EXECUTIVE SUMMARY
City of Berkeley Telecommunications Survey of Residential Households

INTRODUCTION

In November 2000, the City of Berkeley contracted with Communications Support Group, Inc. and its subcontractor, the Social Science Research Center (SSRC) at California State University, Fullerton to assess the telecommunications needs, concerns, and interests of residential households in Berkeley. This study served multiple purposes for City staff and the City's Task Force on Telecommunications. First, residential use of cable television and telecommunications in Berkeley and users' satisfaction with cable service providers was investigated. These data will be useful during re-negotiation of the City's cable franchise. Data on residents' attitudes, opinions, current use and future plans regarding household telecommunications will be used to inform a Telecommunications Master Plan for the City of Berkeley and to recommend telecommunications policies to the City Council.

METHOD

To investigate these issues, the SSRC conducted telephone interviews with 803 randomly selected residents of the City of Berkeley. Interviews were conducted from the SSRC's survey research laboratory, utilizing Computer Assisted Telephone Interviewing (CATI) equipment and software. The CATI system is a sophisticated information gathering protocol that contributes to the accuracy of data and to preserving the random nature of the sample.

Telephone interviews were conducted between November 27th and December 28th 2000. The sample frame for this study consisted of all working blocks of telephone numbers (a working block is defined by the area code, prefix, and first two digits of the final four digit sequence) associated with at least one residential household within Berkeley City limits. Working blocks exclusively assigned to businesses, FAX machines, marine communications, etc. are excluded from the sample frame.

A two-stage sampling procedure is utilized in the RDD process. First, a quantity of working blocks is randomly selected, and secondly, two digits are randomly generated and appended to these working blocks to form complete telephone numbers. This process assures that new, long-established, listed, and unlisted telephone numbers have an equal probability of selection into the sample. Every household in the City of Berkeley with a telephone had an equal, non-zero chance of being selected to participate in the study.

A total of 34,362 individual dial attempts were made to 5,442 unique telephone numbers to complete 803 interviews for the Berkeley 2000 Telecommunications Assessment Survey. The response rate for this survey is 67.25%; a very acceptable outcome for an RDD study with a questionnaire of this length. The response rate is computed based upon the final disposition of all call attempts utilizing a rigorous standard promulgated by the American Association of Public Opinion Researchers (AAPOR).

Twenty-five percent of the interviews were completed on the first attempt, 14.7% on the second, 12.0% on the third attempt, 10.0% on the fourth call, and 38.6% on the fifth or higher attempt. Up to 22 calls were made to some numbers to obtain completed interviews.

As suggested by the introduction, the City's Task Force on Telecommunications presented multiple information needs that required a versatile sample design. First, the City specified a confidence interval for survey data of plus or minus five percent. This refers to the level of precision required of population estimates based upon sample data. The present sample was constructed to meet this specification. For any proportion derived from these data, we can be 95% confident that the true population parameter lies within an interval extending five percent above and below the survey result. A population parameter is the result one would obtain if an adult in every household with a telephone in the City of Berkeley were interviewed.

For this study, confidence intervals are calculated conservatively, that is, based upon the presumption of a fifty/ fifty proportion in the sample data. A sample size of 400 produces the requisite confidence interval of plus or minus five percent. Since one purpose of the study was to assess customer satisfaction with AT&T cable television, at least 400 cable customers needed to be included in the sample. Berkeley residents that do not subscribe to cable television also interest the Task Force on Telecommunications, however, so an additional 400 residents in this category were sampled.

Since there are more non-subscribers in Berkeley than AT&T cable subscribers, yet these groups were sampled in equal numbers, we selected what is called a non-proportional stratified sample. Whether or not the presence of a larger proportion of AT&T subscribers in the sample than exist in the general city population introduced bias into these data is answered in two ways. First, the use of computing and telecommunications technology among cable subscribers and non-subscribers is compared. The lack of any statistically significant difference between these groups suggests that it is appropriate to accept estimates of the prevalence of technology use or other attributes that are derived from the entire sample.

Where statistically significant differences between cable subscribers and non-subscribers are observed, some correction to the estimate is indicated. This is accomplished by confining such estimates to the first 658 completed interviews, which were collected before the imposition of a quota to limit the number of non-subscribers. The first 658 cases comprise a simple random sample of Berkeley residents. Since up to

this point in the study, no qualifying criteria for participation related to cable subscription or non-subscription were imposed, these data produce unbiased estimates of population parameters regardless of differences between cable subscribers and non-subscribers.

Adopting the conservative presumption of a fifty/ fifty split in the data, a confidence interval of five percent applies to sample statistics based upon the sub-group of 400 cable subscribers. When estimates are calculated based upon the first 658 completed interviews, the confidence interval narrows to plus or minus 3.9%. When the entire sample of 803 respondents is used in a calculation, the confidence interval is plus or minus 3.53%. In fact, as many of the proportions reported here show more variability than a fifty/ fifty split, the estimates reported are even more precise than these intervals suggest.

RESULTS

DEMOGRAPHICS

The contractor added an item regarding student status to the survey questionnaire. Among the 792 respondents of 803 that provided a valid response, 266 (33.6%), or about a third of the total sample, indicated that they are currently students. Of these, 213 (80.1%) reported attending UC Berkeley, 50 (18.8%) another institution, and three (1.1%) refused to specify the post-secondary institution they attend. Two hundred and twenty-three of the 266 students (83.8%) attend full time, 41 (15.4%) attend part time, and two respondents did not indicate full time or part time status.

Demographic analyses indicate that students clearly differ from the non-student population of Berkeley in many important respects. However transient the individual members of this population may be, however, students are a standing subgroup and permanent demographic feature of the City's overall population. At about a third of the sample, and likely the same proportion of the City's population, students need to be included in telecommunication policy and planning.

Of the 803 completed interviews, roughly half were conducted with females and half with males. The median age of the survey sample (the point above which and below which half the values lie) is 34. Distribution of the sample across age groups is approximately the same with slightly greater numbers of respondents in the 18-23 group (25.8%) and in the 50-92 group (26.8%).

Although their ages range from 18 to 85, as a group, students are significantly younger (mean age = 25.6, median = 22) than are non-students (mean age = 45.6, median = 44 years). The age distribution of survey respondents is undoubtedly influenced by the fact that interviewers asked to speak with "the head of the household or her or his spouse or domestic partner".

As indicated by Table 1 below, the largest racial/ethnic group is Caucasian/ White (56.9%), with Asian/ Pacific Islanders comprising the second largest ethnic group (13.2%). Eighty-three of 803 respondents (10.3%) stated that they did not know or refused to disclose their racial/ethnic background.

Table 1

Race/Ethnicity	Frequency	Percent
Caucasian or White	457	63.5%
Asian	106	14.7%
Black or African American	68	9.4%
Mixed Ethnicity	53	7.4%
Latino/ Hispanic	27	3.8%
"Other"	6	.8%
Native American	3	.4%
Don't Know or Refused	83	(omitted from total)
Total	803	100.0%

The racial/ ethnic distribution of students is significantly different than among non-students. While the proportions of African Americans are similar (8% of students and 10% of non-students are African American), about 29% of all students (71 of 246) are Asian/ Pacific Islanders, compared to 7% (34 of 471) non-students. Similarly, about 6% of students (14 of 246) are Latino/ Hispanic compared to 3% (13 of 471) of non-students. Conversely, 47% (116 of 246) of the students sampled are White/ Caucasian, compared to 72% (341 of 471) of the Berkeley residents that are not students. These data clearly suggest that students contribute to the racial/ ethnic diversity of the city.

As is indicated in Table 2 on the following page, of the 783 respondents who provided a response, 246 (31.4%) report having a Bachelor's degree. This is followed by 235 (30.1%) with a doctorate or professional degree, and 193 (24.7%) with some college. Only 11% of the respondents report having a high school diploma, GED or less formal education. Differences in educational attainment by student status are depicted in the table. Clearly, the citizenry of Berkeley is extremely well educated. When it is released, the 2000 census data will provide the City a sense of it compares with other Bay Areas cities in this regard.

Table 2

Educational Attainment	Students	Non-Students	Total Sample
Less than high school diploma or GED	5 (1.9%)	8 (1.5%)	13 (1.7%)
High school diploma or GED	37 (14.1%)	36 (6.9%)	73 (9.3%)
Some college – no degree	118 (45%)	75 (14.5%)	193 (24.7%)
Associate degree	8 (3.1%)	13 (2.5%)	21 (2.7%)
Bachelor's degree	56 (21.4%)	190 (36.6%)	246 (31.5%)
Masters, Doctorate or professional degree	38 (14.5%)	197 (38%)	235 (30.1%)
Total	262 (100.0%)	519 (100.0%)	781 (100.0%)

Table 3 on the following page indicates the total annual household income reported by survey respondents. Consistent with the large proportions of students that are not presently employed for wages (37.5%) and that report working 20 or fewer hours per week (36.3%), nearly two thirds (64.1%) of the students that responded to the question indicate that their total annual income before taxes is less than $14,999. In contrast, the largest group of Berkeley residents that are not students (43.6%) falls into the highest income category ($75,000 and above).

In typical Random Digit Dial (RDD) studies conducted by the SSRC, about 15-18% of all respondents decline to state their total annual household income. Survey researchers typically position the income question last on the survey questionnaire for this reason. If the interview is terminated at this point, all other data have been collected. The proportion of residents who declined to answer this question in Berkeley is unusually high. A total of 322 respondents (40.1% of the total sample) either reported that they did not know or declined to state their total annual household income. The percentages in Table 3 are computed on the basis of valid replies (omitting the "Don't Know" and "Refused" responses from the denominator).

Table 3

Total Annual Household Income	Students	Non-Students	Total Sample
Less than $14,999	98 (64.1%)	21 (6.4%)	119 (24.7%)
Between $15,000 and $24,999	20 (13.1%)	17 (5.2%)	37 (7.7%)
Between $25,000 and $34, 999	7 (4.6%)	30 (9.1%)	37 (7.7%)
Between $35,000 and $49, 999	7 (4.6%)	52 (15.9%)	59 (12.3%)
Between $50,000 and $74,999	6 (3.9%)	65 (19.8%)	71 (14.8%)
$75,000 and above	15 (9.8%)	143 (43.6%)	158 (32.8%)
Total	153 (100.0%)	328 (100.0%)	481 (100.0%)

The sample was geographically distributed among 11 zip codes in the City of Berkeley. The largest proportion of respondents (22.3%) reside in 94704, followed by 17.1% in 94703 and 14% in 94709. Complete details regarding the distribution of survey respondents across zip codes can be found in the full report in Table 9.

AN OVERVIEW OF TELECOMMUNICATIONS USES

The survey found that use of computers and telecommunications services varies significantly across the sample. The following table indicates the proportions of survey respondents who report having or subscribing to each of the telecommunications applications.

Table 4a

Service or Equipment Used	**Percentage of Households Using or Subscribing (total respondents)**
Wireline phone	100% (803)
Personal computers	86.1% (675 of 784)
Internet access from residence	81.6% (640 of 784)
Cable television	synthetic estimates suggest penetration of 36.5% (401)
Cellular or PCS phones	56.8% (454 of 799)
Fax machines	45.5% (361 of 793)
Pagers	17.2% (137 of 796)
In-home Network	20.5% (161 of 784)
Satellite television	4% (32 of 796)
Web TV	1.3% (10 of 796)

Data from the Berkeley 2000 Telecommunications survey may be compared to data from a survey conducted in 1999 in the City of San Francisco:

Table 4b

Service or Equipment Used	Percentage of Households Using or Subscribing (total respondents)
Wireline phone	100% (535)
Personal computers	64% (535)
Cable television	64% (534)
Internet access from residence	49% (535)
Cellular or PCS phones	48% (535)
Fax machines	43% (530)
Pagers	34% (535)
Satellite television	5% (531)

From City of San Francisco, 1999[1]

Internet Access

Six hundred forty (92.2%) of the 694 Berkeley respondents who reported having at least one computer at home reported that they also had an Internet connection at home, 48 (6.9%) do not, and six (.9%) did not respond. Another way to look at this issue is to categorize respondents into three groups: those with no computer at home, those with a computer at home but no internet access, and those with a home computer with internet access. This three-level variable is not related at all to cable subscription, thus these proportions may be inferred to accurately represent the total City population. Computer ownership and internet access is highly related, however, to student status, as indicated by Table 5 below.

Table 5

Home Computer and Internet Access	Students	Non-Students	Total Sample
No computer at home	12 (4.5%)	95 (18.2%)	107 (13.6%)
Computer, no Internet Connection	11 (4.2%)	37 (7.1%)	48 (6.1%)
Computer and Internet Connection	241 (91.3%)	390 (74.7%)	631 (80.3%)
Total	264 (100.0%)	522 (100.0%)	786 (100.0%)

[1] Results of the 1999 SURVEY ON TELECOMMUNICATIONS ISSUES July 1999 Prepared for the Department of Telecommunications and Information Services by The Public Research Institute, San Francisco State University, *James W. Newton, Genevieve Ste-Marie, Michelle Marzullo, Holley Shafer Mark Breshears, Arielle Goldberg, Augustine Enrique* In collaboration with Media Connections Group *Edward G. Liebst, Jr.*

WIRELINE TELEPHONE USE AND SATISFACTION

As illustrated by the table below, over one-half of the respondents (57.3%) report only one telephone line in their household, followed by 227 (28.6%) that report two, and 66 (8.3%) that report three phone lines. Only 46 (5.8%) report having four or more lines.

Table 6

Number of telephone lines	Frequency	Percent
One	454	57.3%
Two	227	28.6%
Three	66	8.3%
Four	30	3.8%
Five	11	1.4%
Six	5	.6%
Total	793	100%

Of the 797 valid responses, 320 (40.2%) stated that at least one telephone line is used primarily for a fax machine or a computer, 477 (59.8%) do not use any lines primarily for fax or computer.

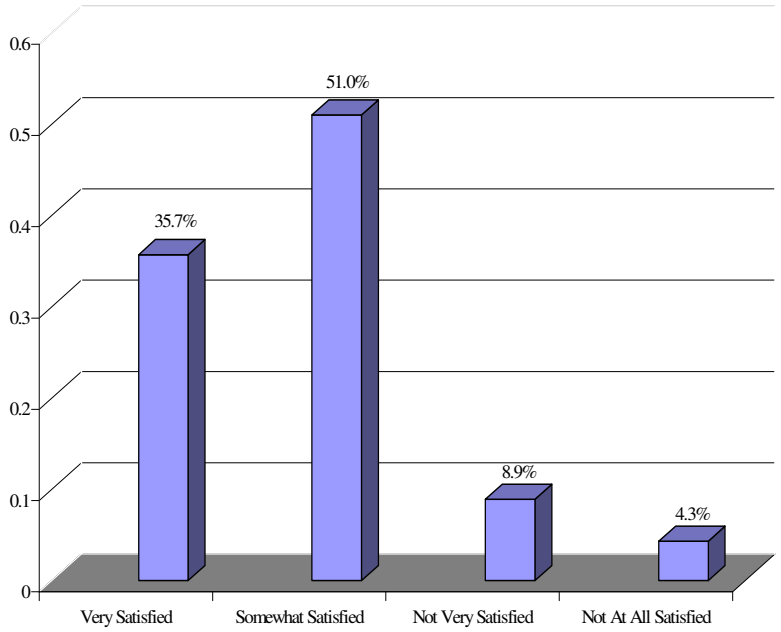
CELLULAR PHONES OWNED BY MEMBERS OF HOUSEHOLD AND SATISFACTION

Of the 799 who responded to a question regarding cellular service, 345 (43.2%) indicated that no cellular phones are owned by members of their household, while 260 (32.5%) report one cellular phone. All of the valid responses are detailed in the table below.

Table 7

Number of cellular phones	Frequency	Percent
Zero	345	43.2%
One	260	32.5%
Two	153	19.1%
Three	24	3.0%
Four	13	1.6%
Five	4	.5%
Total	799	100%

Of the 458 respondents asked about their satisfaction with cellular service, 42 did not know, or had no response, and two refused. Of the 414 who responded, 148 (35.7%) reported that they are "Very Satisfied", and 211 (51.0%) that they are "Somewhat Satisfied".



PAGERS AND FAX MACHINE USE

Fax Machines

Respondents were asked how many Fax machines, including computers with Fax capability, were owned by the members of their household. Of the 793 who answered, over one-half (432, 54.5%) reported that none of the members of their household had a Fax machine. Two hundred sixty-four (33.3%) reported one fax machine in the house, 58 (7.3%) two machines, 25 (3.2%) three, 13 (1.6%) four and one respondent reported six fax machines. The presence of more than one fax machine in 12% of survey respondents' homes may suggest the presence in some homes of a dedicated paper-loading fax machine in addition to a PC-based fax machine. Paper loading machines are often used for sending faxes, while the PC-based fax is sometimes preferred for receiving as the images can then be scanned into text files or archived on the computer's hard drive.

Pagers

Of the 798 who provided a response, the majority of respondents (659, 82.6%) indicated that no one in the household had a pager. One hundred-three (12.9%) said one, 24 (3.0%) two, nine (1.1%) three, and one respondent each said that the members of their household had four, five and six pagers.

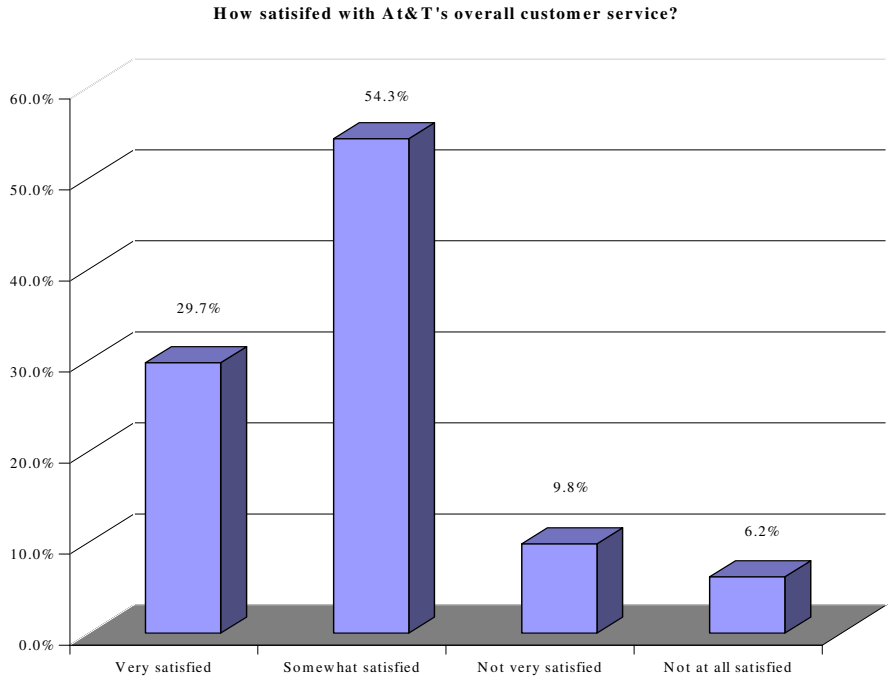
CABLE TELEVISION DISTRIBUTION AND SATISFACTION

Omitting the two zip codes with five or fewer survey respondents, the presence of cable TV in respondents' homes is significantly different across zip codes. The highest proportion of respondents who currently subscribe to cable reside in the 94708, 94707, and 94702 zip codes. The lowest proportion (41.4%) of survey respondents who currently subscribe to cable TV reside in zip code 92704. As previously discussed in the method section, given the nature of the survey (a household survey vs. individual survey), we do not recommend additional analysis comparing the presence of cable television by individual-level attributes like gender, age, and income.

Table 8

Zip Code	Currently Subscribe to Cable TV
94702	58.9%
94703	52.5%
94704	41.4%
94705	49.4%
94706	47.1%
94707	60.0%
94708	61.4%
94709	42.1%
94710	52.4%

All current cable subscribers were asked how satisfied they are with AT&T Cable's overall customer service, picture quality and sound quality. For overall customer service satisfaction, respondents were asked to consider installation, repair, billing, and response to telephone calls, and not to include price or programming as a factor in this rating.

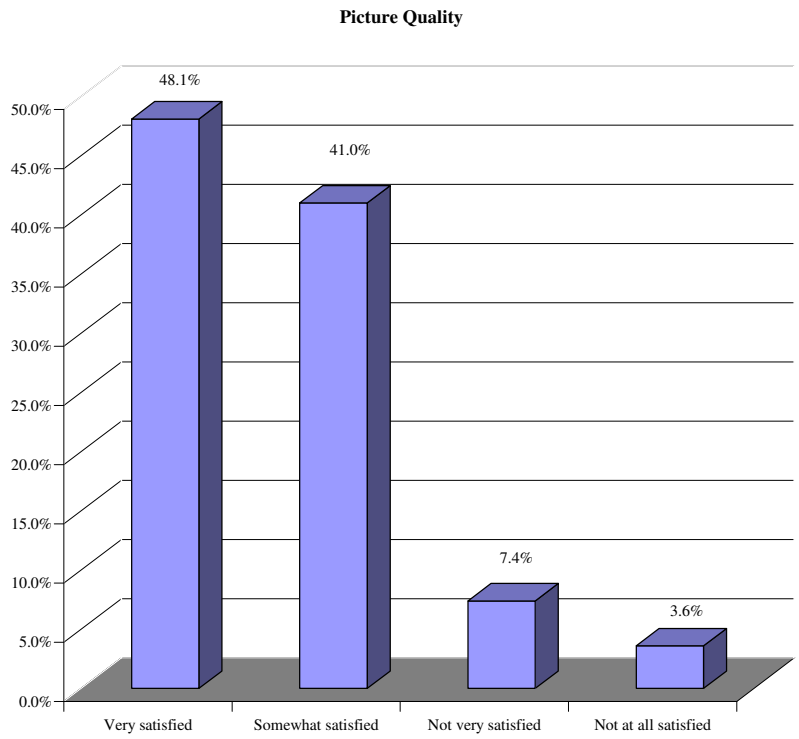


More than four of five respondents (84.0%) indicated that they were either very satisfied or somewhat satisfied with AT&T's customer service.

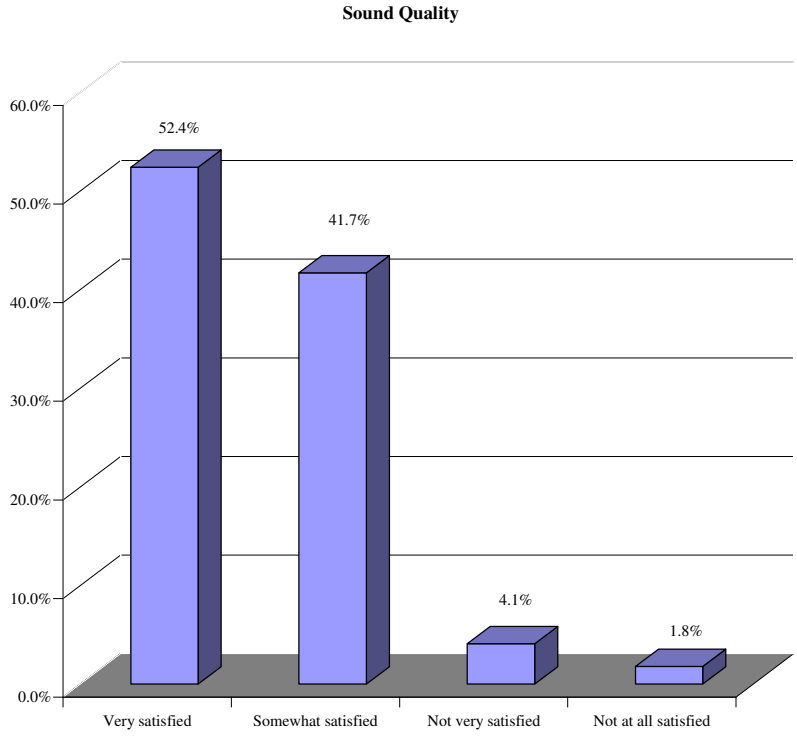
We found the numbers of satisfied respondents shown above and below to be significantly higher in this study than in recent studies performed in Chino Hills (29% not satisfied) and in Fullerton. This may suggest that AT&T, with its recent upgrades to the cable plant, have improved picture quality, and audio.

Picture Quality

Almost one-half of the respondents (48.0%) indicated that they were very satisfied with the picture quality. Only 43 (11.0%) said they were either not very or not at all satisfied.



Sound Quality



Of all of the criteria, the highest proportion of respondents (52.4%) indicated that they were "very satisfied" with the sound quality. Only seven indicated that they were "not at all satisfied."

SUBSCRIPTION TO SATELLITE SERVICE

Of the 796 valid responses, 32 city residents (4%) reported that they subscribe to a satellite service, and 764 (96%) that they do not. Interestingly, 12 of the 32 satellite subscribers (37.5% of all satellite subscribers) also indicated that they are AT&T cable customers. Viewed from another angle, 3% (12 of 395) of the AT&T cable subscribers also subscribe to a satellite service, and 5% (20 of 401) of those that do not subscribe to cable do subscribe to a satellite service.

SATISFACTION WITH SATELLITE SERVICE

The 32 respondents who subscribe to a satellite service were asked how satisfied they are with their service. Of the 30 valid responses, 14 (46.7%) indicated they were "Very satisfied", 14 (46.7%) "Somewhat satisfied", and two (6.7%) "3=Not very satisfied." The mean, or average rating is 1.6.

An overall rating of satisfaction with AT&T cable wasn't obtained, so the ratings of customer service, cable programming, system reliability, and cable rates were averaged to approximate an overall rating of AT&T cable. The average of this rating is 2.15. Since a lower rating is associated with greater customer satisfaction, these data tend to suggest that satisfaction with a satellite service (1.6) is slightly higher than satisfaction with AT&T cable (2.15). This difference can be attributed to three primary factors:

1) satellite subscribers receive, on average, more channels and more choice;
2) satellite's digital picture quality often surpasses cable's analog equivalent;
3) users have made personal investments in hardware, and therefore have greater ownership in the product than cable subscribers.

PERSONAL COMPUTER USE AND INTERNET ACCESS

All survey respondents, regardless of whether they currently subscribe to cable TV, were asked how many personal computers, both desktop and laptop, they had at home. One hundred nine (13.9%) of the 784 who provided an answer said none. The larger proportion of survey respondents (302, or 38.5%) reported having one computer, 197 (25.1%) two, 105 (13.4%) three, 46 (5.9%) four, 17 (2.2%) five, seven (.9%) six, and one respondent (.1%) reported that the members of his household had eight computers at home.

HOMES WITH COMPUTERS NETWORKED

Respondents who indicated that that they had more than one computer, and respondents who were unsure of the number of computers in their household, were asked if the computers were networked. Of the 382 who could provide an answer, 161 (42.1%) indicated that that their computers were networked. This number also surprised us. We

suggest the City perform additional cross-tabulations of the raw data to see whether the student population skewed this finding in favor of in-home networks.

CONNECTION TO THE INTERNET FOR HOUSEHOLDS WITH ONE COMPUTER

Of the 264 respondents with one computer in their households connected to the Internet, 257 were able to identify the type of Internet connection. As shown in the table below, the majority of survey respondents (64.2%) indicated that their computer is connected via a shared telephone line, followed by 38 (14.8%) who connect via cable, and 27 (10.5%) via DSL.

Table 9

Connection	Frequency	Percent
Shared telephone line	165	64.2%
Dedicated line	21	8.2%
Cable	38	14.8%
DSL	27	10.5%
ISDN	1	.4%
Other	5	1.9%
Total	257	100.0%

CONNECTION SPEED AMONG HOUSEHOLDS WITH ONE COMPUTER

Seventy-one respondents (27% of those connected to the Internet at home) did not know the speed of their home connection. Of the valid responses, 97 (50.5%) report a connection speed of 56KBPS, followed by 35 (18.2%) who use a cable modem, and 25 (13.0%) that use DSL. The distribution of the valid responses is presented in the table below. Since fewer persons responded to this question, the percentages reporting DSL and cable speeds deviated from the numbers shown in Table 9.

Table 10

Connection Speed	Frequency	Percent
14.4 KBPS	4	2.1%
28.8 KBPS	14	7.3%
33.6 KBPS	5	2.6%
56 KBPS	97	50.5%
DSL	25	13.0%
Cable Modem	35	18.2%
T1	4	2.1%
Other	8	4.2%
Total	192	100.0%

CONNECTION TO THE INTERNET AMONG HOUSEHOLDS WITH TWO COMPUTERS

Of the 351 respondents with two computers in their household and at least one connected to the Internet, 345 were able to indicate how their first computer was connected. The proportions are similar to the proportions reported above. One hundred ninety-two (55.7%) connect via a shared telephone line, 65 (18.8%) have a cable connection, and 57 (16.5%) DSL. The one respondent who reported a wireless connection was unable to specify what type.

Table 11

Connection of first computer	Frequency	Percent
Shared telephone line	192	55.7%
Dedicated line	22	6.4%
Cable	65	18.8%
DSL	57	16.5%
ISDN	2	.6%
Wireless	1	.3%
Other	6	1.7%
Total	345	100.0%

CONNECTION SPEEDS OF HOUSEHOLDS WITH TWO COMPUTERS

Eighty-eight of 351respondents (25%) did not know the speed with which they connect to the Internet on their first home computer, and one refused to specify. Of the valid responses, 111 (42.4%) report a connection speed of 56KBPS, followed by 57 (21.8%) who use a cable modem, and 48 (18.3%) that use DSL.

Table 12

Connection speed of first computer	Frequency	Percent
14.4 KBPS	8	3.1%
28.8 KBPS	16	6.1%
33.6 KBPS	11	4.2%
56 KBPS	111	42.4%
DSL	48	18.3%
Cable Modem	57	21.8%
T1	1	.4%
Other	10	3.8%
Total	262	100.0%

USES OF THE INTERNET

The 640 respondents with home Internet access were asked if they, or if someone in their household, uses the Internet for each of nine purposes. The table below presents the proportions of affirmative responses. All but nine of the survey respondents indicated

that they, or a member of their household, use the Internet for e-mail. The lowest proportion (21.2%) report using the Internet for chat groups.

Table 13

Purpose	Frequency	Percent
E-mail	631	98.6%
Web browsing for government, services, travel or personal health information	578	90.6%
Educational purposes	506	79.3%
On-line shopping	418	65.4%
Working at home	379	59.5%
Entertainment or games	357	56.0%
Banking	251	39.4%
Running a business from home	138	21.7%
Chat Groups	135	21.2%

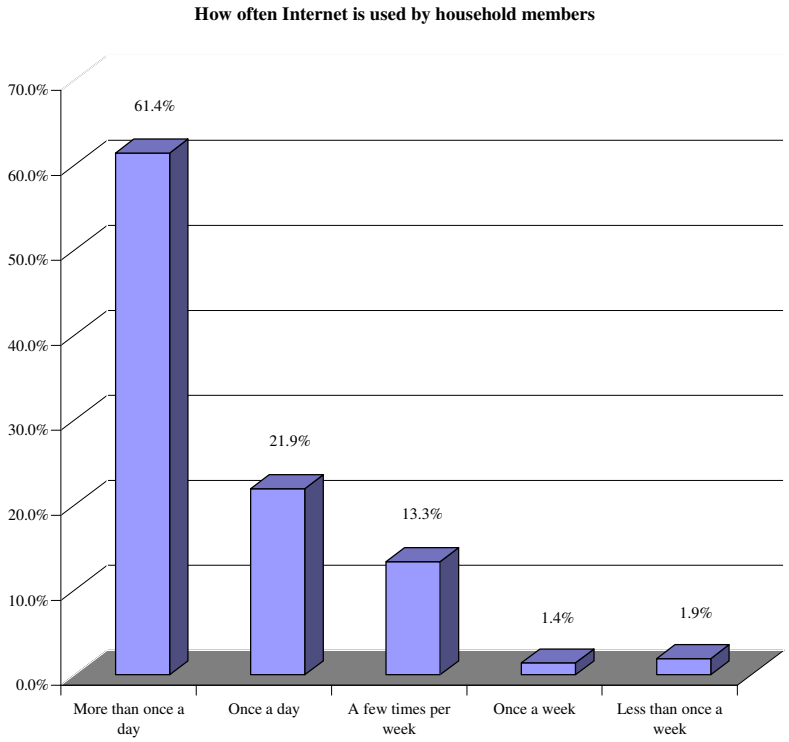
Respondents were also asked if they use the Internet for other purposes than the nine reported above. These answers are provided in the table below. Percentages are computed based on 60 respondents who supplied an additional purpose for household Internet use.

Table 14

Purpose	Frequency	Percent
News/ Information/ Reference	11	18.3%
Business/ Work – not specified	7	11.7%
Research – not specified	7	11.7%
Auctions/ Home buying	5	8.3%
Listening to or downloading music	4	6.7%
Own or maintain a website	4	6.7%
School/ Education	4	6.7%
Weather	3	5.0%
Sex/ Pornography	3	5.0%
Accessing financial information	3	5.0%
Downloading programs	2	3.3%
Other	7	11.7%

Other responses included faxing, talking verbally, renewing library books and browsing for images or photos.

HOW OFTEN IS THE INTERNET USED BY HOUSEHOLD MEMBERS



Of the 638 valid responses, more than four out of five (83.4%) Internet users report accessing the Internet once a day or more than once a day. Eighty-five (13.3%) report accessing the Internet a few times per week, and 21 (3.3%) once a week or less.

INTERNET SERVICE PROVIDERS USED BY BERKELEY HOUSEHOLDS

Of the 607 valid responses, 452 (74.5%) of the respondents indicated that the members of their household subscribe to only one ISP, 155 (25.5%) subscribe to more than one. Thirty-three were not able to answer the question.

Of the 452 Internet users with one ISP, 418 were able to name their provider. One hundred fifty of the 155 Internet users with more than one ISP were able to name at least one of their providers. Because of the number of unique responses, the providers named most often by the Internet users were combined to produce a list of the top fifteen responses. As illustrated by the table on the following page, the greatest proportion of respondents (31.0%) report subscribing to AOL, followed by AT&T (18.1%) and the service provided by UC Berkeley (12.5%). Percentages are computed based on 568 valid responses.

Table 15

Internet Service Provider	Frequency	Percent
AOL	176	31.0%
AT&T	103	18.1%
UCB	71	12.5%
Earthlink	58	10.2%
Pac Bell	56	9.9%
Netzero	26	4.6%
Juno	20	3.5%
Costco	16	2.8%
Compuserve	15	2.6%
Netscape	13	2.3%
DSL/ Broadband/ or Cable	10	1.8%
MSN	10	1.8%
Altavista	7	1.2%
Prodigy	7	1.2%
Mindspring	6	1.1%

PUBLIC ACCESS TO THE INTERNET

All survey respondents were asked, "Do you think the City should provide greater accessibility to the Internet using public facilities, such as libraries, senior centers and others?" Of the 731 valid responses, 638 (87.3%) said yes, and 93 (12.7%) said no. The 638 respondents who said "yes" were asked where the City should provide such access. Seventy-five respondents could not name a specific place. Many respondents mentioned more than one location. Since the first three responses provided were recorded, the percentages in Table 16 do not total 100%. Percentages are computed based upon the 563 respondents who provided at least one location.

Table 16

Where should internet access be provided?	Frequency	Percent
Libraries	459	81.5%
Public Schools	99	17.6%
Senior Centers	84	14.9%
Government or public agencies	35	6.2%
Community/ Recreation/ Youth Centers	32	5.7%
Internet Cafes	31	5.5%
Public places – not specified	26	4.6%
Anywhere/ Everywhere possible	24	4.3%
Places near low income housing/ Access for the homeless	14	2.5%
Restaurants or Grocery stores	9	1.6%

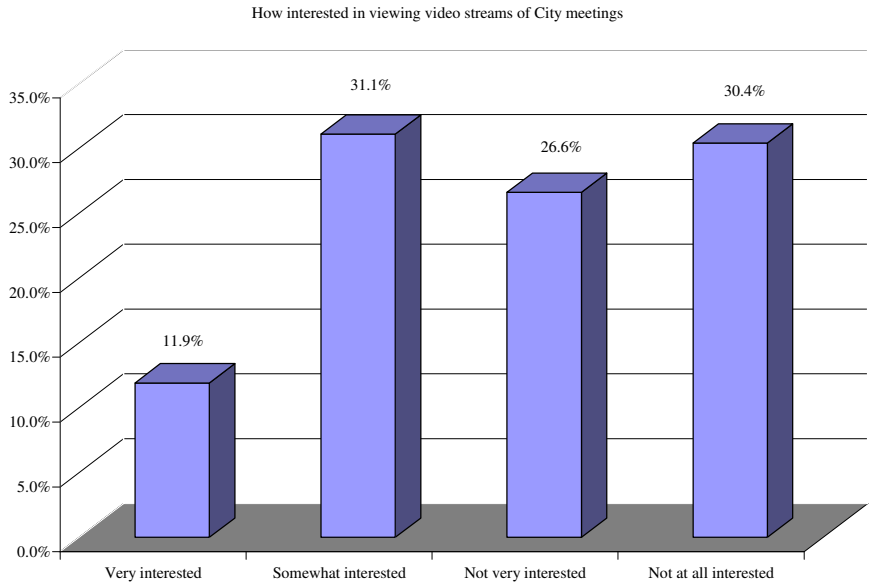
Transportation stations	7	1.2%
Hospitals/ Health Centers	7	1.2%
One in every household	6	1.1%
Public phones	5	.9%
Other	16	2.8%

Other responses included non-profit organizations, kiosks, local businesses, business or copy centers, and churches. Since libraries are mentioned in the phrasing of the question, it is difficult to assess whether the huge proportion of responses indicating that internet access should be provided there represents an unbiased response. Note that senior centers were also mentioned in the question, however, and that a much smaller proportion of respondents named them as a location for public access.

INTEREST IN CITY COUNCIL MEETINGS VIA CABLE AND VIDEO STREAMING

Of the 401 current cable subscribers, 232 (59.5%) reported that either they, or another member of their household, had watched the Berkeley City cable channel in the past year. All respondents were asked how interested they would be in viewing the City Council, Zoning Adjustments Board, and other Board/ Commission meetings if they were available on the Internet via video streaming.

Ninety-four (11.9%) indicated that they would be "very interested", while 246 (31.1%) indicated "somewhat interested" and 452 (57.0%) would be "not very" or "not at all interested."



CONCLUSION

We believe the goals of the survey were met. A tremendous amount of useful data were collected to facilitate our understanding of Berkeley's residential telecommunications users. The data contained in the full report and the raw data being provided to the City along with this executive summary provide the Task Force on

Telecommunications excellent information to inform policies to support the demand, needs, and satisfaction of Berkeley's residential telecommunications users. The raw data also enables the Task Force to perform additional analysis and cross-tabs as may be required.

In summary, the survey indicates relatively high levels of telecommunications service use in all categories except satellite television and web tv. Survey participants gave providers of telecommunications services high marks for customer satisfaction, with over 85% of respondents indicating high levels of satisfaction. The survey results portray a general Berkeley culture embracing the "technological capacities" of its telecommunications providers. More than 40% of residents have more than one telephone line and more than 86% have one or more computers and access the Internet in their homes every day. Nearly a third of the sample reported having fax machines in the home.

More than four out of five (85.5%) respondents believe that having home Internet access is either "very important" or "somewhat important". Only 60 (7.6%) believe that it is not at all important.

As a means to foster universal access, promote economic development and protect the public interest, the City's Task Force should strive to recommend policies that promote highly reliable and available telecommunications systems. Such master plan policies should also strive to improve government services through both the expanded access to information and services, and through deployment of advanced information technologies. Additionally, telecommunications policies must ensure a variety of competitive telecommunications resources. Therefore, the master plan should:

1. Ensure providers are deploying state of the art telecommunications infrastructure by suggesting they strive to meet their own industries standards (for example, in the case of the City's cable television providers, "DOCSIS" and "Open Cable" standards).

2. Encourage telecommunications providers to complete upgrades to enhance the availability of high-speed data services throughout the City. Incentives, such as license extensions, can be given to providers that upgrade their systems.

3. Encourage telecommunications providers to provide services across all classes of citizenry. For example, the City could urge its providers of high-speed internet service to offer packages (ranging in size, speed, and cost) to enable greater accessibility across income classes.

4. Promote access to telecommunications services. As survey results indicated, this could include the City making further efforts to place pay phone, modems, Internet terminals, in libraries, community centers, and other public places. Some cities, such as New York, have modified zoning codes to enable companies to convert old industrial buildings so telecommunications companies can use them to house switching devices that connect multiple parties in densely populated regions. These data centers, are sometimes called "server farms" and house banks

of computers, called servers, that underpin and speed up the delivery of data via the World Wide Web. Santa Monica, as is discussed in additional detail below, has placed public terminals and touch screen kiosks in several public buildings in order to meet the increasing public demand for universal access to the Internet .

5. Encourage use of telecommunications as a resource for city service delivery and public education. The City of Santa Monica has received international acclaim for its Public Electronic Network (PEN). PEN supports the electronic delivery of a variety of government services. Through the PEN network and the World Wide Web site, government information, searchable databases, interactive service request forms, business transactions, conferences on local issues, and free local electronic mail are available to the public. These services are available through dial-up modems, the Internet and public access terminals in libraries and other City facilities.

To accomplish these achievements, a City's Information System's or Information Technology department must do its homework in determining the most cost-effective uses of technology and telecommunications resources for the delivery of government services. To support these services, high bandwidth fiber circuits must be installed within City Hall, Library, Civic Auditoria, and other locations selected for kiosks and Internet terminals. Maintenance and support services for these fiber circuits are often provided through third party contractual agreements.

As advances in internet services that utilize video streaming and audio file transfer applications (such as Napster, RealVideo, Microsoft's Netmeeting and others) begin to bog the internet, faster speeds (gigabit ethernet) will require that fiber networks be pushed deeper into the community. This will require new construction by all telecommunications providers serving the City and will continue for much of the next decade. Consequently, the interests of the City's precious public rights of way require protection.

Telecommunications policies must include protecting public health, safety and welfare; coordinating construction with pedestrian, bicycle and vehicular traffic in the work zone; avoiding repetitive street cuts whenever possible; minimizing private business disruption; preventing unnecessary financial burden to the taxpayers of the City due to street cut degradation of the pavement; ensuring the long-term structural integrity, ride quality and aesthetic properties of the existing infrastructure; enhancing competition among telecommunications providers; and promoting potential partnerships between the City and private utility companies.

Cities are discovering that a well-designed local ordinance can provide an effective means for the proper management of the public right-of-way, especially during the current boom of telecommunications infrastructure expansion activity across the country. In drafting an ordinance for managing the public rights-of-way to accommodate a multiplicity of telecommunications providers (and other users) there are a number of issues and options that the City should address.

1) Compensation Issues

   Fair compensation from telecommunications providers that use and occupy its public property to conduct their businesses for profit and to minimize the inconvenience and to recoup to the extent possible the expenses imposed on, the general public and on other users by the emplacement of each additional facility.

2) Consistency

   Apply policies consistently and equitably to all telecommunications uses of the public rights-of-way and other public property. Such telecommunications uses could include:

   1. Telephone
   2. Cable
   3. Open video systems
   4. Private communications lines, data carriers and radio antennas
   5. Towers
   6. Equipment
   7. Buildings

3) Licenses and Leases. The proposed ordinance would provide that grant of authority to a telecommunications service provider is accomplished by a "telecommunications license" for the provision of telecommunications services utilizing the public rights-of-way within the City. Leases would be issued to telecommunications service providers (or the owner or operator of a communications facilities) to locate a communications facility on specifically-described property owned or controlled by the City, including but not limited to public rights-of-way, public buildings, and/or supporting structures which are either owned or controlled by the City or located upon property owned or controlled by the City. Both licenses and leases should be two-party documents.

4) The Basis and Amount of Compensation. The most important decisions are the basis and amount of the compensation to be paid by providers of telecommunications services. There are basically two different approaches for obtaining compensation for communications "lines" in the public rights-of-way:

   a. Work permits fees and other cost-based fees related to actual construction, operation, maintenance, and inspection.

   b. Per-linear-foot annual occupancy fees and a gross-revenues-based fee.

5) Permitting. The Ordinance should direct the Director of Public Works, or his designee, to promulgate permit application and processing procedures for the granting of work permits which will encompass not only excavation and construction permits, but permits for the placing of equipment or facilities above ground and for maintenance of such equipment. Any permitting provisions should make it clear that the City Engineer shall not issue work permits to an entity until the entity has

provided proof that it has obtained approval of the City in the form of a telecommunications license or lease, or made a showing that it is exempt from such requirements.

6) Conservation Provisions. Licenses and leases might include, in addition to some of the City Engineer's standard construction requirements, the following requirements where appropriate:

   a. Require that a licensee or holder of any work permit make available to any licensee space on its poles to the extent practicable and at a reasonable charge, calculated in accordance with Section 224 of the Communications Act of 1934, as amended, 47 U.S.C. § 224;

   b. Require that every licensee or holder of any work permit make available to other licensees any of its conduits that are excess, so long as they are excess, at a reasonable rental fee; and that the City may require as a condition of issuing any work permit for underground conduit the installation of which requires excavation in or under or along or across any traveled way,

   c. Require that the licensee or holder of the work permit emplace conduit in excess of its present and reasonably foreseeable requirements for the purpose of accommodating other franchisees and licensees for a reasonable charge.

7) The economic development staff should be involved in the telecommunications planning process. Telecommunications infrastructure can attract new business to Berkeley and improve the revenues of existing businesses.

Municipal regulation of telecommunications providers is complex and we recommend the City consult with its City Attorney regarding any license or lease granted to a telecommunications provider. In a short overview, a City's regulation of a telecommunications entity, with the exception of land use controls over antenna siting on private property, must contour to both the parameters of Section 253 of the Telecommunications Act of 1996 (the "Act")[2] and Section 7901 of California Law. Likewise, it is generally acknowledged that municipal franchising, licensing, or other forms of direct access controls to public ROW are controlled by Section 253.

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[2] SEC. 253. REMOVAL OF BARRIERS TO ENTRY.

(a) IN GENERAL.--No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.

(b) STATE REGULATORY AUTHORITY.--Nothing in this section shall affect the ability of a State to impose, on a competitively neutral basis and consistent with section 254, requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers.

(c) STATE AND LOCAL GOVERNMENT AUTHORITY.--Nothing in this section affects the authority of a State or local government to manage the public ROW or to require fair and reasonable compensation from telecommunications providers, on a competitively neutral and nondiscriminatory basis, for use of public ROW on a nondiscriminatory basis, if the compensation required is publicly disclosed by such government.

Section 253(c) provides broad authority to local government to protect and maintain the structural and financial integrity of its ROW including, without necessary limitation, requirements that (1) "regulate the time or location of excavation to preserve effective traffic flow, prevent hazardous road conditions, or minimize notice impacts;" (2) "require a company to place its facilities underground, rather than overhead, consistent with the requirements imposed on other utility companies;" (3) "require a company to pay fees to recover an appropriate share of the increased street repair and paving costs that result from repeated excavation;" (4) "enforce local zoning regulation;" and (5) "require a company to indemnify the City against any claims of injury arising from the company's excavation." (Id. at & 39 citing 141 Cong.Rec.S 8172 Daily Ed. June 12, 1995)).

Additionally, a "Telephone Corporation" under California law, which is a statutory term, possesses unique and sacred rights pursuant to the California Constitution and PUC Section 7901. A "Telephone Corporation" is defined to include "every corporation or person owning, controlling, operating, or managing any telephone line for compensation within the State." (PUC Section 234.) A "telephone line" is defined to include "all conduits, ducts, poles, wires, cables, instruments, and appliances, and any other real estate, fixtures, and personal property owned, controlled, operated, or managed in connection with or to facilitate communications by telephone, whether such communication is had with or without the use of transmission wires." (PUC Section 233). PUC Section 7901, in substance, precludes local franchising and many forms of local regulation of Telephone Corporations constructing Telephone Lines:

> "Telegraph or telephone corporations may construct lines of telegraph or telephone lines along and upon any public road or highway, along or across any of the waters or lands within the state, and may erect poles, posts, piers, or abutments for supporting the insulators, wires, and other necessary fixtures of their lines, in such manner and at such points as cannot incommode the public use of the road or highway or interrupt navigation of the waters."

In a manner similar to Section 253(c) of the Act, the California Legislature has provided somewhat of a "safe harbor" for municipal ROW regulation if certain conditions are satisfied. PUC Section 7901.1 provides:

> "(a) It is the intent of the Legislature, consistent with Section 7901 that municipalities shall have the right to exercise reasonable control after the time, place, and manner in which roads, highways, and waterways are assessed.
>
> (b) The control, to be reasonable shall, at a minimum, be applied to all entities in an equivalent manner.
>
> (c) Nothing in this Section shall add to or subtract from any existing authority with respect to the imposition of fees by municipalities."

The convergence of voice, video, and data technologies through fiber optic architecture has made it difficult to apply the body of interpretive law surrounding PUC Section 7901 since most of the case law predates 1970 and was developed during a time where one could clearly differentiate between voice and non-voice transmission architecture. Similarly, there is little judicial authority providing guidance as to under what circumstances a Telephone Corporation not providing traditional telephone service is entitled to PUC Section 7901 rights and again, we recommend the City seek special legal counsel in this area prior to adopting and implementing a telecommunications policy for regulating the services of a telephone corporation providing other telecommunications services or of a cable television franchisee providing other telecommunications services.

This concludes our executive summary, complete survey results can be found in the main report