

2012 Vermont Telecommunications Survey Report

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Summary

ICF International, on behalf of the Vermont Public Service Department, conducted a survey with 400 Vermont residents (99 cell phone, 301 landline) and 521 non-residential organizations. All public, private, non-profit, and educational organizations were eligible for the survey. The survey measured Vermonters' telecommunication needs, as well as related behaviors, knowledge, awareness, and perceptions. For example, nearly 20 percent of Vermont adult residents report that technology services which could change the way they live are not available from local technology service providers. The Vermont Public Service Department will use the information to identify areas of deficiency in Vermont's telecommunications systems, and work with telecommunications providers to develop programs and policies to address such deficiencies, such as expanded broadband Internet access and cell phone coverage. The survey data will also be used to evaluate Vermonters' needs and behaviors to support short- and long-term planning efforts for bringing relevant technologies to Vermont. The survey was conducted by telephone, including cell phones, from July 30 through September 4, 2012 for residential and from July 31 through August 27, 2012 for non-residential; it researched services related to local telephone, cell phone, internet, television, and telecommuting. Some of the key findings include:

- Nearly 20 percent of Vermont adult residents do not have access to technology that could change the way they live.
- Local telephone subscribers are declining in Vermont. FairPoint holds a 42 percent residential market share of the local telephone subscribers and 44 percent for non-residential.
- Seventy-four percent of Vermont households have at least one cell phone, and 57 percent of businesses subscribe to cell phone service. Verizon Wireless has the largest market share in the residential market at 45 percent. AT&T has the largest market share in the non-residential market at 46 percent.
- Ninety percent of Vermonters use the Internet. Ninety-four percent of internet users have access from home.
- Nearly 43 percent of Vermont households subscribe to cable television, and nearly 42 percent subscribe to satellite television.
- About eight percent of workers telecommute at least one day per week on a regular basis, while six percent report that they telecommute every day.

The sections below describe the survey results. Appendix A contains information on weighting. The residential survey estimates are calculated by region: Champlain Valley, Northeast Kingdom, Central Vermont, and Southern Vermont. The non-residential survey estimates are

calculated by business size as measured by the total monthly expenses spent on telecommunications: \$0-\$100, \$101-\$200, \$201-\$500, and \$500 or more.

Internet

Ninety percent of Vermonters use the Internet, with most (76 percent) using it daily. Eighty percent of residents in the Champlain Valley (Addison, Chittenden, Franklin, and Grand Isle counties) use the Internet daily, compared to 73 percent in the rest of the state.

Exhibit 1 Vermonters' Internet Use Frequency

	Vermont	Champlain Valley	Northeast Kingdom	Central	Southern
Daily	75.75%	80.02%	65.36%	67.64%	78.68%
Weekly	10.32%	9.24%	12.76%	12.79%	9.41%
Monthly	1.38%	2.24%			1.53%
A few times a year	1.68%		2.48%	4.68%	1.84%
Never	10.65%	8.49%	19.39%	14.90%	7.80%

While there are numerous Internet providers servicing Vermont homes, Comcast and FairPoint are by far the market leaders, with shares of 40 percent and 22 percent, respectively. Comcast and FairPoint are also the two market leaders with non-residential consumers, but the gap between them is much narrower, 32 percent versus 24 percent respectively.

Exhibit 2 Estimated ISP Market Share

A. Estimated Residential ISP Market Share

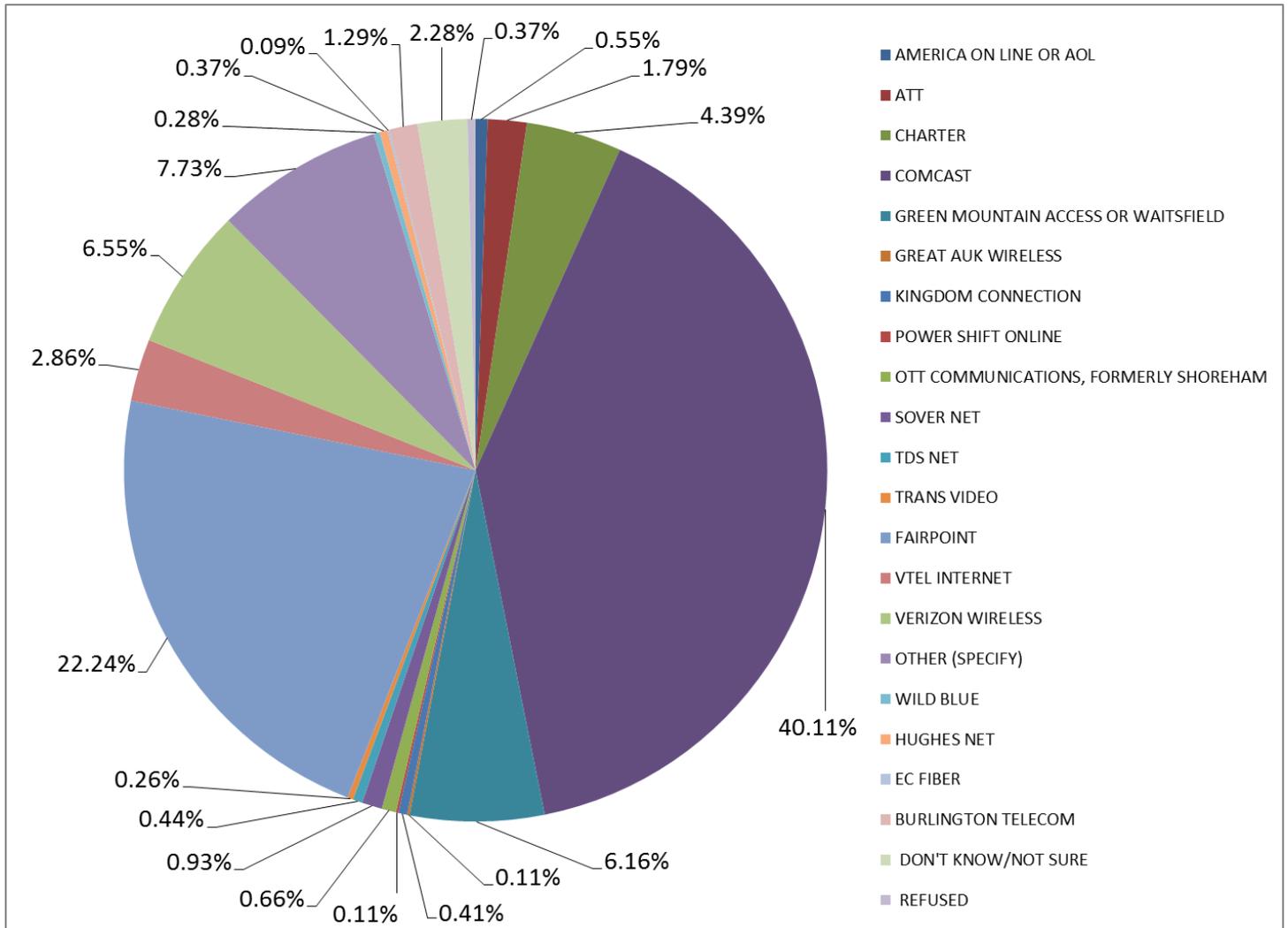
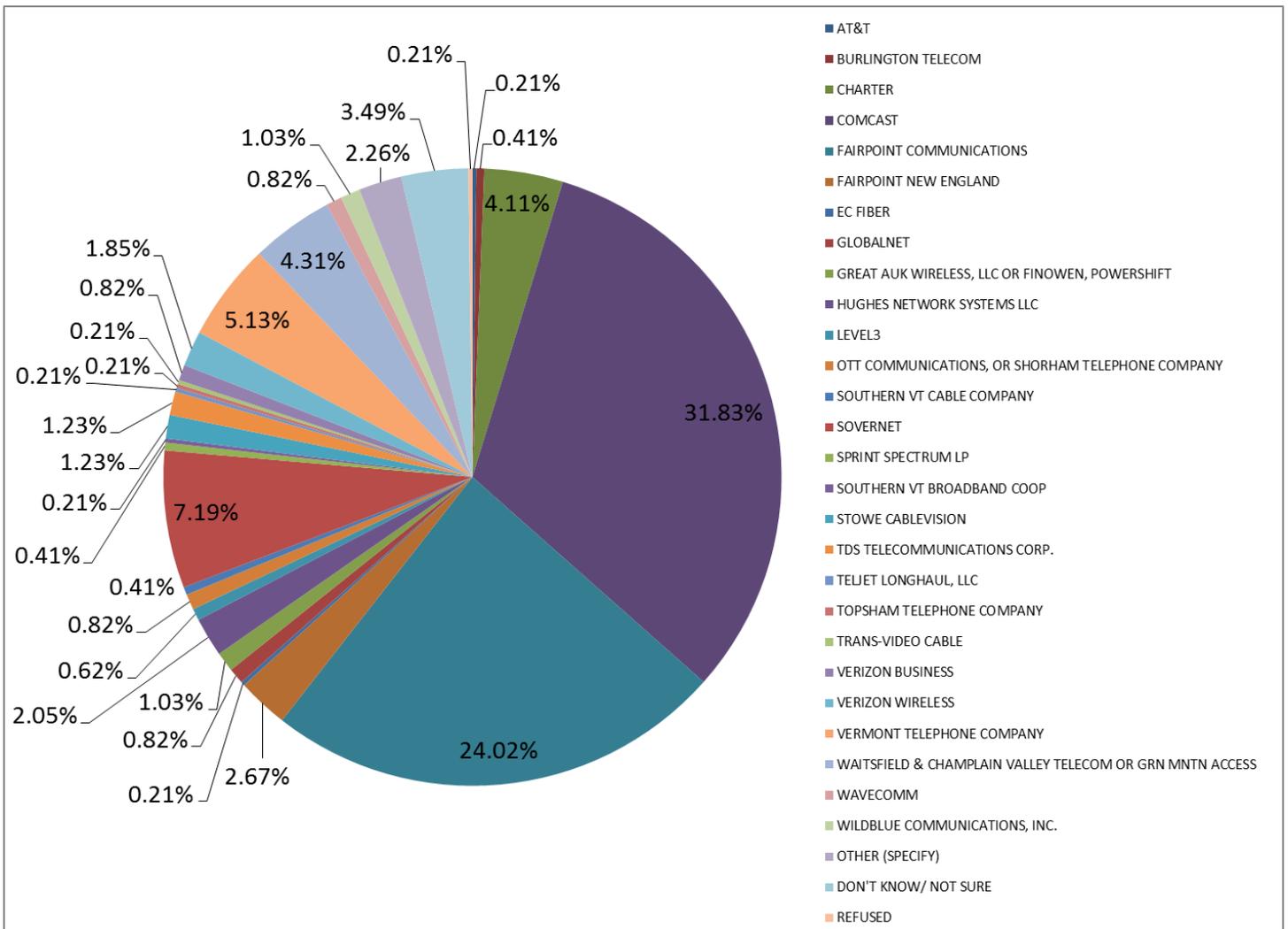


Exhibit 2 Estimated ISP Market Share

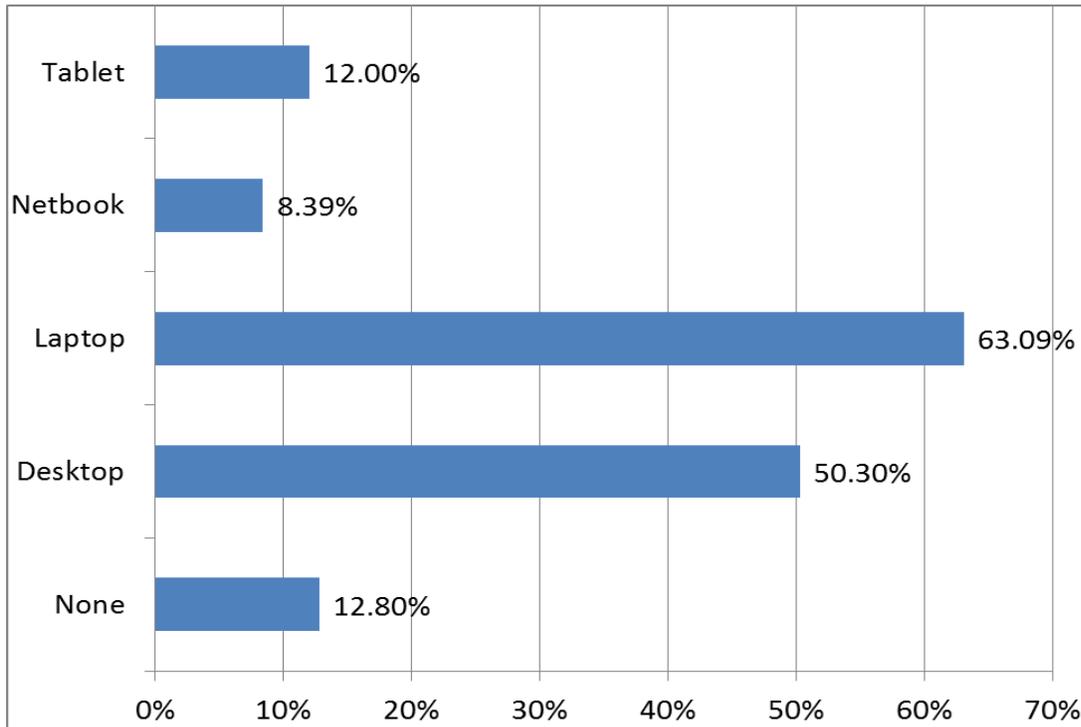
B. Estimated Non-residential Market Share



Residential

Eighty-seven percent of Vermonters own a computer—either a desktop, laptop, or a netbook. Fifty percent own a desktop, 63 percent own a laptop, and eight percent own a netbook. Twelve percent of Vermonters own a tablet.

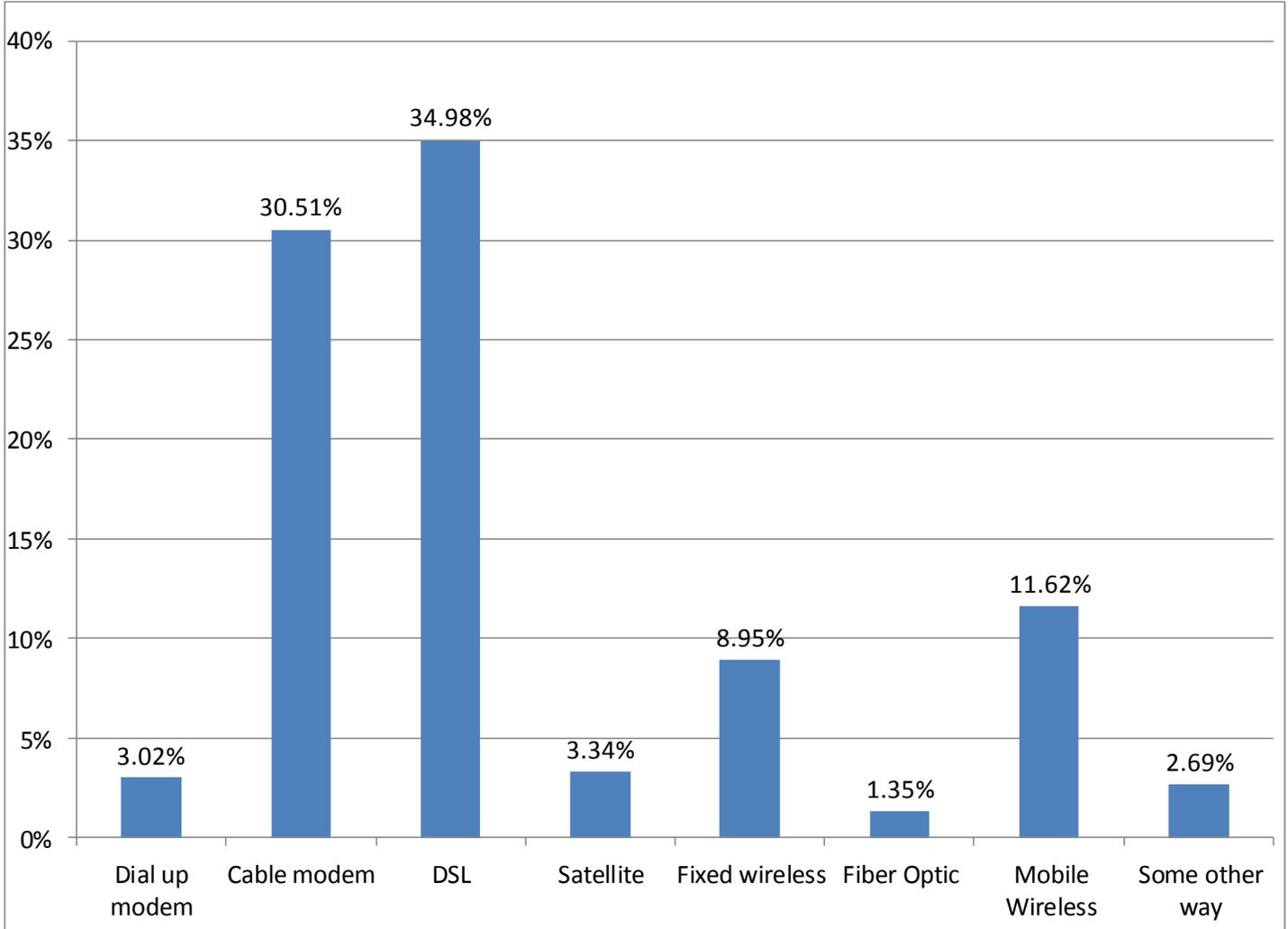
Exhibit 3 Computer Ownership



Broadband Availability and Adoption

Sixty-seven percent of home Internet users have broadband access (DSL, cable modem, or fiber option) in their homes, with DSL and cable modem as the most popular connection methods. Since 94 percent of Vermonters connect to the Internet from home, 56 percent of all Vermonters connect via broadband. The average monthly cost for home Internet access is \$48.54. For home Internet users who do not have broadband access, 30 percent reported that they do not have broadband because it is not available to them where they live. This suggests that broadband is not available for five percent of Vermont's home Internet users.

Exhibit 4 Residential Internet Connection Type



Ninety-four percent of Vermont Internet users connect from home. Forty-seven percent connect from work; 30 percent from a friend, relative, or neighbor’s house; and 15 percent from the library. Eighteen percent connect from a café or restaurant, 14 percent connect from a school in their community, and 13 percent connect from a college or university. Thirty percent of Vermont Internet users connect while traveling.

Exhibit 5 Locations Where Vermonters Access the Internet

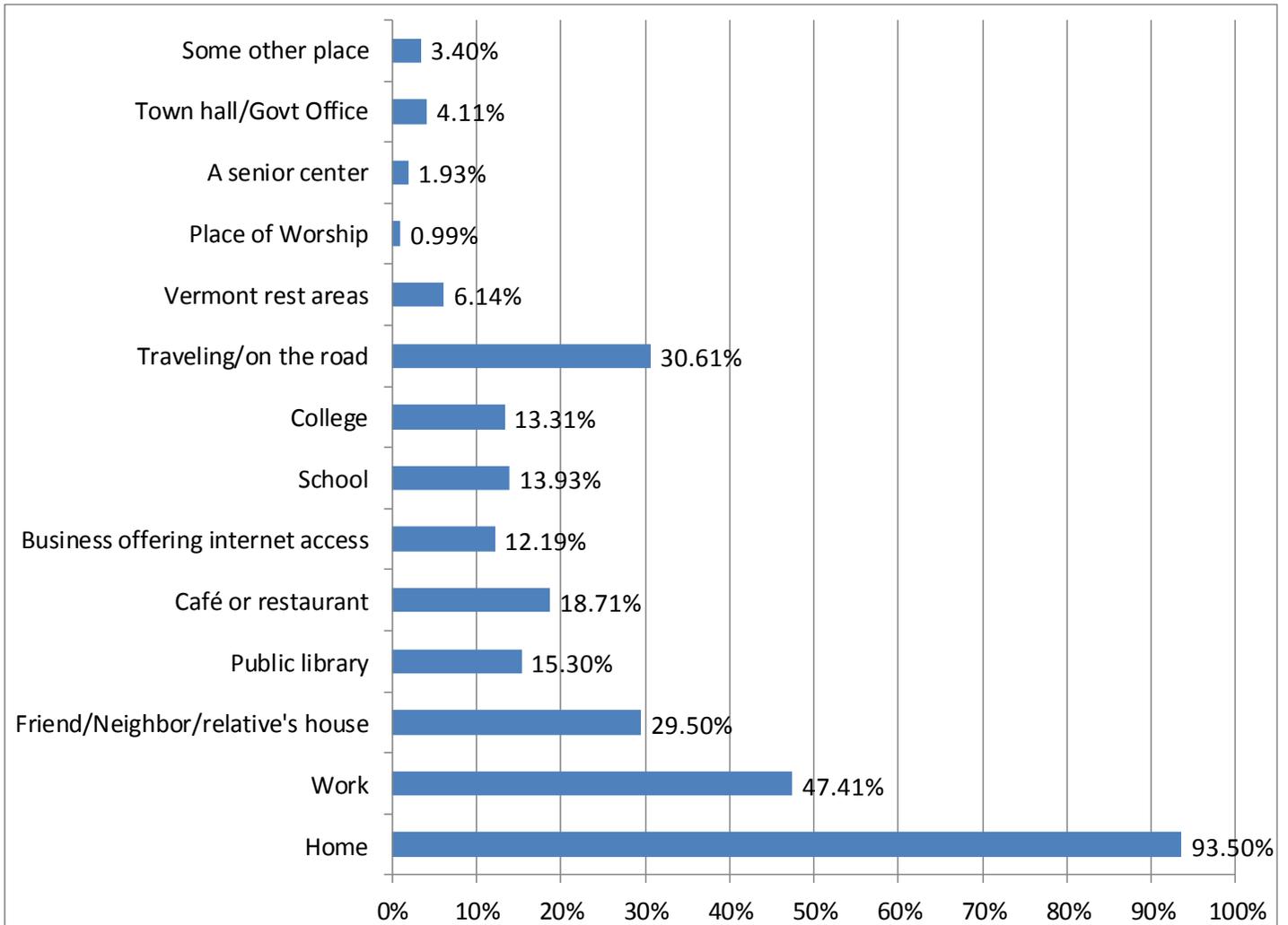


Exhibit 6 Reasons for Not Having Broadband at Home

Reason	
Broadband not available	29.82%
Equipment too expensive	5.34%
Service too expensive	4.81%
Don't use it enough	1.66%
Don't know how to use web well enough	1.90%
Other	45.73%

Fourteen percent of home Internet subscribers indicated that they will be upgrading to faster Internet service in the next year. This is less than in 2009 when 24 percent reported that they planned to upgrade.

We asked home Internet users about the nine internet activities listed in Exhibit 7—respondents were asked about these activities as they took place the time span of the four weeks or six months (depending on the category) prior to the survey. Nearly all access the internet from home to use personal email or other written electronic communication. Seventy percent access the Internet from home to pay bills or manage finances. Getting advice on health or medical services is also a frequent reason for accessing the Internet from home, as are downloading and streaming media, social networking sites, and work.

Exhibit 7 Online Activities of Home Internet Users

Activity	
Paying bills or managing your money or finances in last 4 weeks	69.74%
Getting health or medical services, advice or information in last 4 weeks	48.00%
Downloading music or video file in last 4 weeks	47.44%
Distance Learning/Online classes in last 4 weeks	20.46%
Video Conferencing or webcam in last 4 weeks	21.88%
Personal email or other written electronic communication	95.60%
Social networking sites	62.04%
Streaming media for entertainment	50.69%
Work	49.93%

Seventy-seven percent of internet users have visited a Vermont State Government website. The Department of Motor Vehicles was the most frequently mentioned. Nearly fifty percent of respondents provided at least one response that did not fit within the answer categories offered. Of the other responses provided, twenty-two percent mentioned job-related searches, twenty percent were looking for information on agriculture, hunting, and fishing, and seventeen percent were researching legislative and election information were the most frequent responses. About thirty-six percent of the open-ended answers were not able to be categorized.

Exhibit 8 Vermont State Government Online Services Used in the Past Two Years

	Vermont	Champlain Valley	Northeast Kingdom	Central	Southern
Buy hunting and fishing licenses	6.86%	7.55%	2.16%	3.25%	9.45%
Driver's license reinstatement fee payment	4.18%	3.97%	3.99%	2.35%	5.52%
Pay traffic tickets and court violations online	0.41%	0.73%			0.35%
Tax filing and refund status lookup	13.08%	12.53%	6.40%	23.65%	10.15%
Unclaimed property search	1.29%	3.10%			
Vital records request services	0.09%	0.22%			
Bizfile business tax filings and payments	3.11%	6.85%		0.79%	0.40%
Obtain a criminal conviction report	1.33%	0.25%		5.69%	0.82%
Order Police reports and public records	2.09%	2.00%		2.16%	2.85%
Something else	49.19%	52.19%	41.86%	37.58%	53.97%

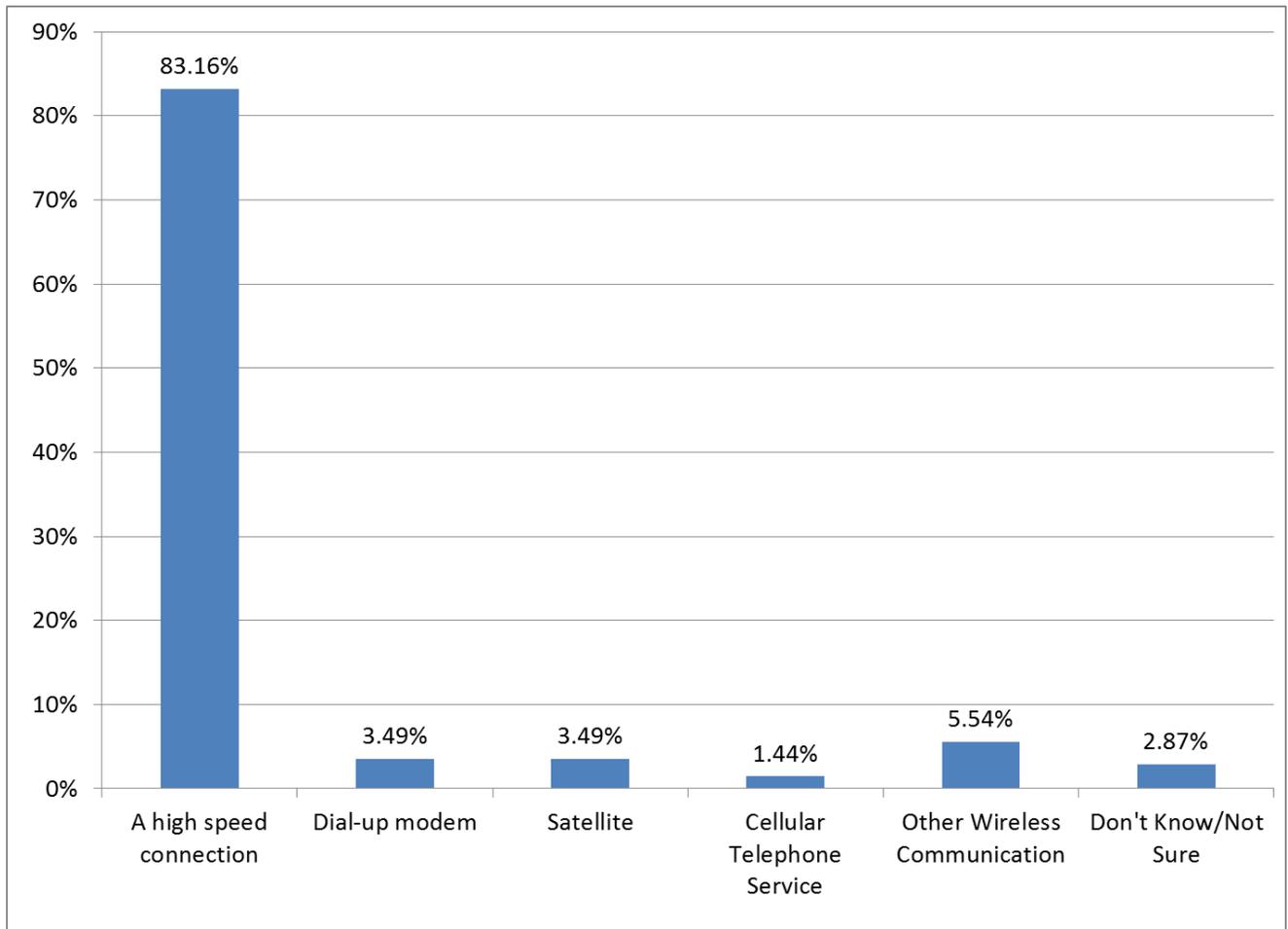
For those who do not access the internet, or access it infrequently (a few times a year), expense does not seem to be a barrier. Six percent reported that the equipment, Internet service, or telephone expenses are too expensive. This is similar to 2009, when seven percent reported that faster Internet service was too expensive. Twenty-seven percent of non- and infrequent users reported that they *don't have the necessary equipment or access to the necessary equipment*.

When asked about the availability of computers with free Internet access in their community, 20 percent of Vermonters were unsure. The percentage of non-users who were unsure was 32 percent. Vermonters were split on the issue of whether their community needs more Internet terminals that are available for public use. About one-third agreed, one-third disagreed, and one-third were unsure.

Non-residential Internet

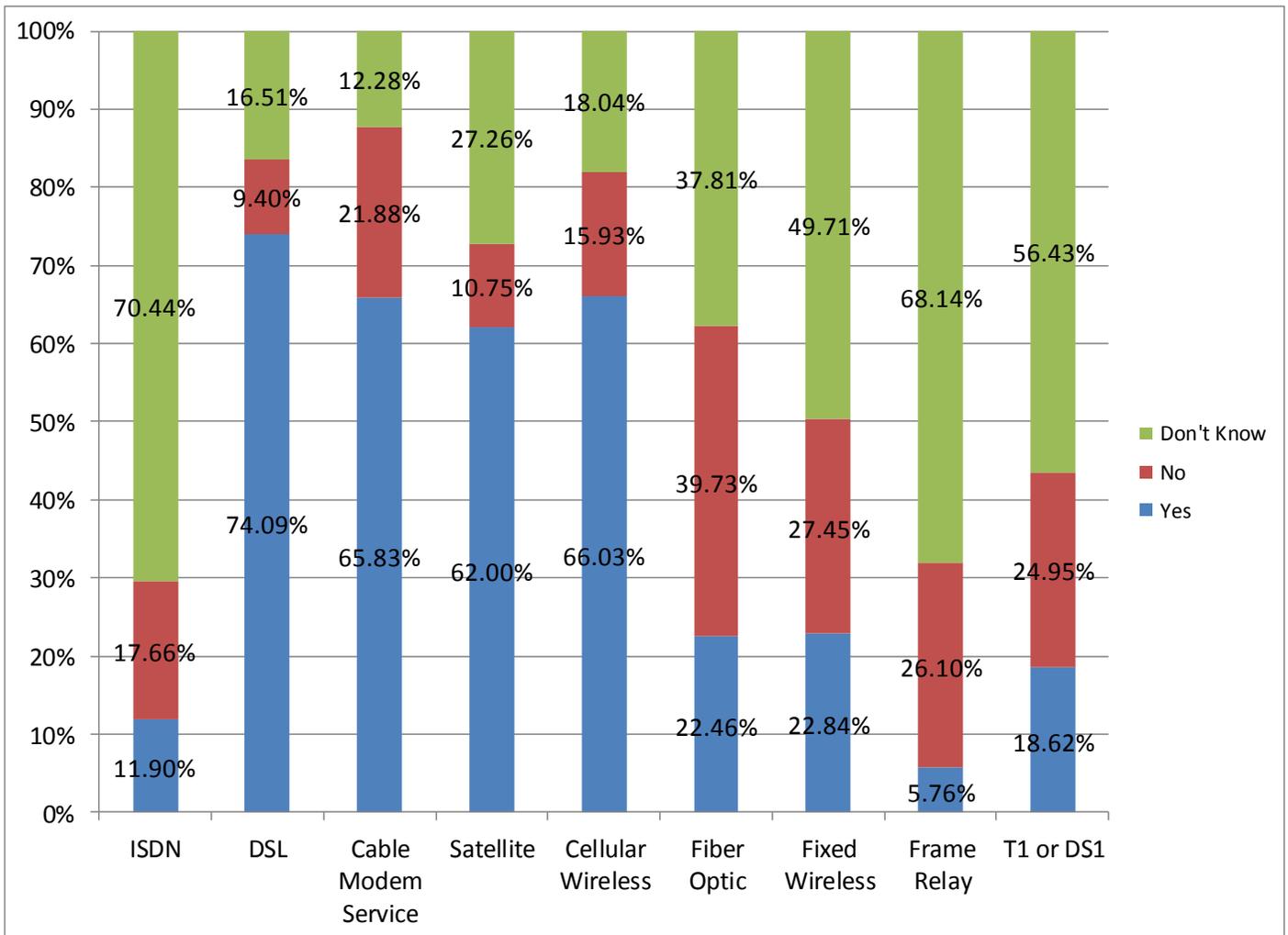
Ninety-three percent of non-residential consumers have Internet service at their location. Of these, 83 percent have broadband access. Fifty percent of the broadband access is DSL, followed by cable modem at 33 percent, T1/DS1 at two percent, and direct fiber optic at two percent.

Exhibit 9 Non-residential Internet Connection Type



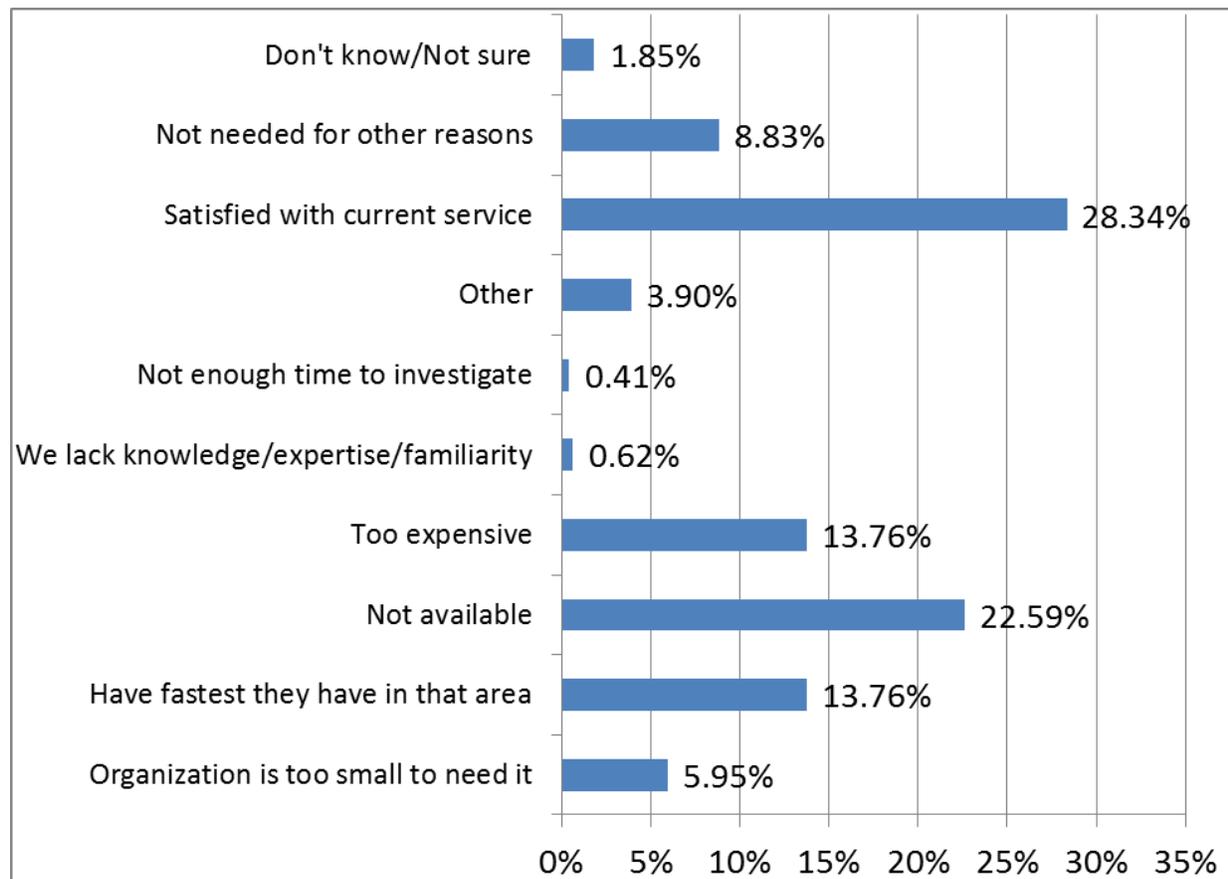
The average cost for internet service, as reported by non-residential consumers, is \$81.36 per month. Sixteen percent of non-residential consumers reported having an additional Internet service other than their primary one, with over half reporting that it is a broadband connection. Non-residential consumers were asked about the availability of various types of Internet connections. There was a high degree of uncertainty about availability of ISDN, Fiber Optic, Fixed Wireless, Frame Relay, and T1/DS1.

Exhibit 10 Availability of Internet Service Types



When asked about plans to upgrade to a faster service, 76 percent of non-residential consumers reported that they have no plans to upgrade and two percent didn't know. Almost 23 percent of non-residential consumers who do not have high speed access reported that high speed not being available was the most important reason their organization had not subscribed to a faster service.

Exhibit 11 Most Important Reason that Organization Does Not Subscribe to a Faster Service



Non-residential consumers reported that an average of 74 percent of their employees use e-mail at work, with over 65 percent reporting that all of their employees use e-mail. Almost 70 percent of non-residential consumers reported conducting business-to-business transactions over the Internet. Over sixty percent report that they have a website, most of which are used by the public and employees. Only two percent of organizations indicated that their website was for internal use only. Twenty-seven percent of the non-residential consumers who have publicly-accessible websites allow customers to make purchases online.

Non-residential consumers were asked the following two questions about their Internet service:

- Internet services may provide different speeds for uploading information to the Internet and downloading information from the Internet. For your organization, is upload or download speed more important?
- For your organization, which is most important: the reliability of your Internet service, the speed of your Internet service, or the price of that service?

Most non-residential consumers felt that download speeds were more important than upload speeds, and the vast majority of non-residential consumers reported that reliability is more important than price or speed.

Exhibit 12 Non-residential Importance of Internet Download and Upload Speed

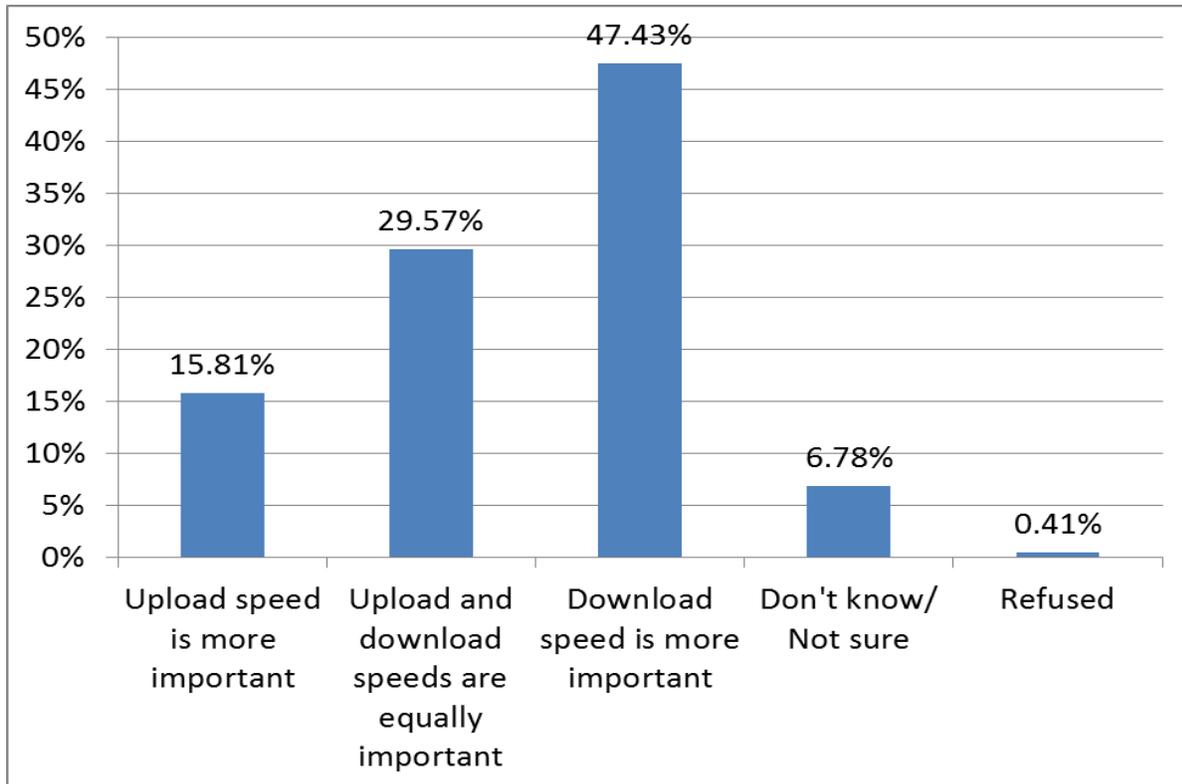
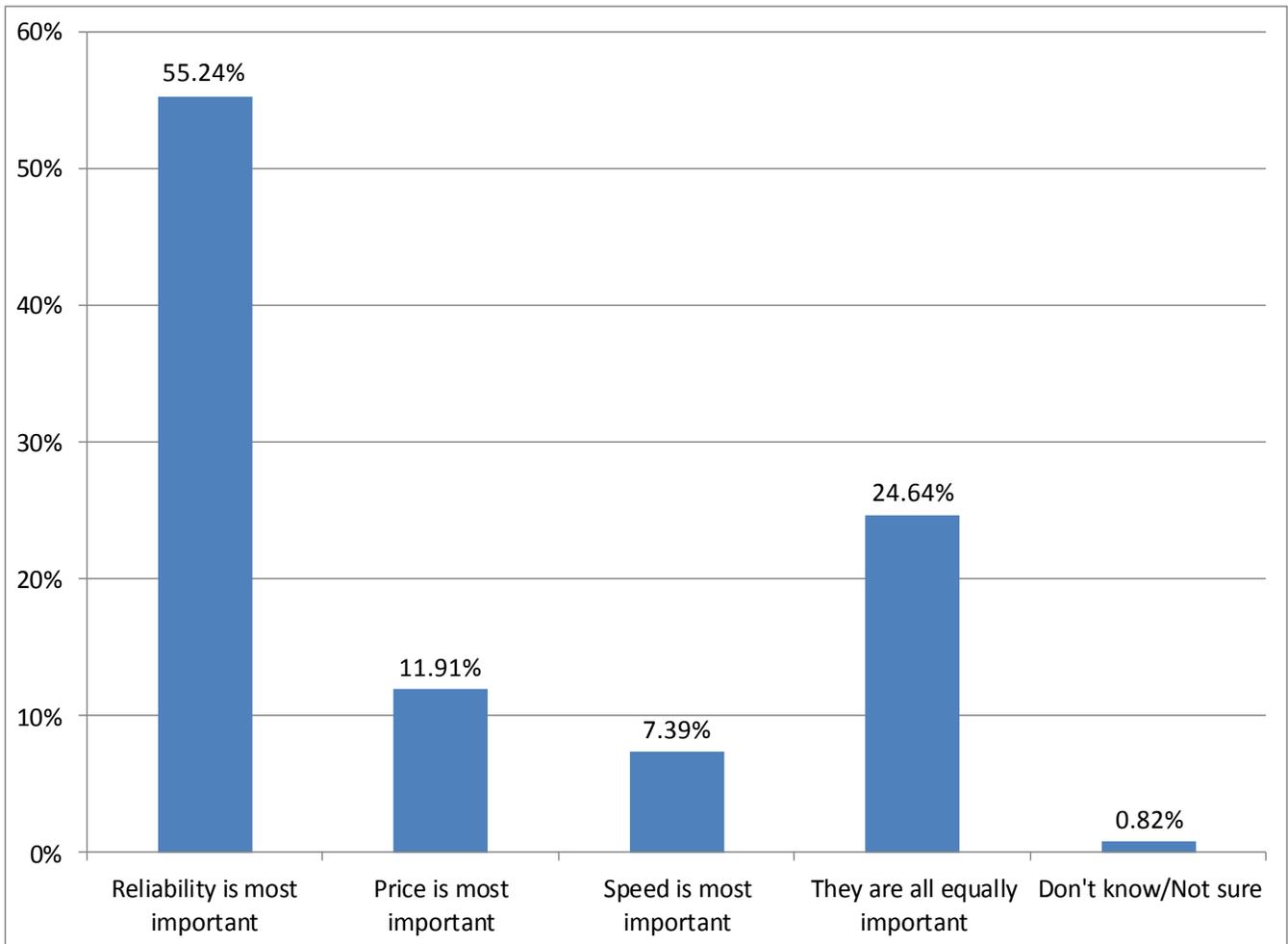


Exhibit 13 Non-residential Importance of Internet Reliability, Price, and Speed



Most non-residential consumers reported that they had an interruption in their primary Internet Service at least once per year, with around a quarter reporting that interruptions occur at least monthly. However, over 90 percent of consumers report that their Internet service is reliable, with two-thirds reporting it is very reliable. Consumers overwhelmingly report that keeping prices low is most important to the future of their business (63 percent).

Exhibit 14 Non-residential Frequency of Interruptions in Primary Internet Access Service

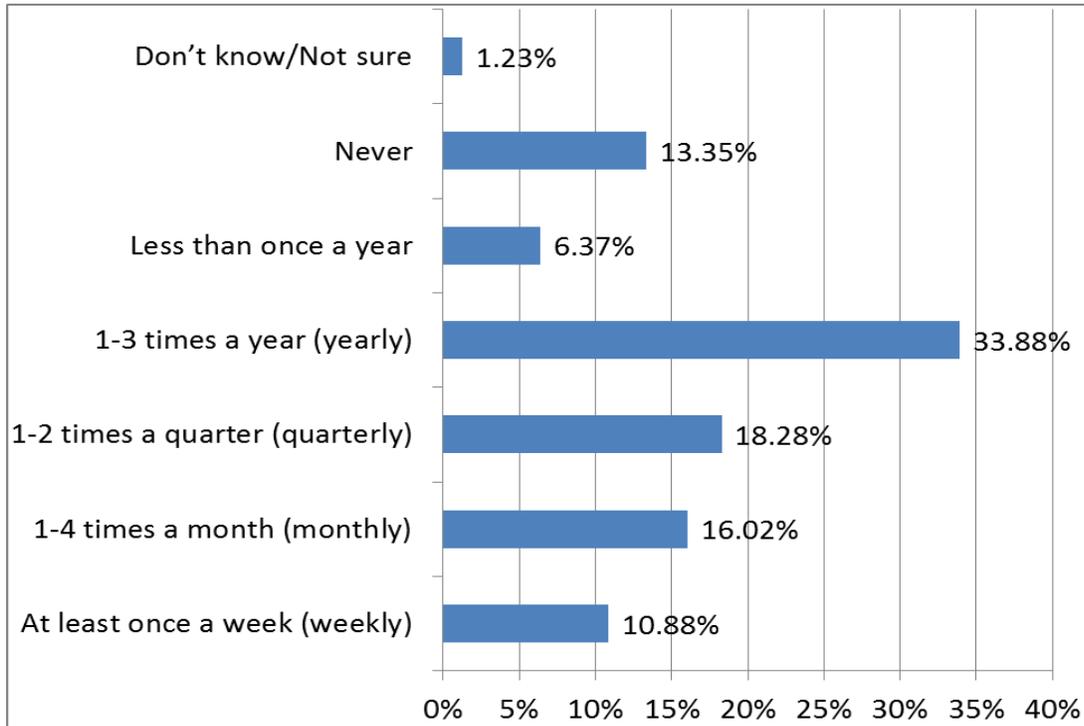
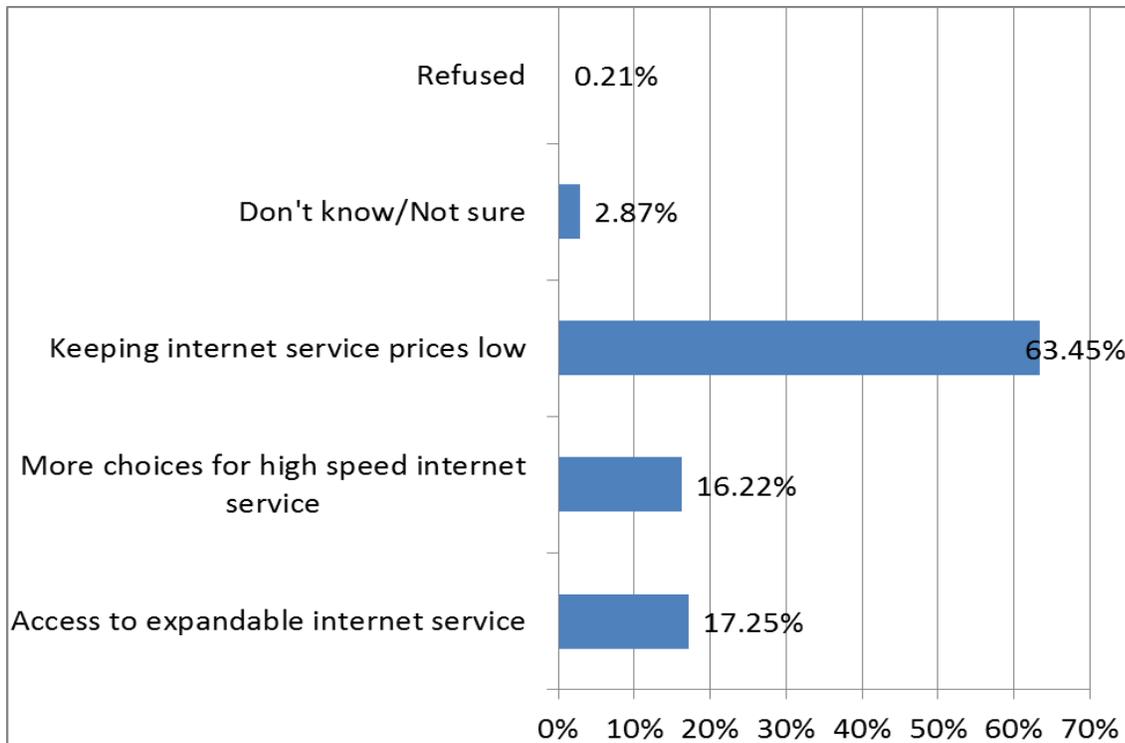


Exhibit 15 Which is Most Important for the Future of Your Business?



Cellular Telephone

Verizon Wireless has the largest share of residential subscribers in Vermont, at 45 percent. AT&T has an estimated 38 percent of residential subscribers, followed by Tracfone at nine percent. For the non-residential market, Verizon Wireless and AT&T hold over 80 percent of the market.

Exhibit 16 Estimated Cell Phone Market Share

A. Estimated Residential Cell Phone Market Share

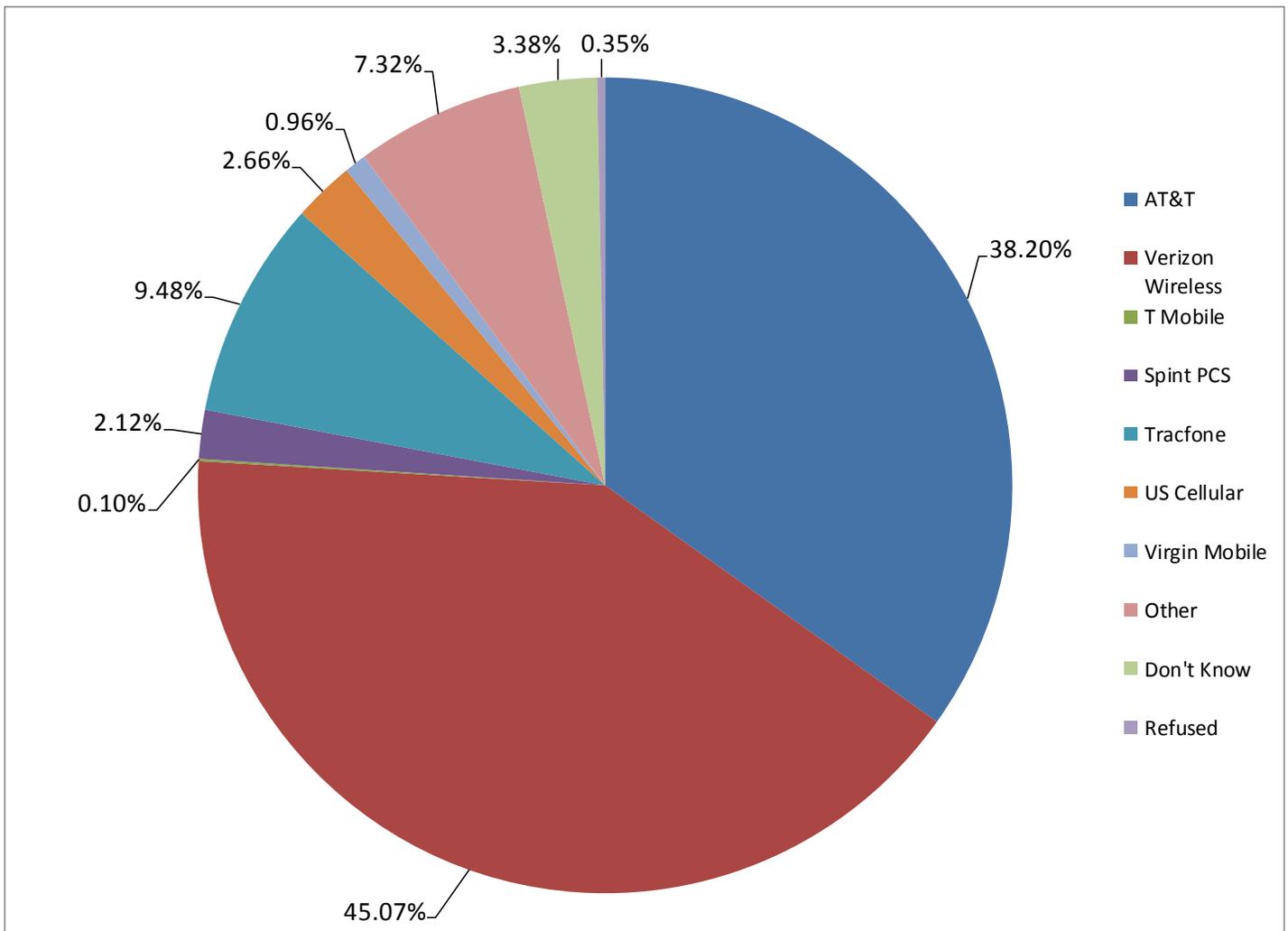
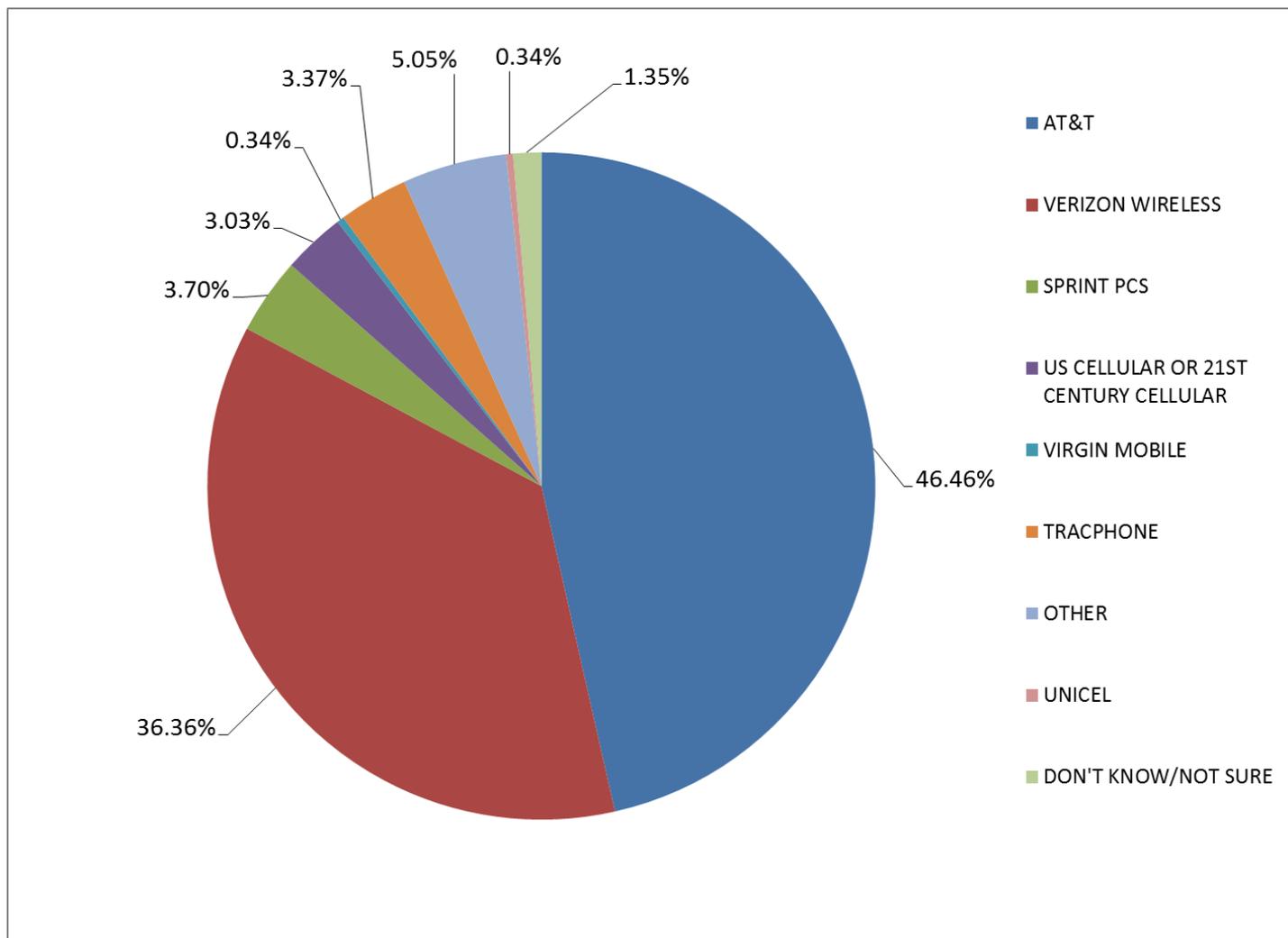


Exhibit 16 Estimated Cell Phone Market Share

B. Estimated Non-residential Cell Phone Market Share



Residential

Eighty-eight percent of Vermont households have at least one cell phone, and the average number of household members who have cell phones is 1.94. Vermont’s cell phone penetration among adults is similar to the national penetration rate of 89.6 percent.¹ Vermont residential consumers spend an average of \$83 per month on cell phone service. Cell phones are being used for a variety of purposes aside from voice communications; 83 percent of cell phone

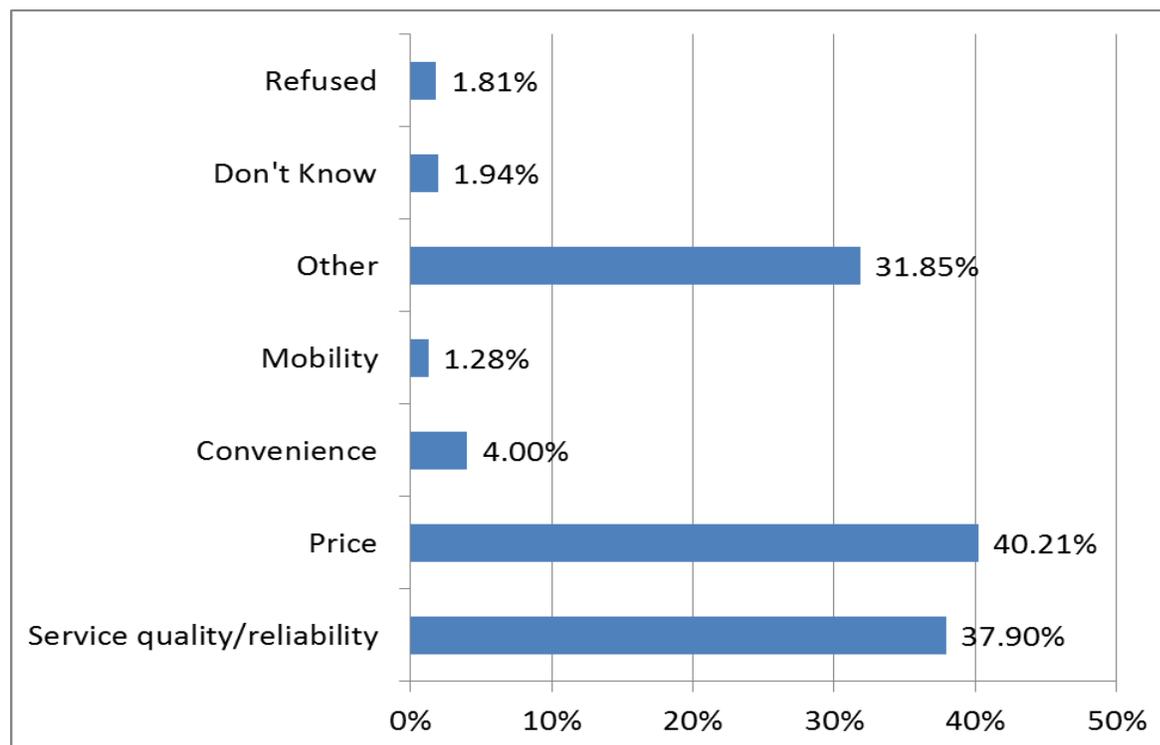
¹ Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, July-December 2011. National Center for Health Statistics. June 2012. Available from: <http://www.cdc.gov/nchs/nhis.htm>.

consumers use their phones for texting and nearly two-thirds of cell phone consumers use their phones for data and internet connections.

Approximately 6 percent of Vermonters reported replacing their landline with a cell phone.

Over half of cell phone consumers reported that their cell phone is their primary phone, and 36 percent of cell phone consumers who maintain a landline have considered dropping their landline. When asked what factors they would consider when deciding to end landline service and use a cell phone exclusively, *service quality* (including coverage and reliability) and *price* were the two factors mentioned most often. *Convenience* was mentioned by about four percent of the residential consumers. While the other responses were difficult to categorize, respondents indicated that a *lack of need* for a landline telephone would be the main reason they would eliminate their landline service.

Exhibit 17 Factors Vermonters would Consider When Eliminating Landline Service for Cell Service



Thirty-six percent of Vermont residents rate the geographic cell phone coverage as good or excellent. The lowest percentage is among residents of Southern Vermont (Rutland, Windsor, Bennington, Windham counties) where 30 percent reported that coverage was excellent or good. This is a change from 2009, where Central Vermont (Lamoille, Orange, Washington

counties) had the lowest percentage of residents reporting that coverage was excellent or good. While very few residents of Central Vermont reported that coverage was excellent, the percentage of these residents reporting that coverage was good increased to nearly 44 percent.

Exhibit 18 Residential Ratings of Cell Phone Service Coverage

	Vermont	Champlain Valley	Northeast Kingdom	Central	Southern
Excellent	3.60%	4.90%	2.68%	0.40%	4.05%
Good	32.26%	29.81%	37.74%	43.66%	26.73%
Fair	46.33%	48.77%	41.05%	36.67%	50.74%
Poor	15.88%	15.44%	18.53%	17.26%	14.65%
Don't Know	1.47%	0.84%			3.83%

Vermont residents universally agree that cell phone service ought to be as reliable as landline service in areas where it is available. Vermonters are split when given the choice between improving cell phone coverage with a large number of short cell phone towers or a small number of large cell phone towers. Thirty-six percent chose numerous small towers, and 38 percent chose tall towers, while six percent chose neither and 24 percent were unsure.

Nearly all Vermonters would support the placement of more towers in their community if it were necessary to improve two-way mobile radio communications for police, ambulance, or fire services.

Exhibit 19 Attitudes about cell phone coverage

Agreement that cell phone service ought to be as reliable as landline service					
	Vermont	Champlain Valley	Northeast Kingdom	Central	Southern
Strongly Agree	62.17%	57.16%	70.54%	63.23%	65.39%
Somewhat Agree	32.50%	40.09%	27.36%	31.77%	24.11%
Somewhat Disagree	2.22%	1.19%		1.99%	4.70%
Strongly Disagree	0.98%	0.99%		1.79%	0.85%

Cell towers are a necessary part of cell phone service. Would you prefer building a smaller number of tall towers or a larger number of short towers?

	Vermont	Champlain Valley	Northeast Kingdom	Central	Southern
A large number of short towers	36.35%	32.34%	44.89%	29.57%	42.57%
A small number of large towers	38.22%	41.66%	43.18%	41.76%	29.69%
Neither	5.87%	7.40%	5.71%	5.25%	4.26%
Don't Know/Unsure	16.69%	16.43%	6.21%	21.23%	18.23%

Non-residential

Fifty-seven percent of non-residential consumers subscribe to cell phone service. Of these subscribers, nearly 75 percent have agreements with service providers that set the price for an extended period. Approximately 1 in 5 non-residential cell phone subscribers rated the coverage as good or excellent.

Exhibit 20 Non-residential Cell Phone service subscription

Does your organization subscribe to a cell phone service?	
Yes	57.01%
No	42.80%
Don't know/Not sure	0.19%

Do you have cell phone contracts, that is, agreements with service providers that set the price for an extended period, not just month to month?	
Yes	74.41%
No	23.23%
Don't know/Not sure	2.36%

Local Telephone

FairPoint is the largest local telephone provider in the State of Vermont with 42 percent of the residential market and 44 percent of the non-residential market. Comcast has secured the second largest share of residential consumers with 21 percent, followed by cell phone companies at nine percent and AT&T at eight percent. For the non-residential market, Sovernet, Comcast, Verizon, Waitsfield and Champlain Valley Telecom, and VTel join FairPoint in the top five (Sovernnet and Waitsfield and Champlain Valley Telecom were both selected by four percent of non-residential consumers).

Exhibit 21 Estimated Local Telephone Market Share

A. Estimated Residential Local Telephone Market Share

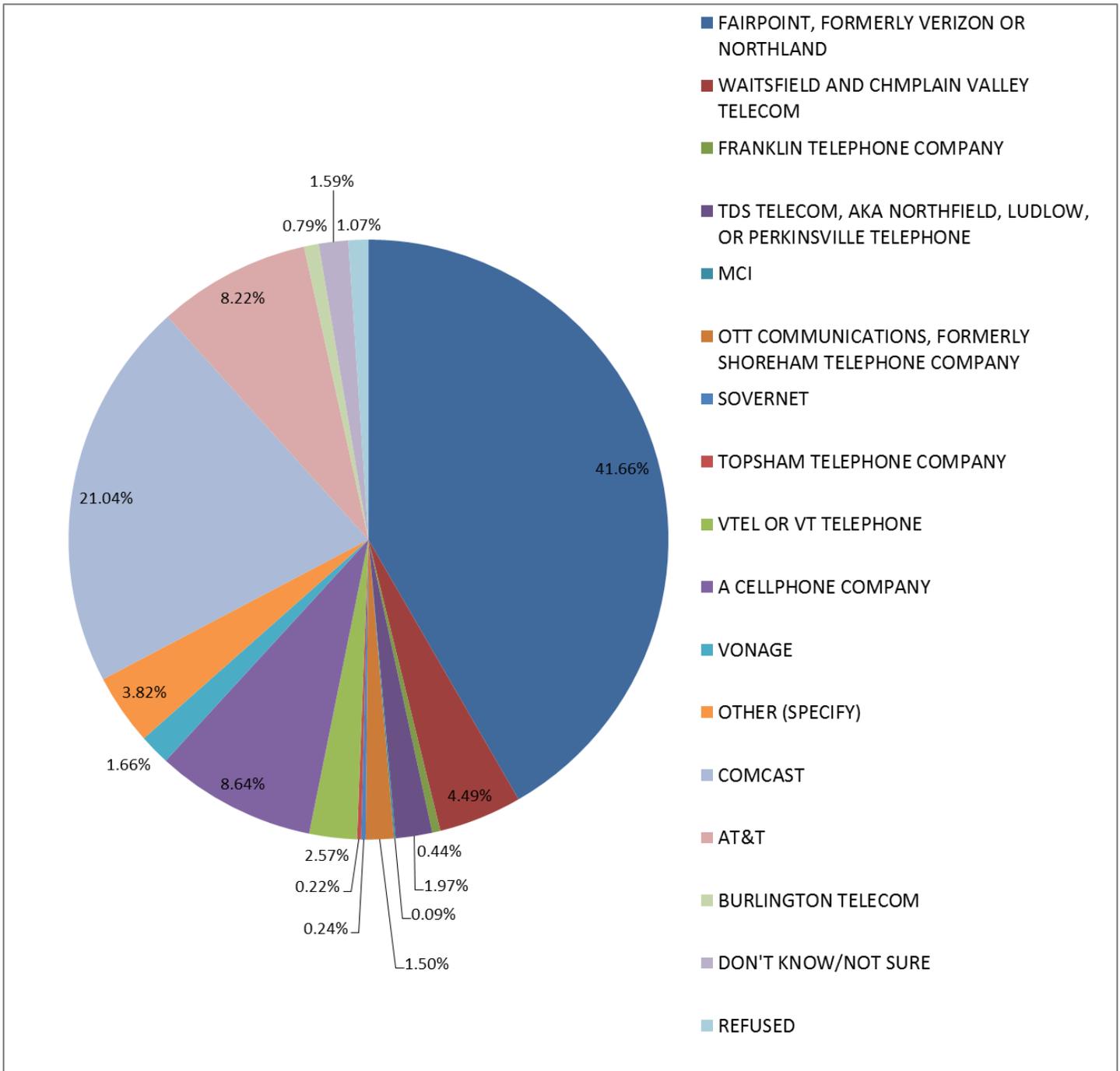
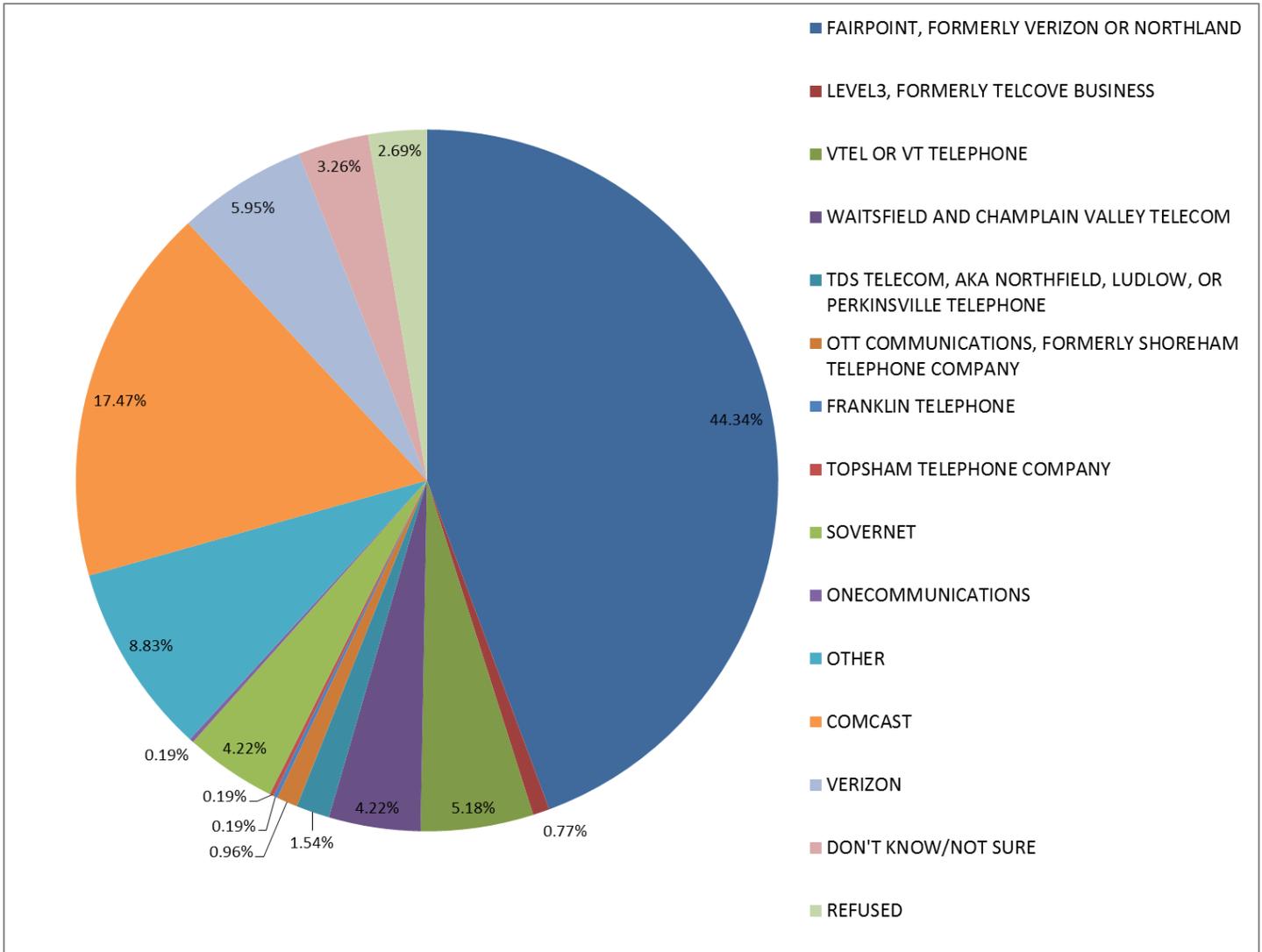


Exhibit 21 Estimated Local Telephone Market Share

B. Estimated Non-residential Local Telephone Market Share



Eighteen percent of non-residential consumers reported that they have contracts to purchase voice and fax telephone service for a certain period of time, instead of just month-to-month. This is consistent with the 2009 Vermont Telecommunications Survey. Over one-half of the non-residential consumers have one or two telephone lines used for fax or voice communications.

Exhibit 22 Non-residential Telephone Service Contracts and Line Counts

Do you have any contracts to purchase voice and fax telephone service for a certain period of time instead of just month to month?

Yes	18.43%
No	77.74%
Don't know/Not sure	3.65%
Refused	0.19%

How many telephone lines does this location have for voice and fax communications?

1	40.69%
2	24.76%
3	13.05%
4	4.22%
5	5.57%
6	3.45%
7	1.15%
8	1.54%
9	0.58%
10	1.34%
12	0.38%
14	0.19%
16	0.19%
26	0.19%
29	0.19%
30	0.19%
50	0.19%
52	0.19%
53	0.19%
100	0.19%
115	0.19%
400	0.19%
552	0.19%
800	0.19%
997	0.77%
999	0.19%

Trends

Two percent of landline-equipped residential consumers reported having more than one residential phone lines in their home. This is lower than in 2009, and continues a downward trend since 1999. As discussed in the next section, many households have no landline, or wireline, service at all.

Subscribers to local telephone service in Vermont have been in decline since 2001. At its peak, the number of telephone subscriptions reached over 425,000. Since then, it has declined over 10 percent. As discussed in the next section, many consumers are migrating to cell phones as their primary telephone communication.

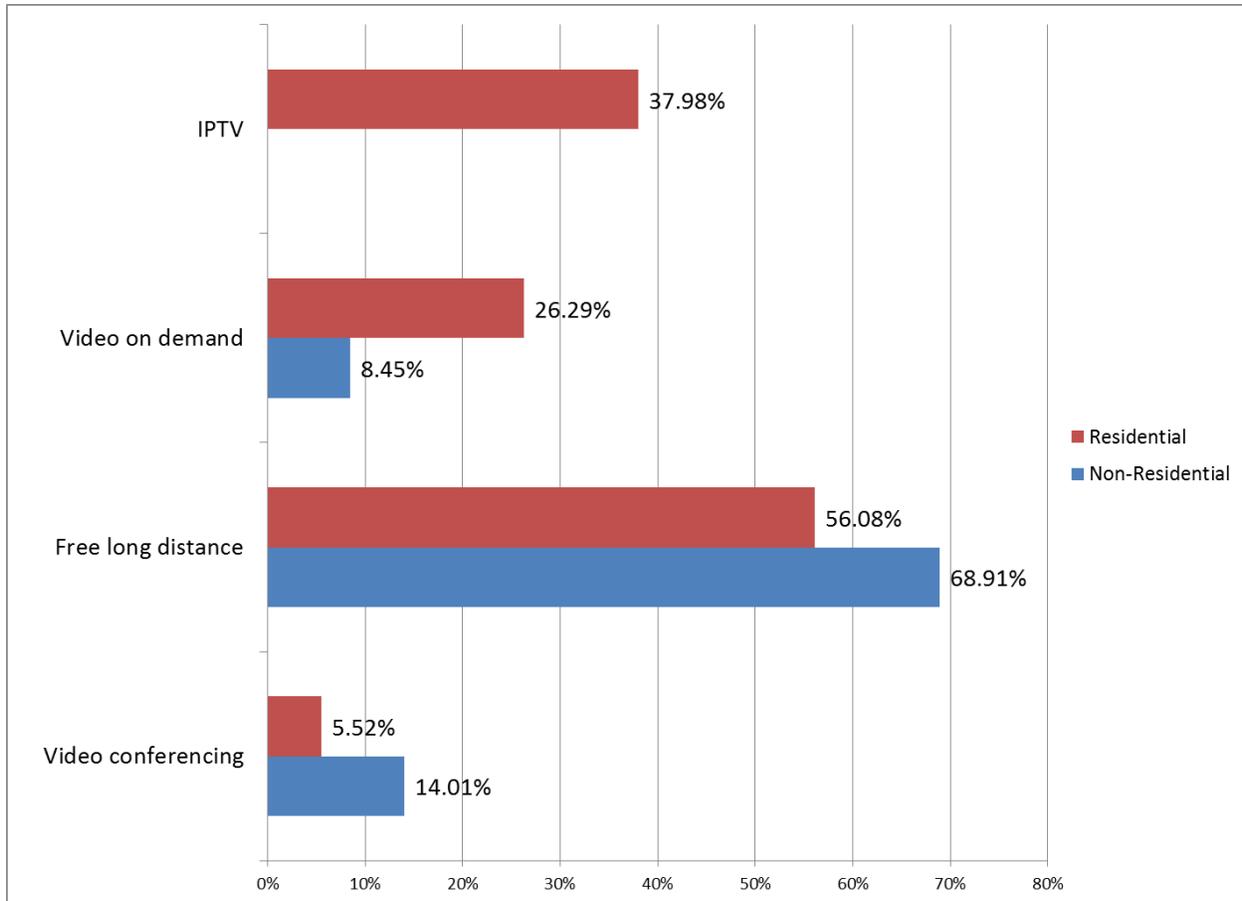
This trend seems to be continuing as less than one percent of residential consumers anticipate adding an additional telephone line in the next six months, yet seven percent anticipate dropping a local landline.

Eight percent of non-residential consumers reported eliminating a fax line in the past year. When asked whether their organization will consider changing its telephone service to a VoIP provider, such as Skype or Vonage, 26 percent reported they would, 68 percent reported they would not, and 7 percent were unsure.

Service Changes and Improvements

When asked about features that would make local telephone service more relevant or useful, the majority of residential and non-residential consumers were in favor of *free long distance*. *IPTV* was also fairly popular for residential consumers (not asked for non-residential). *Video on demand* was more popular with residential consumers than non-residential consumers. *Video conferencing* was not a popular feature with residential or non-residential consumers.

Exhibit 23 Features That Would Make Local Telephone Service More Relevant



A majority of consumers believe that having the whole state as the local calling area is very or somewhat important, but most are not willing to pay extra for the service. Residential and non-residential consumers were asked, “How important would it be for you to have the whole state as your local calling area?” If they responded very or somewhat important, a follow-up question was posed, “In order to have the whole state as your local calling area, would you be willing to pay more for local service?”

Non-residential consumers who were willing to pay extra were then asked, “How much more per month per line would you be willing to pay to have the whole state as your local calling

area?” Non-residential consumers were willing to pay an average of \$5.40 extra to have the whole state as the local calling area. The amounts below were asked in descending order until the respondent said ‘yes’. Over 20 percent said they were willing to pay \$9 extra, the maximum amount presented.

Exhibit 24 Importance of Whole State in Local Calling Area

Residential	
Very Important	36.11%
Willing to Pay	41.94%
Not Willing to Pay	37.53%
Unsure	18.90%
Somewhat Important	27.35%
Willing to Pay	17.15%
Not Willing to Pay	76.51%
Unsure	5.42%
Not very important	19.44%
Not at all important	13.81%
Non-residential	
Very Important	54.37%
Willing to Pay	18.12%
Not Willing to Pay	31.93%
Unsure	4.53%
Somewhat Important	45.63%
Willing to Pay	12.62%
Not Willing to Pay	29.13%
Unsure	3.88%
Not very important	0.00%
Not at all important	0.00%

Exhibit 25 Non-residential Amount Willing to Pay for Whole State in Local Calling Area

Extra per Month	2009	2012
9 Dollars	51.00%	21.05%
6 Dollars	56.00%	9.47%
5 Dollars	78.00%	36.84%
4 Dollars	79.00%	9.47%
3 Dollars	85.00%	8.42%
2 Dollars	87.00%	4.21%
1 Dollars	89.00%	3.16%
Nothing	90.00%	1.05%
Don't know/Not Sure	6.00%	5.26%
Refused	--	1.05%

Service Satisfaction

Vermonters rated their satisfaction with their local telephone service as a 4.0 on a scale of one (very dissatisfied) to five (very satisfied). Fifty-eight percent of local telephone customers have had to call their telephone company to speak to a service representative about a service issue. Nearly 80 percent reported that the wait time to speak with a customer service representative was acceptable.

When asked about their expectations, local telephone consumers provided the following average duration limits before the delay is unacceptable:

Exhibit 26 Wait Time Expectations for Local Telephone Service

Residential	
To speak to a telephone company representative	5.8 Min
To have a telephone line repaired	1.7 Days
To have an additional line installed	2.7 Days
Non-Residential	
To speak to a telephone company representative	4.4 Min
To have a telephone line repaired	1.3 Days
To have an additional line installed	N/A

Non-residential consumers were presented with a scenario where their organization needs an additional telephone line installed as soon as possible. After requesting the line and learning that it will take more than a week to be installed, the following were presented as options. Respondents were asked whether or not they would consider each option.

Exhibit 27 Alternatives to Local Telephone Service Installation Wait Time

Alternatives	
Purchasing cellular service	21.31%
Purchasing a VOIP service	10.36%
Waiting for the landline	60.46%
Don't know/Not Sure	6.91%
Refused	0.96%

Non-residential consumers were also asked the following questions about back-up providers for telephone and internet. One-third reported that they have back-up for telephone and 13 percent for Internet. Of those who reported having a back-up provider for telephone, 85 percent reported that their back-up was cellular service.

Exhibit 28 Non-residential Backup Providers

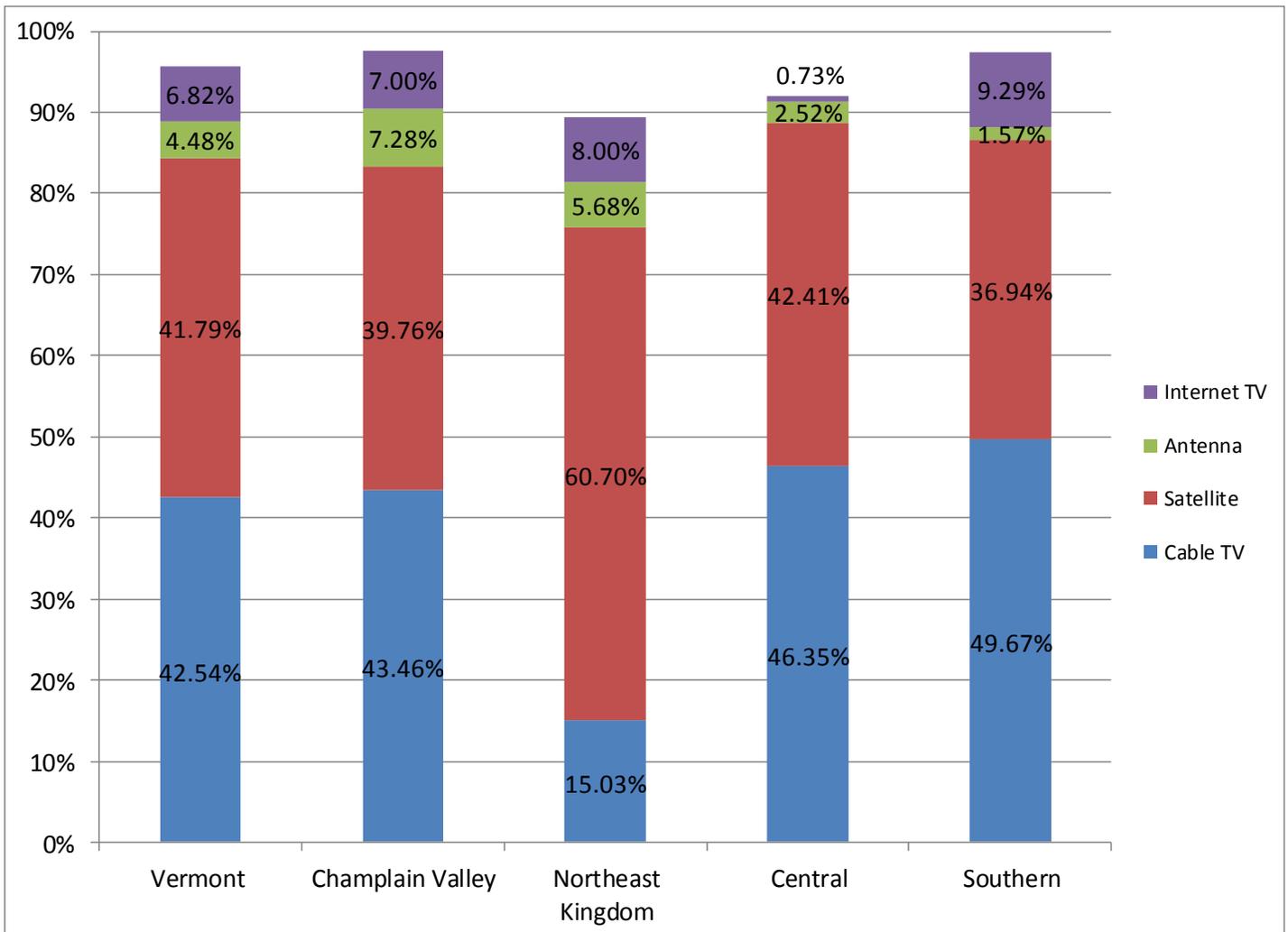
In case of an outage, have secondary providers for:	
Telephone Service	32.82%
Internet Service	12.67%

Television

Ninety-three percent of Vermonters live in households with at least one television. The average number of televisions is slightly more than two. Forty-three percent of Vermont households subscribe to cable television. Of those who do not, 72 percent subscribe to satellite television. The cable and satellite subscription rates are similar to 2009, where 48 percent had cable service, and 74 percent of those who did not have cable service, had satellite service.

Cable television subscriptions in the North East Kingdom are much lower than the rest of the state.

Exhibit 29 Regional Distribution of Television Service Types



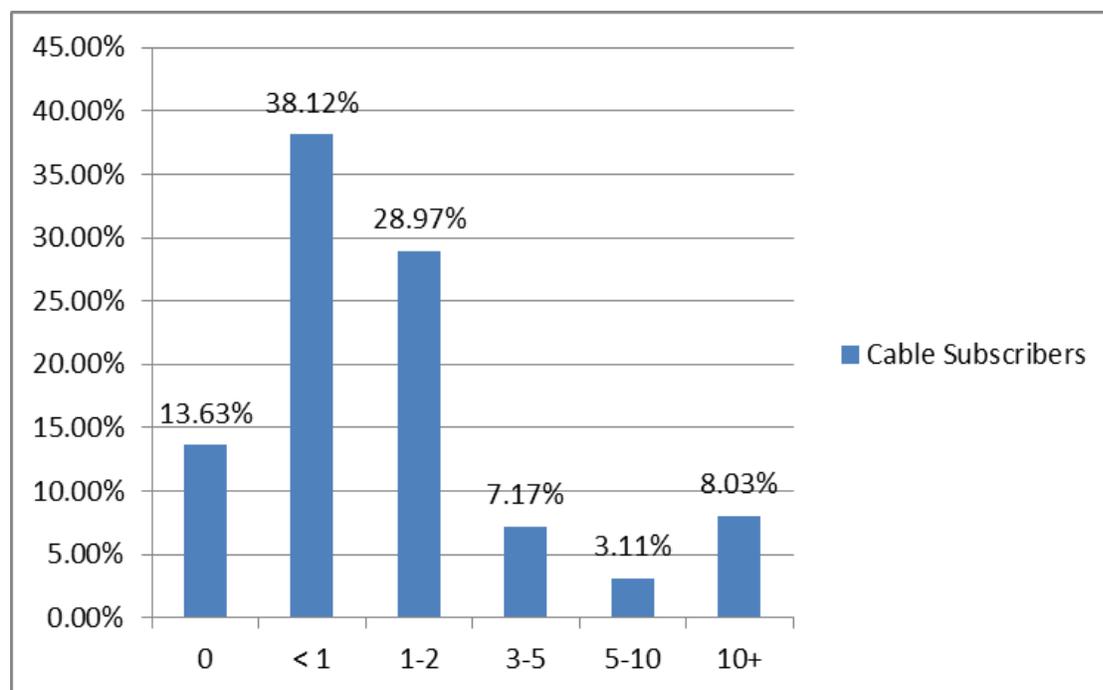
Nearly thirty percent of satellite television subscribers dropped cable service when they subscribed to satellite. Nearly 60 percent of satellite television subscribers have a choice of cable or satellite, while 35 percent report that cable does not run past their house and six percent were unsure.

Exhibit 30 Percentage of Satellite Subscribers Who Have Access to Various Forms of Cable Service

Do cable TV company wires run past your house so that you could subscribe to:	
Television	59.12%
Internet	55.81%
Telephone	49.60%

Public access television channels, sometimes called PEG access channels, are designated cable TV channels used exclusively for transmitting television programs produced by the public, educators, and local or other governments, such as Town Council meetings, Statehouse press conferences, educational events, etc. After providing this description during the survey, the respondents were asked if they have ever watched PEG access channels. Eight-two percent of cable subscribers responded that they have, with 85 percent of those who have ever watched PEG channels in the past 12 months.

Exhibit 31 Hours Spent Watching PEG Channels in Past 12 Months



Fifty-one percent of cable subscribers have watched a town meeting on a PEG access channel. Nearly thirty-nine percent of Vermonters with a cable subscription reported that PEG channels are *very important*.

Exhibit 32 Importance of PEG Access Channels to Cable Subscribers

	Vermont	Champlain Valley	Northeast Kingdom	Central	Southern
Very important	38.61%	24.32%	57.14%	44.83%	54.17%
Moderately important	38.61%	44.59%	14.29%	44.83%	29.17%
Little importance	15.82%	21.62%	14.29%	6.9%	12.50%
Unimportant	6.96%	9.46%	14.29%	3.45%	4.17%

Telecommuting

Forty-four percent of respondents reported that they worked for pay or profit in the week prior to the survey. Of those who did, 26 percent spent at least one day where they worked mostly in a home office, with nearly eight percent working five or more days from a home office.

Of respondents who were employed, about seventeen percent of respondents used the internet most of the time for their work, while more than two-thirds use the internet less than half of the time or not at all.

Exhibit 33 Time Spent Online or on the Telephone for Business or Employment Purposes

Last week, in the course of your business or employment, how much time did you spend on the telephone or online?

Most of the time	17.22%
About half the time	11.44%
Less than half of the time	48.80%
None of the time	21.92%

About 14 percent of workers telecommute at least one day per week on a regular basis with six percent reporting that they telecommute every day. This is similar to 2009 where 14 percent reported telecommuting at least one day per week on a regular basis. Another 18 percent reported telecommuting occasionally. This is similar to 2009, where 19 percent reported telecommuting occasionally. Slightly more than three percent of those who never telecommute expect to begin doing so next year, and another four percent did not know what their plans would be.

Exhibit 34 Telecommuting Behavior

Telecommuting means working at home with the capability to connect to your office's computer network. Do you telecommute?

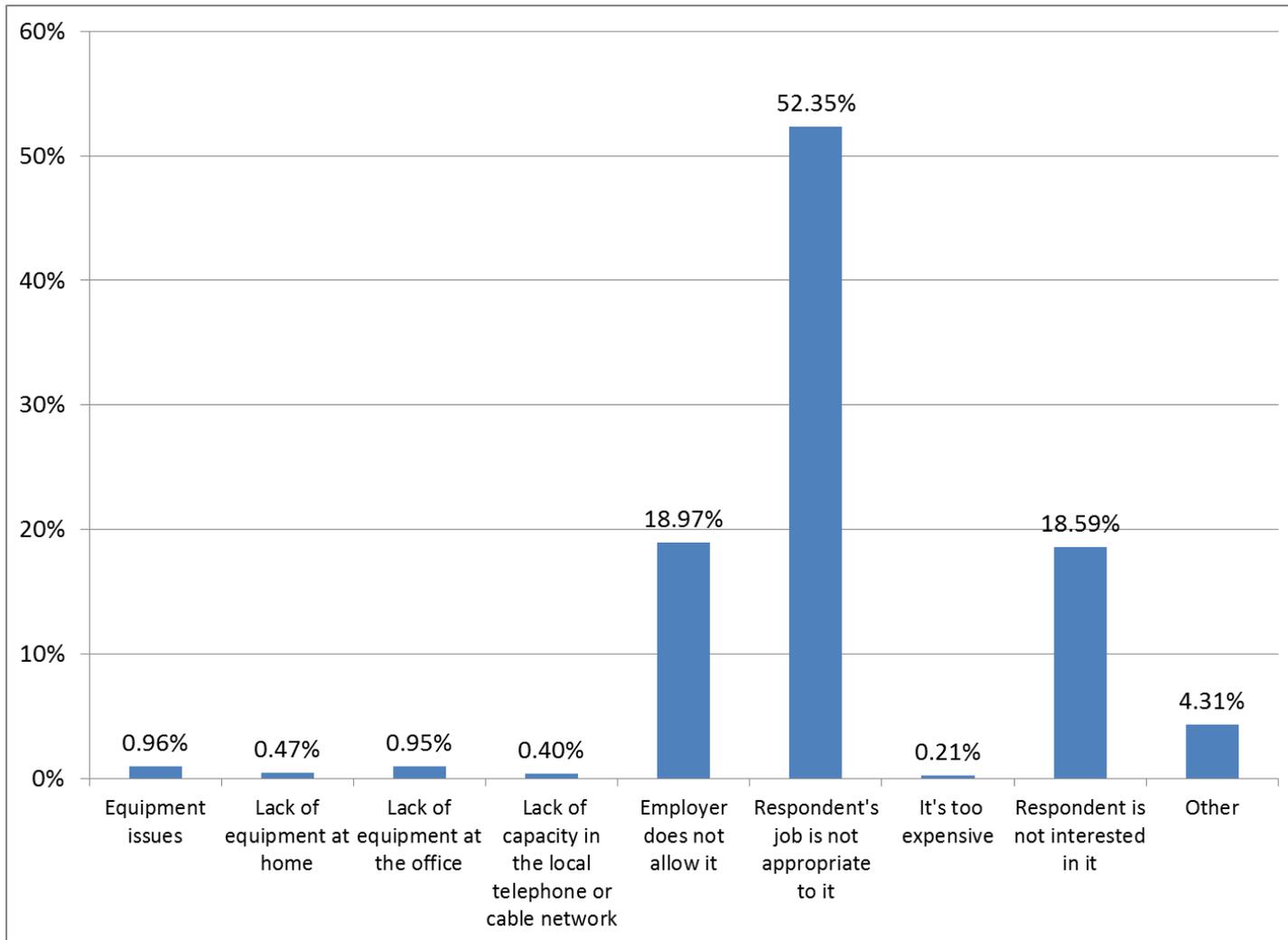
Everyday	6.24%
One or more days per week on a regular basis	7.78%
Occasionally	17.79%
Never	67.90%

Do you expect to begin telecommuting in the next year?

Yes	3.35%
No	91.81%
Don't Know	4.45%

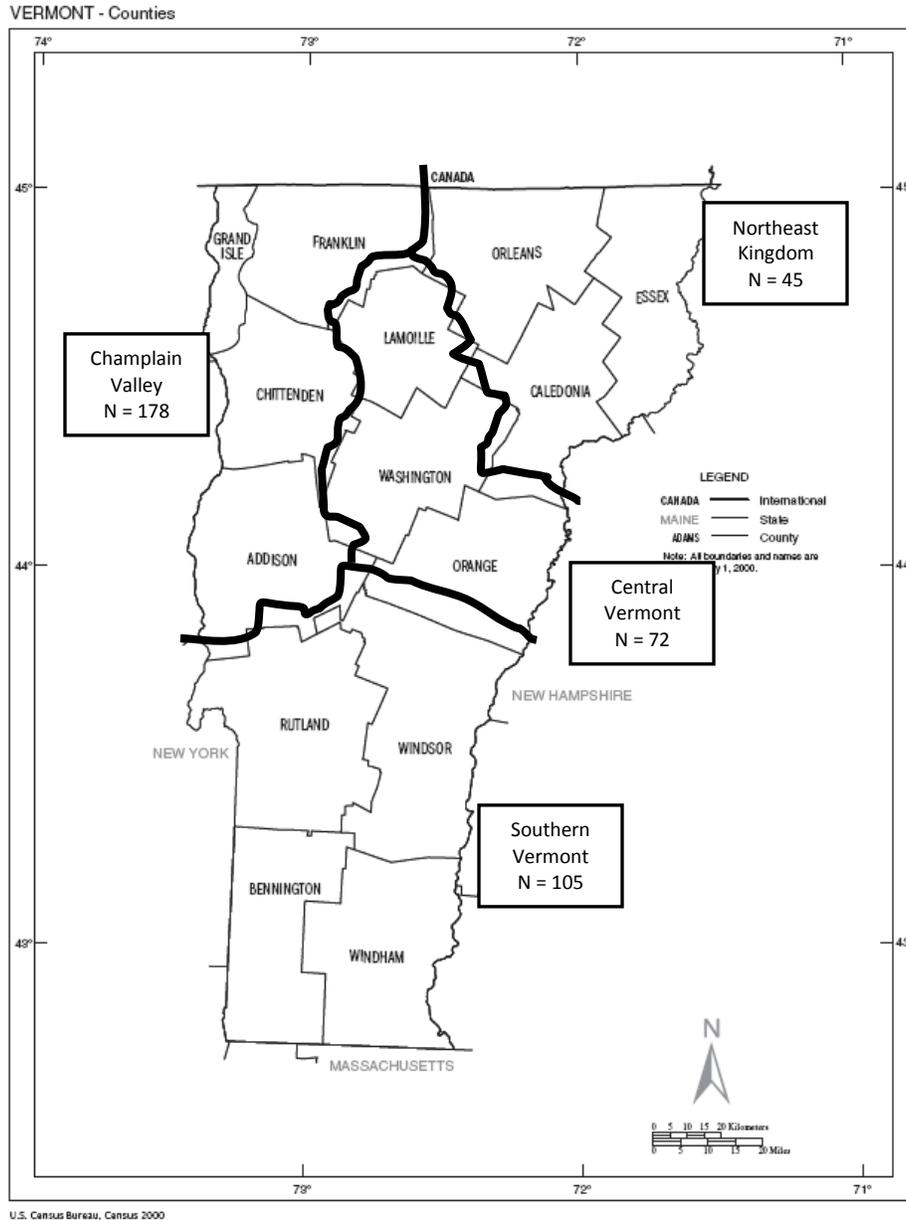
When asked about barriers, more than half responded that their occupation is not appropriate for telecommuting. About 19 percent reported that they were not interested, and another 19 percent reported that their employer does not allow it. Many fewer people reported that lack of equipment (at work or at home) was a barrier.

Exhibit 35 Reasons for Not Telecommuting



Survey Methodology

The sample for the Vermont Telecom Residential Survey was a dual-frame Random Digit Dialing (RDD) sample. The survey is referred to as “dual-frame” since some Vermont residents were selected from a cell phone sampling frame, and some Vermont residents were selected from a landline telephone frame. In total, 400 Vermont residents were interviewed—301 on landline phones and 99 on cell phones. The landline sample was stratified into four regions of the State: Champlain Valley, Northeast Kingdom, Central Vermont, and Southern Vermont.



Interviewers asked for the adult (18+) member of the household “who knows the most about the telephone and internet services that your household uses.”

Interviewing took place between July 30, 2012 and September 4, 2012 for residential consumers. Attempts to reach the household were made on weekdays, weeknights, and weekends between the hours of 9 AM and 9 PM. The questionnaire averaged 19.4 minutes in length (19.5 for landline and 19.1 for cell phone).

Exhibit 36 Demographics of Survey Respondents

	Residential Survey	
	Landline	Cell
Gender		
Male	40.86%	52.53%
Female	58.80%	47.47%
Age Group		
18-24	1.00%	7.07%
25-34	5.65%	10.10%
35-44	9.97%	17.17%
45-54	24.58%	33.33%
55-64	26.25%	25.25%
65+	29.24%	7.07%
DK/Ref	3.32%	0.00%
Educational Attainment		
LT HS	1.66%	2.02%
HS Grad	25.91%	24.24%
Some college or Tech school	21.59%	21.21%
College degree	24.58%	27.27%
Graduate Degree	22.59%	24.24%
DK/Ref	3.65%	1.01%
Income		
Less than \$15,000	3.99%	7.07%
\$15,000-\$25,000	10.63%	9.09%
\$25,000-\$35,000	8.64%	5.05%
\$35,000-\$50,000	13.29%	11.11%
\$50,000-\$75,000	17.61%	16.16%
\$75,000 or more	26.25%	40.40%
DK/Ref	19.60%	11.11%

The residential sample was weighted to account for unequal selection probabilities, non-response in the cell phone survey, and finally weighted to match the Vermont demographics of age, gender, and educational attainment. The weighting is described in detail in Appendix A.

The non-residential survey was administered to 521 non-residential organizations. All public, private, non-profit, and educational organizations were eligible for the survey. The organizations were selected from the Dunn & Bradstreet database. All interviewing took place between 9AM and 5 PM, Monday through Friday, beginning July 31, 2012 and ending September 4, 2012. The questionnaire averaged 15.8 minutes in length.

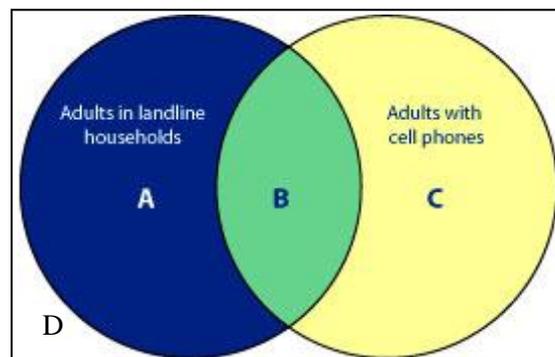
Exhibit 37 Summary Characteristics of Non-residential Respondents

Number of locations in Vermont	Non-Residential Survey
1	86.37%
2	9.21%
3+	4.42%
Primary Location	
In Vermont	97.70%
In residence	48.33%
Not in residence	51.08%
DR/Ref	0.59%
Not in Vermont	2.11%
DR/Ref	0.19%
Customers Served	
Mostly in Vermont	52.02%
Mostly outside of Vermont	10.56%
Both in and outside Vermont	36.66%

Appendix A: Landline and Cell Dual-Frame Weighting

A landline and cell phone dual-frame sampling design requires a weighting plan that ensures that the frames are combined so that the survey respondents accurately represent the population. The Venn diagram (Exhibit C-1) displays three populations covered by the cell and landline sampling frames. Adults with a landline but no cell phone (A) must be reached through a landline telephone sample. Adults with a cell phone and no landline (C) must be reached through the cell phone sample. Adults with both a landline and a cell phone (B) can be reached through either of the frames. The population with no telephone (D) is not covered by either frame, but is only two percent of the population.

Exhibit C-1: Overlap between the two telephone sample components



An outcome of the dual frame weighting process is an estimate of the cell-only population in Vermont. The estimate is based on dual-frame estimation methods, described in the *Combine landline sample with cell phone sample* section. The accuracy of the estimate is improved with a non-response adjustment described in *Cell phone response adjustment: propensity model methodology* section. The results of this estimation produce an estimate of the cell-only population of 17 percent.

Base weights

The weighting process begins by computing sampling weights that reflect the unequal probabilities of selection. Specifically, sampling weights are the reciprocal of the probabilities of selection. This weighting adjustment accounts for the oversampling of the Northeast Kingdom and Central Vermont Regions.

Combined landline sample with cell phone sample

The cell phone survey will include the following question designed to adjust for the overlap between the two components: “In addition to your cell phone, is there at least one telephone inside your home that is currently working and is not a cell phone? Do not include telephones only used for business or telephones only used for computers or fax machines.” Those who respond ‘yes’ are cell and landline adults, while those who responded ‘no’ are cell-only adults. Similarly, the landline survey will ask the question, “In addition to your residential landline telephone, do you also use one or more cell phone numbers?” Those who answer ‘yes’ are cell and landline, while those who respond ‘no’ are landline only. Based on these questions, We classify respondents as follows emulating the notation in Exhibit C-1:

- a_1 : Landline respondents without a cell phone
- b_1 : Landline respondents with a cell phone
- b_2 : Cell phone respondents with a landline
- c_2 : Cell phone respondents without a landline

We estimate the phone user group population totals using the fact, illustrated in Exhibit C-1, that the sum of the phone group percentages equals one, $P_A + P_B + P_C = 1$. This can be restated in terms of the dual user group, $P_B = 1/(P_A/P_B + 1 + P_C/P_B)$. We estimate the number of landline-only adults relative to dual-user adults (P_A/P_B) and the number of landline-only adults relative to dual-user adults (P_C/P_B) using the sample estimates a_1 , b_1 , b_2 , and c_2 . Thus, an estimate of the dual-user percentage is $\hat{p}_B = 1/(a_1/b_1 + 1 + c_2/b_2)$. The estimated percentages for landline-only adults and cell phone-only adults are derived from this estimate. Specifically, the estimate of landline-only adults is $\hat{p}_A = \hat{p}_B(a_1/b_1)$ and the estimate of cell phone-only adults is $\hat{p}_C = \hat{p}_B(c_2/b_2)$. Estimated population totals for the user groups (\hat{A} , \hat{B} , \hat{C}) are calculated by multiplying the total population by each estimated percentage.

Cell phone response adjustment: propensity model methodology

Prior to estimating the user group population totals, we weight the cell phone respondents based response propensity. Cell phone surveys tend to over-represent cell users who use their cell phone more often such as those who are cell-only and cell-mostly. In other words, the sample will have a higher percentage of cell-only and cell-mostly users relative to dual users and landline-only users. To reduce the cell-only bias inherent in cell phone surveys, We will adjust the cell phone sample using a response propensity model. The model will estimate the probability of observing a cell phone respondent in a cell phone sample relative to observing a cell phone respondent in the NHIS, an in-person survey that is not skewed according to cell phone use. The predictor variables include age group, race group, and the key variable that describes an individual’s cell phone use with four categories:

- Does not have a landline (cell-only);

- Very few or none received on a cell phone (mostly landline);
- Some received on a cell phone and some on a regular landline phone (dual); and
- All or almost all calls received on a cell phone (cell mostly)

The model is built using a national cell phone sample and data from the National Health Interview Survey NHIS, which tracks the phone status for the U.S. population. This national model can be applied at state and local levels under the assumption that response propensities for cell phone users do not vary across geographies.

With estimates of the population totals, we weight-adjust the landline sample and the cell sample to their respective population estimates:

- The landline only sample (a_1) to the landline population (\hat{A});
- The cell-only sample (c_2) to the cell-only population (\hat{B}); and
- Each dual user sample (b_1, b_2) separately to the dual user population (\hat{C}).

The dual-user groups (b_1, b_2) can be further classified into three subgroups. Sample sizes for the two groups are broken down for those who receive most calls on cell phone (b_{13}, b_{23}), those who receive most calls on landline (b_{11}, b_{21}), and those who receive calls on both regularly (b_{12}, b_{22}). To permit this finer adjustment, the survey will ask dual users (landline and cell), “Of all the telephone calls that you receive, are...”

- All or almost all calls received on a cell phone?
- Some received on a cell phone and some on a regular landline phone?
- Very few or none received on a cell phone?

Each of the three dual-user groups is represented by samples from the landline and the cell samples, both weighted to the population. For each of the three dual-user groups, we average the two sets of weights with a composite weight based on sample size and estimated design effect:

$$f_j = \frac{b_{1j} / deff_{1j}^2}{b_{1j} / deff_{1j}^2 + b_{2j} / deff_{2j}^2}, \text{ where } deff_{1j} = b_{1j} \sum_{b_{1j}} w_1^2 \times \left(\sum_{b_{1j}} w_1 \right)^{-2}.$$

By weighting by inverse variances (the square of the design effects divided by sample sizes), or by the reciprocals of effective sample sizes, the weighting coefficients are developed to minimize mean square errors of the composite weighted estimates.

Population Weighting

Finally, the combined cell phone and landline sample is weighted to match the Vermont adult population based on age, sex, and educational attainment.