTACHMENT 4

**MINNEAPOLIS CURRENT AND NEAR TERM
TRANSFER RATE NEEDS**