Center for
Technology in Government

Broadband Internet Service Adoption and Use in New York State Households

Prepared by the Center for Technology in Government
University at Albany-SUNY

In collaboration with the
Center for Survey Research
Stony Brook University-SUNY
and
The Rockefeller Institute of Government
University at Albany-SUNY

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Executive Summary

Broadband access for households has become an important resource for individuals and communities. A high speed connection to the internet provides opportunities for a great many economic, social and cultural benefits. This study was to done to explore the extent to which those opportunities and benefits are currently available to households in New York State. With the support of the NY State Office of Cyber Security, and the New York State Broadband Development and Deployment Council, the Center for Technology in Government partnered with Stony Brook University to conduct the study. We surveyed 3044 New York households to discover the extent of availability and adoption of broadband services and how they are used. We also asked about the social and economic characteristics of the households to explore how those factors affect broadband adoption and use. The results presented here cover 1002 surveys covering the state as a whole and an oversample of 2042 surveys in low income counties.

These results show that adoption and use are wide spread and diverse, with a pattern of high user satisfaction overall, but substantial disparities in access and adoption for economically and socially disadvantaged New Yorkers. Broadband was reported as available by 92% of the sample, with just under 67% as the overall adoption rate. Broadband service is primarily by cable providers (58.7%), another 32.3% divided between optical fiber (8.1%) and digital subscriber line (DSL: 22.2%), and the remainder a mix of satellite, dialup, and cellular. There are lower adoption rates in the poorer counties (around 63%) and at 72% in the state-wide part of the sample. Adoption rates vary in significant ways across racial, economic, and educational levels, as well as by age and employment status. Only 37% of the poorest households (<$20,000) had broadband service, with over 91% adoption in the richest households. Respondents with less than a high school education and those over 65 had some of the lowest adoption rates—44% and 39% respectively. However, the group with the lowest adoption rate (20%) was those rating themselves as “very low” on internet skills.

Uses of broadband and barriers to adoption were similarly eclectic. About 23% of the overall sample reported working from home using an internet connection. Overall, the most frequent uses were social (e.g., links to family and friends), cultural (e.g., access to music and video), economic (banking, shopping), and information access (news, government information, etc). Patterns of use do vary among the demographic groups, but by relatively small amounts compared to adoption rates. Reasons for non-adoption, besides unavailability, were a mix of too expensive, lack of interest, and a perception of high risk due to malware, offensive material, and threats to children. These reasons were fairly consistent across demographic groups.

This picture of adoption and use is grounds for optimism but not complacency. Adoption rates and satisfaction are high overall. However disparities in access and opportunity are substantial and disproportionately affect the less privileged groups of New Yorkers. No single strategy appears sufficient for these challenges.

The report recommends a combination of initiatives to reduce the overall costs of broadband, reduce knowledge and attitude barriers, and encourage investment in greater access and online security. Since the economic benefits of broadband are important for business as well, the report recommends additional research on access, adoption, and use among users, especially small businesses in the low income areas of the state.

Project Background

The project was undertaken in response to a request from the New York State Office of Cyber Security (OCS) in support of the activities of the New York State Broadband Development and Deployment Council. OCS is the recipient of a State Broadband Data and Development grant funded by the National Telecommunications Information Administration.. The project was designed to develop and apply a method for answering basic questions about the access to and adoption of broadband internet services by New York State households.[1] The project research addressed these questions:

- How do the demographics of New York State in terms of income, educational attainment, ethnicity, region, and age affect access to and uptake of broadband internet services by New York State residents?
- What other factors affect the access to and uptake of broadband internet services by New York State residents?
- What are the barriers to adoption of broadband services (e.g. cost, education, language, other cultural factors)?

The project team sought answers to these questions with household surveys planned to occur in two phases. Phase 1 included analysis of data from completed surveys collected up to January 5, 2011, presented in a preliminary report. The second phase included in this report covers all data from the 2064 surveys in the preliminary report combined with an additional 980 collected to complete the minimum of 3000 surveys called for in the project plan. Those results are presented in the sections below.

Project Organization

The survey design and development are the product of a collaboration among the CTG project team and staff of the Center for Survey Research (CSR) at Stony Brook, SUNY. The CSR conducted the data collection portion of the project. CTG was responsible for designing the data analysis and reporting of project results. The CTG project team collaborated with The Nelson A. Rockefeller Institute of Government (RIG) for assistance with data analysis and presentation materials under the direction and support of the CTG team.

Sampling Design

Two sampling levels were used: (1) a sample of 1002 New York State residents chosen to be representative of the state as a whole (the *New York State sample*); and (2) an oversample of 2042 New York State residents in low income counties selected to represent concentrations of underserved populations. A minimum of 1000 completed surveys was required for the state-wide sample, with 1002 reported here, and 2042 additional completed surveys for the low income counties with median family incomes below 80 percent of the state average.

1. By broadband adoption we mean the choice by a household to subscribe to available broadband Internet services. The FCC defines a broadband connection as one that provides two-way data transmission to and from the Internet with advertized speeds of at least four megabits per second (mbps) downstream and greater than one megabit per second upstream. By this criterion not all satellite internet service qualifies as broadband, as does 3G and 4G cell phone service and wide-area wireless service, though these land-based wireless services are not available in all areas of the state.

The Survey

The survey instrument was developed by the CRS and CTG, based in part on the recent surveys by the FCC and the Social Sciences Research Council.[2] The instrument includes questions about the respondent's demographic characteristics, location, availability of, access to, types of internet use, purchase decisions for broadband services, reasons for use/non use, and related technical information. All but two items are closed-end, fixed choice in form.

Surveys were conducted by telephone, including land line and cellular. The overall data collection was concluded in as short a time as possible to limit the effects of changes in broadband services or availability.

Responsibility for Results

At the completion of the survey phases, the CSR submitted the survey results (an SPSS file) along with sufficient documentation of the data structure and coding to support comprehensive analysis. Aside from reviewing the data for purposes of error checking and cleaning, the polling organization was not responsible for additional analysis or narrative reporting concerning the results. The CSR was responsible for submitting a written report describing the polling methods and any additional information needed to support subsequent analysis. The Rockefeller Institute provided data analysis with methodological comments and preparation of results in tables or charts.

The Survey

The survey results include data from telephone interviews conducted between November 12, 2010 and February 11, 2011. In those calls, residents of New York State were asked about their Internet connections and activities, primarily targeted at home use. Phone numbers were obtained through a list-assisted method of random-digit-dialing, and up to seven contact attempts were made to each household phone number selected. Once contact was established, the interviewer asked for responses from an individual 18 years or older considered to be "most responsible for all computer connections to the Internet." To assure the most representative sample possible, all households and individuals initially unwilling to participate in the survey were contacted again, and an attempt was made to persuade them to participate.

A total of 3044 interviews were completed for the data reported. One thousand and two interviews were conducted in the general population of New York State, with 303 respondents located in New York City (Bronx, Kings, New York, Queens, and Richmond Counties), 172 respondents in the surrounding suburbs (Nassau, Rockland, Suffolk, and Westchester Counties), and 527 respondents in counties in upstate New York. An additional 2042 interviews were conducted with a targeted oversample, consisting of respondents in three regions: 1) the Bronx (516 completes), 2) Brooklyn (506 completes), and 3) upstate (1020 completes). This latter, upstate region consisted of respondents living in 19 counties: Allegany, Broome, Cattaraugus, Chautauqua, Chemung, Chenango, Delaware, Essex, Franklin, Hamilton, Herkimer, Jefferson, Lewis, Montgomery, Oswego, Otsego, Steuben, St. Lawrence, and Yates Counties. These 19

2. John B. Horrigan. *Broadband Adoption and Use in America, OBI Working Paper Series No . 1*. Washington, D.C.: Federal Communications Commission, 2010. Dharma Dailey, Amelia Bryne, Alison Powell, Joe Karaganis, and Jaewon Chung. *Broadband Adoption in Low-income Communities Version 1.1*. New York: Social Science Research Council, March 2010.

counties were chosen because their median household income was below 80% of the state median household income.

For the data reported, margins of error depend on the sample size used. For the main sample of 1,002 respondents, the margin of error is +/- 3.1%. For the oversample in the upstate region, the margin of error is +/- 3.1%. For the oversamples in the Bronx and Brooklyn, the margin of error is +/- 4.3 and 4.4%, respectively.

To correct for sample bias, a set of weights derived from U.S. Census American Community Survey (ACS) state- and county-level data was applied to each sample group (general population, Bronx, Brooklyn, and upstate region). These weights compensate for a lower response rate among certain groups, such as minorities, males, less educated, lower income individuals, and employed individuals. These individuals tend to be underrepresented in the sample. The weights were used in the statistical analyses referred to below.

Questions Summary

Demographic questions regarding age, income, race, gender, internet skills, etc. were asked of all respondents. Also, all participants were asked whether they possessed an internet connection in their homes and its nature. Those interviewees who indicated that they had a cable, DSL, fiber, satellite, or cellular connection, or that their connection was “not dialup but not sure what it is” were deemed “high speed” respondents. The remainder were grouped as “dial-up” or “none” respondents.

“High speed” respondents were asked a series of questions that break down into three categories. The first group was general in nature: type of connection, provider, cost, satisfaction, etc. The second group queried their internet usage: shopping, education, social networking, etc. The last group reviewed the same usages and asked whether each was a major, minor, or not a reason for subscribing.

The remaining respondents were further subdivided according to whether high speed internet was available in their area. For those participants who could subscribe, the reasons for not doing so were explored: not interested, no time, too expensive, lack of ability, etc.

Respondents for whom broadband access was not available were divided further between those would subscribe if it were available and those who would not. Those who would subscribe were asked how they would use internet if available, such as for shopping, education, social networking, etc. in terms of whether each type of use would be a major, minor, or not a reason for subscribing. Those who would not subscribe even if high speed internet were available were asked the reasons got their preference in terms of lack of interest, no time, too expensive, lack of ability, etc. The entire survey is included in Appendix A.

Analysis Methods

The results reported here include two types of analysis: descriptions of the respondents in the sample and their responses to individual questions, and analyses exploring reasons for variation in broadband adoption and use. The latter analyses focus primarily on how broadband adoption and use varies across minority or disadvantaged groups (low income, age, racial/ethnic minority, etc.), and the rest of the sample. The analysis includes pair-wise examination of demographic

factors related to broadband adoption and use (using Pearson chi-square tests of independence and linear regression). The demographic variables are :

1. Age: 18-24; 25-34; 35-49; 50-64; 65+; unknown.
2. Education: less than high school diploma; high school diploma; some college; bachelor's degree; graduate +; unknown.
3. Employment: full-time employed; part-time employed; self-employed; unemployed; retired; other.
4. Income: less than $20,000; $20,000-$35,000; $35,000-$60,000; $60,000-$100,000; more than $100,000; unknown.
5. Ethnicity/Race: white, black/African American; Hispanic/Latino; Asian; other.
6. Marital Status: single, married/living with partner; other.

The binary dependent variable for the chi-square and regression analyses was coded as "high speed" (those that responded "cable, fiber, DSL, or not dial-up but not sure what it is") or "not high speed" (those without internet connection or those who responded "dial-up, satellite, cellular, don't know").

The chi-square analysis for all these demographic variables showed a statistically significant relationships with the presence or absence of a broadband connection. For all variables the statistical results indicate a robust relationship of each demographic variable with the likelihood of broadband adoption.

The results of the chi-square analysis were used to construct a statistical model of broadband adoption. The further analysis examined the degree to which the model could account for the combined effects of the demographic variables on broadband adoption. This test was done using ordinary least-squares regression. The basis for the regression model and details of the analysis results are available in detail in Appendix B. The findings from the model analysis are presented in a later section below.

Results

Sample Characteristics

The tables (1-7) below show the number of respondents and their reported demographic characteristics. For the basic demographic variables we report the weighted and unweighted numbers to show the actual response rates and how they were adjusted. The weighting takes into account how characteristics of the sample diverge from the state population as a whole. Some of these differences are the likely consequences of the survey method, namely telephone interviews to home and personal cell phone numbers conducted during the day. The sample therefore somewhat over-represents the elements of the population less likely to be at home during the day or not reachable by phone. The weighted results are adjusted to ensure the results of the analysis are as close as possible to what would result from an unbiased sample. The downstate responses are those from Nassau, Rockland, Suffolk, and Westchester counties. In the interest of keeping the body of the report to manageable length, the remaining analyses of broadband adoption and use report only the results for the weighted sample. The results for the unweighted analyses are available from the author on request.

Table 1 - Age of Sample Respondents v. NY State

Table 1: Age of Sample Respondents				
Age Group	Reported		Weighted	
	Number	Percent	Number	Percent
18-24	154	5.1	268	8.8
25-34	289	9.5	567	18.6
35-49	728	23.9	785	25.8
50-64	894	29.4	753	24.7
65 & over	735	24.1	540	17.7
Unknown	244	8.0	131	4.3
Total	**3,044**	**100.0**	**3,044**	**100.0**

Table 2 - Gender of Sample Respondents v. NY State

Table 2: Gender of Sample Respondents				
Gender Group	Reported		Weighted	
	Number	Percent	Number	Percent
Female	**1,862**	**61.2**	**1,600**	**52.6**
Male	**1,177**	**38.7**	**1,434**	**47.1**
Unknown	**5**	**0.2**	**10**	**0.3**
Total	**3,044**	**100.0**	**3,044**	**100.0**

Difference in the racial/ethnic distributions in the actual sample versus the weighted sample are likely the result of different factors. The sample differences may be the result of respondents who assigned themselves to categories included as “Others” or proportion of unknown or refused answers. The current ACS and Decennial Census have more detailed racial categories that are too long and complicated for use in phone interviews, so the simpler categories were used. The underrepresentation of Black/African American Hispanic/Latino proportions in the unweighted sample is likely a result of the oversample in the low income upstate counties that have relatively larger White-Non Hispanic populations.

Table 3 - Race of Sample Respondents v. NY State

Table 3: Race of Sample Respondents				
Race Group	Reported		Weighted	
	Number	Percent	Number	Percent
White	**2,062**	**67.7**	**1,926**	**63.3**
Black / African-American	**456**	**15.0**	**519**	**17.0**
Hispanic / Latino	**203**	**6.7**	**359**	**11.8**
Asian	**78**	**2.6**	**65**	**2.2**
Other / Unknown	**245**	**8.0**	**175**	**5.8**
Total	**3,044**	**100.0**	**3,044**	**100.0**

The distribution of household income in (Table 4) reflect the adjustment of the sample for oversampling in the low income areas. The unweighted sample has a disproportionately low

frequency in the lower income ranges than the population as a whole. The weighted frequencies produce a distribution closer to what would be expected due to the oversampling of low income areas of the state. However, these distributions should be interpreted with caution due to the large proportion in the "Unknown" category—large numbers of respondents refused to answer the income question.

Table 4 - Household Income of Sample Respondents v. NY State

Table 4: Household Income of Sample Respondents				
Household Income Group	Reported		Weighted	
	Number	Percent	Number	Percent
Less than $20,000	312	10.2	522	17.1
$20,000 to $35,000	313	10.3	503	16.5
$35,000 to $60,000	450	14.8	559	18.4
$60,000 to $100,000	513	16.9	563	18.5
More than $100,000	397	13.0	450	14.8
Unknown	1,059	34.8	446	14.7
Total	3,044	100.0	3,044	100.0

The education level distribution (Table 5) is somewhat more difficult to interpret. The unweighted sample distributions show a somewhat higher overall education level than the 2009 ACS NY state data for the state. As with the income levels, the weighted distribution is a better representation of the overall education levels in the state.

Table 5 - Education Level of Sample Respondents v. NY State

Table 5: Education of Sample Respondents				
Education Group	Reported		Weighted	
	Number	Percent	Number	Percent
Less than High School	239	7.9	488	16.0
High School graduate	712	23.4	906	29.8
Some College	816	26.8	759	24.9
Bachelor's degree	611	20.1	478	15.7
Graduate degeree	545	17.9	321	10.6
Unknown	121	4.0	92	3.0
Total	3,044	100.0	3,044	100.0

The marital status of the original and weighted samples is very similar. However there are some differences from the ACS NY state data. The 2009 ACS results are not directly comparable to our survey since the 2009 ACS includes ages 15–65 and does not include a category for living with partner, whereas our survey respondents were required to be 18 years or older, with no upper age limit. For rough comparison, the NY ACS data set shows 48.1% married (including separated), 36.9% never married, 8.5% divorced, and 6.4% widowed.

Table 6 - Marital Status of Sample Respondents v. NY State

Table 6: Marital Status of Sample Respondents				
Marital Status Group	Reported		Weighted	
	Number	Percent	Number	Percent
Married	1,549	50.9	1,435	47.2
Living with a partner	156	5.1	205	6.7
Separated	71	2.3	91	3.0
Divorced	298	9.8	277	9.1
Widowed	333	10.9	251	8.2
Never married	528	17.3	715	23.5
Refused	109	3.6	70	2.3
Total	3,044	100.0	3,044	100.0

Compared to some other demographic distributions, the employment status data for the sample (Table 7) are more closely comparable to the state as a whole. The direct comparisons are a bit are difficult, since both the 2009 ACS employment data and more recent 2010 Bureau of Labor Statistics (BLS) data for NY state report employment as a proportion of the labor force; our survey does not. The 2010 BLS data for NY state reports 57.1% employed and 6% unemployed. That compares closely with the 59% of the sample who reported being employed and the 8.5 % reported as out of work.

Table 7 - Employment Status of Sample Respondents v. NY State

Table 7: Employment Status of Sample Respondents				
Employment Status	Reported		Weighted	
	Number	Percent	Number	Percent
Employed full-time	1,170	38.4	1,316	43.2
Employed part-time	244	8.0	281	9.2
Self-employed	201	6.6	212	7.0
Out of work > 1 year	129	4.2	161	5.3
Out of work < 1 year	80	2.6	97	3.2
Homemaker	120	3.9	130	4.3
Full-time student	79	2.6	89	2.9
Retired	820	26.9	540	17.7
Unable to work	118	3.9	115	3.8
Don't know	14	0.5	20	0.6
Refused	69	2.3	83	2.7
Total	3,044	100.0	3,044	100.0

Overall, the demographic characteristics of the weighted sample support their use as representative of the state as a whole. While the demographics do differ in some ways from the overall statistics for the state, the differences are not large enough to justify substantial adjustments in the analysis or qualifications in the interpretations.

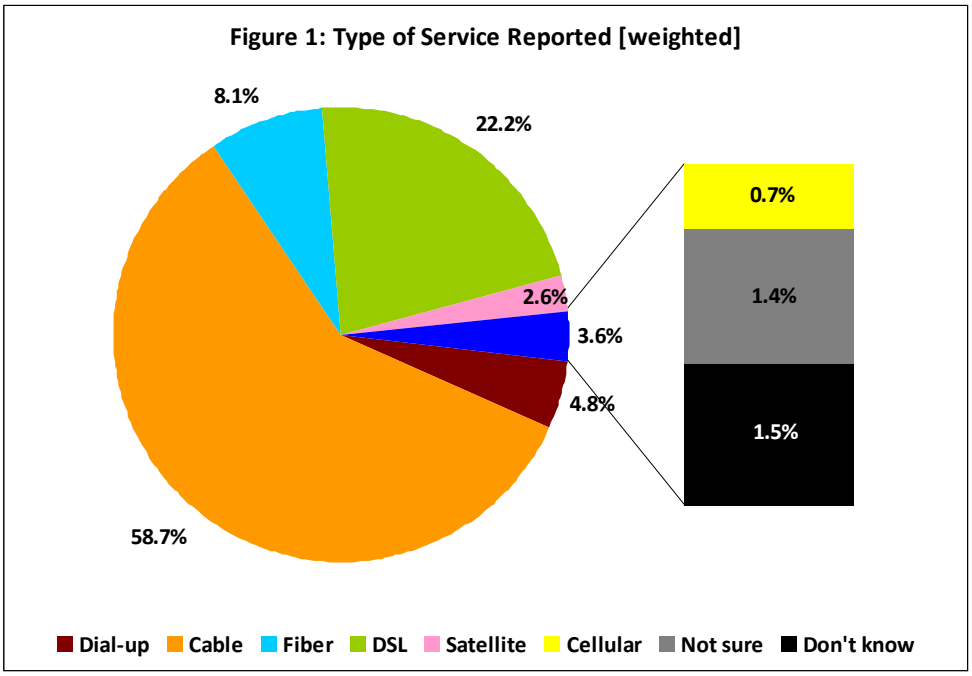
Broadband Service in New York

The main topics of concern for the report are broadband adoption and use. To better understand the findings in that regard, it is useful to map out the context of broadband service in New York.

Therefore, the survey includes questions about availability, service providers, cost, and user satisfaction as background for the subsequent in-depth analysis of adoption and use.

Broadband service in New York is characterized by a wide variety of service types. NY state subscribers acquire broadband services by most of the technologies currently available, though not uniformly across areas of the state. Fixed forms of wired service are the dominant type, accounting for just under 90% of the broadband subscribers in the survey, plus an additional 4% for dial-up. The proportions are shown in Figure 1 below.

Figure 1- Percent of Subscribers for Each Type of Broadband Service



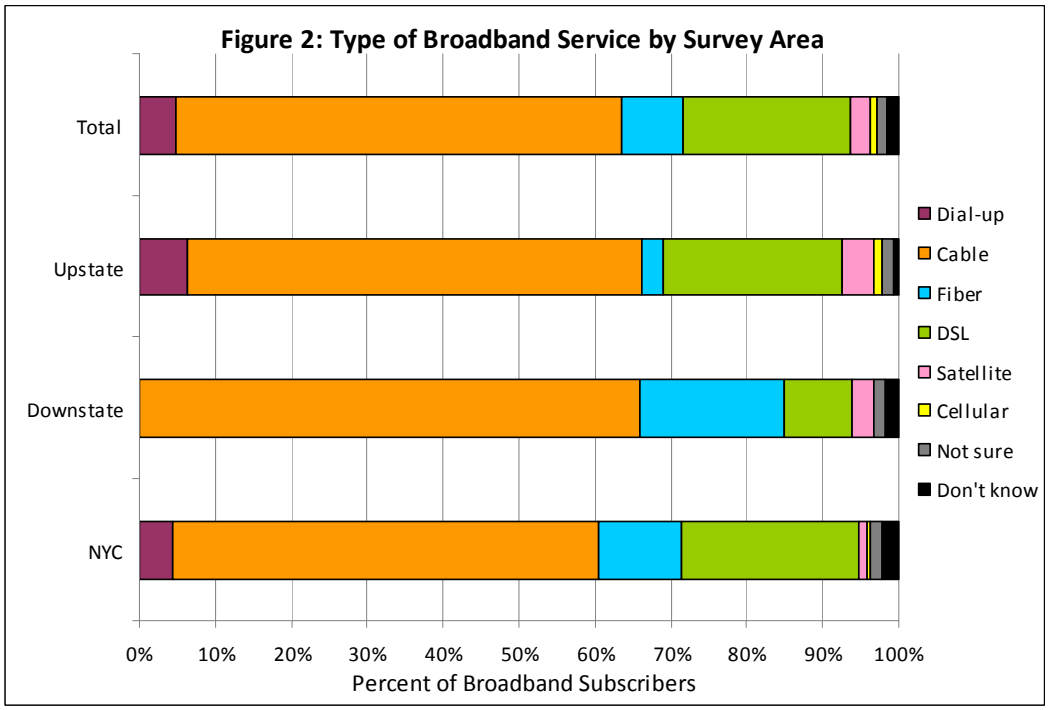
These proportions are very similar to those reported for the US in the 2010 FCC survey, which reported 58% cable modem service, 10% fiber, and 44% DSL.[3] However, the direct comparison with the FCC data is not possible because that survey includes multiple services per household and ours does not.

A view of the availability of different service types by area reveals some noteworthy differences as shown in

Figure 2 below. The figure shows the availability of cable modem service is roughly similar across the areas of the survey. In the downstate suburbs, however, dialup is virtually absent and fiber is more prevalent. DSL, by contrast, is much more common upstate and in NY City compared to the suburbs. Though the overall percentage is small, satellite service is more prevalent upstate.

[3] John B.Horrigan (2010) *Broadband Adoption and Use in America*. OBI Working Paper Series No. 1. Washington, DC: Federal Communications Commission.

Figure 2 - Type of Broadband Service by Survey Area



There are some differences across these regions in terms of broadband adoption. Subscribers in NY City and suburbs have had broadband on average longer (6 and 8 years respectively) than upstate (4.7 years). The monthly cost for broadband does not appear to vary substantially, on average, across these reasons. The estimated mean for NY City (over $49) and the downstate suburbs (over $48) was somewhat higher than for upstate ($43.65).[4] Differences are also rather small with respect to satisfaction with broadband service. Overall, slightly less than 92% of respondents answered "very satisfied" or "somewhat satisfied" with their service, with 56.4% marking "very satisfied." By region those reporting "very satisfied" ranged from a high of 62.5% in the downstate suburbs to 54% in NY City and 57% upstate. Taken together, the range of these difference is moderate, suggesting that overall regional disparities in broadband service, at least in the aggregate, are not a major problem.

Broadband Availability

In terms of broadband availability, although there is ample room for improvement across the state, the overall results are fairly positive. The availability of broadband overall is high, with over 92% of the households reporting broadband availability. The breakout of availability is also fairly consistent across the different areas covered in the sample, as shown in Table 8 below.

[4] These monthly cost figures are only estimates due to the large variation in actual reported cost data, which required eliminating many implausible outliers and a large proportion of refused or "don't know" responses.

Table 8 - Broadband Adoption by Region of Survey

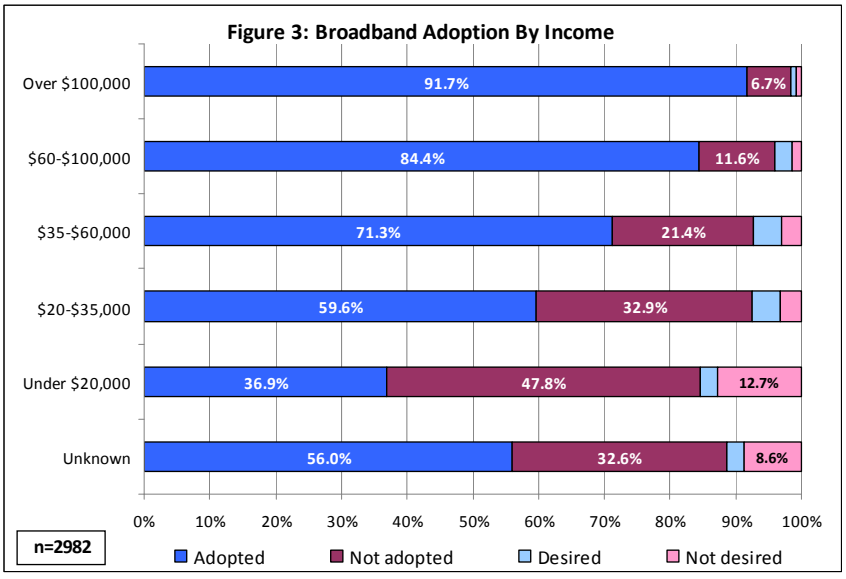
Table 8:Broadband Adoption by Region					
Region	Available		Not-Available		Total Number
	Adopted	Not adopted	Desired	Not desired	
NYC	63.6%	29.9%	1.5%	5.0%	1,410
Downstate	87.2%	8.7%	0.3%	3.8%	216
Upstate	67.1%	23.1%	4.8%	4.9%	1,356
Total	**66.9%**	**25.3%**	**2.9%**	**4.9%**	**2,982**

Despite generally low income in the two NY City counties, the broadband availability there is only slightly below the overall state rate. This is likely a consequence of the large numbers of subscribers in those high density areas as well as the lower cost per subscriber of building out urban networks. The generally lower incomes in the NY City counties and the upstate sample are reflected in the lower rates of adoption where broadband is available. In Brooklyn and the Bronx, non-adopters are over 30%, compared to around 20% in the rest of the state. This substantially underserved population will not necessarily be aided by more network expansion.

Demographic Factors in Broadband Adoption

Broadband availability in relation to the demographics of the population are more pronounced. Income clearly matters, as seen in Figure 3 below. Where broadband is available, the adoption rate in the lowest income stratum is little more than one-third of that in the highest income group, and half that of the middle income groups. The lowest income group also has the highest proportion of respondents who do not desire broadband service, even if it were available. this is likely linked to non adopters considering broadband service to be too expensive (see Figure 12Figure 12). Where broadband service is available, the non-adoption rates for the lower income groups (between $20,000 and $60,000) is high, from one in five to one-third of the households not adopting the service. The implication is clear that lack of affordability is a substantial barrier to full broadband adoption among a large proportion of New Yorkers.

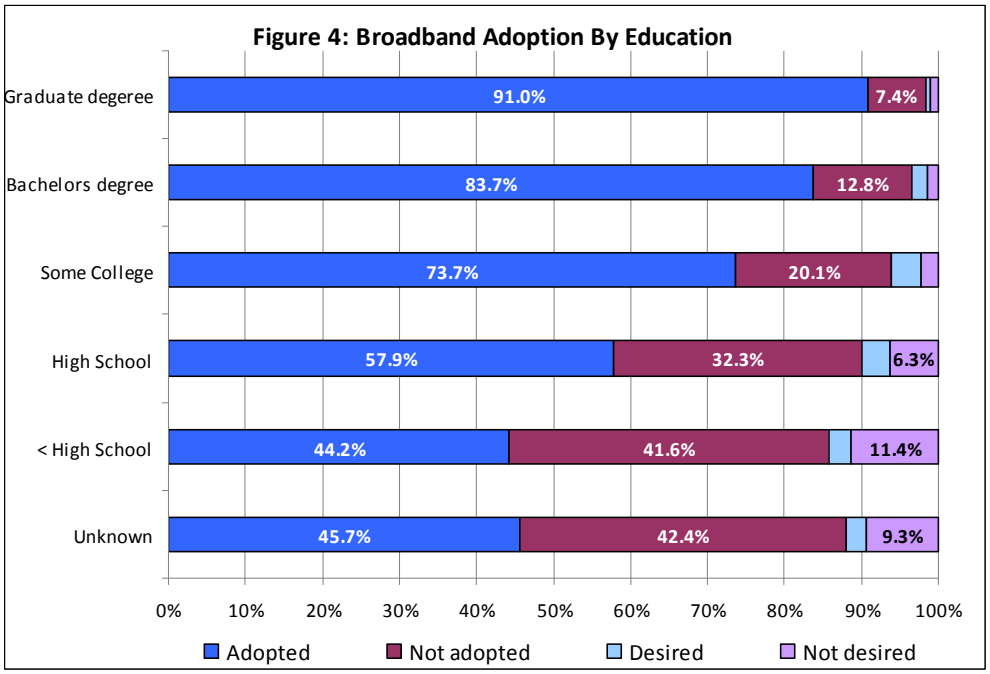
Figure 3 - Broadband Adoption by Type and Income



Because of the close association with income, the education level patterns evident in broadband adoption relative to income should be similar. That same pattern for education is evident in Figure 4 below. The survey protocol asked for answers from the person in the household most responsible for the computer connection, who may or may not have been the head of household. As a result, the reported education levels are for that person and reflect their characteristics and by extension those of the household, at least as far as broadband adoption is concerned.

The patterns in adoption rates by education levels are virtually identical to those for household income. The effects of lower educational advantages on broadband adoption match those for income and represent the same underlying socio-economic circumstances. Those most in need of the economic and social benefits of high speed internet access and use are those least able to acquire it.

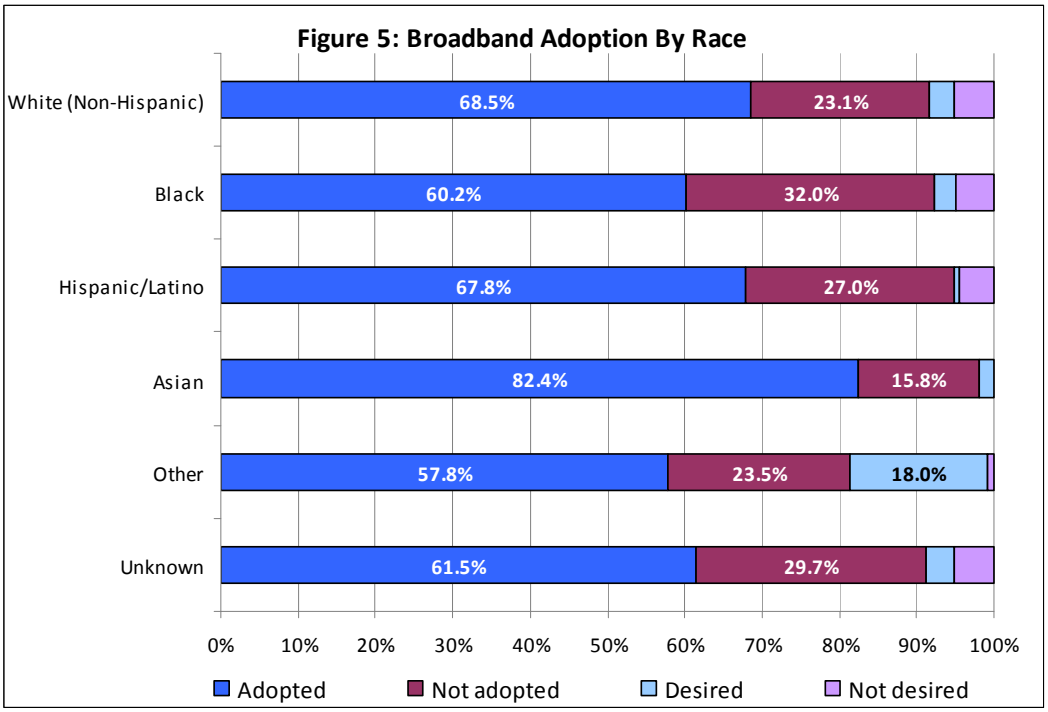
Figure 4 - Broadband Adoption by Education Level



Patterns of adoption by race of respondent do not reflect the same clear relationship to social and economic advantage as with income and education level (Figure 3 and Figure 4) above. This result is likely a consequence of the more complex relationship of race as defined by these categories with the income and education variables. The income distributions in the sample across these racial groups showed lower income generally in the Black and Hispanic/Latino respondents, but both groups reported over 20% in the two highest income levels. The Asian respondents reported a marked bimodal income distribution, with 37% in the two lowest levels and over 44% in the two highest levels. Similarly, the education levels across these racial categories vary widely. The Asian respondents reported the highest proportion of college degrees (52%) compared to the Hispanic/Latino respondents (less than 18%). The White respondents reported only moderate levels of college degrees (29%), and slightly over 20% for the Black

respondents. Both White and Black respondents reported relatively high proportion at the high school or less levels (50% and 44% respectively). In addition the large proportion of reported "Other" in the race categories adds additional complexity in the mix. Thus the weak relationship of race with adoption rates is consistent with the mix of income and education levels in the sample.

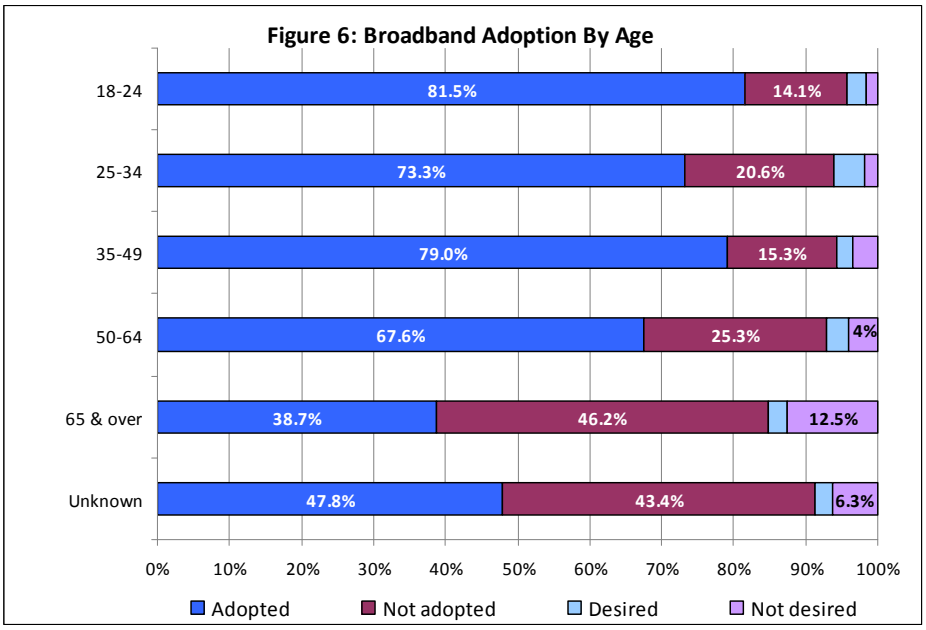
Figure 5 - Broadband Adoption by Race



As with higher income and education levels, stronger preferences for broadband adoption are associated with youth. The results in Figure 6 below show the highest adoption rates are in the lower age segments and highest non-adoption rates in the over-65 age cohort. The non-adoption rate for that highest age cohort is more than three times that among the 18-24 year-olds. There may be an income effect at work in this pattern as well, since the over-65 cohort has a lower income overall compared to the 18-24 cohort. Other research has shown that preferences of internet use or computer technology more generally tend to be lower among older age cohorts.[5] Preferences for or familiarity with online activities may increase over time but the affordability barriers are likely to remain.

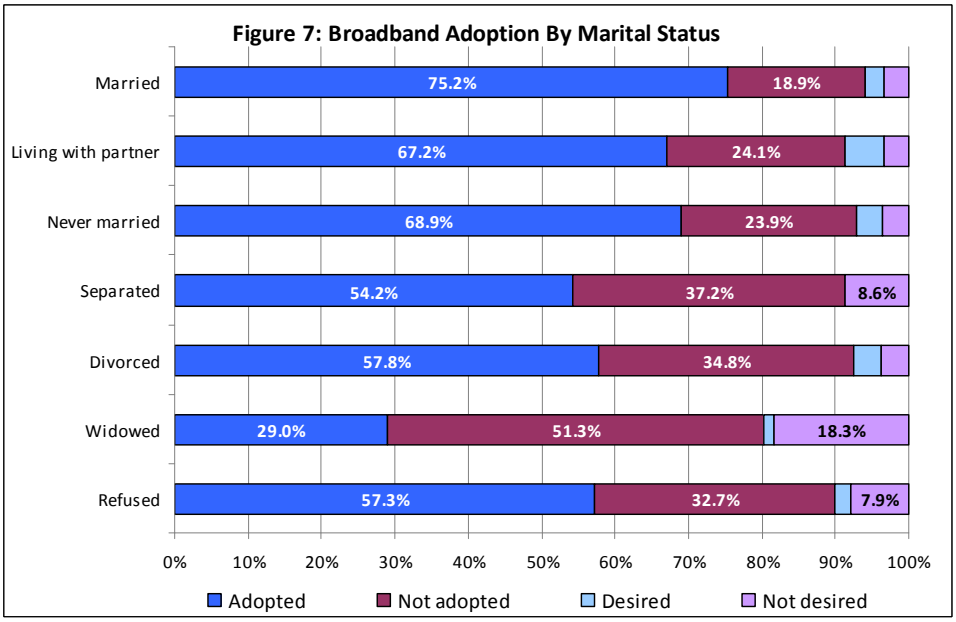
[5] See Aaron M. Cohen (2010) "Wiring the Elderly." *The Futurist* 44:2, p. 7-8; and Chee Wei Phang et al. (2006) "Senior Citizens' Acceptance of Information Systems in the Context of e-Government Services." IEEE Transactions on Engineering Management 53:4, p. 555-569.

Figure 6 - Adoption by Respondent Age



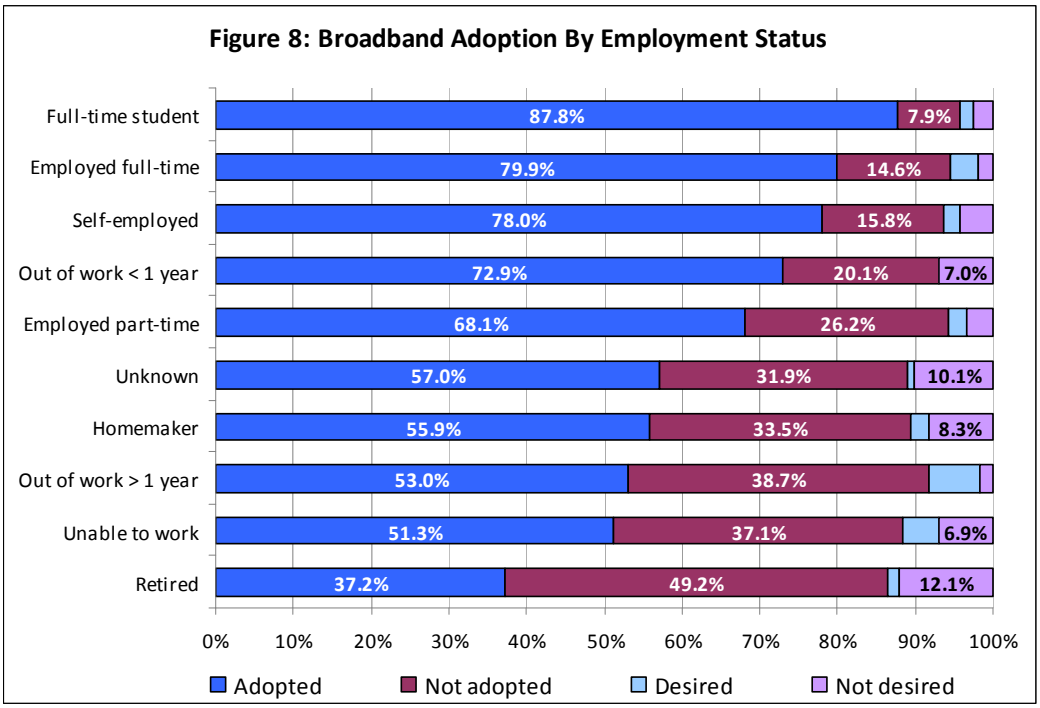
The relationship of broadband adoption rates with marital status mirrors the patterns with the other demographic factors (Figure 7 below). Respondents that are married, never married, or living with a partner have the highest adoption rates. These groups are younger and have generally higher income and education levels than the others. Thus, they are more likely to have a strong preference for and be able to afford broadband. The widowed cohort is by far the oldest cohort, with over 79% reporting 65 years old or older, which is coupled with the lowest adoption rate and the highest proportion of respondents that do not desire broadband.

Figure 7 - Adoption by Respondent Marital Status



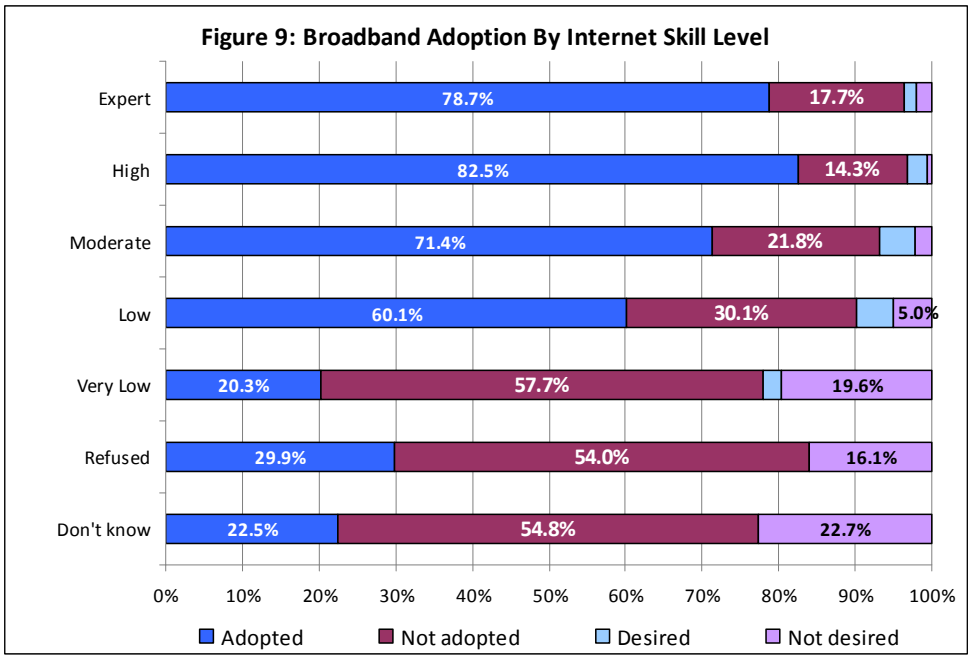
Broadband adoption rates in relation to employment status (Figure 8 below) further reinforce the importance of affordability and utility. The higher adoption rates in relation to employment are among the employed respondents and those that have been out of work less than one year, with full time students as the highest. These are the respondent cohorts that are most likely able to afford access and/or be able to use it for economic or educational purposes. Those retired and unable to work have the lowest adoption rates, reflecting lower ability to pay and reduced need or desire.

Figure 8 - Adoption by Respondent Employment Status



Along with economic and social factors, skill with use on the internet appears to be related to adoption rates (Figure 9). The lowest adoption rates are for those reporting the lowest skill levels, plus those responding “don’t know” and who refused the question. In addition, the lowest desire for broadband was reported by the lowest skilled respondents and those responding “don’t know” to the skill level question. These groups may in fact be able to benefit in important ways from broadband access but are not likely to do so without access to better information or training about the value of access along with support and incentives to learn about broadband.

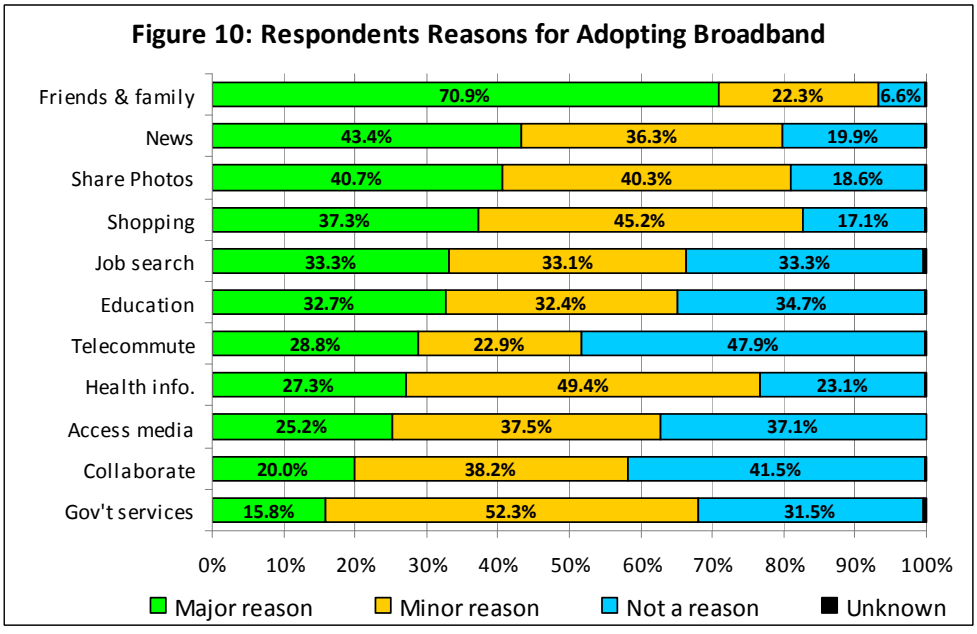
Figure 9 - Adoption by Reported Internet Skill Level



Reasons for Adoption

To examine the value of broadband access to the respondents, the survey included questions about motivation for subscribing or not subscribing. For subscribers, questions included how they use their access. Based on previous studies of broadband use, we created a list of possible reasons for subscribing and asked the respondents if each was a major reason, minor reason, or not a reason for their adoption. A summary of those answers is shown below in Figure 10.

Figure 10 –Respondents Reasons for Adopting Broadband

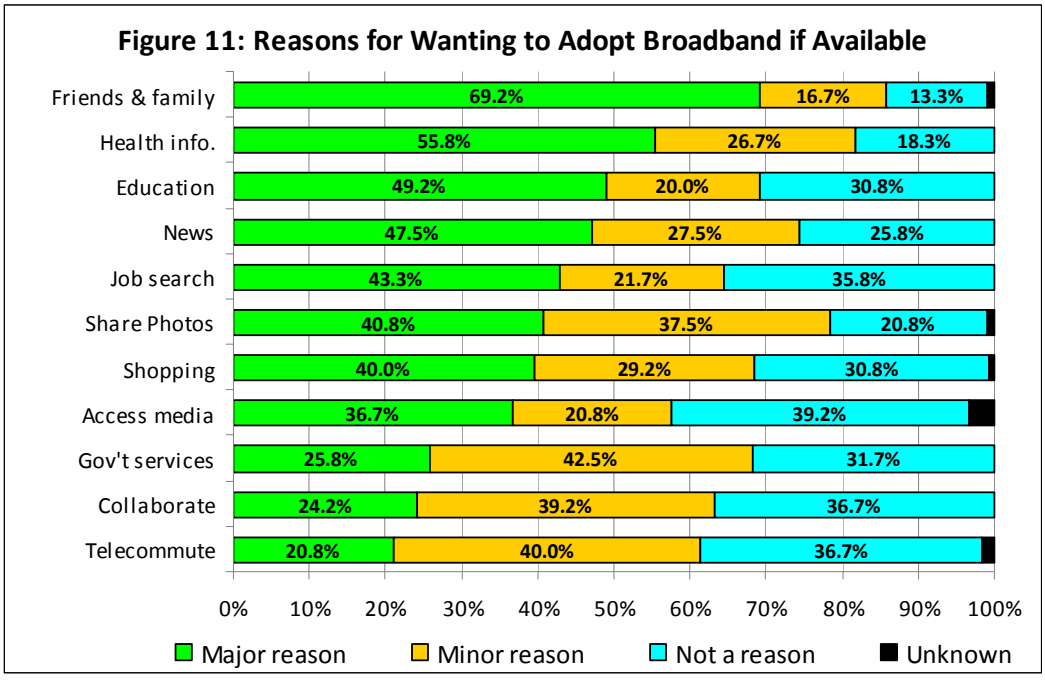


The reasons for adoption are quite diverse but the ones that appeared most frequently as a major reason are personal and social. Maintaining social relationships is clearly the most important motivation, with two out of three respondents identifying that as a major reason. The frequency of citing the next closest reason, access to news, is just a little over 40%. The other important reasons are a mix of economic interests, like shopping, telecommuting, and job search, plus information seeking and more social interaction in the form of photo sharing. In only one instance—telecommuting—did more than 50% respondents mark a potential use as "not a reason," though it was just over 50%. Overall these results reveal that the respondents who adopt broadband see a wide range of benefits from broadband access, the most important ones related to social and cultural activities.

Since the demographic factors were shown to be related to rates of broadband adoption, we examined whether they are also linked to reasons for adopting. In most cases, they are not. For staying in touch with "friends & family," for example, the proportion of those in the sample who listed that as a major reason is very similar to their overall proportion in the sample for household income, race, and gender. For the age distribution, however, the respondents over 65 were much more likely to list "friends and family" as not a reason for adopting broadband. With that exception, the reasons for adopting broadband appear to transcend many social and economic differences. This observation for the consistent importance of "friends and family" as a adoption reason may be a consequence of the rapid and wide spread use of social media, such as Facebook and Twitter in the past few years.

This observation holds in part for those without broadband access. We asked them why they would want to subscribe if broadband were available (see Figure 11 below).

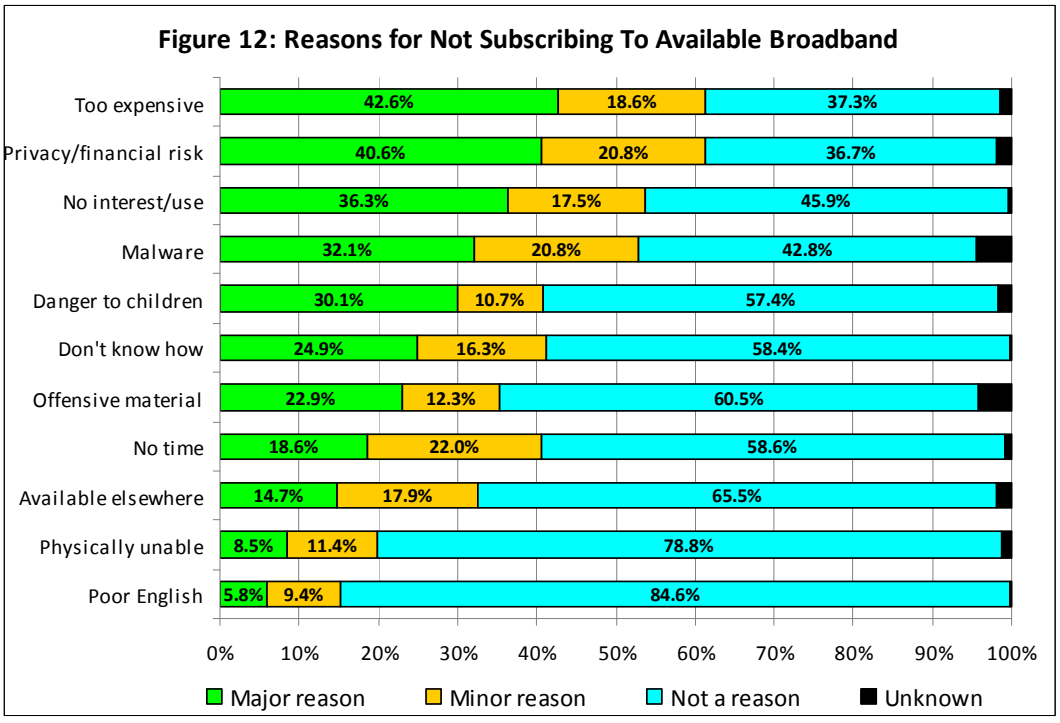
Figure 11 - Reasons for Wanting to Adopt Broadband if Available



For this group, the social relationship uses are also the most important reasons for wanting to have broadband. On the other hand, telecommuting is much less important while job search, education, and seeking health information are more important. The reasons for desiring broadband do not relate in as simple a way to the demographics of the sample as do the reasons for adopting. The non-adopting portion of the sample is lower on income and education levels and a much smaller number altogether (n=120 out of 3044). The social relationship maintenance reason ("friends & family") was less important for the lower education portion of this group than the higher levels and somewhat more important to Black respondents compared to the other racial/ethnic groups.

An important part of the sample (n=754; 27% of those with broadband available) chose not to subscribe even though broadband is available at their location. The reasons given for this decision are revealing of the attitudes about use of the internet and the barriers to universal adoption below). The diversity in reasons for having broadband is reflected also in the reasons for not adopting. The non-adopters see the internet as both an expensive and risky proposition. Concerns over privacy and malware are as important as expense. However, lack of interest in internet use and lack of time are also important. For these non-adopters the broadband value proposition is somewhat unattractive for wide ranging reasons. Simply providing access or lowering the cost of access would not, it appears, reduce these other barriers. Other forms of education, support, and risk reduction—or at least reduced risk perception—will be necessary to lower these barriers.

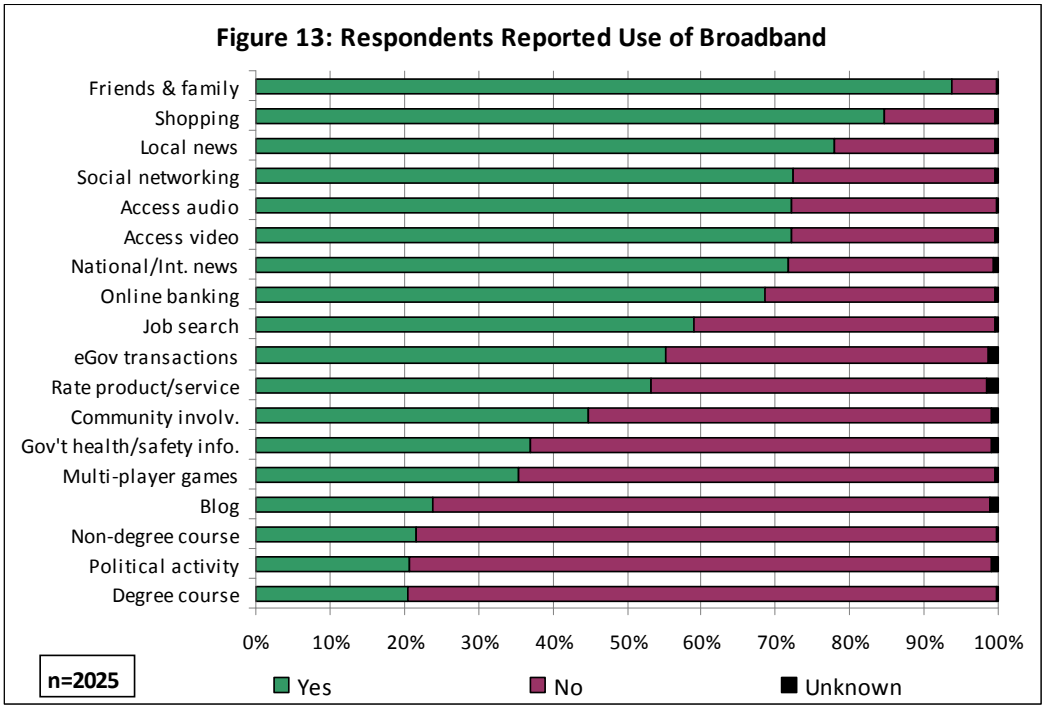
Figure 12 - Reasons for Not Subscribing To Available Broadband



We also found that expense is a more important factor for the lower income non-adopters in the sample to a notable degree. Of the respondents in the two lowest income groups (up to $35,000),

56.6% rated expense as a major reason for not subscribing, compared to 30.% for the two highest income groups. Also, being physically unable to use the internet rated as a major reason for 14.5% of the low income group, but only 8.6% in the overall sample. Otherwise, the low income group's reasons for not adopting were similar to the other non-adopters.

Figure 13 - Respondents Reported Use of Broadband



The reported uses of the broadband connection, not surprisingly, closely mirror the reasons given for adoption. Broadband use appears to be thoroughly integrated into the social and economic lives of the adopters. The always-on nature of broadband service, with free or low-cost access to information and interpersonal communication channels, makes it an attractive alternative to common, every-day types of activities that would otherwise require travel (e.g., banking, shopping) or comparatively slower, less efficient, or more expensive communication or access (postal mail, newspapers, purchasing CDs or DVDs). These uses are heavily loaded on the consumption and leisure side of life rather than directly related to the investment or income side of the household's economic activity. Online banking is widely used, but can mix expenditure and investment activity. Job search, educational activities, and possibly blogging are more income or investment oriented, but are much less used. Very little reported use is related to economic development and human capital development; formal education gets the lowest level of use across the sample.

The pattern of uses of broadband does vary modestly by demographic groups of respondents compared to the overall sample. For the lower income households (up to $35.000), the relative position of the uses remains largely intact, but the changes are notable. The lowest uses—credit courses, blogging, and politics—are all used less frequently while games are used more frequently. Seeking government information and community involvement are less frequent. Job

search use is more frequent for the low income group, but similar to the overall sample. Usage levels for the lower income group are about 10 lower than the overall sample but for the "Family & friends" uses.

The differences between the overall sample and the racial/ethnic minority portion of the sample were smaller overall, compared to the low-income group. The non-White group uses were higher for job search and games by 10-15% and somewhat less so for degree courses and social networking. Minority group uses were lower than the overall sample in most other areas by 5-10%. The "friends & family" use remained over 90%, as it does for the low income group as well. Overall, the difference in broadband use patterns for these subgroups is consistent with their lower overall incomes and educational levels. The demographic differences in broadband alone do not seem large enough to justify separate policy or technological responses.

Broadband is used at a low level for telecommuting. A total of 331 (16% of the overall sample) reported using their service to work from home. Over 50% of those so reporting were in the two highest income groups. The telecommuters were distributed across the state, but somewhat more heavily concentrated in the suburbs and upstate. Broadband in this sense is an economic resource and likely important to those so employed. And the results show a clear benefit, given the high incomes of these home workers. It is not clear, however, that broadband access for work at home is an important source of opportunity for less advantaged groups.

Accounting for Broadband Adoption

The overarching question of why some households have broadband and others do not was the focus of a separate analysis. We recognize that a number of factors enter into the household's decisions on this question. Therefore, this part of the analysis is a statistical look at the evidence of how the factors enter together into this decision. For that analysis, we used a regression analysis, which estimates the contribution of several variables acting together to account for the presence or absence of a broadband connection in the household. The foregoing analysis of the individual demographic variables shows that the decision to adopt broadband and preferences for how a connection is used do vary by the social and economic characteristics of the households and respondents. The regression analysis here examines how much of the differences in broadband adoption can be accounted for by the demographic variables taken together. This section presents the final result of this analysis and its interpretation. A more complete description of the regression analysis method we used is included in Appendix B.

A Statistical Model of Broadband Adoption

A question unanswered thus far is how important are each of the demographic factors in a household's decision to adopt broadband. Since a goal of this study is to inform state policy and government programs to promote broadband adoption, information about the relative importance of these factors can be of value. If low income is an important predictor of non-adoption, improving affordability may be effective. On the other hand, if age or retirement is more important, educational programs and non-financial incentives may be more effective.

THE MODEL

We used the results of the analyses above to construct a model of broadband adoption. The predictor variables (including negative ones) are age groups 18-24, 25-34, 35-49, and over 65;

marital category of married or living together; education categories of having a high school education, some college, a bachelor's degree, and graduate degree; full-time employed, part-time employed, self-employed, retired, income levels of under $20,000, $35,000-$60,000, $60,000-$100,000, and over $100,000. The ethnicity/race categories were analyzed in a left out since they were not very reliable indicators. In the model summary below, the R square is 0.241 meaning that 24% of the variance in being a Broadband Adopter can be explained by the model's independent predictor variables. The Analysis of Variance (ANOVA) table of the model shows the F-statistic of 56.66 and a p-value that is statistically significant.

The Coefficients table shows that all of the variables except full-time and part-time employed, have t-statistics that are statistically significant. All of the betas are positive except for over 65 years old, retired and income under $20,000 which are negative meaning they are predictors of no Broadband Adoption. All of the tolerances are over 0.400 and VIFs are small suggesting that collinearity is not an issue in our model.

Table 9 - Regression Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.491[a]	.241	.237	.41511

a. Predictors: (Constant), >$100K, 18-24, self-employ, somecoll, part-time, 25-34, $35K-$60K, Married_Together, bach, 65+, <$20K, gradcoll, 35-49, $60K-$100K, full-time, hs, retired

Table 10 - Analysis of Variance Test of Regression Results

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.969	17	9.763	56.656	.000[a]
	Residual	521.404	3026	.172		
	Total	687.373	3043			

a. Predictors: (Constant), >$100K, 18-24, self-employ, somecoll, part-time, 25-34, $35K-$60K, Married_Together, bach, 65+, <$20K, gradcoll, 35-49, $60K-$100K, full-time, hs, retired

b. Dependent Variable: Broadband

The regression coefficients in Table 11 below shows that most of the variables have some independent impact on adoption (t-statistics are statistically significant). Only *Employed, income of $60,000-$100,000,* and *Asian* have t-statistics that are not statistically significant. All of the tolerances are over 0.400 and VIFs are small suggesting that collinearity is not an issue in our model.

Table 11 - Regression Coefficients and Significance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.407	.028		50.983	.000		
	18-24	.197	.030	.118	6.476	.000	.760	1.316
	25-34	.066	.023	.054	2.882	.004	.714	1.400
	35-49	.087	.021	.080	4.158	.000	.681	1.468
	65+	-.095	.029	-.076	-3.317	.001	.474	2.108
	Married_Together	.072	.016	.075	4.388	.000	.855	1.170
	hs	.071	.023	.068	3.114	.002	.524	1.910
	somecoll	.160	.024	.145	6.642	.000	.522	1.914
	bach	.197	.028	.151	7.035	.000	.545	1.833
	gradcoll	.246	.032	.159	7.706	.000	.586	1.706
	full-time	.034	.022	.035	1.544	.123	.477	2.094
	part-time	.012	.030	.007	.389	.697	.766	1.306
	self-employ	.073	.034	.039	2.177	.030	.773	1.294
	retired	-.108	.031	-.086	-3.448	.001	.399	2.506
	<$20K	-.127	.024	-.100	-5.328	.000	.707	1.415
	$35K-$60K	.094	.023	.077	4.149	.000	.729	1.371
	$60K-$100K	.165	.024	.135	6.923	.000	.658	1.519
	>$100K	.198	.027	.148	7.372	.000	.625	1.601

a. Dependent Variable: Broadband

Overall, the results shown in Table 11 paint a reasonably clear though partial picture of what accounts for broadband adoption. Statistically, only about one-fourth of the variation in adoption is accounted for, which means that other, non-measured factors are important. The evidence of what does matter shown by the Beta coefficients is consistent with expectations. Membership in a younger age cohort is positively related to adoption, as is having at least a bachelors degree, having a high income, and being self-employed. Being in the lowest income group or being retired is related to non-adoption. Being a member of a particular racial/ethnic group does not appear to affect adoption rates separately from the variables shown here. Similarly, having moderate incomes does not appear to have an independent relationship with adoption.

The income and education variables have the strongest and most consistent relationship to adoption. The income relationships, indicated particularly by high income Beta coefficients, are strong and in the expected direction: higher income, more likely to have broadband. Low income has the expected negative relationship with adoption. Having a college education, especially at

the graduate level, has the strongest relationship with adoption. The age relationships are in the same direction, but suggest different interpretations. The acceptance and use of internet and other technologies is typically higher in younger age groups, so the impact of the 18-25 age variable most likely reflects that acceptance and preference for internet activities. Persons in the older groups are in their main earning years and employed at a high rate, and thus possibly be more likely to afford broadband service. The positive effects of relative youth in this group may be offset to some degree by lower employment rates, due to higher proportions that were out of work for more than a year and homemakers.

The results for differences among racial/ethnic groupings are unambiguous, but not easily interpreted. Being White or Asian were clearly positive indicators of broadband adoption in the analysis in which the racial/ethnic variable were examined separately from the other demographics. In the context of the income, education and other demographic variables, however, the racial/ethnic classifications did not show a statistically significant relationship with broadband adoption. This finding is most likely a consequence of the relationship between the racial/ethnic categories and the other variables linked to adoption. In addition, the White respondent group has a much smaller proportion of respondents on two variables related to adoption compared to the other racial/ethnic groups: full-time student status and employment. The oversample in low income upstate counties that have fewer racial and ethnic minorities in the population means that the demographic characteristics of the White respondent group in this sample may differ from the state as a whole. We did not use the same racial and ethnic categories as the Census data, so we are not able to directly compare our sample to the state as whole.

Discussion

The purpose of this study was to learn about patterns of broadband adoption in New York State households. The work focused on the three main questions posed in the opening section:

- How do the demographics of New York State in terms of income, educational attainment, ethnicity, region, and age affect access to and uptake of broadband internet services by New York State residents?
- What other factors affect the access to and uptake of broadband internet services by New York State residents?
- What are the barriers to adoption of broadband services (e.g. cost, education, language, other cultural factors)?

The analysis results presented above provide the detailed answers to these main questions. This section summarizes those findings, adds some additional interpretation of selected findings, and outlines recommendations for improving the overall access to and use of broadband internet services for New York.

Demography and Broadband Adoption

These survey results include clear evidence of the importance of demographic factors in adoption or non-adoption of broadband service. While the overall adoption rate was just under 70% for the total sample, rates for different demographic groupings ranged from over 91% for high income households to 37% for the lowest income households and 29% for the widowed. When examined individually, all the factors included in this analysis—age, educational level, employment status,

ethnicity, income, and marital status—show a relationship with adoption rates. The rates are lower for those with lower education levels, income, and employment.

The differences between racial/ethnic groups are not large. Black households on average (60%) have lower adoption rates compared to Asian (82%) and White households (68.5%), with Hispanic and other ethnic groups slightly lower (67.5% and 58%). Broadband adoption rates vary much more by income and education level: over 80% for college graduates compared to below 50% for those without a high school diploma; over 90 percent for households with annual income over $100,000 compared to 37% for the under $20,000 group. The relationship with age is less straightforward, with two cohorts, 18-24 and 35-49, around 80%, and the over 65 age group dropping to 39% adoption. Employment differences are substantial as well, ranging from a high of over 87% for full-time students and 80% for fully employed down to 37% for retirees. Interestingly, those unemployed for less than a year have a higher adoption rate (81.5%) than those with part-time jobs (70.6%), which likely reflects the lessened economic impact of short-term unemployment. Marital status differences are less overall, from 75% for married couples, around 67% for domestic partners and never married, down to less than 30% for the widowed.

Since income showed as an important factor in adoption, we examined the reasons for non-adoption for the two lowest income groups. Somewhat surprisingly, there is very little difference in the importance of the factors reported by those households. Lack of interest is somewhat less important for the low income households, and expense is more important, but only by 10-15%. Importance for the other reasons matches closely with the overall sample. This suggests that reducing these three types of barriers—lack of interest, affordability, and risk perception—will take a more nuanced approach than simply making broadband more affordable or available.

The demographic analysis highlights the importance of social and economic advantages in accounting for broadband adoption. Affordability appears to be the most important factor, but linked to the value derived from internet use. The value proposition is reflected in data from two other sets of questions. One is broadband uses, which show the dominant uses of the connection are discretionary, largely social activities, based on links to family and friends, shopping, entertainment, news, and social networking. These are activities that a high income or otherwise economically secure household can afford more easily than a low income one. Even among low-income adopters the consumption-oriented internet activities were the most frequent. The value perception is also reflected in non-adopters most frequent reasons for their decision: expense, low interest, and high risk.

One way to interpret these demographic factors is in terms of the adopter’s relationship to the knowledge or information economy. High education levels are usually associated with professional, technical, and managerial jobs. These jobs and families are much more likely to be more deeply involved in the knowledge economy, make extensive use of technology, and rely on information access and connectivity for both their employment and personal activities. For these households internet access is more likely to be seen as both an economic and social necessity. Upward social mobility and economic development are linked to the opportunity for households to move into the knowledge and information economy. Broadband access is an important resource for those households and more generally for their communities and the state.

Demographic disadvantages such as low income or education are not total barriers to broadband adoption. Even the lowest income group (< $20,000 per year) has a better than one third adoption rate. The group likely to have the lowest adoption rate, based on the demographic results, would be low income widows. This sample included 52 in that group, of which only7 had broadband access plus one using dial-up. This suggests that the desire for broadband access can be found in all segments of society and can potentially be increased by appropriate strategies.

Other Factors and Barriers to Broadband Adoption

The main evidence of how other barriers affect broadband adoption comes from the reasons non-adopters gave for their decision. These reasons can be grouped into three types: limited ability, insufficient incentive or reward, and high risk perception. Risk perception and insufficient incentive or reward were by far the most important types. Risk of a personal or financial information breach was listed as a major reason by over 60% of the non-adopters. They also reported high importance for risks due to malware, danger to children, and offensive material. Lack of incentive or sufficient reward is reflected in the reports of no interest, too expensive, no time, and access elsewhere as major reasons. The limited ability factors—lack of knowledge, poor English skill, and physical inability—together had the lowest importance ratings for non-adoption; only “don’t know how” appeared as a major reason for over 40% of the non-adopters.

The relatively high level of “don’t know” and “not sure” answers to questions about service highlight an additional educational and information problem. Consumers who lack accurate and detailed information about the nature and cost of broadband service are not able to make good decisions about whether or what kinds of service to purchase. Since broadband service is frequently bundled with TV cable and telephone services, consumers are often unaware or unsure of the level and cost of each service. This may be a consequence of billing statements that are difficult to decipher, or lack of attention by consumers, or some combination of both.

These three types of concerns or barriers are clearly important to the non-adopters, and they suggest multiple strategies will be necessary to overcome what are markedly issues. Lowering the affordability barriers part of the solution to overcoming insufficient incentives or rewards. If the cost is lowered through improved technology, increased competition, or subsidies, this barrier is lowered. It can also be lowered by making broadband more attractive through information and educational strategies that can effectively communicate the social and economic benefits of broadband adoption. Educational and advertising programs can also lower risk perception, though technical research and development programs to reduce actual risk are necessary as well. Since some of the actual online risk is largely a consequence of criminal activity, improvements in law enforcement capabilities and stiffer penalties for cybercrime can be part of the overall effort to increase adoption.

The usage data from adopters suggest that the economic development value of broadband availability is far from fully appreciated or exploited. This can be an indirect but potentially important barrier to adoption, or conversely an effective incentive for adoption. Use of broadband for work or operating a home business were relatively infrequent.

Recommendations

These results provide some valuable, though preliminary, guidance for recommendations to improve New York's broadband adoption rates. These recommendations address what we judge to be the most important gaps or challenges to broadband adoption across the state.

1. Make broadband more affordable for the lower income households in the state. This can be accomplished by policies to increase competition among providers, public provision of service in low income or isolated areas, subsidies for low income households or for providers serving those areas.
2. Reduce risk as a barrier to broadband adoption by increasing security for online activity through technical improvements, law enforcement programs, and educational program that reduce distorted risk perceptions, and regulations that call for or require higher levels of security at the provider level.
3. Provide improved educational materials and programs, particularly in low income areas, to enhance the understanding of internet use and the skills necessary to derive economic and social benefits from broadband adoption.
4. Institute policies that ensure consumers have full, accurate, and easily accessed information about the nature, quality, and cost of their broadband services so that they can make better informed decisions.
5. The benefits of broadband at the household level are linked to the economic environment, especially employment and business development opportunities. Therefore we recommend additional research on broadband access and use by businesses, especially small and medium enterprises in low income areas.

The survey result have revealed a complex but encouraging picture of broadband adoption in New York. Broadband as a social and economic resource is widely available but far from universal. The service provides a wide range of opportunities for adopters, many of which are social and cultural, as well as economic opportunities for education and working at home. The disparities in the availability of these opportunities is the primary challenge apparent in these results. We hope that these survey findings will help New York state officials respond effectively to these challenges and move the state closer to the goal of universal broadband for all New Yorkers.

Appendix A – Broadband Adoption Phone Survey

INTRODUCTION

Hello, my name is _____ and I am calling from Stony Brook University. We are conducting a survey about New York State residents' use and choice of broadband internet service. The results will be used to inform New York State government agencies on how to increase internet access for state residents.

1. Continue with interview
2. Callback, household
3. Hang up
4. No connection with a household (e.g., busy, no answer, bad number, business number, etc.)
5. Do Not Call List [SKIP TO NOCALL]
6. Non-English speaking household [SKIP TO NOENGL]

SCREENING

A. I would like to talk to the person in your household who is MOST responsible for all computer connections to the internet AND is 18 years of age or older. Is that you?

[DO NOT READ]
1. Yes – [CONTINUE]
2. No – [GO TO C]
3. Callback, household [schedule callback]
4. No Internet connection at home [SKIP TO PERMISSION AND SKIP TO Q.D]
5. Non-English speaking household
6. Household Refusal [SKIP TO GOODBYEI]

B. Do you have one or more computers with an internet connection in your home?

[DO NOT READ]
1. Yes – SKIP TO PERMISSION AND SKIP TO Q.1
2. No - SKIP TO PERMISSION AND SKIP TO Q.D
3. Refusal by ER [SKIP TO GOODBYEI]
4. ER Language Unable
5. ER Physically/Mentally Unable [SKIP TO GOODBYEI]
6. Do Not Call List [SKIP TO NOCALL]

C. May I speak to the person MOST responsible for all computer connections to the internet in your household aged 18 years of age or older?

[DO NOT READ]
1. Yes – [CONTINUE]

2. No, ER is not available [SCHEDULE CALLBACK]
3. No person responsible for internet connection in household [SKIP TO QC.1]
4. Non-English speaking household
5. Household Refusal [SKIP TO GOODBYEI]

C1. Do you have one or more computers with an internet connection in your home?

[DO NOT READ]
7. Yes – SKIP TO PERMISSION AND SKIP TO Q.1
8. No - SKIP TO PERMISSION AND SKIP TO Q.D
9. Refusal by ER [SKIP TO GOODBYEI]
10. ER Language Unable
11. ER Physically/Mentally Unable [SKIP TO GOODBYEI]
12. Do Not Call List [SKIP TO NOCALL]

PERMISSION1

This study is funded by the New York State Office of Cyber Security and takes only 10 minutes to complete. We will skip over any questions you don't want to answer, and all answers will be kept confidential. Your telephone number was randomly dialed by a computer. You do not have to participate in this study if you do not want to. Now with your permission, let's begin.

ASK Q.D AMONG NON-INTERNET HOUSEHOLDS (Q.A=4)
AND THEN SKIP TO A2.

D. Do you plan to subscribe to high speed internet service in the future?

[DO NOT READ]
1. Yes
2. No – [QA2]

8. Don't know-
9. Refused – [QA2]

IF YES
E. Approximately how many months from now would that be?

____ ENTER NUMBER FOR MONTHS OR YEARS.

SKIP TO REASONS FOR QUESTIONS QA2.

A. BROADBAND CONNECTION

QUESTION Q01
At home, do you connect to the Internet through a dial-up telephone line, or do you have some other type of connection, such as a DSL-enabled phone line, a cable TV (television) modem, a wireless connection, a fiber optic connection such as FIOS or a satellite connection:

1. Dial-up [Earthlink]
2. Cable [Time Warner, Comcast]
3. Fiber [Verizon FIOS]
4. DSL [ATT, Verizon]
5. Satellite or [Dish Network "Wild Blue"]
6. Cellular [ATT Aircard, Verizon Netbook or USB modem]

[DO NOT READ]
7. Not dialup but not sure what it is
8. Don't know
9. Refused

IF SELECT "DIAL UP" IN Q01, SKIP TO Q41. IF SELECT "DON'T KNOW" ASK Q02, OTHERWISE SKIP TO Q03

QUESTION Q02
Do you know if you connect to the internet through a dialup telephone connection?
[IF NEEDED: With a dialup connection, you plug one end of the cable into your computer and the other into a phone or a phone jack; you then connect to the internet through a modem]

[DO NOT READ]
3. Yes
4. No

8. Don't know
9. Refused

IF DIAL-UP, SKIP TO Q41, OTHERWISE CONTINUE.

A-1. HAVE BROADBAND CONNECTION (Q03-Q40)

QUESTION Q03
As far as you know who is the provider of your home internet service?

The list can name the main carrier, which will pick up a large proportion of answers, then just "Other."

[DO NOT READ]

1. ATT
2. Comcast
3. Cox Cable Internet
4. Cablevision/Optimum Online
5. Time Warner/Roadrunner
6. Verizon
7. Other (Please specify) ----------

88. Don't know
99. Refused

QUESTION Q04
What is the speed of the connection in megabits per second? Just your best guess is fine.

------ MPS (megabits per second)

[DO NOT READ]
08. Don't know
09. Refused

QUESTION Q05
To the nearest dollar, how much per month do you pay for your internet service? **If your Internet access is combined with television or other services, I would like to know just the amount you pay for Internet service.**

$____

[DO NOT READ]
888. Don't know
999. Refused

QUESTION Q06
For about how many years have you had a high speed internet connection at home?
(If Less than a year, ask) About how many months is that?

---------- Years
---------- Months (IF IT'S ONLY LESS THAN A YEAR)

[DO NOT READ]
88. Don't know
99. Refused

QUESTION Q07
How many computers in your home use this high speed internet connection?

____ Enter Number

[DO NOT READ]
88. Don't know
99. Refused

QUESTION Q08
How satisfied are you with the internet service you currently have at home?

1. Very Satisfied
2. Somewhat satisfied
3. Somewhat unsatisfied
4. Very unsatisfied

[DO NOT READ]
8. Don't know
9. Refused

Internet usage – 22 items in the list

I'm going to read a list of things that you can do online. Please tell me those that you or any other member of your household has done on the internet:

RANDOMIZE THE LIST

QUESTION Q09
Have you or any other member of your household used the internet to …..
Get international or national news

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q10
[Have you or any other member of your household used the internet to …..]
Get information about or apply for a job

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q11
[Have you or any other member of your household used the internet to…..]
Get advice from a government agency about a health or safety issue, like where to get flu shots or to report consumer fraud.

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q12
[Have you or any other member of your household used the internet to …..]
Download or stream a video *including youtube*

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q13
[Have you or any other member of your household used the internet to …..]
Do online banking

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q14
[Have you or any other member of your household used the internet to …..]
Take a class or course online which DID not lead to a degree

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q15
[Have you or any other member of your household used the internet to …..]
Play multi-player online games such as Medal of Honor or World of Warcraft.

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q16
[Have you or any other member of your household used the internet to …..]
Get local or community news

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

THERE IS NO Q.17

QUESTION Q18
[Have you or any other member of your household used the internet to …..]
Visit local, state or federal government web sites to pay taxes, obtain a permit, or conduct some other transaction

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q19
[Have you or any other member of your household used the internet to…..]
Download or stream music or listen to on-line radio?

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q20
[Have you or any other member of your household used the internet to …..]
Purchase goods or services online

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q21
[Have you or any other member of your household used the internet to …..]
Access a social networking site

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q22
[Have you or any other member of your household used the internet to …..]
Rate a product or service

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

THERE IS NO Q.23
THERE IS NO Q.24

QUESTION Q25
[Have you or any other member of your household used the internet to …..]
Update your own or someone else’s blog

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q26
[Have you or any other member of your household used the internet to …..]
Take a course or class which would lead to a degree or diploma

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q27
[Have you or any other member of your household used the internet to …..]
Communicate with family & friends through email, skype, or some other means

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q28
[Have you or any other member of your household used the internet to …..]
Obtain or share information about getting involved in community events or issues

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

QUESTION Q28-1
[Have you or any other member of your household used the internet to …..]
Participate in a political campaign or support a candidate for public?

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

THERE IS NO Q.29

Reasons for having a high speed internet connection – 11 items

Now I'm going to read a list of REASONS people give for why they subscribe to high speed internet. For each question please tell me whether it is a major reason, a minor reason or not a reason at all in your decision, or any other member of your household, to subscribe to high speed internet.

QUESTION Q30
Is access to TV and music… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q31
Is access to news and current events…. a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q32
Is Online shopping …. a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q33
Is being able to stay in touch with family and friends online … a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q34
Is use of government services on-line…. a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q35
Is access to health information… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q36
Is access to online classes, help with school work, and other education-related activities… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q37
Is being able to work from home or run a home business… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q38
Is the ability to get employment information or apply for a job…. a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q39
Is the ability to share photos … a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q40
Is the ability to work with friends or community members on local projects online… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason

2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

SKIP TO DEMOGRAPHIC QUESTIONS

A-2. DO NOT HAVE BROADBAND CONNECTION

Reasons for not having a high speed internet connection
Ask among those who have dial-up in q.2, otherwise skip to demographics

QUESTION Q41
Is high speed internet service available where you live?

[DO NOT READ]
1. Yes
2. No

8. Don't know
9. Refused

IF YES CONTINUE, OTHERWISE SKIP TO Q.54 IN SECTION C
We are interested in the reasons you do not have a high speed internet connection at your home. I'm going to read a number of reasons why you might not have a high speed internet connection. For each reason, please tell me whether it is a major reason, a minor reason or not a reason at all.

QUESTION Q42
Is not being interested or having no use for a high speed internet connection…. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason,
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q43
Is the expense of an internet connection or your inability to pay for it ……. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]

1. Major reason,
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q44
Is your access to high speed internet elsewhere…. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason ---- [ASK Q.44A]
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q44a
Where do you have access to high speed internet….
1. At Work
2. At a Library
3. At School or college
4. At a Free internet hotspot
5. or somewhere else– (please specify)----------

DO NOT READ
8. Don't know
9. Refused

QUESTION Q45
Is not having the time to use the internet…… a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q46
Is not knowing how to use the internet ….. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q47
Is your physical inability to use the internet ……. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q48
Is your lack of good English language skills ……. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q49
Is the presence of too much offensive material online……. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q50
Are the dangers of the internet for children ……. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q51
Is the ease with which someone can steal personal or financial information online….. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION 52
Is the presence of viruses or other malicious online software …. a major reason, a minor reason or not a reason at all (for why you do not have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at that

8. Don't know
9. Refused

QUESTION 53
Is there any other major reason that you can think of for not having a high speed connection at home?

Open ended question…

7. No
8. Don't know
9. Refused

SKIP TO DEMOGRAPHIC QUESTIONS

B. SERVICE UNAVAILABLE (Q.54-Q66)
ASK AMONG THOSE WHO SAID HIGH SPEED INTERNET SERVICE IS NOT AVAILABLE WHERE THEY LIVE

QUESTION 54
If high speed internet service was available where you live, would you subscribe?

[DO NOT READ]
1. Yes
2. No - [GO TO 67]

8. Don't know
9. Refused

QUESTION 55
To the nearest dollar, how much per month, would you be willing to spend for high speed internet service at home?

$$ ---------

[DO NOT READ]
888. Don't know
999. Refused

Reasons to subscribe – 11 items

Now I'm going to read a list of REASONS people give for why they subscribe to high speed internet service. For each reason please tell me whether it would be a major reason, a minor reason or not a reason at all in your decision, or any other member of your household, to subscribe if high speed internet became available where you live.

QUESTION Q56
Is access to TV and music… a major reason, a minor reason or not a reason at all for why you might have high speed internet connection at home.

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q57
Is access to news and current events…. a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q58
Is Online shopping …. a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q59
Is being able to stay in touch with family and friends online … a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q60
Is use of government services on-line…. a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q61
Is access to health information… a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q62
Is access to online classes, help with school work, and other education-related activities… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q63
Is being able to work from home or run a home business… a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q64
Is the ability to get employment information or apply for a job…. a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q65

Is the ability to share photos … a major reason, a minor reason or not a reason at all (for why you might have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q66

Is the ability to work with friends or community members on local projects online… a major reason, a minor reason or not a reason at all (for why you have high speed internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

SKIP TO DEMOGRAPHIC QUESTIONS

Reasons to not subscribe – 12 items

We are interested in the reasons why you or any other member of your household might NOT WANT a high speed internet connection at your home. I'm going to read a number of reasons why you might NOT WANT a high speed internet connection. For each reason, please tell me whether it is a major reason, a minor reason or not a reason at all.

QUESTION Q67

Is not being interested or having no use for a high speed internet connection…. a major reason, a minor reason or not a reason at all for why you might not want an internet connection at home.

[DO NOT READ]
1. Major reason,
2. Minor reason or
3. Not a reason at all

8. Don't know

9. Refused

QUESTION Q68

Is the expense of an internet connection or your inability to pay for it ……. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason,
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q69

Is your access to high speed internet elsewhere…. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason ---- [ask Q.69a]
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q69a

Where do you have access to high speed internet….

1. At Work
2. At a Library
3. At School or college
4. At a Free internet hotspot
5. or somewhere else– (please specify)----------

8. Don't know
9. Refused

QUESTION Q70

Is not having the time to use the internet…… a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason

2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q71
Is not knowing how to use the internet ….. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q72
Is your physical inability to use the internet ……. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q73
Is your lack of good English language skills ……. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q74

Is the presence of too much offensive material online……. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q75
Are the dangers of the internet for children ……. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION Q76
Is the ease with which someone can steal personal or financial information online….. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at all

8. Don't know
9. Refused

QUESTION 77
Is the presence of viruses or other malicious online software …. a major reason, a minor reason or not a reason at all (for why you might not want to have an internet connection at home)

[DO NOT READ]
1. Major reason
2. Minor reason or
3. Not a reason at that

8. Don't know
9. Refused

QUESTION 78
Is there any other major reason that you can think of for not wanting a high speed internet connection at your home..

Open ended question…

7. No
8. Don't know
9. Refused

DEMOGRAPHICS

QUESTION QD01
In what year were you born?

[INTERVIEWER: Must be BEFORE 1992]

[DO NOT READ]
9998. Don't know
9999. Refused

[Open-ended response]

QUESTION QD01-1
Are you married; not married but living with a partner; separated; divorced; widowed; or have you never been married?

[DO NOT READ]
1. Married
2. Not married, living with a partner
3. Separated
4. Divorced
5. Widowed
6. Never married
8. Don't know
9. Refused

QUESTION QD01-2
How many children under the age of 18 are currently living in your household?

1. None
2. 1 or more
8. Don't know
9. Refused

QUESTION QD02
What is the highest grade of school, year of college or highest degree that you have received?

[DO NOT READ]
1. No grades
2. 1st, 2nd, 3rd or 4th grade
3. 5th, 6th, 7th or 8th grade
4. 9th grade
5. 10th grade
6. 11th grade
7. 12th grade, no diploma
8. High school graduate
9. Some college, no degree
10. Associate degree (occupational/academic)
11. Bachelor's degree (BA, AB, BS)
12. Master's degree
13. Professional school degree (J.D.,M.D)
14. Doctorate (Ph.D., Ed.D., Sc.D)
15. Or something else?

98. Don't know
99. Refused

QUESTION QD03
Are you currently:

1. Employed for wages full-time
2. Employed for wages part-time
3. Self-employed
4. Out of work for more than 1 year
5. Out of work for less than 1 year
6. Homemaker
7. Full-time student
8. Retired
9. Unable to work / permanently disabled

[DO NOT READ]
98. Don't know
99. Refused

QUESTION QD04

IF CURRENTLY EMPLOYED in QD03(1,2,3,6) ASK Q04 OTHERWISE SKIP TO Q5

Do you work at home using a broadband or other internet connection?

[DO NOT READ]

1. Yes
2. No

8. Don't know
9. Refused

QUESTION QD05
Which of the following income categories best describes the total 2009 household income of all members of your family living there before taxes. Stop me when I reach your income group. Was it:

1. Less than $20,000
2. $20,000 to less than $35,000
3. $35,000 to less than $60,000
4. $60,000 to less than $80,000
5. $80,000 to less than $100,000
6. $100,000 to less than $120,000
7. $120,000 to less than $150,000
8. $150,000 or more

[DO NOT READ]
9. Don't know / Refused

QUESTION QD06
Are you Hispanic or Latino/Latina?

1. Yes
2. No

[DO NOT READ]

8. Don't know
9. Refused

QUESTION QD07
Do you consider yourself White, Black, Asian or something else?

[DO NOT READ]

1. White
2. Black/African-American
3. Hispanic/Latino
4. Asian
5. Pacific Islander
6. Native American or Alaskan native
7. Black and another category

8. Don't know
9. Refused

QUESTION QD8
How would you rate your ability to use the internet on a scale of 1 to 5, where 5 is being an expert and 1 is very low or no ability to use the internet?

---------- Enter Number

[DO NOT READ]
98. Don't know
99. Refused

QUESTION QD9
What is your ZIP CODE (where you currently live)?

[DO NOT READ]
8. Don't know
9. Refused

[Open-ended response]

QUESTION QD10
[INTERVIEWER: WHAT IS THE RESPONDENT'S GENDER
INFER sex from the sound of respondent's voice]
1. Female
2. Male
3. Could not tell

Thank you for your cooperation. Your answers have been extremely helpful to us. For further information on the survey, you can call Soraya Zabihi, Survey Center's Director of Operations at (631) 632-4006, or Judy Matuk, Committee on Research Involving Human Subjects at Stony Brook at (631) 632-9036 about your rights as a participant.

Appendix B – Analysis Methods

Association of Demographic Variables with Broadband Adoption: Results of Pearson Chi-Square and Cramer's V Analyses

AGE
There was a significant association between Broadband Adopter and AGE ($\chi 2 = 292.9$, df = 5, $p < 0.001$). Cramer's V (0.310, $p < 0.001$) indicates a strong relationship between the variables. When we examine the crosstabs table and charts, we see that *high speed* is associated with younger age categories and *no high speed* is associated with older age categories (see Figure 6).

EDUCATION
There was a significant association between Broadband Adopter and EDUCATION ($\chi 2 = 318.39$, df = 5, $p < 0.001$). Cramer's V (0.323, $p < 0.001$) indicates a strong relationship between the variables. When we examine the crosstabs table and charts, we see that *high speed* is associated with more education and *no high speed* is associated with less education (see Figure 4).

EMPLOYMENT
There was a significant association between Broadband Adopter and EMPLOYMENT ($\chi 2 = 340.58$, df = 5, $p < 0.001$). Cramer's V (0.335, $p < 0.001$) indicates a strong relationship between the variables. When we examine the crosstabs table and charts, we see that *high speed* is associated more with full-time, part-time, and self-employed and *no high speed* is associated more with retired (see Figure 8).

INCOME
There was a significant association between Broadband Adopter and INCOME ($\chi 2 = 463.11$, df = 5, $p < 0.001$). Cramer's V (0.390, $p < 0.001$) indicates a strong relationship between the variables. When we examine the crosstabs table and charts, we see that *high speed* is associated with higher income and *no high speed* is associated with lower income (see Figure 3).

ETHNICITY/RACE
There was a significant association between Broadband Adopter and ETHNICITY/RACE ($\chi 2 = 28.13$, df = 5, $p < 0.001$). However, Cramer's V (0.096, $p < 0.001$) indicates a weak relationship between the variables. When we examine the crosstabs table and charts, we see that a larger percentage of white and Asian respondents are *high speed* users versus *no high speed* (see Figure 5).

MARTIAL STATUS
There was a significant association between Broadband Adopter and MARITAL STATUS ($\chi 2 = 179.05$, df = 2, $p < 0.001$). Cramer's V (0.238, $p < 0.001$) indicates a moderate relationship between the variables. When we examine the crosstabs table and charts, we see that a large percentage of married/living with a partner are *high speed* users versus *no high speed*.

Methods For Regression Analysis Of Demographic Variables

We used the weighted data from the main sample. We recoded the demographic variables into dummy variables in order to use the categorical variables as independent predictor variables in a regression analysis. The dependent variable, broadband adopters, is defined as respondents who answered: "cable, fiber, DSL, or not dial-up but not sure what it is" to Question 01.

Using the results of the previous chi-square analyses as a guide, we conducted regression on each of the following five demographic variables and screened for multicollinearity:

7. Age = 18-24; 25-34; 35-49; 50-64; 65+; unknown.
8. Education = less than high school diploma; high school diploma; some college; bachelor's degree; graduate +; unknown.
9. Employment = full-time employed; part-time employed; self-employed; unemployed; retired; other.
10. Income = less than $20,000; $20,000-$35,000; $35,000-$60,000; $60,000-$100,000; more than $100,000; unknown.
11. Ethnicity/Race = white, black/African American; Hispanic/Latino; Asian; other.

Below are the results of the individual regression analyses that we then used to build the regression model that follows.

METHODOLOGY FOR REGRESSION ANALYSES – ALL SAMPLES

Below are the results of the individual regression analyses on the full sample that we then used to build the final regression model that follows.

AGE

The R square (and adjusted R square) in the table below indicates that about 10% of the variance in "Broadband Adopter" can be predicted by age.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.310[a]	.096	.095	.45221

a. Predictors: (Constant), 65+, 18-24, 25-34, 50-64, 35-49

The ANOVA table shows that age as a predictor has an F value of 64.69 and is statistically significant. The following table of Coefficients shows that all the independent variables are predictors of a Broadband Adopter and all have statistically significant p-values less than 0.05.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	66.148	5	13.230	64.693	.000[a]
	Residual	621.226	3038	.204		
	Total	687.373	3043			

a. Predictors: (Constant), 65+, 18-24, 25-34, 50-64, 35-49

b. Dependent Variable: Broadband

The age group 65+ (65 years and older) has a negative Beta, meaning that this variable is a predictor of not being a Broadband Adopter.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.463	.039		37.072	.000
	18-24	.326	.048	.194	6.762	.000
	25-34	.257	.044	.211	5.872	.000
	35-49	.313	.043	.288	7.332	.000
	50-64	.205	.043	.186	4.783	.000
	65+	-.089	.044	-.071	-2.014	.044

a. Dependent Variable: Broadband

MARITAL STATUS

About 6% of the variance in "Broadband Adopter" can be predicted by marital status, as indicated by the R square in the table below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.238[a]	.057	.056	.46173

a. Predictors: (Constant), Married_Together, Single

The ANOVA table shows that marital status as a predictor has an F value of 91.65 and is statistically significant.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.079	2	19.539	91.650	.000[a]
	Residual	648.294	3041	.213		
	Total	687.373	3043			

a. Predictors: (Constant), Married_Together, Single

b. Dependent Variable: Broadband

The Coefficients table below shows that both single and married or living together are predictors of broadband adoption and have statistically significant p-values less than 0.05. Too few cases were in the sample to test the other marital status categories for variance.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.452	.018		82.549	.000
	Single	.215	.025	.192	8.730	.000
	Married_Together	.283	.021	.297	13.515	.000

a. Dependent Variable: Broadband

EDUCATION

The R square (and adjusted R square) in the table below indicates that about 10% of the variance in "Broadband Adopter" can be predicted by education.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.323[a]	.105	.103	.45011

a. Predictors: (Constant), gradcoll, bach, no hs, somecoll, hs

The ANOVA table shows that education as a predictor has an F value of 70.98 and is statistically significant. However, the following table of Coefficients shows that not having completed a high school education is not a predictor of Broadband Adoption.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.900	5	14.380	70.976	.000[a]
	Residual	615.473	3038	.203		
	Total	687.373	3043			

a. Predictors: (Constant), gradcoll, bach, no hs, somecoll, hs

b. Dependent Variable: Broadband

The remaining education categories of having a high school diploma, some college, bachelor's degree or a graduate degree are all predictors of a Broadband Adopter and have statistically significant p-values less than 0.05.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.441	.047		30.679	.000
	no hs	-.017	.051	-.013	-.340	.734
	hs	.129	.049	.124	2.610	.009
	somecoll	.286	.050	.260	5.747	.000
	bach	.385	.051	.295	7.499	.000
	gradcoll	.445	.053	.288	8.351	.000

a. Dependent Variable: Broadband

EMPLOYMENT

The R square in the table below indicates that 11% of the variance in "Broadband Adopter" can be predicted by employment variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.335[a]	.112	.110	.44828

a. Predictors: (Constant), retired, self-employ, out of work, part-time, full-time

The ANOVA table shows that employment as a predictor has an F value of 76.55 and is statistically significant.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.911	5	15.382	76.546	.000[a]
	Residual	610.462	3038	.201		
	Total	687.373	3043			

a. Predictors: (Constant), retired, self-employ, out of work, part-time, full-time

b. Dependent Variable: Broadband

The Coefficients table indicates that only the employed (full-time, part-time, and self-employed) and retired variables are statistically significant, but in opposite ways. The beta is positive for employed variables and negative for retired meaning that employed is a predictor of Broadband Adopter while retired is a predictor of not a Broadband Adopter.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.585	.021		73.892	.000
	full-time	.204	.025	.213	8.245	.000
	part-time	.089	.034	.054	2.585	.010
	self-employ	.194	.038	.104	5.172	.000
	out of work	-.003	.035	-.002	-.079	.937
	retired	-.223	.029	-.179	-7.729	.000

a. Dependent Variable: Broadband

INCOME

The R square and adjusted R square in the table below indicates that 15% of the variance in "Broadband Adopter" can be predicted by income.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.390[a]	.152	.151	.43800

a. Predictors: (Constant), >$100K, $20K-$35K, <$20K, $35K-$60K, $60K-$100K

The ANOVA table shows that income as a predictor has an F value of 109.03 and is statistically significant.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	104.581	5	20.916	109.026	.000[a]
	Residual	582.792	3038	.192		
	Total	687.373	3043			

a. Predictors: (Constant), >$100K, $20K-$35K, <$20K, $35K-$60K, $60K-$100K

b. Dependent Variable: Broadband

However, the table of Coefficients shows that one of the income variables, $20,000-$35,000, is not a statistically significant predictor of Broadband Adopter. Income variables over $35,000 are statistically significant with p-values less than 0.05. Incomes under $20,000 are also statistically significant but have a negative beta so this income category is a predictor of no Broadband Adoption.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.548	.021		74.665	.000
<$20K	-.200	.028	-.159	-7.077	.000
$20K-$35K	.042	.028	.033	1.464	.143
$35K-$60K	.153	.028	.125	5.510	.000
$60K-$100K	.287	.028	.234	10.336	.000
>$100K	.360	.029	.269	12.295	.000

a. Dependent Variable: Broadband

ETHNICITY/RACE

The Ethnicity/Race category is not a good predictor of Broadband Adoption. The R square and adjusted R square in the table below indicates that less than 1% of the variance in "Broadband Adopter" can be predicted by race.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.096[a]	.009	.008	.47348

a. Predictors: (Constant), other, asian, hispanic, black, white nonhispanic

The ANOVA table below shows that ethnicity/race as a predictor has an F value of 5.67 and is statistically significant.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.353	5	1.271	5.668	.000[a]
	Residual	681.020	3038	.224		
	Total	687.373	3043			

a. Predictors: (Constant), other, asian, hispanic, black, white nonhispanic

b. Dependent Variable: Broadband

From the Coefficients table, we see that only White, nonhispanic and Asian have statistically significant p-values less than 0.05.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.585	.039		40.667	.000
	white nonhispanic	.093	.040	.095	2.285	.022
	black	-.005	.044	-.004	-.106	.916
	hispanic	.074	.045	.055	1.639	.101
	asian	.228	.070	.070	3.245	.001
	other	-.007	.098	-.001	-.068	.946

a. Dependent Variable: Broadband

If we switch independent variables out in the analysis and have White as the reference category, the results are similar with an adjusted R square of 0.01 and a statistically significant F value of 5.69. However, Black, and unknown race categories are statistically significant but with negative Betas suggesting these are predictors of no Broadband Adoption. Asian is still

statistically significant with a positive Beta indicating that it is a predictor of Broadband Adoption.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.677	.011		152.168	.000
	black	-.097	.024	-.077	-4.130	.000
	hispanic	-.019	.025	-.014	-.743	.457
	asian	.136	.060	.041	2.278	.023
	other	-.099	.091	-.020	-1.090	.276
	unknown	-.093	.040	-.042	-2.285	.022

a. Dependent Variable: Broadband

THE MODEL

We used the results of the analyses above to construct a model of broadband adoption. The predictor variables (including negative ones) are age groups 18-24, 25-34, 35-49, and over 65; marital category of married or living together; education categories of having a high school education, some college, a bachelor's degree, and graduate degree; full-time employed, part-time employed, self-employed, retired, income levels of under $20,000, $35,000-$60,000, $60,000-$100,000, and over $100,000. The ethnicity/race categories were left out since they were not very reliable indicators. In the model summary below, the R square is 0.241 meaning that 24% of the variance in being a Broadband Adopter can be explained by the model's independent predictor variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.491[a]	.241	.237	.41511

a. Predictors: (Constant), >$100K, 18-24, self-employ, somecoll, part-time, 25-34, $35K-$60K, Married_Together, bach, 65+, <$20K, gradcoll, 35-49, $60K-$100K, full-time, hs, retired

The ANOVA table of the model shows the F-statistic of 56.66 and a p-value that is statistically significant.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.969	17	9.763	56.656	.000[a]
	Residual	521.404	3026	.172		
	Total	687.373	3043			

a. Predictors: (Constant), >$100K, 18-24, self-employ, somecoll, part-time, 25-34, $35K-$60K, Married_Together, bach, 65+, <$20K, gradcoll, 35-49, $60K-$100K, full-time, hs, retired

b. Dependent Variable: Broadband

The Coefficients table shows that all of the variables except full-time and part-time employed, have t-statistics that are statistically significant. All of the betas are positive except for over 65 years old, retired and income under $20,000 which are negative meaning they are predictors of no Broadband Adoption. All of the tolerances are over 0.400 and VIFs are small suggesting that collinearity is not an issue in our model.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.407	.028		50.983	.000		
	18-24	.197	.030	.118	6.476	.000	.760	1.316
	25-34	.066	.023	.054	2.882	.004	.714	1.400
	35-49	.087	.021	.080	4.158	.000	.681	1.468
	65+	-.095	.029	-.076	-3.317	.001	.474	2.108
	Married_Together	.072	.016	.075	4.388	.000	.855	1.170
	hs	.071	.023	.068	3.114	.002	.524	1.910
	somecoll	.160	.024	.145	6.642	.000	.522	1.914
	bach	.197	.028	.151	7.035	.000	.545	1.833
	gradcoll	.246	.032	.159	7.706	.000	.586	1.706
	full-time	.034	.022	.035	1.544	.123	.477	2.094
	part-time	.012	.030	.007	.389	.697	.766	1.306
	self-employ	.073	.034	.039	2.177	.030	.773	1.294
	retired	-.108	.031	-.086	-3.448	.001	.399	2.506
	<$20K	-.127	.024	-.100	-5.328	.000	.707	1.415
	$35K-$60K	.094	.023	.077	4.149	.000	.729	1.371
	$60K-$100K	.165	.024	.135	6.923	.000	.658	1.519
	>$100K	.198	.027	.148	7.372	.000	.625	1.601

a. Dependent Variable: Broadband

Appendix C – Additional Tables

Table 12 - Availability and Adoption of Broadband Service By Household Income

Table 12: Availability and Adoption of Broadband Service By Household Income [weighted]					
Income	Available		Not-Available		Total
	Adopted	Not adopted	Desired	Not desired	Number
Under $20,000	36.9%	47.8%	2.7%	12.7%	493
$20-$35,000	59.6%	32.9%	4.3%	3.2%	498
$35-$60,000	71.3%	21.4%	4.3%	3.0%	551
$60-$100,000	84.4%	11.6%	2.6%	1.4%	557
Over $100,000	91.7%	6.7%	0.6%	0.9%	446
Unknown	56.0%	32.6%	2.8%	8.6%	437
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 13 - Availability and Adoption of Broadband by Race of Respondent

Table 13: Availability and Adoption of Broadband Service By Race of Respondent [weighted]					
Race / Ethnic Group	Available		Not-Available		Total
	Adopted	Not adopted	Desired	Not desired	Number
White (Non-Hispanic)	68.5%	23.1%	3.2%	5.2%	1,823
Black/ African-American	60.2%	32.0%	2.9%	4.9%	500
Hispanic/Latino	67.8%	27.0%	0.8%	4.4%	426
Asian	82.4%	15.8%	1.8%	0.0%	65
Other	57.8%	23.5%	18.0%	0.8%	27
Unknown	61.5%	29.7%	3.7%	5.1%	140
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 14 – Availability and Adoption of Broadband Service by Education Level

Table 14: Availability and Adoption of Broadband Service By Education Level [weighted]					
Education Level	Available		Not-Available		Total
	Adopted	Not adopted	Desired	Not desired	Number
< High School	44.2%	41.6%	2.8%	11.4%	468
High School	57.9%	32.3%	3.6%	6.3%	892
Some College	73.7%	20.1%	3.9%	2.3%	748
Bachelors degree	83.7%	12.8%	2.0%	1.5%	472
Graduate degeree	91.0%	7.4%	0.6%	1.0%	313
Unknown	45.7%	42.4%	2.6%	9.3%	89
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 15 - Availability and Adoption of Broadband by Age of Respondent.

Table 15: Availability and Adoption of Broadband Service By Age of Respondent [weighted]					
Respondent Age	Available		Not-Available		Total
	Adopted	Not adopted	Desired	Not desired	Number
18-24	81.5%	14.1%	2.7%	1.7%	259
25-34	73.3%	20.6%	4.4%	1.8%	557
35-49	79.0%	15.3%	2.1%	3.5%	771
50-64	67.6%	25.3%	3.1%	4.0%	744
65 & over	38.7%	46.2%	2.6%	12.5%	524
Unknown	47.8%	43.4%	2.5%	6.3%	127
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 16 - Availability and Adoption of Broadband by Marital Status

Table 16: Availability and Adoption of Broadband Service By Marital Status [weighted]					
Marital Status	Available		Not-Available		Total
	Adopted	Not adopted	Desired	Not desired	Number
Married	75.2%	18.9%	2.5%	3.3%	1,425
Living with partner	67.2%	24.1%	5.4%	3.4%	200
Never married	68.9%	23.9%	3.7%	3.5%	692
Separated	54.2%	37.2%	0.0%	8.6%	91
Divorced	57.8%	34.8%	3.8%	3.7%	269
Widowed	29.0%	51.3%	1.4%	18.3%	240
Refused	57.3%	32.7%	2.1%	7.9%	65
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 17 - Availability and Adoption of Broadband by Employment Status

Table 17: Availability and Adoption of Broadband Service By Employment Status [weighted]					
Employment Status	Available		Not-Available		Total
	Adopted	Not adopted	Desired	Not desired	Number
Employed full-time	79.9%	14.6%	3.7%	1.8%	1,301
Employed part-time	68.1%	26.2%	2.4%	3.3%	278
Self-employed	78.0%	15.8%	2.1%	4.2%	212
Out of work > 1 year	53.0%	38.7%	6.6%	1.7%	150
Out of work < 1 year	72.9%	20.1%	0.0%	7.0%	97
Homemaker	55.9%	33.5%	2.3%	8.3%	129
Full-time student	87.8%	7.9%	1.8%	2.5%	81
Retired	37.2%	49.2%	1.5%	12.1%	525
Unable to work	51.3%	37.1%	4.7%	6.9%	112
Refused	57.0%	31.9%	0.9%	10.1%	96
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 18 - Availability and Adoption of Broadband by Internet Skill

Table 18: Availability and Adoption of Broadband Service By Internet Skill [weighted]					
Internet Skill Level	Available		Not-Available		Total Number
	Adopted	Not adopted	Desired	Not desired	
Expert	78.7%	17.7%	1.6%	2.0%	654
High	82.5%	14.3%	2.6%	0.7%	878
Moderate	71.4%	21.8%	4.5%	2.2%	679
Low	60.1%	30.1%	4.8%	5.0%	280
Very Low	20.3%	57.7%	2.4%	19.6%	424
Refused	29.9%	54.0%	0.0%	16.1%	27
Don't know	22.5%	54.8%	0.0%	22.7%	40
Total	66.9%	25.3%	2.9%	4.9%	2,982

Table 19 - Frequency of Working at Home by Use of Internet

Work at Home	Frequency	Percent
Yes	454	23.4%
No	1,480	76.3%
Unknown	5	0.3%
Total	1,939	100.0%

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