strategic networks group
the broadband economists

Broadband Illinois eSolutions Benchmarking Report

Utilizations and Impacts of Broadband for Businesses, Organizations and Households

April 3rd, 2013

Prepared for:
Partnership for a Connected Illinois

broadbandillinois

Highlights

The following are selected highlights from the eSolutions Benchmarking that was conducted by Strategic Networks Group, Inc. (SNG) for Partnership for a Connected Illinois (PCI) in 2012.

Businesses and Organizations

Connectivity: While connectivity speeds failed to meet the FCC definition of broadband (768kbps or more in at least one direction) for only 7.8 percent of respondents, a full 31.2 percent of those taking the speed test had upload speeds of *less* than 768 kbps. Section 2.2 outlines the types of connectivity of respondents, as well as their levels of satisfaction.

Internet Utilization Patterns: Over 79 percent of organizations use the Internet to purchase goods and services online. In contrast, only 45.9 percent of organizations sell goods and services online. Section 2.3 looks at the level of adoption of different types of Internet applications, as well as cloud solutions, use of mobile services, and which impacts of Internet use are most valued by their users.

Barriers: The two barriers that rate the highest in importance are security and privacy concerns, considered very important by 44 percent and 34 percent of organizations respectively. Section 2.4 examines barriers to higher levels of Internet use, as well how organizations acquire the Internet related skills that they need.

Financial and Employment Impacts of Internet Use: while reporting organizations created 10,200 new positions in the preceding 12 months, the same organizations experienced sizeable job reductions, resulting in a net job increase of 5,043 positions. The net job increase attributed to using the Internet was 2,027 positions. *The Internet facilitated the creation of 22.3 percent of all new jobs created and constituted 40.2 percent of net jobs created.* Section 2.5 outlines employment impacts, as well as reported impacts on revenues and costs in responding organizations.

Households

Connectivity: of the 652 households that took the speed test, 51.8 percent of recorded less than 768kbps on the upload speed test, 21.3 percent failed to record 768kbps or higher on the download speed test. Section 3.1.2 outlines the connectivity characteristics of respondents, including costs.

Utilization: Broadband households using the Internet for a home-based business or for teleworking were a significant group at just over 23.7 and 25.6 percent respectively of all responding households. Section 3.2 explores how household use the Internet to increase their economic well-being, with particular attention to home-based businesses and teleworking.

Barriers: 70 percent of households wish to increase or improve their use of the Internet. The two main barriers are an inadequate Internet connection (57% say this is a very important barrier), followed by concerns over privacy and security (39%). See Section 3.3 for a more detailed review of this issue, including the methods that household prefer to acquire additional skills. For example, online information, webinars, and training courses are favored by over 80 percent of households. Classroom courses are the least preferred learning method, with 34 percent of respondents saying they would never take classroom courses to acquire Internet skills.

Eighteen percent of households surveyed operate a **home-based business**.

- ✓ Only 57.1 percent of home businesses have a business web site, compared to 74.9 percent of other small businesses with 0 to 4 employees. On the other hand, home-based businesses are more likely to sell online (56.5%) compared to other small businesses (48.7%).
- ✓ 36.4 percent of home businesses strongly agree that they would not be in business without broadband, and 28 percent would need to relocate to get broadband if it was not available.

Over eighteen percent households **telework**.

- ✓ Over 60 percent of teleworkers are employed by organizations more than 30 miles (one-way distance) from their residence.
- ✓ The most important motivation factors for teleworking households are life-work balance (cited by 75.4% of teleworkers), followed by reduced commute time (68.9%), productivity (68.2%), and more family time (66.8%).
- ✓ Relocating to another community would be necessary for 30 percent of teleworkers if they could not telework.

Benchmarks for Organizations and Household:

Sections 4.2 and 4.3 provide state-wide benchmarking to compare how different regions, industry sectors and types of households utilize the Internet. For both organizations and households, Chicagoland performs best on the benchmarks, with the southern regions performing below average.

Sector Analysis (Community Anchor Institutions)

Section 5 provides data on six types of community anchor institutions, as well as on farms. Section 5 includes data on Internet applications specific to that type of organization or sector. Some notable findings in this section include:

Of the 683 **Community Anchor Institutions** that responded, 30 percent reported that they provided some form of **public Internet access**. The most common types of access included public Internet terminals (98.2%) and public access Wi-Fi (70.5%). Over 50 percent of these organizations also provided Internet training.

Local governments in metropolitan areas (populations in excess of 50,000) have noticeably higher utilization than those outside metropolitan areas. Local governments outside of metropolitan areas use

on average two less Internet applications than local governments from metropolitan areas. Collaborating on eSolutions can be a means of addressing both cost issues and lack of internal expertise. Current levels of collaboration among local governments are low at 19.6 percent. This could indicate an opportunity to improve their use of Internet applications and processes.

Over 60 percent of the 247 responding **libraries** provide one-on-one training and almost 75 percent assist patrons in accessing e-government services.

Among the 186 respondents identifying themselves as **farmers**, the leading farm specific uses of the Internet focus on information (weather, GIS, prices) and productivity. Direct market sales through the Internet falls roughly in the middle of eSolutions currently being used by farmers, but was the highest rated for future growth together with training.

Of the 116 respondents identified as **public safety** agencies, 39.6 percent stated that their Internet connectivity was insufficient or inadequate. The majority of organizations reporting inadequate connectivity were non-police services (911 – Dispatch, ambulance, and fire).

Seventy seven **economic development** agencies participated in the survey and reported a high level of interest in training and assessment in relation to use of the Internet by businesses. Nonetheless, only 25 percent of these economic development agencies provided such services.

Response Levels: A total of 7,253 organizations and 2,129 households contributed to the broadband benchmarking effort. The organizations consisted of 4,620 commercial businesses, 1,497 government entities and 1,136 non-for profits. See Section 1 for a comparison of the profile of survey respondents to the state profile.

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This report is one of several products that are part of the Illinois Broadband Benchmarking Project. The project derives from the American Recovery and Reinvestment Act (ARRA) of 2009: funded from the State Broadband Initiative (SBI), and administered by the National Telecommunications and Information Association (NTIA) for a five-year period from 01/01/2010 to 12/31/2014. The **eSolutions Benchmarking Report** on the following pages was prepared by Strategic Networks Group under contract to the Partnership for a Connected Illinois.

1 INTRODUCTION AND METHODOLOGY OVERVIEW

The following report provides the results of broadband utilization and impact data collected and prepared by Strategic Networks Group's (SNG) as part of the **Broadband Planning Project** for the Partnership for a Connected Illinois (PCI), the designated broadband authority for the State of Illinois.

The overarching objective of this research is to provide both qualitative and quantitative assessments of the socio-economic impact of broadband, or more aptly, *high-speed* Internet access, on communities and regions across Illinois.

The findings from this research are important input for developing appropriate policy and programs at the state and regional level, as well as for promoting economic development through broadband at a local level. Therefore the 'broadband data' in this report includes forward-looking metrics and indicators that are important to understand the factors necessary for driving economic development and improving quality of life through broadband:

- **Utilization** – how businesses, organizations, and households are currently using, or planning to use, broadband and eSolutions.
- **Gaps and Barriers** – where the gaps in the utilization of eSolutions are and which factors inhibit, or prevent adoption.
- **Drivers and Needs** – understanding the needs and preferences of end-users in order to raise awareness, to increase adoption, and to drive effective utilization.
- **Benefits** – how things have improved and which eSolutions have benefitted businesses, organizations, and households.
- **Impacts** – the quantification of benefits in terms of new revenues, cost efficiencies, new jobs, quality of life, etc.
- **Profile Data** – Internet connection type, tested speed, length of time using broadband, organization size, industry sector classification, demographics, etc.

The data included in this report was collected through two web-based surveys: one for households, and one for businesses and organizations. Both the Household and Organization Surveys invited participants to express the benefits of high-speed Internet access in terms that were relevant to each user group, including quantitative terms (e.g., new jobs, new revenues, cost savings, etc.) and qualitative terms (improved delivery and access to services, increased access to opportunities, better quality of life, etc.).

The surveys explored these issues at a very detailed level, generating a large quantity of data, only the highlights of which are covered in this report.

This Broadband Illinois eSolutions Benchmarking Report (eSB Report) will be followed by a separate report on Broadband Illinois e-Strategies that includes recommendations for how Illinois and its regions[1] can improve the utilization of broadband, thereby improving their economies and quality of life. The Broadband Illinois e-Strategies Report is for broader circulation, while this eSB Report serves as a reference document for the client. In addition, a large amount of the data collected through this initiative is available through an online platform (Digital Economy Analytics Platform - DEAP) which is accessible by the Partnership for a Connected Illinois and designated stakeholders. An outline of the data and reports available through DEAP is included in Appendix B.

The report is organized in the following sections:

Introduction and Methodology Overview – A brief description of eSolutions Benchmarking initiative, including a brief overview of the key methods used and scope of research and analysis.

Key Findings – Businesses and Organizations – Summary and highlights of information provided by businesses and organizations.

Key Findings – Households – Summary and highlights of information provided by households. Detailed appendices are included to provide supplemental reference information on survey deployment statistics and additional detailed charts and tables.

Illinois Benchmarks for Analysis of Utilization of the Internet – Use of a benchmarking process (Digital Economy index -DEi) to compare Internet use between groups and regions by various characteristics, such as industry, business size, and household demographics. Benchmarks create reference points against which the performance of any individual or group can be compared.

Key Findings for Specific Sectors - Summary and highlights of sector specific uses of the Internet based on information provided by respondents belonging to one of the following sectors: farming, public Internet access sites, K – 12 schools, public safety organizations, libraries and local governments.

Methodology Overview

The core methodology is founded on primary research consisting of data collection through online surveys of businesses, organizations and households. Due to the distinct nature of the uses and benefits of different categories of Internet users, separate and distinct surveys were used for businesses and organizations (Business Survey) and for households (Household Survey). Information was collected directly from Internet users in the following categories: user profile, Internet utilization, Internet benefits

[1] This report organizes the state of Illinois into ten distinct regions: Southwest Central, Southeast Central, West Central, Northeast Central, North Central, Northern, Central, Southern, Northwest, Chicagoland.
[2] North American Industry Classification System. Industry breakdowns are at the 2-digit NAICS code level. Some

and barriers to Internet use. In addition, organizations that identified themselves as belonging to a sector of special interest were asked questions specific to their sector (farming, public Internet access sites, K – 12 schools, public safety organizations, libraries and local governments).

The surveys are made available online through one of two means:

- Individual organizations and households were invited to participate via direct email invitations sent to a large, state-wide contact list.
- In addition, organizations and households were encouraged through a variety of other communications channels to access a link to the survey through the website of the Partnership for a Connected Illinois

An active public outreach and awareness campaign was carried out by Broadband Illinois. This campaign included press releases from the governor and PCI, media interviews, and engagement of stakeholder organizations (requesting that they endorse and promote the survey through their networks.

E-mail invitations were sent directly to 44,650 households and 106,800 organizations in Illinois. Two contact lists were purchased from a national list provider. Surveys were deployed using direct email invitations to households and organizations providing access to online surveys. The surveys were deployed in February 2012, followed by a second deployment targeting organizations only in September 2012. Invitations were followed by reminder emails. The survey was finally completed in October 2012.

A total of 7,253 organizations and 2,129 households contributed to the broadband benchmarking effort. The organizations consisted of 4,620 commercial businesses, 1,497 government entities and 1,136 non-for profits.

2 KEY FINDINGS – BUSINESSES AND ORGANIZATIONS

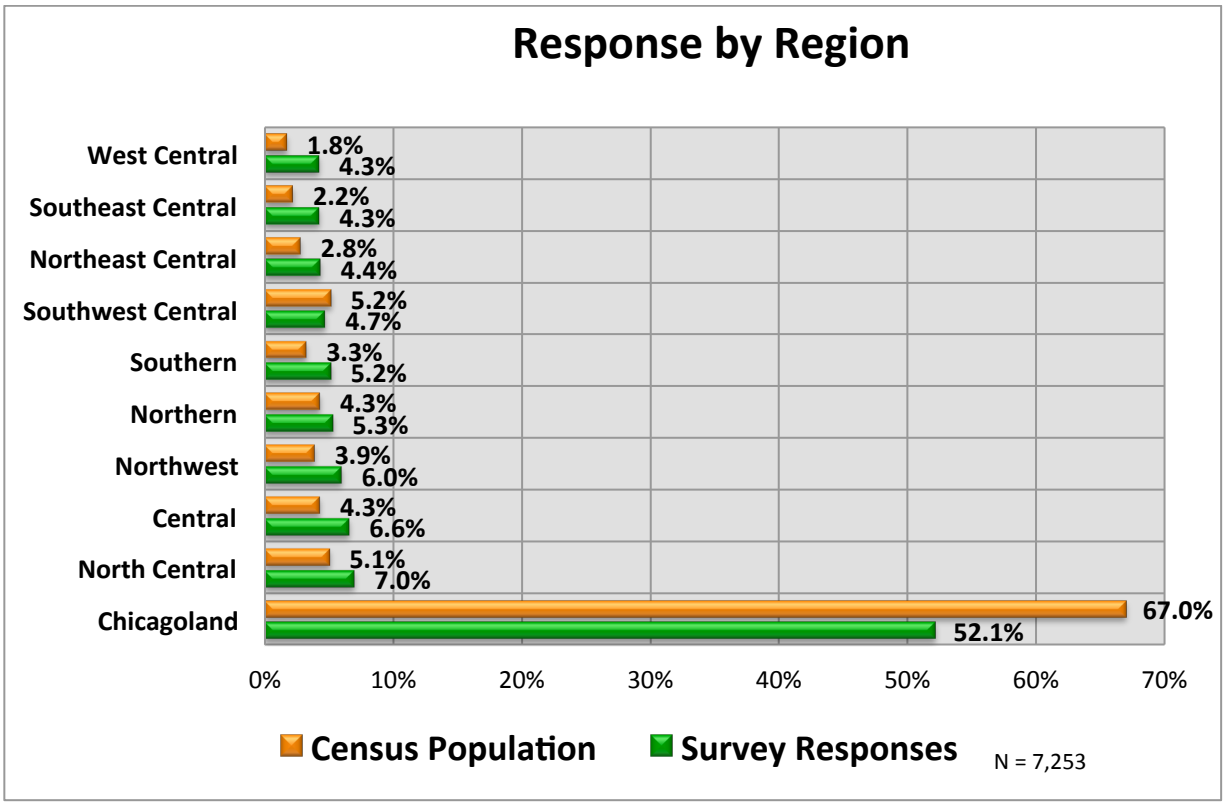
The analysis of responses identifies key findings related to Internet usage, benefits and barriers, with selected results broken down by key respondent characteristics such as industry sector, employment size and connectivity type.

2.1 Respondent Profile

This report includes data from businesses and organizations across the state. In addition, the sample includes survey responses from businesses and organizations across all 20 industries classified by NAICS.[2] This profile includes commercial businesses and non-commercial organizations, such as government entities, educational institutions and non-profit organizations.

Figure 1 shows the distribution of organizational responses by region, compared to each region's share of the state population. The Chicagoland region is under-represented by design (the non-metro areas are a priority from a policy and planning perspective). To derive results more representative of the state's actual population distribution, a simple weighting process can be carried out. This report does not include any weighting. A map of the ten regions in the state can be found on the next page.

Figure 1 – Organization Survey Responses by Region



[2] North American Industry Classification System. Industry breakdowns are at the 2-digit NAICS code level. Some survey responses did not have an industry classification.

Map of the Ten Regions in Illinois

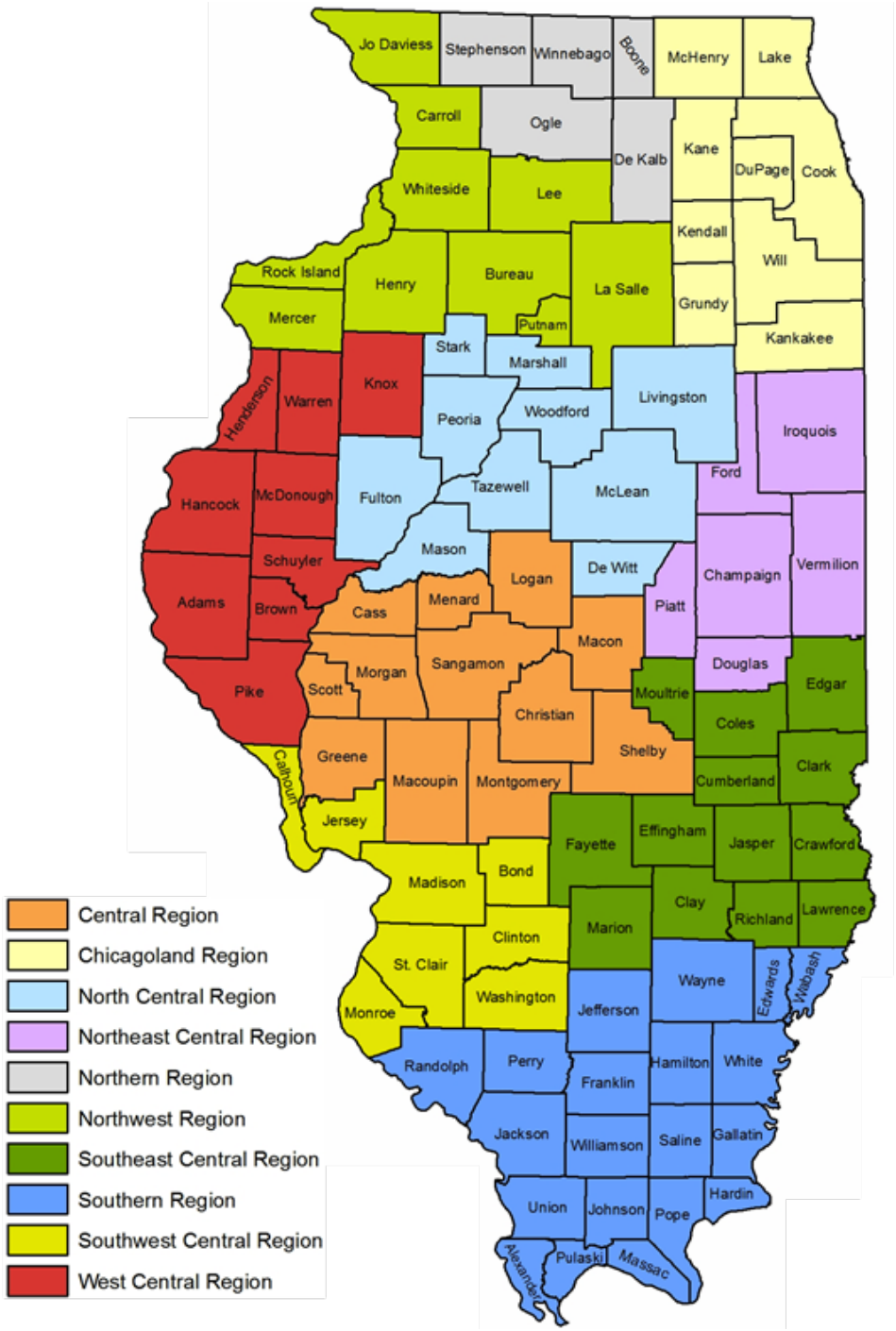


Figure 2 shows the breakdown of survey responses by size of establishment, as measured by number of employees. The chart provides a comparison to the state profile of establishments. Medium to large organizations are over-represented. Micro enterprises (those with 4 or fewer- employees) are under-represented, though they still make up over 36 percent of the entire sample.

Figure 2 – Organization Survey Responses by Establishment Employment Size

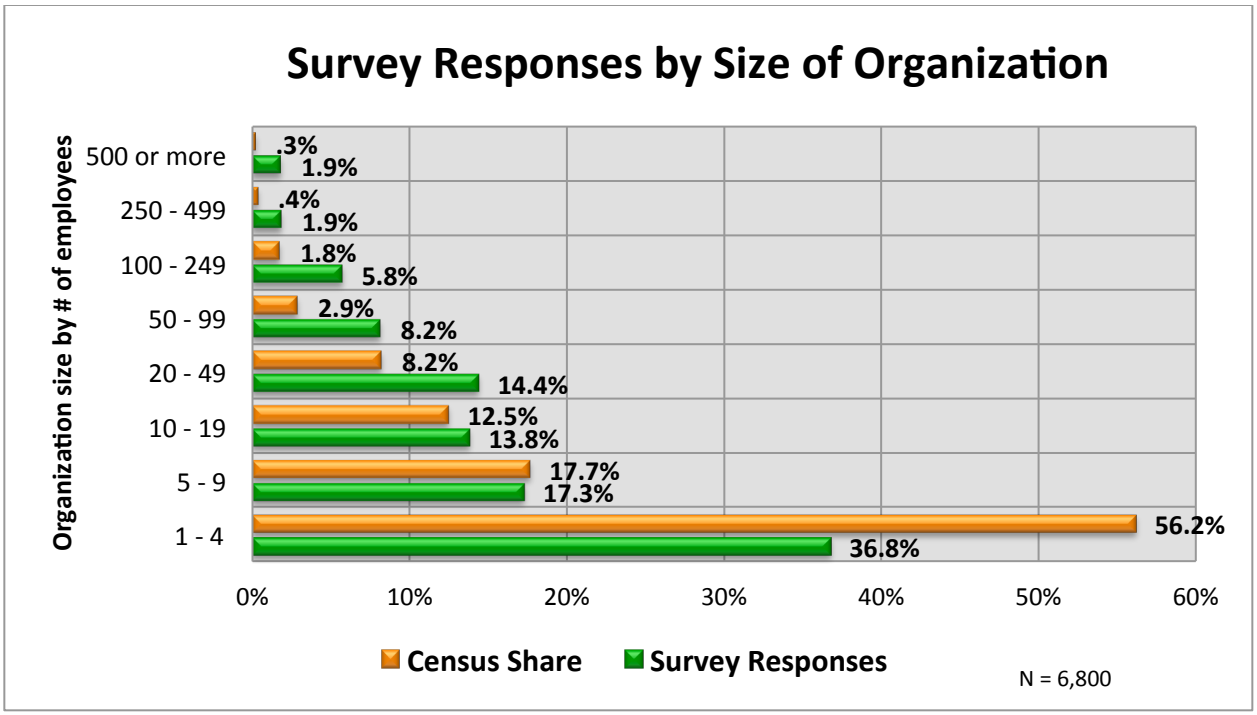
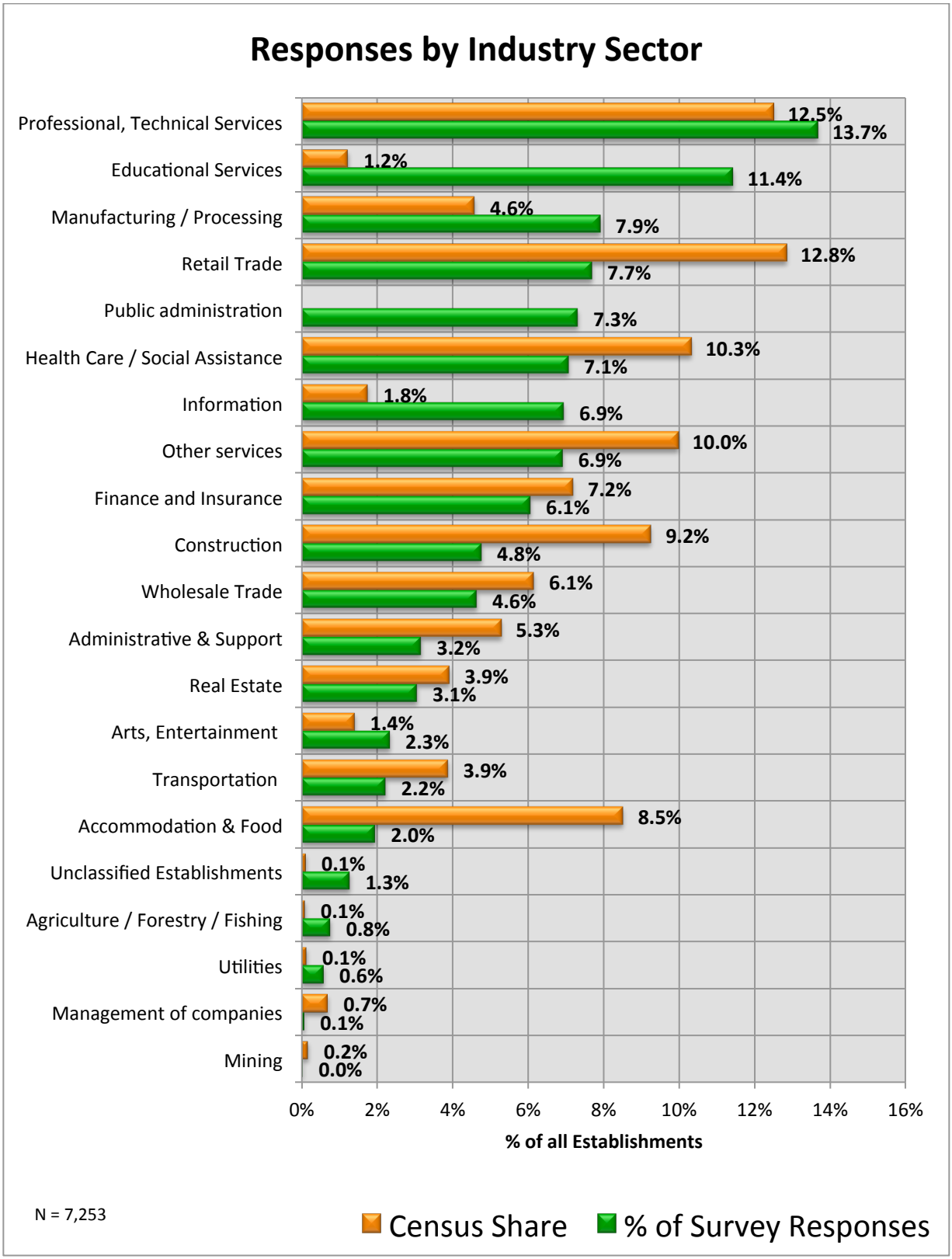


Figure 3 provides a comparison of survey responses to the industrial profile of Illinois. The sample resulting from the survey is under-represented in retail trade, construction, accommodation and food services, and administration and support services. Survey respondents were over-represented in Information, Education, and Unclassified establishment. State profile data does not include data for Public Administration. [3]

The survey also collected information from organizations that are often referred to as Community Anchor Institutions. These include: K – 12 schools (683 responses); local government bodies (285), health services (400), state and federal entities (139), postsecondary institutions (228), economic development agencies (111), libraries (309), and public safety organizations (171).

[3] State data source: US Census Bureau County Business Patterns 2009 – Number of establishments. Percentages shown for sample do not include Public Administration in the totals for comparative purposes.

Figure 3 – Organization Survey Responses by Industry



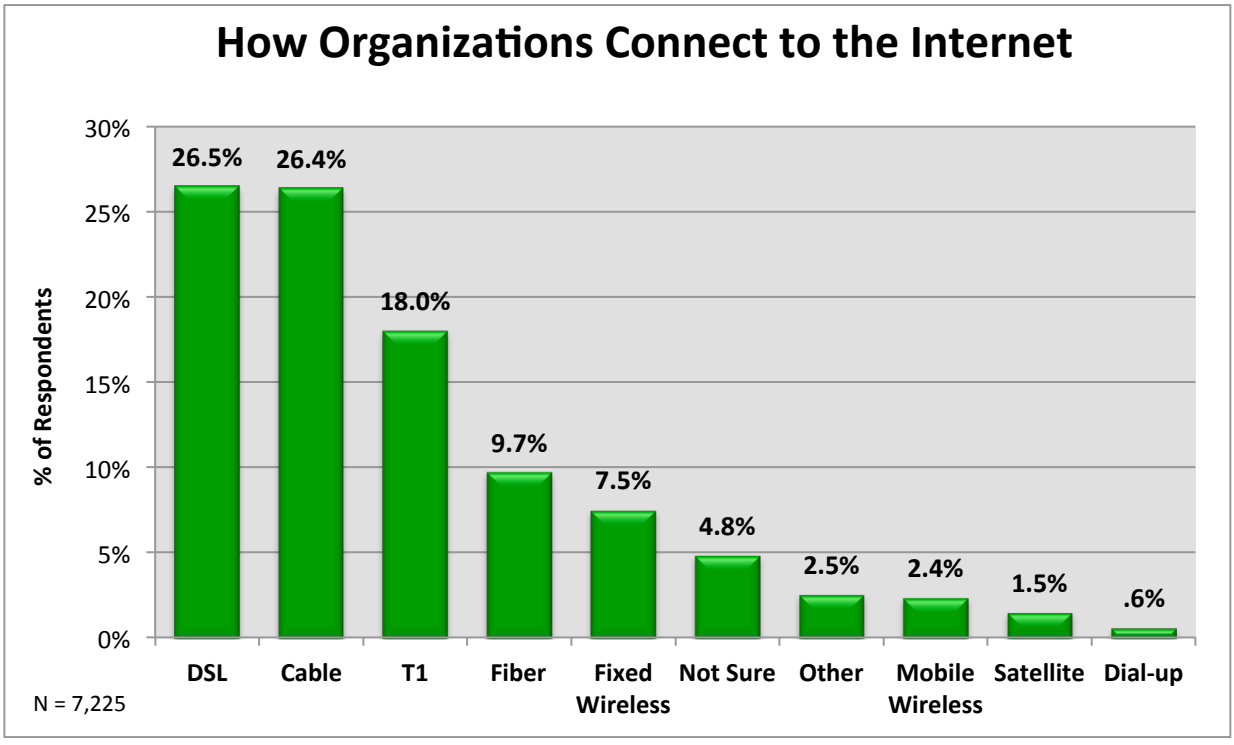
2.2 Connectivity Characteristics

The survey sample includes a mix of Internet connectivity technologies, including a small number of organizations using dial-up Internet connections. Use of broadband services is high across all types and locations of businesses and organizations. Over 99 percent of responding businesses and organizations have connectivity other than dial-up, but many still lack broadband level connections in at least one direction (broadband speeds as defined by the Federal Government = 768kbps in at least one direction).

Access Technology

1. A small percentage of organizations use dial-up (0.6%) and satellite (1.5%) connections as their primary connect.
2. Small commercial enterprises (fewer than 20 employees) tend to use DSL (34.7%) and cable (33.2%). Fewer than 15 percent of medium-sized (100–499) enterprises use DSL or cable.
3. The use of fiber Internet technologies increases steadily with organizational size and is the predominant technology for organizations with more than 500 employees.

Figure 4 – How Organizations Connect to the Internet



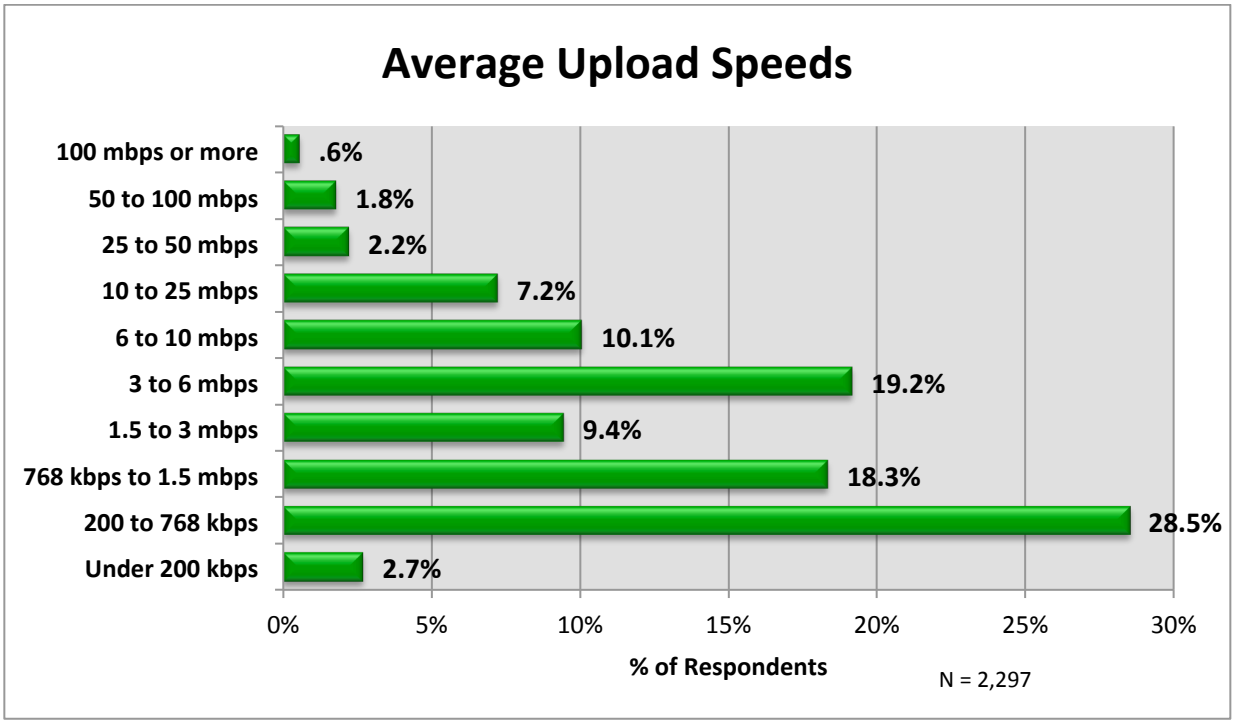
The survey included an opportunity for respondents to take a live speed test that assessed their actual up-load and down-load speeds. The speed test utilized is one also used by the FCC. Over 2,250 organizations took the speed test, results of which were automatically entered into the survey.

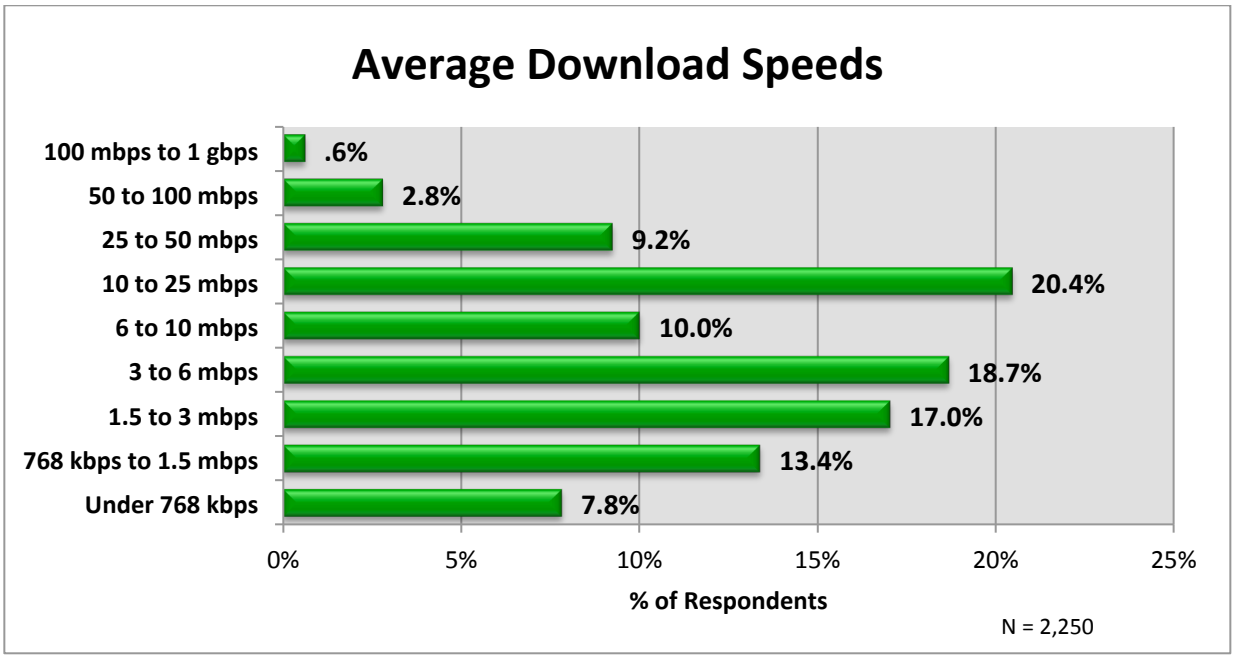
4. While connectivity speeds failed to meet the FCC definition of broadband (768kbps or more in at least one direction) for only 7.8 percent of respondents, a full 31.2 percent of those taking the speed test had upload speeds of less than 768 kbps. Statistical analysis by Strategic Networks

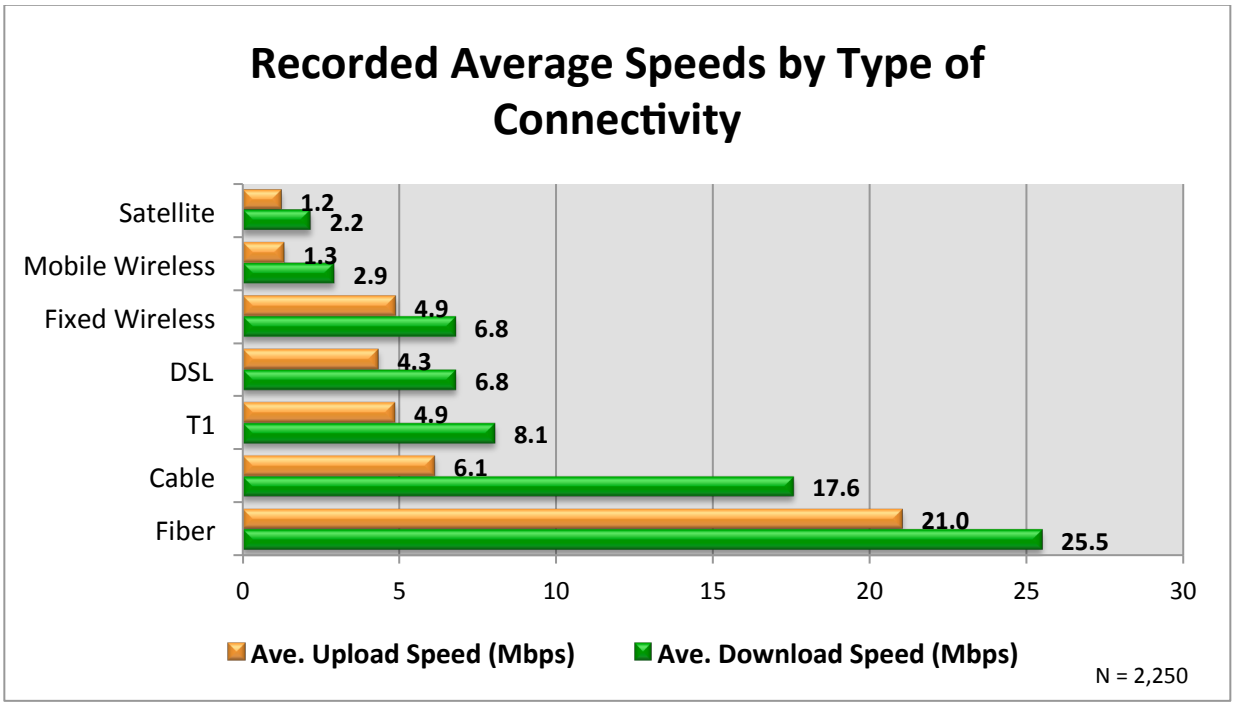
Group has shown uploads speeds to have a higher correlation a user's broadband utilization than download speeds. See Section 4 for a discussion of benchmarking Internet utilization.

5. There were significant differences in speed test results between different technologies, with fiber the winner, followed by cable. T1, Fixed Wireless, DSL connections formed the second fastest tier of services, while satellite and mobile wireless recorded the slowest speeds.
6. Speed test results should be used with great care. Different reports and broadband mapping exercises have produced markedly different results, largely because they measure different outputs. Key points to keep in mind in using speed test data from this survey include:
   - ✓ The test measured ***actual*** upload and download speeds at the time the test was taken. Most broadband mapping exercises report speeds ***available*** in the area. *Many consumers purchase an Internet access service with less than the maximum available speed,* usually due to cost. Moreover, reported available speeds often reflect the maximum speed in a larger geographic area, not necessarily the speed available at that specific location.
   - ✓ Because the survey data were intended to assist in regional planning efforts, the survey results are over-weighted to non-Chicago areas of Illinois. Non-Chicago areas of Illinois have lower average speeds than Chicago (see Table below), thereby lowering the overall state-average.
   - ✓ Overall speed-test results from the survey are consistent with download speeds noted in the 3rd Quarter Report from Akamai, a world leader in testing actual Internet connections (http://www.akamai.com/stateoftheinternet/). The findings are also consistent with data on the NTIA Broadband Map site, which reports a median upload speed for small businesses (which make up the vast majority of this report's sample) of 1.3 mbps and download speed of 3.9 mbps (http://www.broadbandmap.gov/summarize/state/illinois).

Figure 5a – Speed-Test Results – Organizations







7. There are noticeable and predictable differences in speed test results from the various regions of the state. Metropolitan areas, especially Chicago, reported relatively higher speeds, while less urban areas and the Southern and Southeast Central regions had a relatively high percentage of organizations reporting low speeds – less than .768 megabits per second (mbps), as well as less than 4 mbps. ***The FCC has set a goal of affordable broadband with a minimum download speed of 4 megabits per second*** (http://www.broadband.gov/plan/).

Figure 5b – Speed-Test Results by Geography[4] – Organizations

Organizational Connectivity	Download		Upload		
Incidence of Low Speeds	Less than 3 mbps	Less than .768 mbps	Less than 3 mbps	Less than .768 mbps	Sample size
Chicagoland	30.9%	5.4%	50.1%	24.5%	1,092
Urban*	34.1%	6.5%	53.8%	27.5%	1,612
Micropolitan	42.8%	8.8%	66.1%	37.1%	283
Small Town	55.7%	15.0%	75.5%	45.1%	246
Isolated small town	48.9%	9.1%	83.7%	42.4%	88

* Urban includes Chicagoland

Organizational Connectivity	Download		Upload		
Incidence of Low Speeds	Less than 3 mbps	Less than .768 mbps	Less than 3 mbps	Less than .768 mbps	Sample size
Central	39.1%	11.2%	59.8%	36.1%	161
Chicagoland	30.9%	5.4%	50.1%	24.5%	1,092
North Central	42.1%	6.1%	65.6%	39.1%	147
Northeast Central	46.0%	17.0%	61.4%	35.6%	100
Northern	39.2%	3.2%	54.3%	26.0%	125
Northwest	43.0%	7.9%	72.6%	31.4%	151
Southeast Central	53.0%	11.8%	76.8%	47.2%	119
Southern	64.3%	16.8%	80.5%	51.1%	137
Southwest Central	44.4%	8.9%	70.7%	39.2%	90
West Central	36.0%	9.0%	64.3%	32.2%	111

Cost

8. The monthly expenditures of Internet connectivity increase with organization size. Over 78 percent of very small establishments (1 – 4 employees) spend less than $100 per month, while 52.8 percent of establishments with 100 or more employees spend $1,000 or more per month.
9. Between 34 and 40 percent of DSL and fixed wireless users spend less than $50 per month, compared to 12 percent of cable users. In contrast, over 26 percent of fiber users pay $2,000 or more per month.

Satisfaction

10. Of the non-dial-up technologies, fiber is considered the most reliable and satellite the least reliable with 21 percent of establishments with satellite service reporting frequent problems (twice the level for fixed and mobile wireless and four times the levels for DSL and cable).
11. While 28 percent of respondents felt that the value of their Internet service was poor or below expectations, this number increased to 57.7 percent of satellite users.
12. Cable, fixed wireless and DSL were closely rated in terms of reliability and value.
13. Fiber is considered the best value of all technologies despite its higher average monthly cost.

[4] A metropolitan area is defined by the Census Bureau as having a core urban area of over 50,000 with a population density greater than 1,000 people per square mile. A Micropolitan area has a population of 10,000 to 49,999. A small town has a population of 2,500 to 9,999. The category of "isolated small town" includes the remainder.

2.3 Broadband Utilization and Benefits

2.3.1 Utilization Patterns

The extent to which organizations use eSolutions[5] provides an indication of their engagement in the digital economy and their leveraging of broadband capacity. The following findings summarize the uses of broadband by businesses and organizations with breakdowns by organizational characteristics.

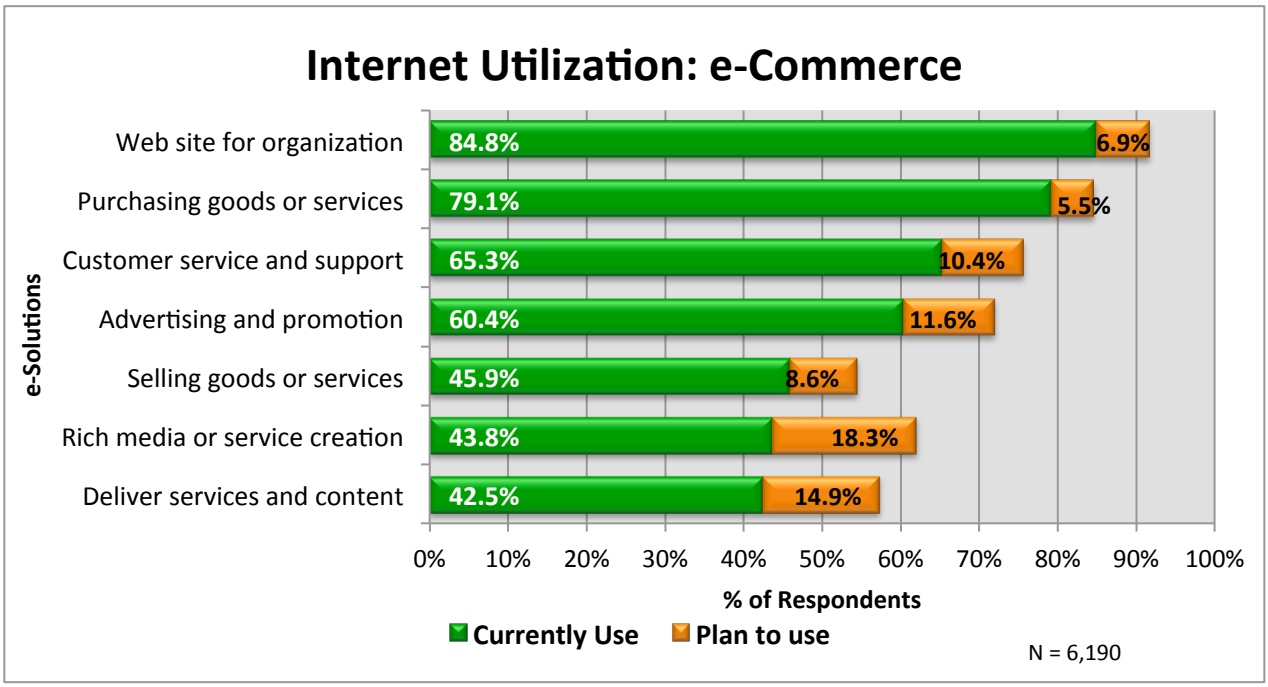
Utilization of Internet-enabled applications and operations is still very much an evolving process. Simpler processes that have been available for a long time are heavily accessed across all types of users – e.g., email. Differentiation in utilization patterns emerges as more complex business and transactional processes come "online", and more current technologies spawn enhanced or new process capabilities – e.g., social networking and social sites. The two most significant factors in utilization levels are size of organization and industrial classification to which an organization belongs.

The survey of businesses and organizations explores the uses of the Internet in two major categories:

e-Commerce uses, which include activities related to the sales, marketing and delivery of products and services; and,

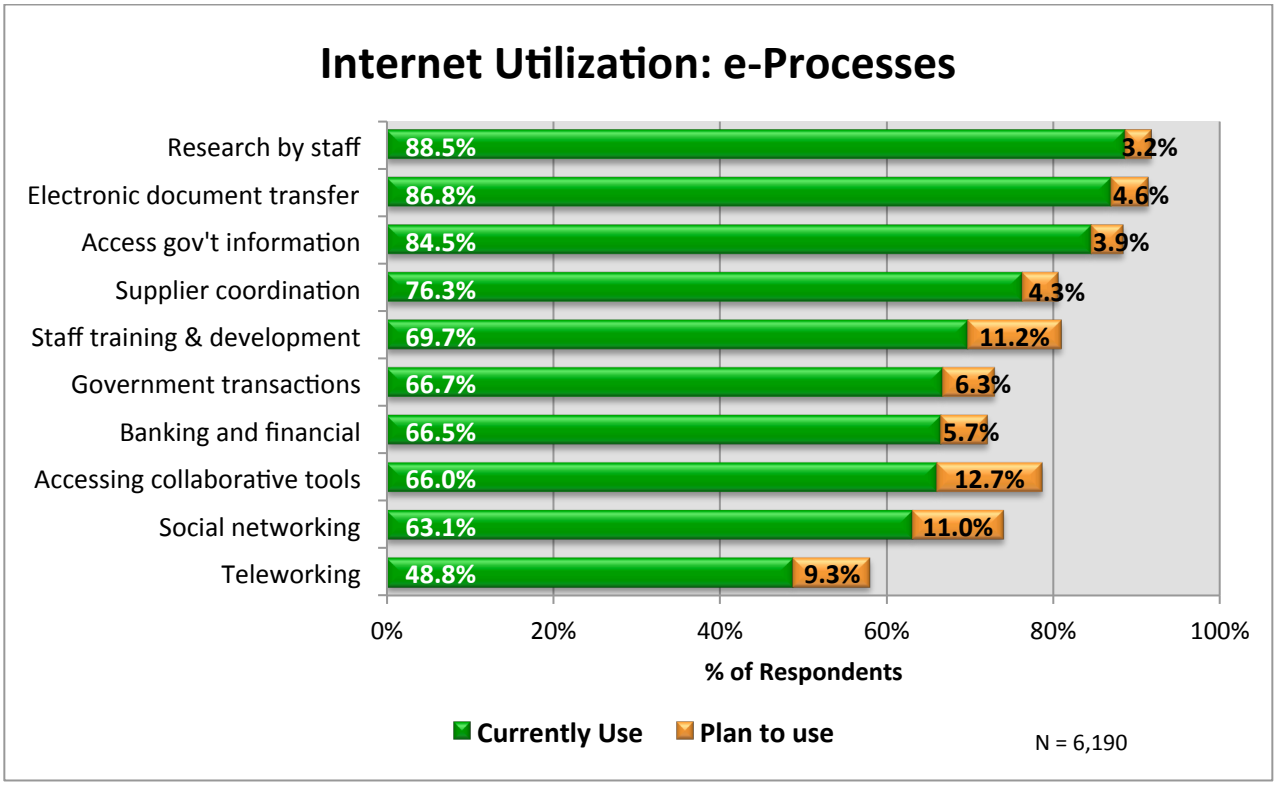
e-Process uses, which include internal operational uses, such as supplier coordination, training and teleworking.

Figure 6 – e-Commerce Uses of Broadband



[5] **eSolutions** refers to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. Please see Glossary in Appendix C for an explanation of other terms used in this report.

Figure 7 – e-Process Uses of Broadband



Uses: Current

1. Over 79 percent of organizations use the Internet to purchase goods and services online. In contrast, only 45.9 percent of organizations sell goods and services online.
2. Commercial businesses use the Internet to a higher degree for selling products online (56.8%). However, nonprofit (32.5%) and government organizations (21.7%) also use the Internet to sell their services.
3. Broadband offers uses that can transform how organizations conduct their operations. Over 76 percent of organizations use broadband for coordination with suppliers, while almost 70 percent use broadband for employee training and another 65.3 percent for improving customer service.
4. Broadband utilization increases with employment size.

Uses: Future

1. Where smaller organizations lag in current utilization, they often show higher levels of planning for utilization, indicating a tendency for smaller organizations to try and catch up with larger organizations over time. Experience from earlier surveys is that these intentions do translate into a shrinking gap in utilization between smaller and larger organizations.
2. These breakdowns uncover variation in utilization by organizational characteristics. Where there are large gaps in utilization between organizations grouped by industry, size or length of broadband experience, there are opportunities to target adoption efforts to increase utilization.

3. Some eSolutions such as research, document transfer, and accessing government information online, show immediate high levels of use with little change over time. Other eSolutions show a distinct upward trend over time, either as a result of increasing familiarity with broadband capabilities or due to the complexity of adopting sophisticated eSolutions.
4. The two areas with lowest current utilization (service delivery and rich media content) also have the highest level of planned use.

2.3.1.1 Broadband Utilization by Length of Broadband Use

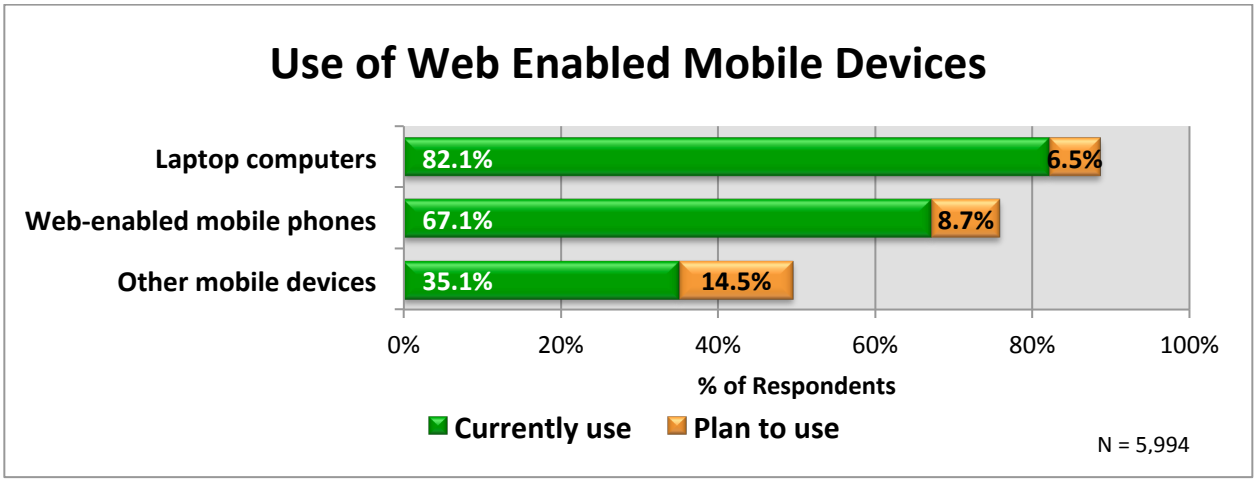
The majority of organizations have been using some form of broadband connectivity for more than five years. Some eSolutions show immediate high levels of use with little change over time, such as research, document transfer and access to government information online. Other eSolutions show a distinct upward trend over time, either as a result of increasing familiarity with broadband capabilities or due to certain eSolutions being more complex and sophisticated. ESolutions such as teleworking, collaboration, and online service delivery may take organizations more time to evaluate benefits and to determine the most appropriate solutions to implement. In addition, some eSolutions have greater implications on internal business processes than others, such as staff training, supplier coordination and customer service.

These trends have implications for broadband planning and adoption strategies as they demonstrate that the impacts of broadband deployments are not always immediate and need time to develop.

2.3.1.2 Utilization of Mobility Services

Organizations provided the following information on the utilization of mobility devices for Internet access and the importance of mobility functions to their organizations.

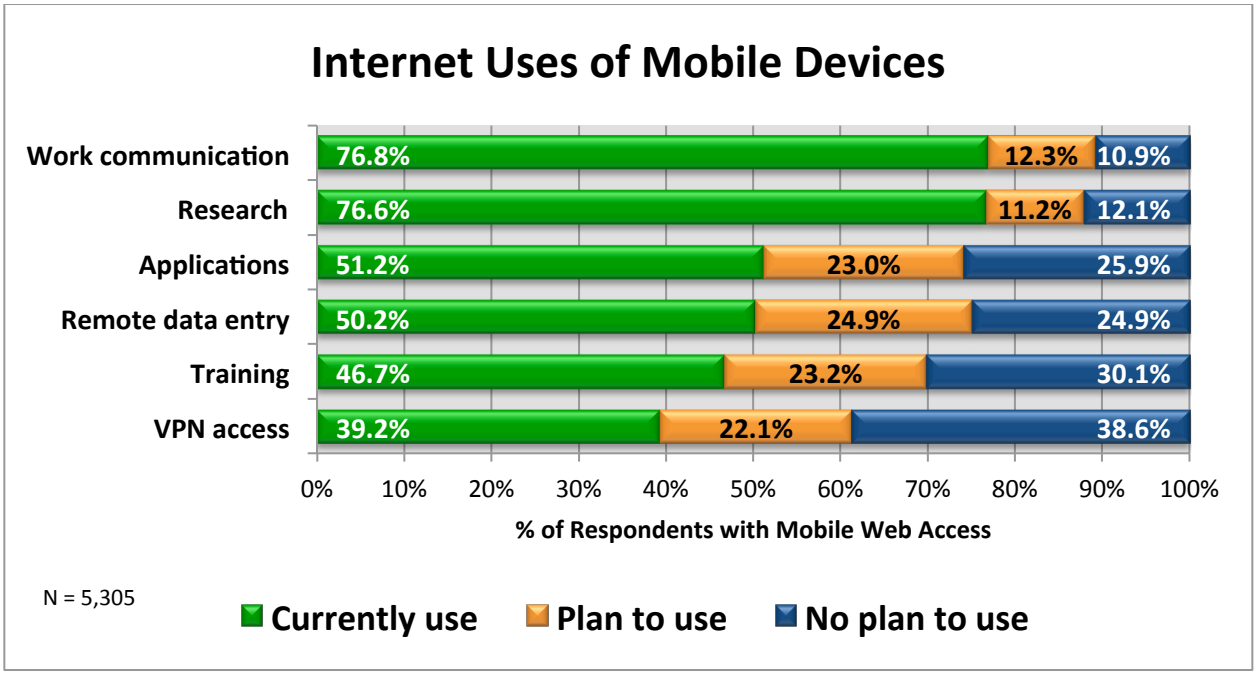
Figure 8 – Adoption Levels of Web-enabled Mobile Devices



Over 82 percent use a web-enabled laptop computer, closely followed by web-enabled mobile phones (67.1%). Other devices (including tablets) are used by 35 percent of organizations. There are significant differences in use of mobile web access across industry sectors. The most frequent mobile use of the

web can be found in the Education and Professional and Technical. The highest use of mobile web access is for research and communication.

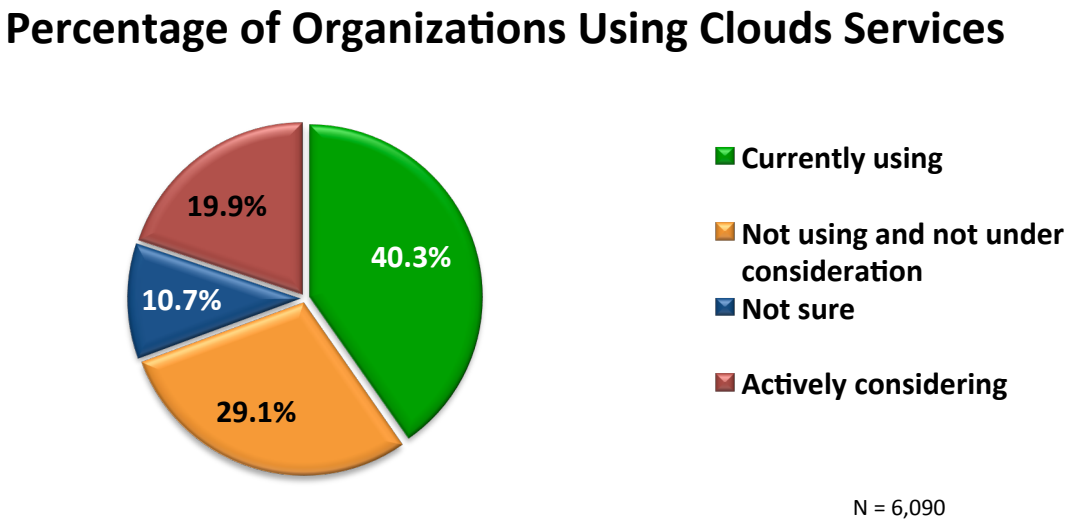
Figure 9 – Internet Uses of Web-enabled Mobile Devices



2.3.1.3 Cloud Services

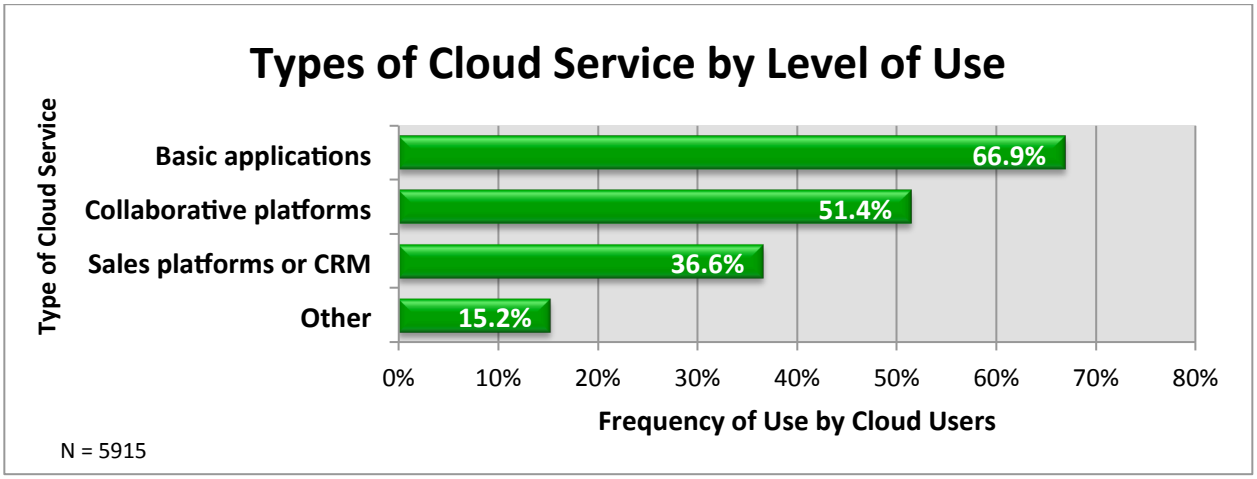
With the recent rapid growth in cloud based services, the survey probed how many organizations were using these services and for what purposes. Over 40 percent of respondents indicated that they were already using cloud based services, with another 19.9 percent actively considering them. The larger the organization, the more likely it uses cloud application.

Figure 10 – Percentage of Organizations Using Cloud Based Services



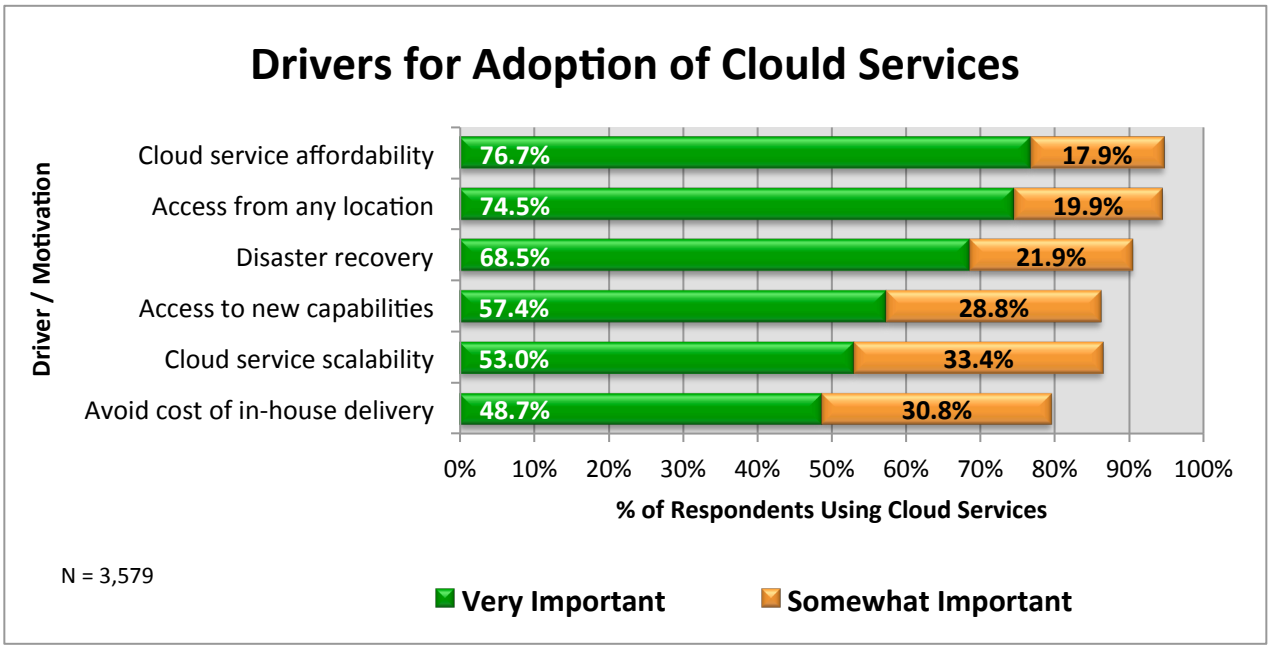
Cloud based services are most frequently used for basic applications (e-mail, word processing, etc.), by 66.9 percent of cloud service users. Collaborative platforms[6] were the second most commonly used cloud based type of service, at 51.4 percent.

Figure 11 – Types of Cloud Services by Frequency of Utilization



There is a broad mix of motivations for utilizing cloud based services, with all six possible motivating factors offered being identified as very important or somewhat important by over 72 percent of cloud services users (see Figure 12). The three most frequently cited drivers were affordability, mobile access to the Internet and disaster recovery.

Figure 12 – Drivers for Adoption of Cloud Services



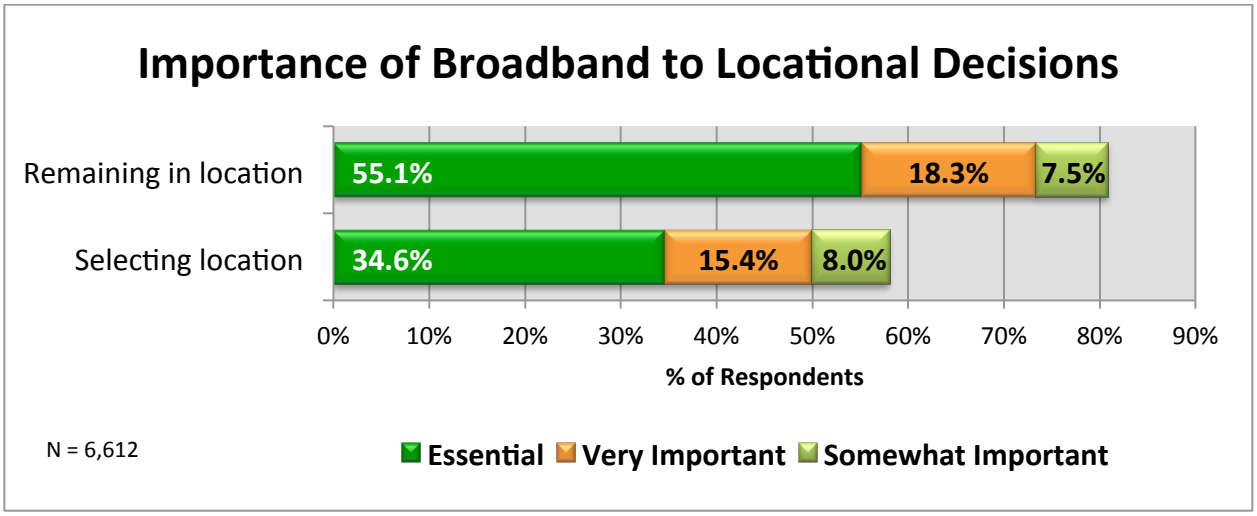
[6] "Collaborative platforms integrate a range of software components that enable groups of individuals and organizations to work together on common tasks or projects. Typical components are messaging (email, calendars and scheduling), file sharing with version control, and real-time communication (e.g., instant messaging and Internet conferencing).

2.3.2 Broadband and Deciding Where to Locate

To provide a perspective on the impact of broadband, organizations were asked about the importance of broadband for both selecting their location and for remaining in their current location. Responses to the survey clearly indicate that availability and suitability of broadband play an important role in corporate decisions to remain in a community, and if an organization is moving, which areas it is willing to consider.

Over 34 percent of organizations say that the availability of broadband services was "essential" for selecting their business location, and over 55 percent say broadband is "essential" for remaining in their current location. These statistics are relatively unaffected by the size of organization.

Figure 13 – Importance of Broadband for Location



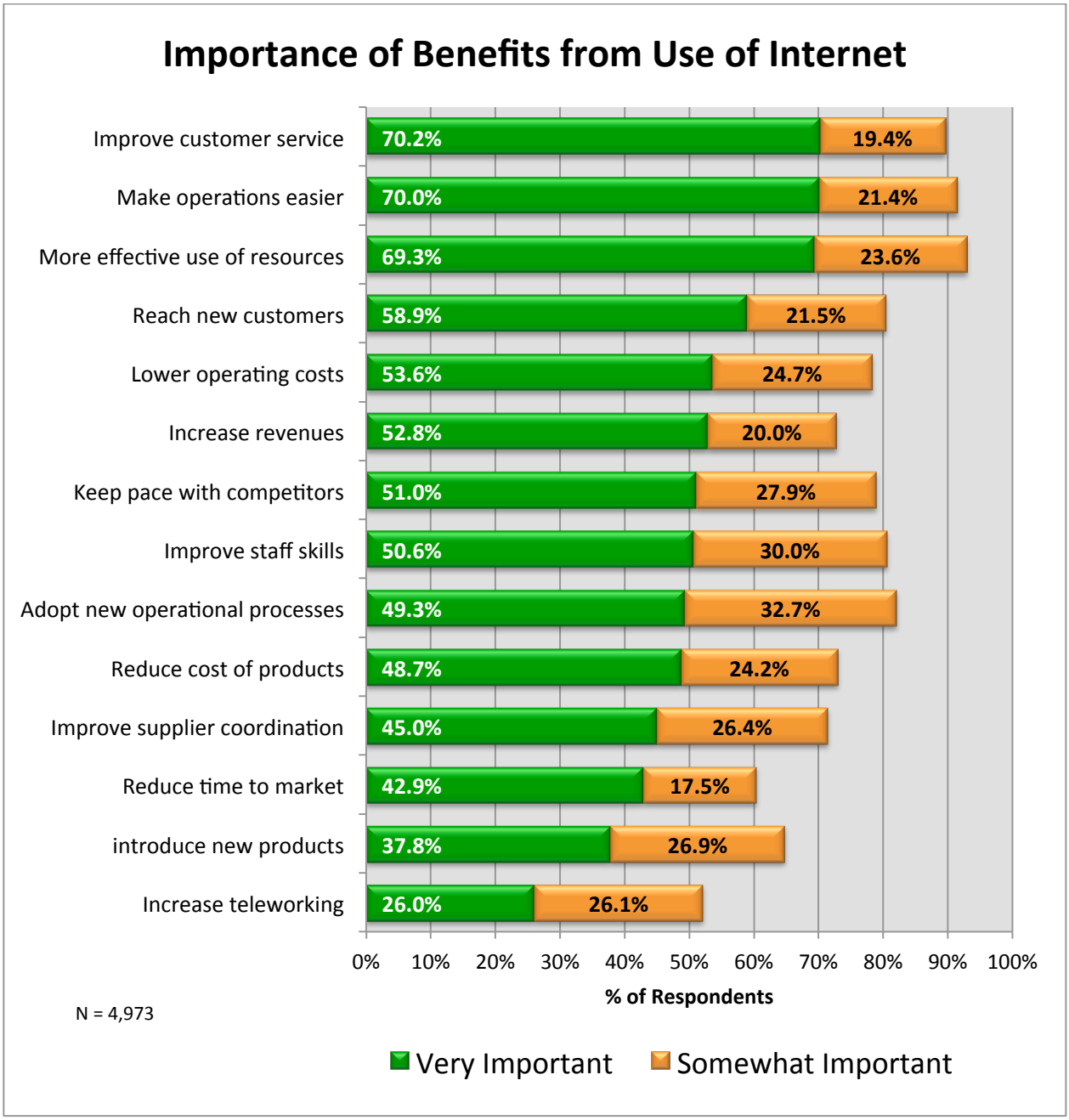
2.3.3 Broadband Benefits and Impacts

While understanding patterns of utilization of broadband helps to identify gaps and opportunities for increased adoption of eSolutions, it is equally important to understand the benefits and impacts of broadband utilization on businesses and organizations.

Overall, the majority of organizations recognize broadband as "very important" or "somewhat important" across all benefits dimensions (see Figure 14). The most generally recognized benefits are related to improved efficiency and productivity. The most recognized external-facing benefit of broadband is improved service to customers. Productivity-related benefits are recognized by more organizations than the revenue-related benefits, such as market reach, competitiveness, increasing revenues, and introducing new products.

The net effect of these benefits is to increase competitiveness and productivity and, where applicable, increase organizational revenues, reduce costs and improve profitability. Understanding the perceived importance of broadband in contributing to these benefits provides an indication of its impact.

Figure 14 – Importance of Broadband for Organizational Benefits



In comparing the importance of broadband by the three major sectors (business, nonprofit and local government), the difference in how broadband delivers benefits between commercial business and non-commercial organizations becomes apparent. The top three benefits remain the same for all three sectors. However, market reach, revenue, and competitiveness take on more significance for commercial businesses, as may be expected; while staff training becomes a higher priority for nonprofit and government sectors.

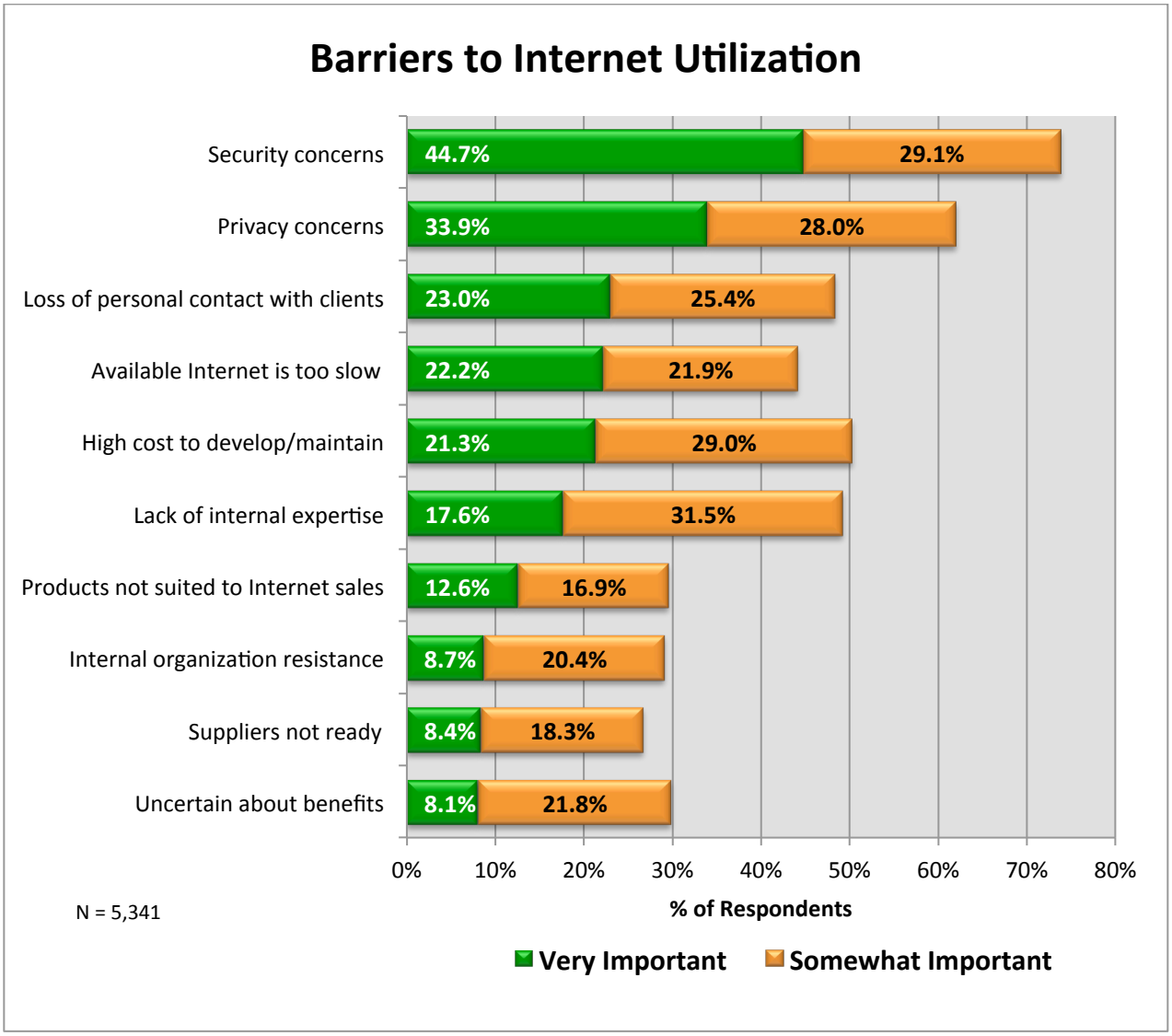
2.4 Barriers and Adoption Issues

2.4.1 Barriers to Adoption

Organizations were asked to rate the significance of a number of barriers to effectively using broadband Internet in their operations. These barriers tend to inhibit the adoption of eSolutions that need to be recognized and overcome to increase broadband utilization.

Two barriers that rate the highest in importance are security and privacy concerns, considered very important by 44 percent and 34 percent of organizations respectively.

Figure 15 – Barriers to Broadband Utilization



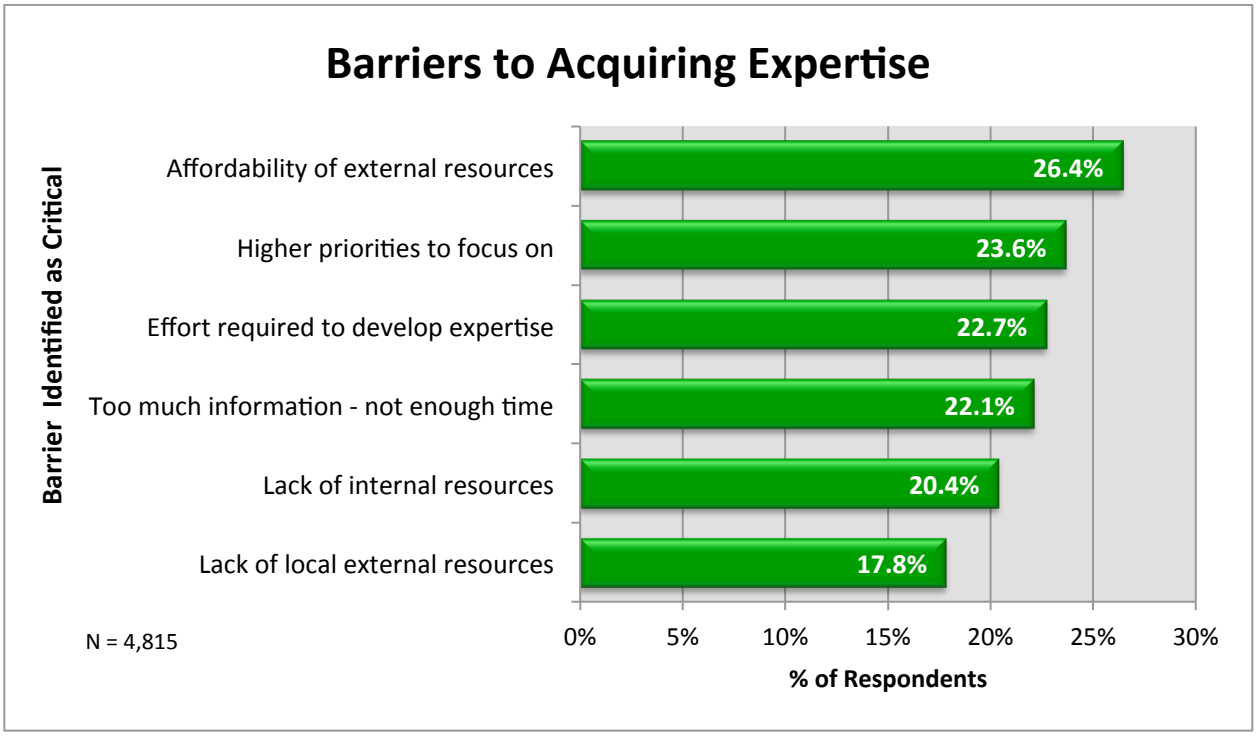
2.4.2 Expertise and Knowledge Issues

The knowledge and expertise needed to implement and use eSolutions are key factors in the level of broadband utilization achieved. There are several inter-related issues that organizations may encounter in moving forward with eSolutions:

- Lack of internal resource with necessary skills
- Time and effort required to develop expertise
- Lack of local external support resources
- Affordability of local external support resources
- Too much information – not enough time to research options
- Higher priorities to focus on

Organizations were asked to identify which of these issues are: critical barriers to progress; challenging but manageable; or not an issue for them. Overall, the lack of internal resources is a critical barrier for over 20.4 percent of organizations, and the cost of acquiring external resources is critical for 26.4 percent.

Figure 16 – Barriers to Acquiring Expertise

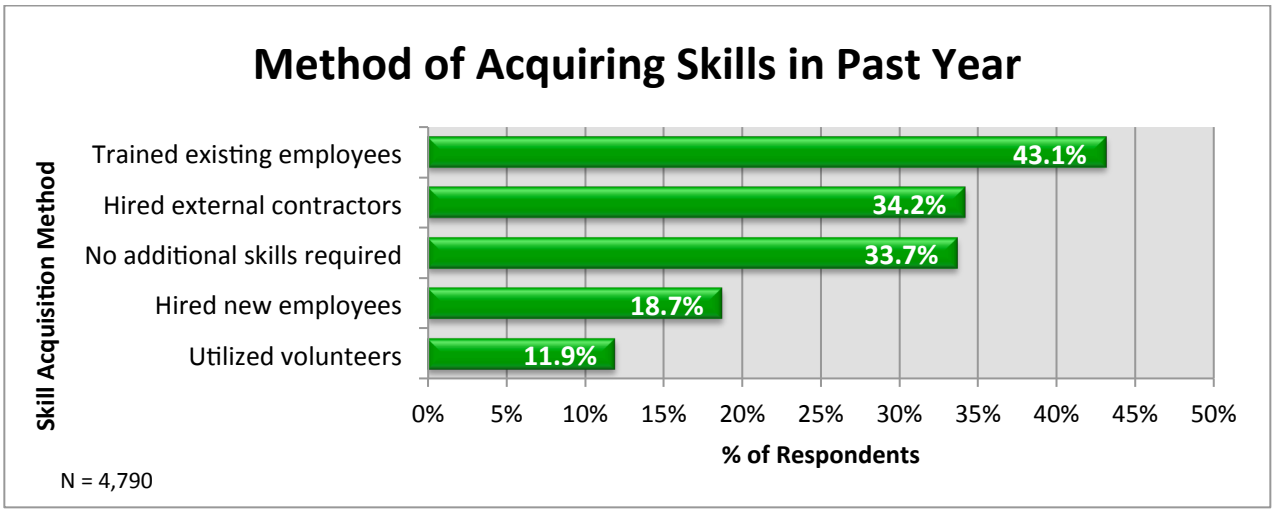


Given that expertise and knowledge within an organization are intimately tied to its human resources, a key question is to what extent these issues change with the size of organization. In fact, the lack of appropriately skilled resources, both internal and external, is more often a critical issue for small businesses, though these issues continue to exist for organizations with over 100 employees.

2.4.3 Skills Acquisition

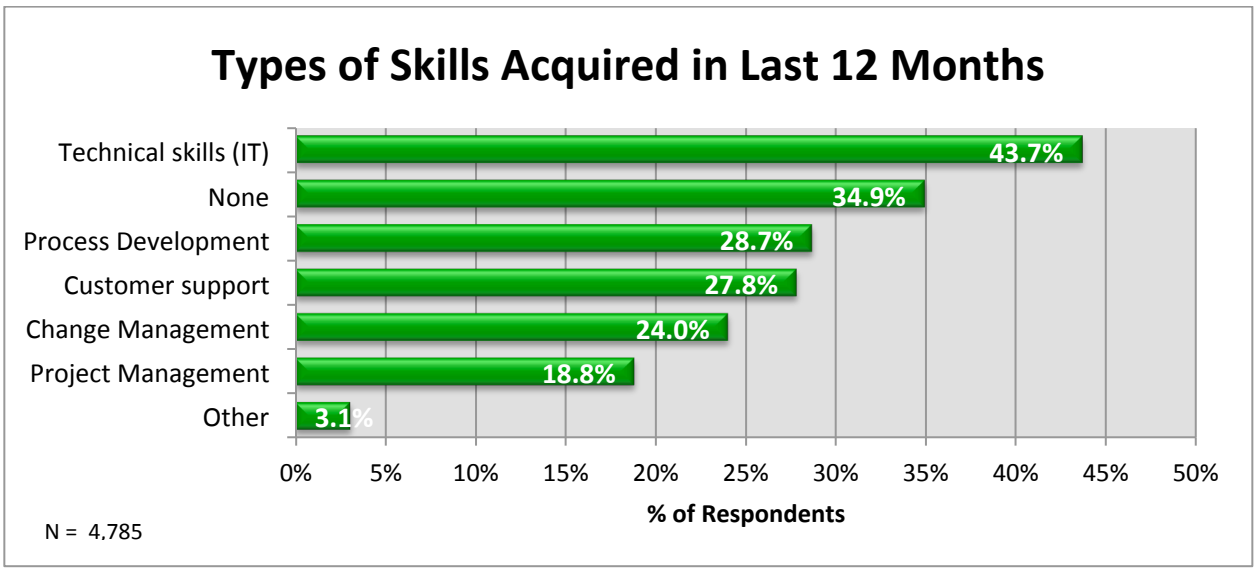
The survey examined how organizations did in fact address their expertise needs related to use of the Internet in the preceding 12 months. Organizations indicated a clear preference for training existing employees (43.1%). Generally, larger organizations (more than 50 employees) indicate a higher preference for hiring new staff with expertise compared to smaller organizations. To understand the extent to which organizations acquire or train resources, they were asked how they had acquired expertise and knowledge for eSolutions within the past 12 months. Organizations may have used one or more of the following methods as shown below.

Figure 17 – Method for Acquiring Skills in Past Year



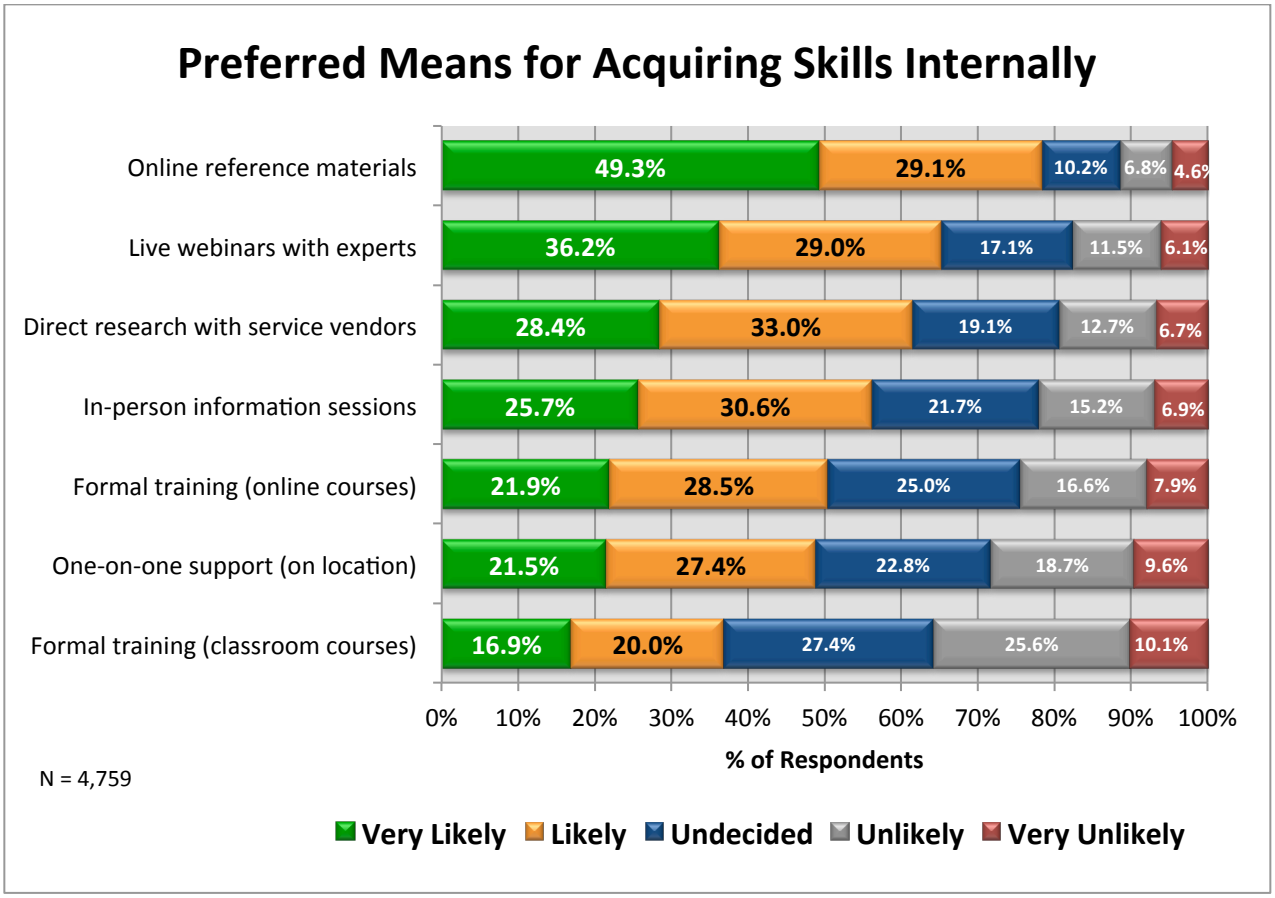
Organizations were also asked which skills they had actually acquired in the preceding 12 months. The most frequently cited areas of skill acquisition were in technical support (43.7%). However, organizations recognize the need to acquire customer support skills (27.8%) and process development skills (28.7%) to support the development and use of eSolutions.

Figure 18 – Type of Skills Acquisition over Last 12 Months



There are essentially two methods for organizations to acquire the needed skills, either through training internal resources or through hiring resources with the required skills. From a training perspective, organizations were asked about which methods they are most likely to use for the internal development of knowledge and expertise for researching, planning or implementing eSolutions.

Figure 19 – Preferred Methods for Acquiring Internal Knowledge



Self-directed methods of knowledge development, such as online research and webinars, are most likely to be used by the majority of organizations. Notably, formal training methods are less likely to be used, with in-person classroom training unlikely to be used by over 35.7 percent of organizations. This information is useful in determining the most appropriate methods to support organizations in developing the expertise they require for eSolutions adoption skills.

While 34.9 percent of organizations did not actively acquire skills in the prior year, 44.1 percent of organizations undertook some level of training of existing employees. To acquire the needed skills, 34.2 percent hired external contractors and 18.7 percent hired new employees. While past action is not necessarily a predictor of future action, these statistics do provide a base to assess the propensity of organizations to actually hire and train their employees.

2.5 Financial and Employment Impacts from Internet Use

In order to gauge the impacts of Internet use on the operations, organizations were asked to quantify how using the Internet has affected the generation of revenues, operating cost savings and employment. Due to the proprietary and sensitive nature of this information, these questions were optional for survey respondents. As a result, the sample sizes for usable data in these areas is significantly less than for the total survey response set. The largest amount of data collected was in relation to employment and the impacts of the Internet, on which 2,453 establishments (33.8% of all survey respondents) reported data. In all, 762 (10.5%) and 428 (5.9%) organizations reported data for revenues and operating cost savings related to the Internet respectively.

Organizations were asked to provide their total annual[7] revenues, operating costs, and current employment to provide a baseline for assessment of impacts. They were also asked to provide the changes that resulted from using the Internet, specifically:

> **Total Annual Revenue** from the Internet over the past 12 month period.
> *Example: This may include direct Internet sales (online) and income enabled by using the Internet to interact with customers.*
>
> **Total Annual Cost Savings** from using the Internet over the same period.
> *Example: This may include direct labor costs and other operating cost savings through efficiencies in purchasing and new operating processes.*
>
> **Number of new jobs created** in the past 12 month period and the number of new jobs created that can be attributed to using the Internet.
> *Consider the difference to job creation if your organization did not use the Internet.*

Figure 20 shows that while 10,200 new positions were created, reporting organizations experienced sizeable job reductions in the preceding 12 months, resulting in a net job increase of 5,043 positions. The net job increase attributed to using the Internet was 2,027 positions. The Internet facilitated the creation of 22.3 percent of all new jobs created and constituted 40.2 percent of net jobs created.

Figure 20 – Summary of Employment Impacts (part and full time combined)

Size of Employer	# of Organizations	Current Employees	New Jobs Created	Lost Jobs	Net Jobs
0 - 19	1,305	10,045	1,568	954	614
20 - 49	481	15,300	1,376	542	834
50 - 99	307	21,292	1,631	636	995
100 - 499	296	58,730	2,720	1,528	1,192
500 or more	64	76,886	2,905	1,497	1,408
	2,453	182,253	10,200	5,157	5,043

[7] Annual figures were requested for the past 12 month reporting period.

Size of Employer	New Jobs from Internet Use	Lost Jobs from Internet Use	Net Jobs from Internet Use	New Jobs from Internet as % of All New Jobs
0 - 19	428	65	363	27.3%
20 - 49	383	36	347	27.8%
50 - 99	575	16	559	35.3%
100 - 499	477	117	360	17.5%
500 or more	414	16	398	14.3%
	2,277	250	2,027	22.3%

In terms of the impact of the Internet on generating both revenues and cost savings, 45.2 percent of revenues from 762 establishments were generated through the Internet. Cost savings were significantly more modest at 2 percent.

Figure 21 – Revenues and Cost Savings from Internet Utilization

Annual Revenue Impacts			
# of Establishments	Total Annual Revenue ($M)	Annual Revenue from Internet ($M)	% of Revenue Enabled by the Internet
762	$10,938.9	$4,942.8	45.2%
Annual Operating Cost Impacts			
# of Establishments	Total Annual Operating Cost ($M)	Cost Saving from Internet ($M)	% of Cost Savings Enabled by the Internet
428	$2,557.1	$51.8	2.0%

3 KEY FINDINGS – HOUSEHOLDS

The following analysis is based on survey responses from 2,129 households from across the state of Illinois. The results focus on key findings related to Internet usage, benefits and barriers, with selected results broken down by key respondent characteristics, such as household income, connectivity type and rural versus non-rural regions.

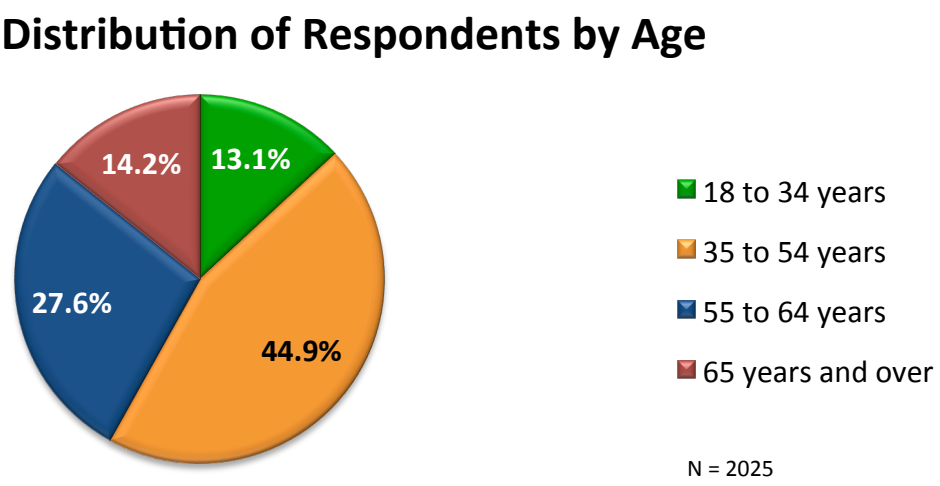
3.1 Household Profiles and Connectivity

3.1.1 Respondent Characteristics

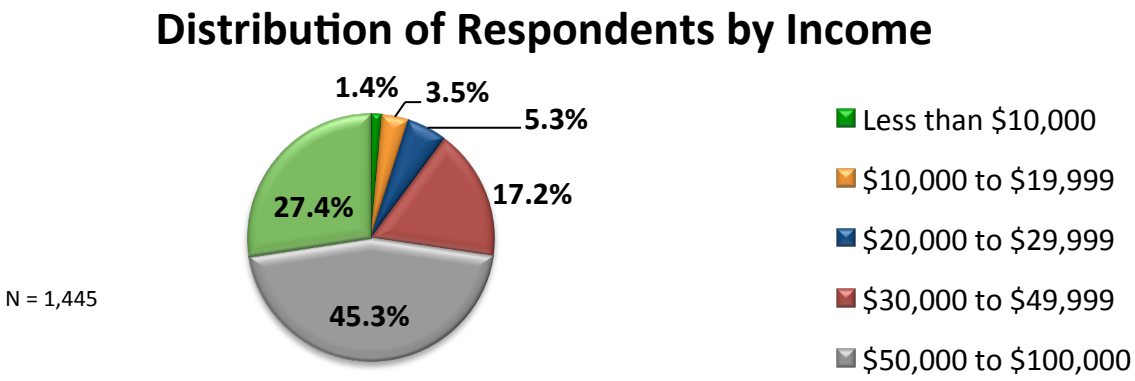
The household sample includes data from counties across the state. The household sample represents a good mix of demographics based on age, household income, and employment status, as well as a mix of communities from urban/metropolitan, micropolitan, small town and isolated small towns[8]. Figures 22 to 24 provide an overview of the demographic characteristics of the respondents. These characteristics can be used in analysis of survey data and are available as filters in the Digital Economy Analysis Platform. Having good sample sizes from each demographic group, region or type of community allows planners to conduct comparative analysis of how that group, region or type of community utilized the Internet, relative to its peers.

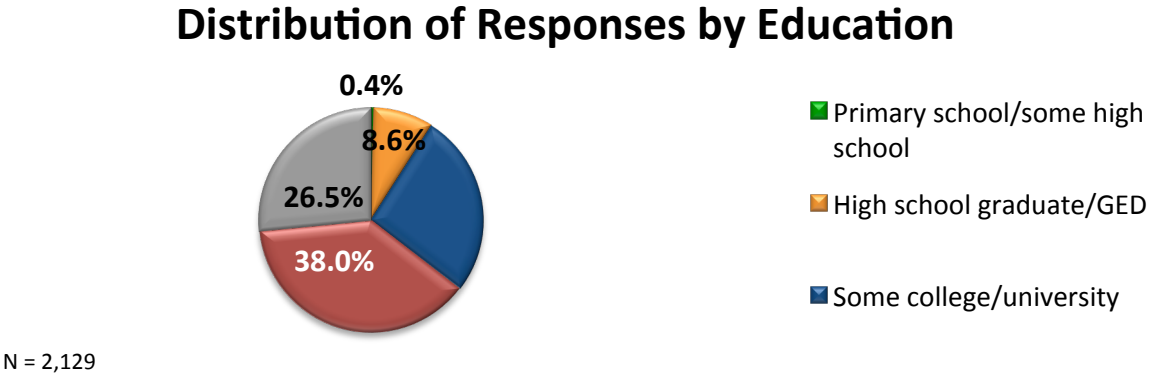
Compared to the US Census profile of Illinois, the sample collected is overweight in the 35 to 54 age category and underweight in the 18 to 34 year old groups. In terms of education, the sample is overweight in those with post-graduate degrees while being underweight in those with only a high school degree or less. In terms of income, the sample is overweight in households over the median state income.

Figure 22 – Household Demographics



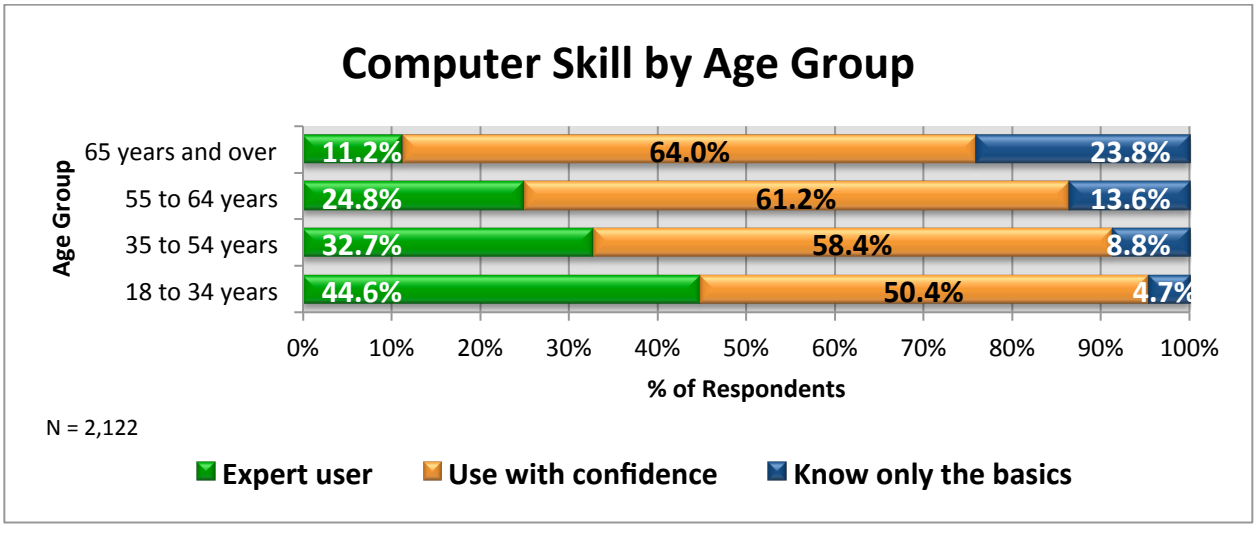
[8] A metropolitan area is defined by the Census Bureau as having a core urban area of over 50,000 with a population density greater than 1,000 people per square mile. A micropolitan area has a population of 10,000 to 49,999. A small town has a population of 2,500 to 9,999. The category of "isolated small town" includes the remainder.





Computer-skill levels and their implications for using the Internet provide an important frame of reference when evaluating and utilizing broadband services. As one might expect the level of computer expertise increases for younger age groups. For Illinois, 23.8 percent of those over the age of 65 "know only the basics", compared to just 4.7 percent of 18–34 year-olds. In contrast, 44.6 percent of respondents under age 34 consider themselves "expert users", compared to 11.2 percent of those aged 65 and more.

Figure 23 – Computer Skills by Age Group and Region

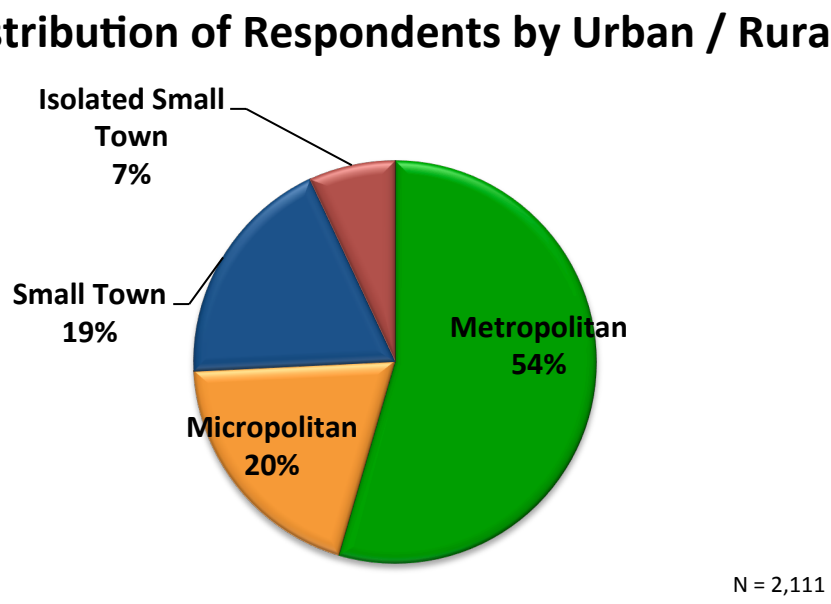


Data is available for a good cross section of the state, whether defined as regions or degree of urban concentration.

Figure 24 – Responses by Region

Region	# of Responses	% of All Responses
Chicagoland	515	24.2%
Southern	271	12.7%
Southeast Central	221	10.4%
Central	203	9.5%
Southwest Central	197	9.3%
North Central	190	8.9%
West Central	153	7.2%
Northeast Central	150	7.0%
Northwest	145	6.8%
Northern	84	3.9%
	2,129	100.0%

Figure 25 – Distribution of Respondents by Urban / Rural[9]

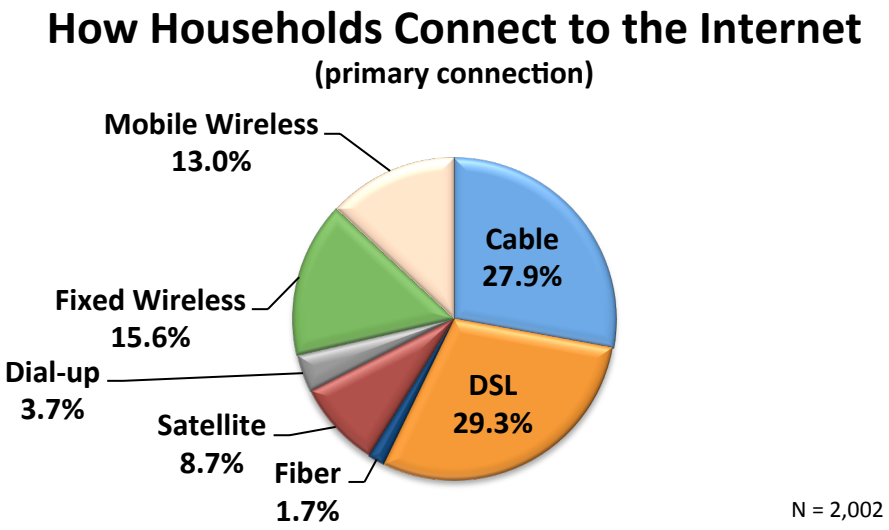


[9] A metropolitan area is defined by the Census Bureau as having a core urban area of over 50,000 with a population density greater than 1,000 people per square mile. A Micropolitan area has a population of 10,000 to 49,999. A small town has a population of 2,500 to 9,999. The category of "isolated small town" includes the remainder.

3.1.2 Connectivity Characteristics

The survey sample includes a broad mix of Internet connectivity technologies. Only 3.7 percent of households surveyed use dial-up Internet access, with another 8.7 percent using satellite. The following figure summarizes the Internet technologies used.

Figure 26 – How Households Connect to the Internet



The predominant technologies are DSL used by 29.3 percent, cable at 27.9 percent of households, fixed wireless at 15.6 percent, mobile wireless at 13 percent, and fiber at 1.7 percent. For non-metro areas, DSL is used by over 30.8 percent of households, with cable at 18.2 percent. However, in metro areas, the roles reverse, with cable serving 34.5 percent of households, compared to DSL at 26.6 percent. Significantly higher percentages of households in non-metropolitan areas use satellite Internet services, most likely because other forms of high-speed Internet access are not available.

Internet Access Speeds[10]

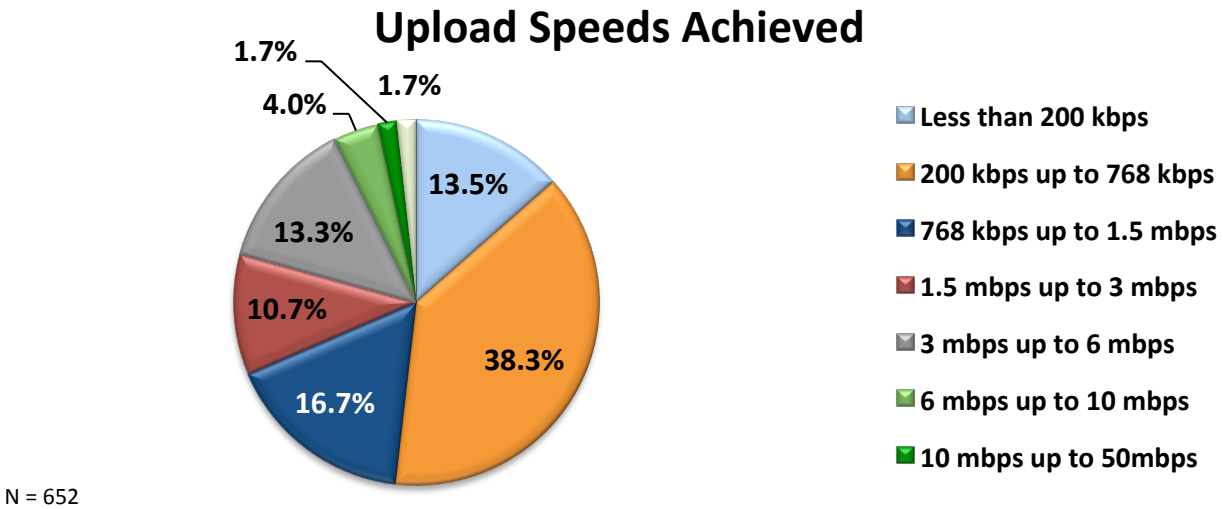
Households were provided the option of taking a speed test to measure the upload and download speeds of their connections. While 51.8 percent of households recorded less than 768kbps on the upload

[10] Speed test results should be used with great care. Different reports and broadband mapping exercises have produced markedly different results, largely because they measure different outputs. Key points to keep in mind in using speed test data from this survey include:

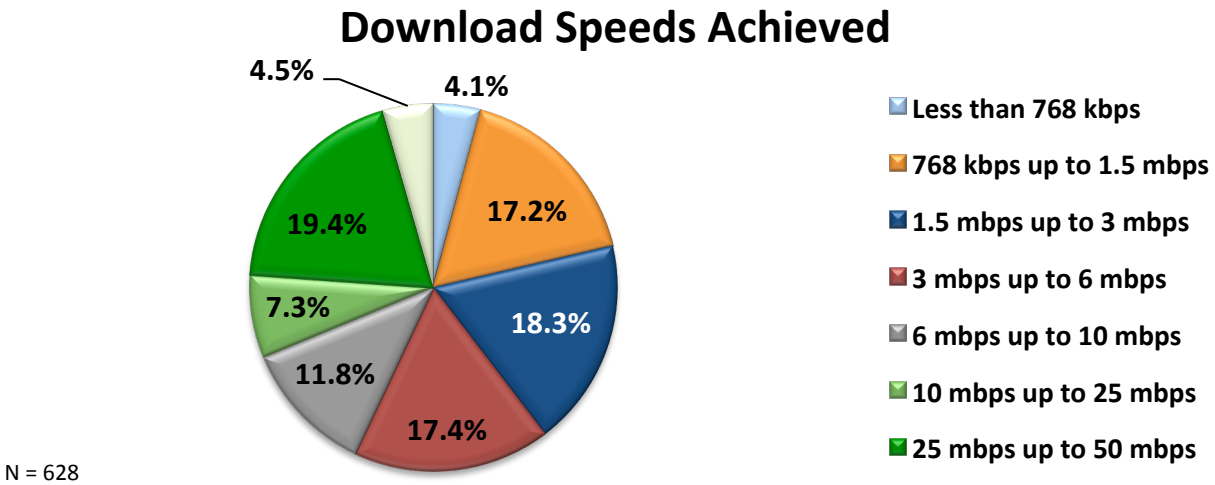
- ✓ The test measured ***actual*** upload and download speeds at the time the test was taken. Most broadband mapping exercises report speeds ***available*** in the area. *Many consumers purchase an Internet access service with less than the maximum available speed,* usually due to cost. Moreover, reported available speeds often reflect the maximum speed in a larger geographic area, not necessarily the speed available at that specific location.
- ✓ Because the survey data were intended to assist in regional planning efforts, the survey results are over-weighted to non-Chicago areas of Illinois. Non-Chicago areas of Illinois have lower average speeds than Chicago thereby lowering the overall state-average.

speed test, 21.3 percent failed to record 768kbps or higher on the download speed test. The following charts provide a summary of the speed-test results for upload and download speed ranges and average upload and download speed by connectivity type. The findings are also consistent with data reported on the NTIA Broadband Map site, which reports a median upload speed for households of 1 mbps and download speed of 5.4 mbps (http://www.broadbandmap.gov/summarize/state/illinois).

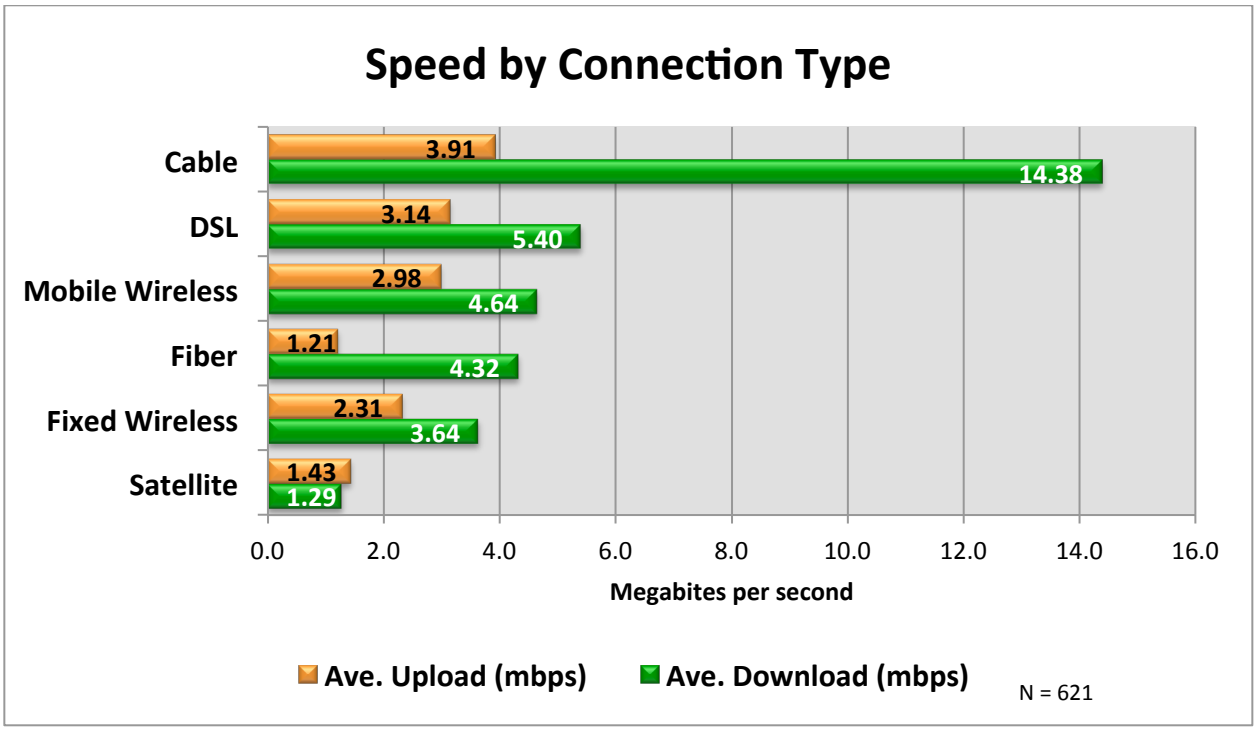
Figure 27 – Speed-Test Results for Households



N = 652



N = 628



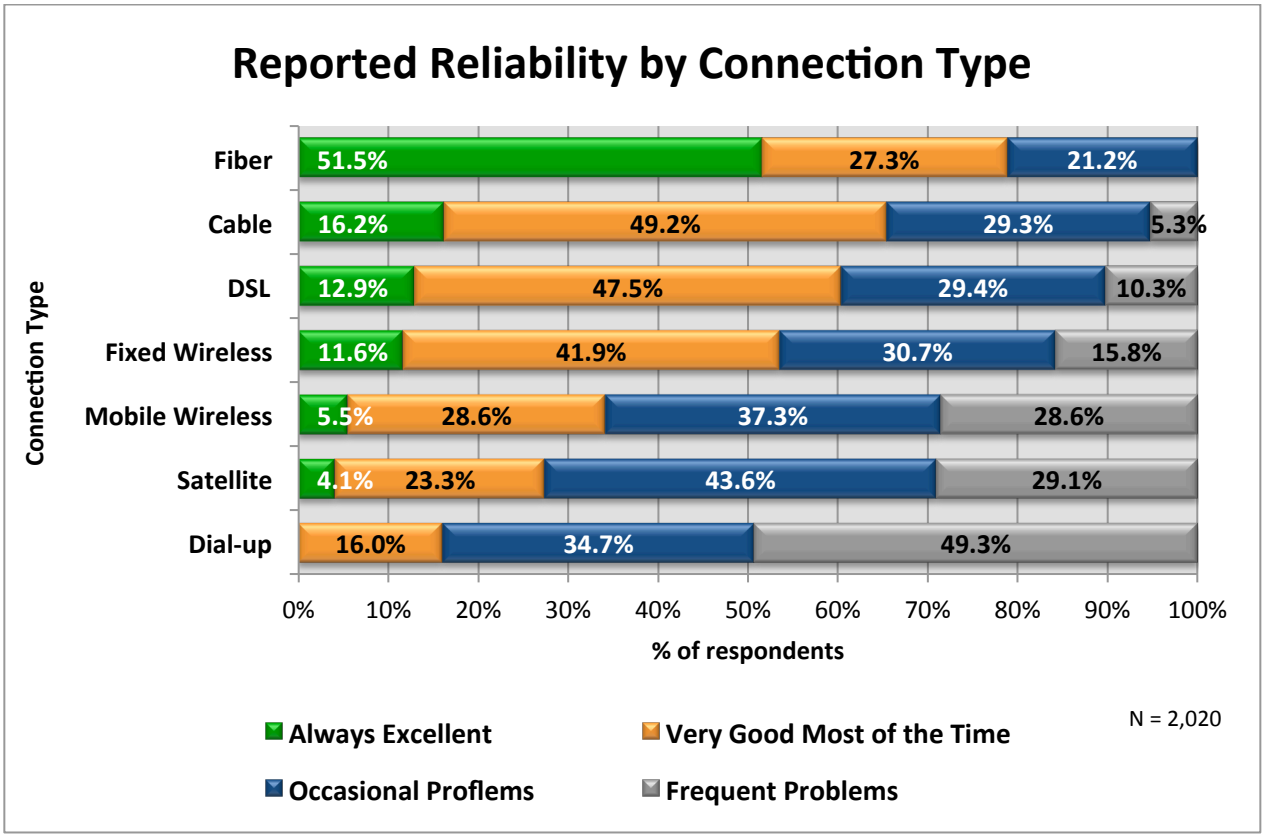
Internet Costs

The most common forms of broadband access – DSL, cable, mobile and fixed wireless – have very similar median cost ranges which, for the majority of households, fall in the range of $30 to $50 per month. Satellite and mobile wireless Internet services tend to fall in the $50 to $80 per month range, while dial-up service is the lowest cost option. The monthly costs for Internet service tends to be similar in rural versus non-rural areas.

Internet Reliability and Satisfaction Levels

Households were asked to rate how well their current Internet service meets their needs in terms of speed, reliability and value. Fiber rates the best of the broadband options. Cable, DSL and fixed wireless are comparable in terms of meeting household needs and expectations for speed, reliability and price/value. Reliability is generally poor for both dial-up and satellite Internet (as well as for mobile wireless to a lesser extent), contributing to poor ratings on price/value expectations.

Figure 28 – Reliability of Connection



Fiber is rated best for reliability by users. Cable was a distant second, followed closely in order by DSL and fixed wireless. Satellite service shows occasional or frequent problems by 72.7 percent of households, slightly better than dial-up Internet at 84 percent. As a result, 80 percent of satellite users state that their service is of poor value or below expectations, compared to 47.6 percent of users overall.

3.2 Broadband Utilization and Benefits

3.2.1 Broadband Utilization

Households were asked about their current uses of the Internet as well as their planned use over the next 12 months. Results are included for both dial-up users and households with broadband. Household utilization is examined in five major categories:

- Communication
- Research and information
- Online transactions
- Entertainment and recreation
- Personal productivity

The results of utilization in these five categories can be found in the online Digital Economy Analytics Platform (DEAP), which is described in detail in Appendix B. This eSB Report focuses primarily on household utilization in the productivity category. Households were asked about how they use the Internet for personal productivity for:

- Educational or training courses (remote learning or supplemental courses from home)
- Accessing workplace from home (occasional use)
- Teleworking (formal workplace all or part of normal work hours)
- Home-based business (full-time or part-time)

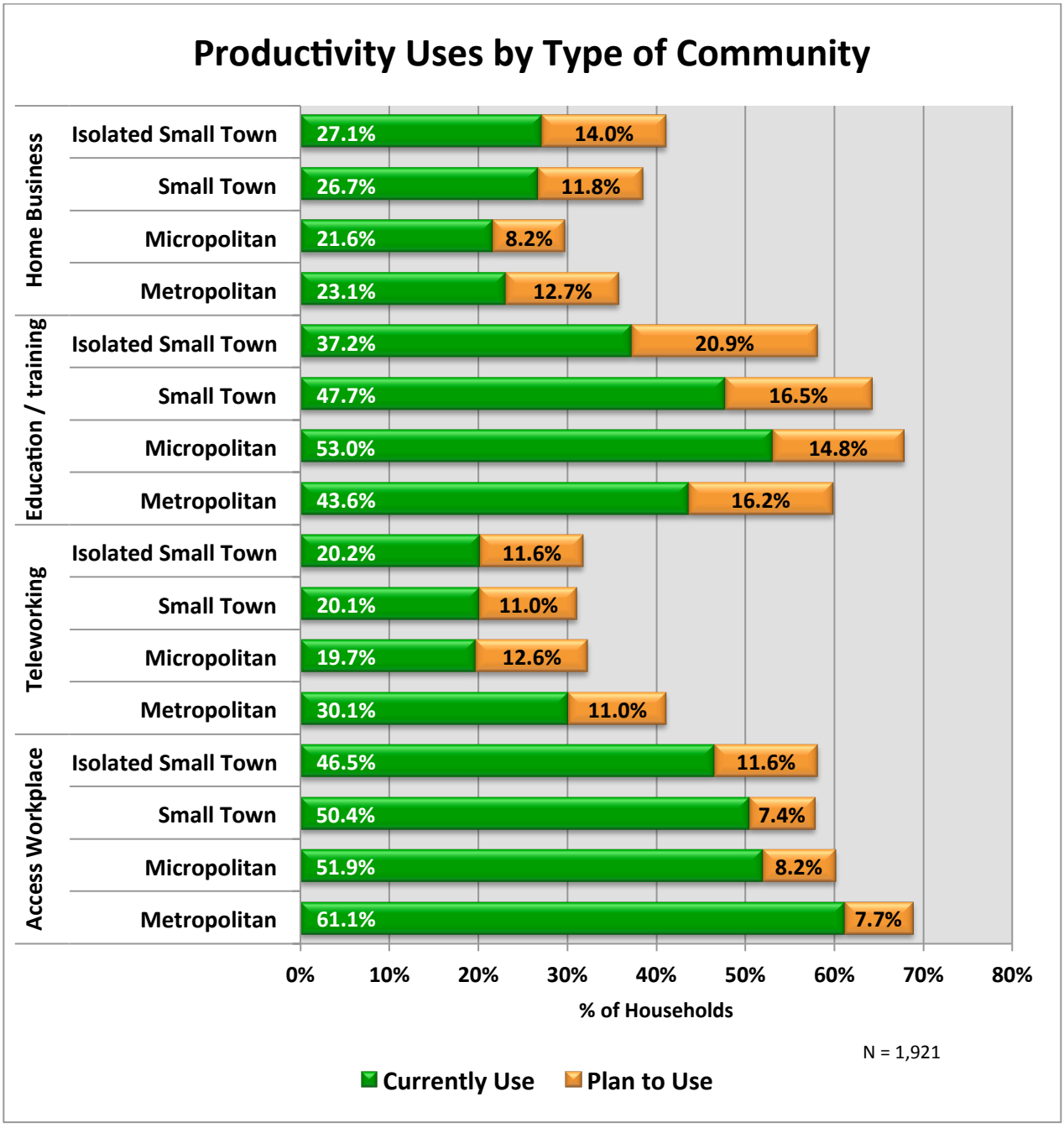
Utilization of the Internet for personal productivity is generally lower than the other usage categories. This can be attributed to a number of reasons, primarily in that these uses will not be applicable to all households or may not be an option available to them. For example, accessing the workplace would not be applicable to those who are retired, self-employed, students or unemployed. Only a certain portion of the population will be motivated to have a home-based business, and teleworking is not always an option depending on one's occupation or an employer's willingness to allow teleworking. However, the levels of usage in these personal productivity areas are significant, as are their implications.

The most frequent productivity use for households is for accessing their work place, with over 56 percent of broadband households currently using the Internet for this purpose and another 8 percent planning to do so. Education and training was the next most frequent productivity use, with 45.6 percent currently using and another 16.4 percent planning to do so. Broadband households using the Internet for a home-based business or for teleworking were a significantly smaller group at just over 23.7 and 25.6 percent respectively. However, this still represents a significant segment of the population. Moreover, planned use for both these categories exceeded 10 percent.

As seen in Figure 29, the impact of population density on these productive uses of the Internet by broadband users is noticeable though relatively minor. Higher population density increases use of the Internet to telecommute and access the workplace, while isolated small towns show a higher use of the Internet for home-based businesses.

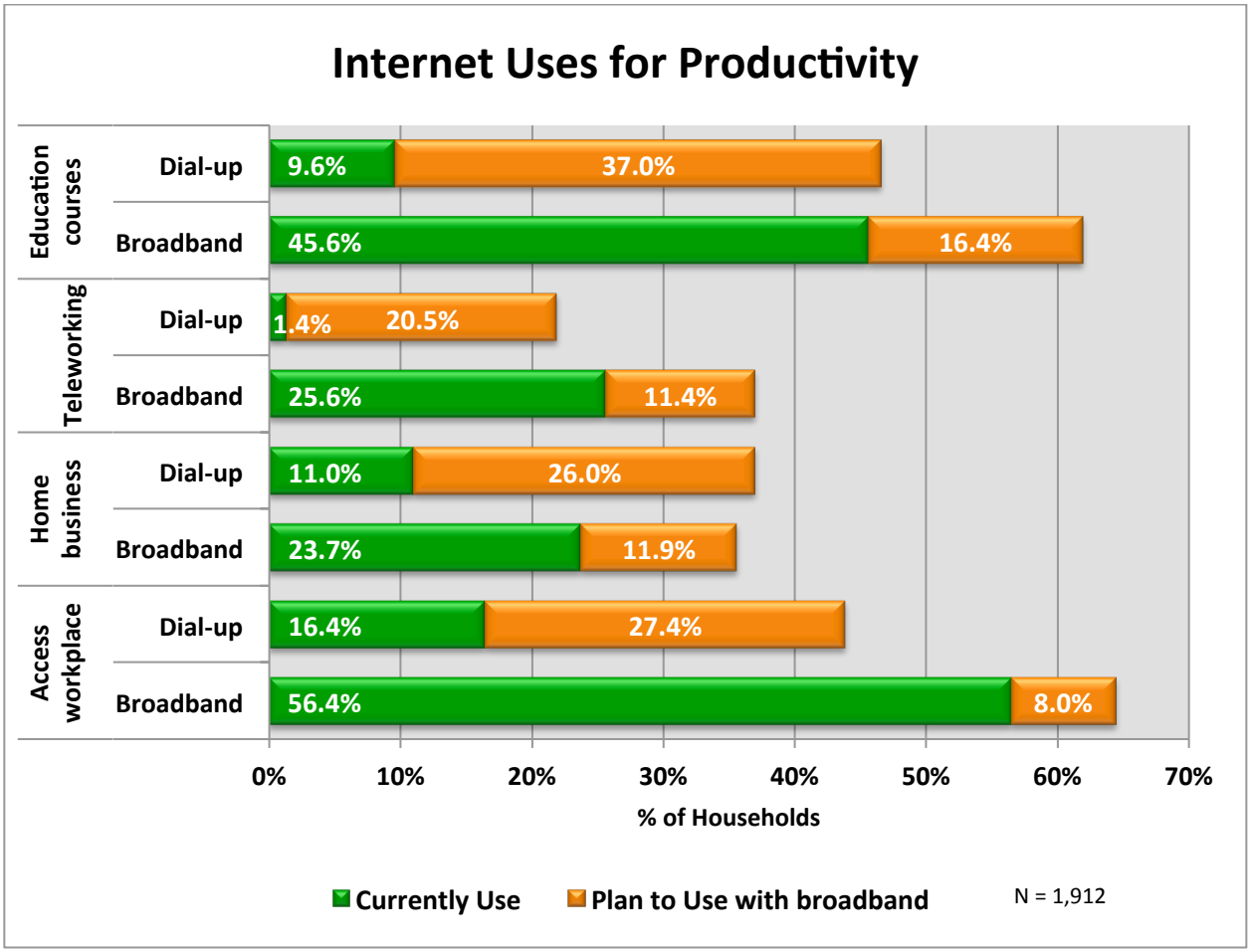
However, Figure 29 deals exclusively with users of broadband and not dial-up users. It is important to note that households in communities with a population less than 50,000 are three times as likely to be on dial-up compared to those in communities larger than 50,000. Households in isolated small towns are almost four times as likely to be on dial-up. As seen in Figure 30, having lower quality connectivity (e.g., dial-up) has a major negative impact on a household's Internet uses in the area of productivity.

Figure 29 – Productivity Uses by Type of Community (Broadband users)



As with other Internet uses there is a significant difference in utilization between dial-up and broadband users. This is more than simply a matter of convenience of higher speeds and bandwidth. For these uses the lack of broadband becomes a practical and meaningful impediment. Participation in online training that may include real-time interactions, presentations and video, is impractical if not impossible with dial-up access. Home-based businesses that are "Internet intensive" or that require continual online access without tying up the telephone line cannot operate effectively with dial-up. Similarly, teleworking requires home-based employees to be able to operate with the same effectiveness and efficiency as they would at their normal workplace.

Figure 30 – Household Internet Uses – Personal Productivity

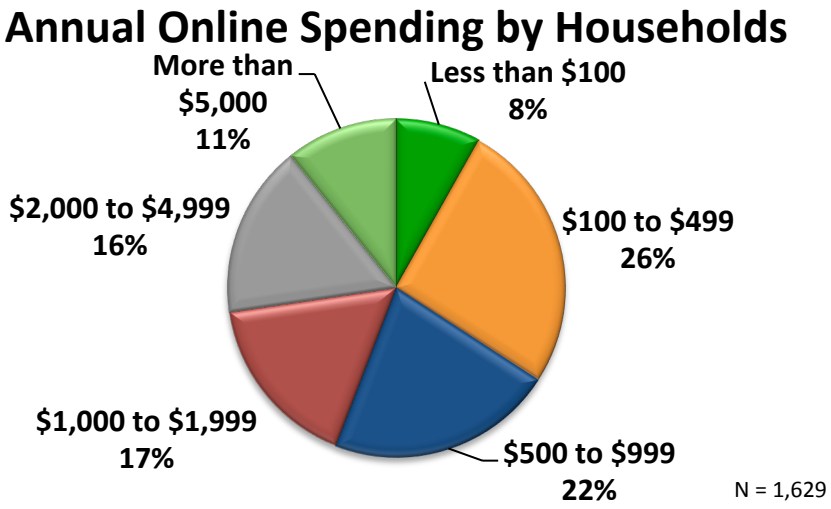


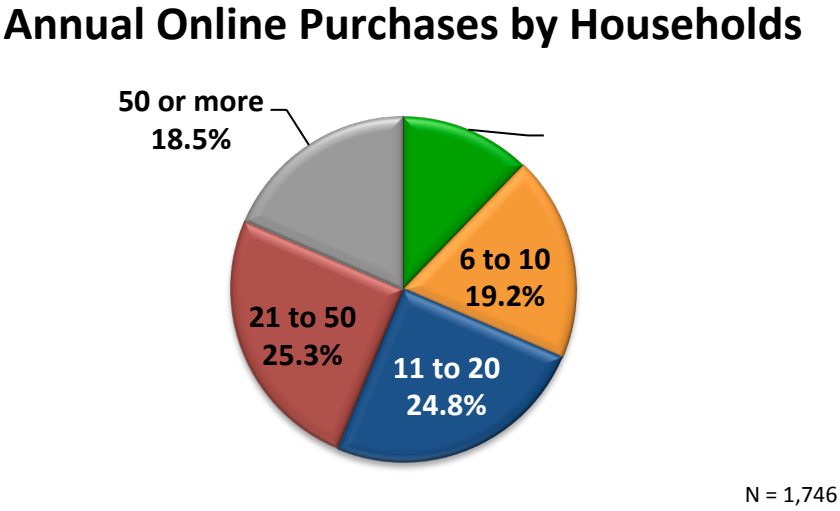
Evident in the figure above is the desire of many dial-up households to obtain broadband so that they can engage in specific and productive activities. In all, 37 percent of dial-up households want to obtain broadband so they can take educational courses. Another 26 percent want broadband for a home based business.

3.2.1.1 Online Transactions and Spending

The survey reveals that 94.5 percent of broadband households use the Internet to purchase goods and services online, with 68.5 percent of all households conducting more than 10 purchase transactions per year, and 66 percent of households spending more than $500 per year online. Not surprisingly, broadband users conduct more transactions and spend more online than dial-up users.

Figure 31 – Annual Online Spending by Households





3.2.1.2 Home-based Business

One somewhat surprising finding was the number of households that generated income over the Internet, particularly through a home-based business. Over 23 percent of broadband households stated that they currently operate a home-based business. These households were further asked if they operate a home-based business under the following definition:

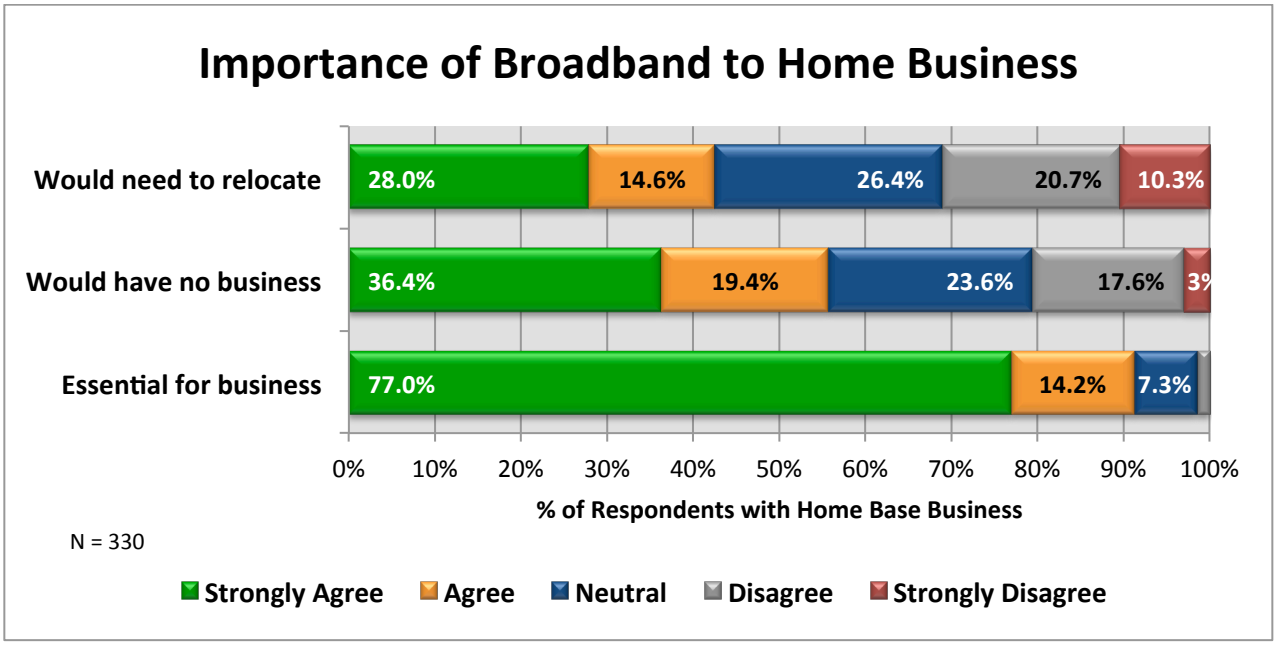
"A home-based business may be part-time or full-time activity by one or more household members that operate their business exclusively from home. This may include self-employed professionals and many other types of entrepreneurial business activities."

Using the tighter definition, 18% of all households surveyed operate a home-based business. (In other words, based on the more precise definition, 71 percent of 23 percent of respondents who initially

stated that they ran a home-based business confirmed operating a home-based business using broadband.)

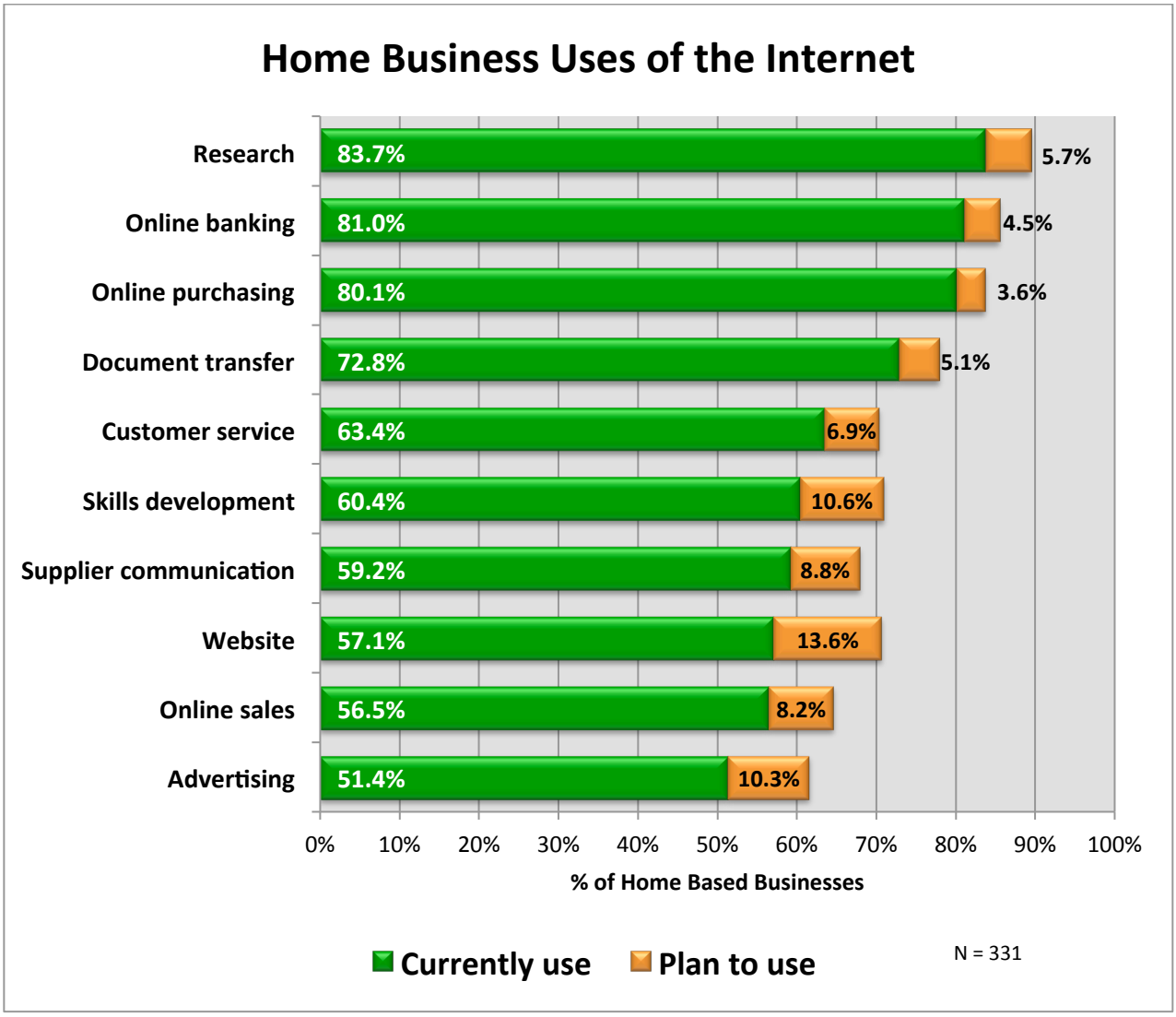
1. Of all home-based businesses, 98.2 percent use a form of broadband, while the remainder uses dial-up service.
2. Only 57.1 percent of home businesses have a business web site, compared to 74.9 percent of other small businesses with 0 to 4 employees. On the other hand, home-based businesses are more likely to sell online (56.5%) compared to other small businesses (48.7%).
3. Over 67 percent of home businesses see using the Internet as very important for making day-to-day operations easier and making more effective use of their resources (productivity). Over 60 percent consider the Internet very important for improving services and increasing sales.
4. As well, 77 percent of home-based businesses stated that broadband is essential for their business to function. Taking this broad statement one step further, 36.4 percent of home businesses strongly agree that they would not be in business without broadband, and 28 percent would need to relocate to get broadband if it was not available.
5. Home-based businesses were asked to identify[11] in which industries they operate. The largest industry component is Professional & Technical Services[12], followed by the broad categories of Retail Trade and "Other Services"[13].

Figure 32 – Importance of Broadband for Home Business



[11] Respondent self-identified based on a list of industry categories. The results must be viewed with caution as individuals may not accurately identify their industry based on standard NAICS definitions.
[12] Professional, Scientific and Technical Services includes a wide range of business categories, including legal services, accounting and tax preparation, architectural, landscaping, interior design, graphic design, etc.
[13] Other Services (excl. Public Administration) includes a wide range of business categories, such as auto repair, personal care services, pet care services, and a variety of repair and maintenance services.

Figure 33 – Home Business Uses of the Internet



3.2.1.3 Teleworking

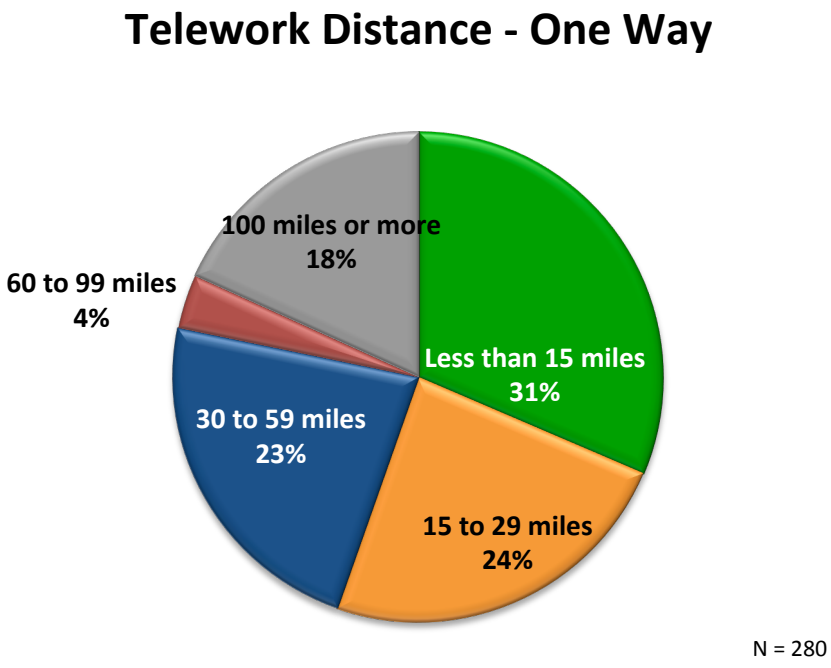
In response to questions concerning use of the Internet for personal productivity 25.6 percent of households stated that teleworking is currently practiced. These households were further asked if one or more household members telework under the following definition:

"Teleworking is considered to be working from home during normal working hours as part of an ongoing arrangement with your employer. Teleworking may be part time (one or more days per week) or all of the time. Teleworkers typically have access to company resources online (e.g., company Intranet) with the ability to work from home in the same manner that they would in their company location. Occasional access to work or doing work from home after normal working hours is not considered teleworking."

Of the original 25.6 percent of households that identified themselves as teleworking, 73 percent confirmed that they telework using this definition (18.7% of total households). This more precise definition provides a more conservative estimate of teleworking. It is likely that additional households work at home on an occasional basis, but not as a formal working arrangement with their employer.

1. Over 60 percent of teleworkers are employed by organizations more than 30 miles (one-way distance) from their residence. Over 12 percent would need to travel over 100 miles to their workplace.
2. The most important motivation factors for teleworking households are life-work balance (cited by 75.4% of teleworkers), followed by reduced commute time (68.9%), productivity (68.2%), and more family time (66.8%).
3. Thirty two percent strongly agree that they would not be able to work in their present position if it were not for the ability to telework, i.e., teleworking is a requirement for their current job.
4. Relocating to another community would be necessary for 30 percent of teleworkers if they could not telework.
5. The largest industry category for teleworking is "Professional and Technical Services" at 20 percent, followed by "Educational Services" at 18 percent. However, teleworkers can be found in a broad range of other industries.

Figure 34 – Teleworking Characteristics – Days and Distance



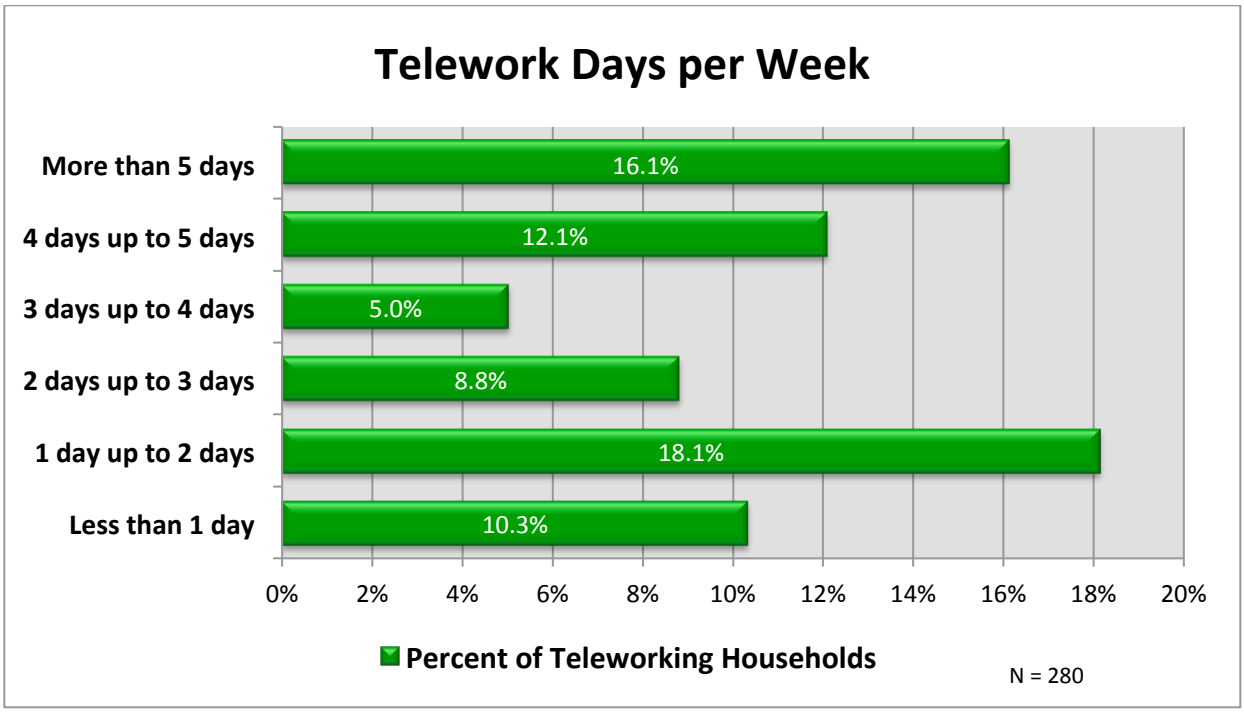
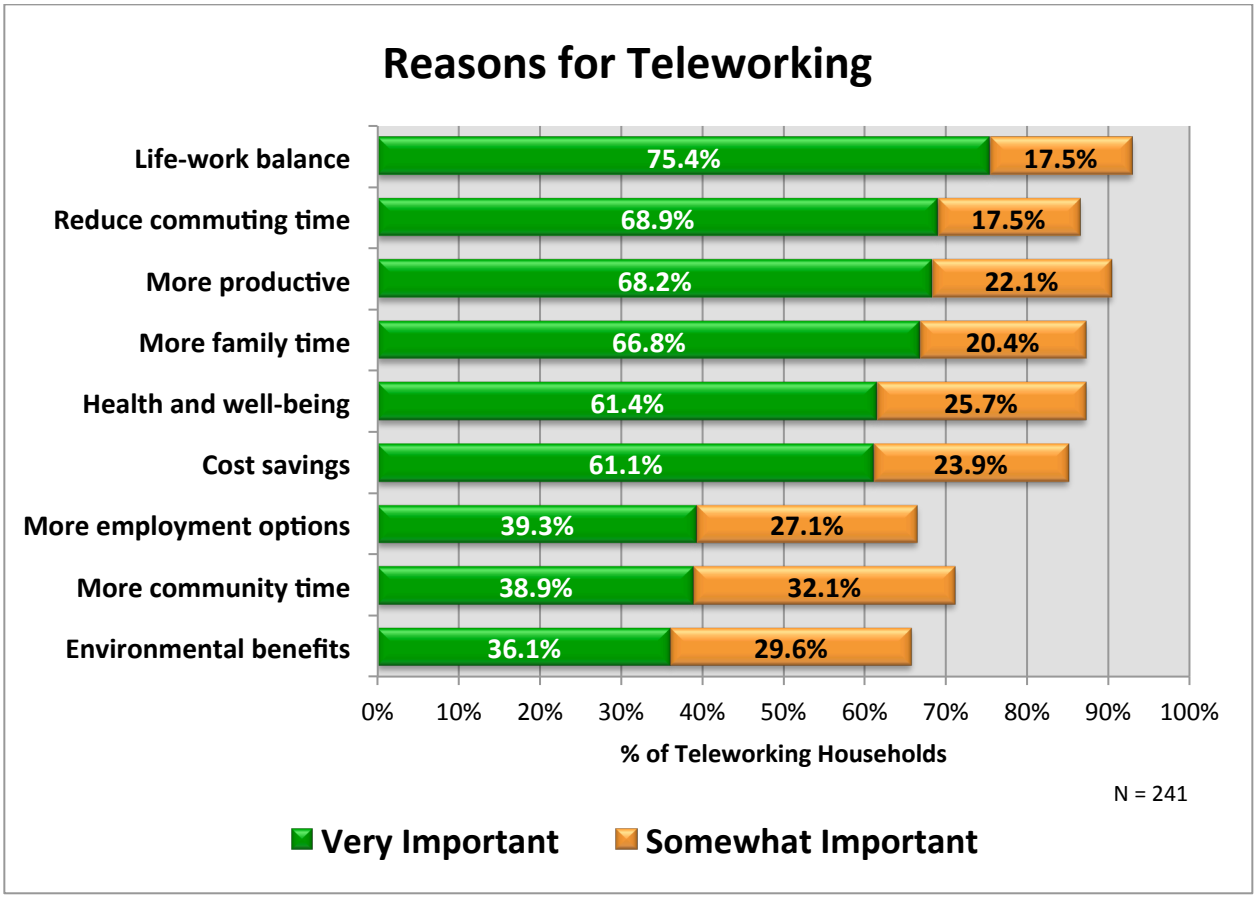


Figure 35 – Motivations for Teleworking



3.2.2 Household and Community Benefits

While it is important to understand patterns of Internet use to identify gaps and opportunities for increased utilization, it is equally important to understand the benefits and impacts of broadband utilization for households and their communities.

To provide a perspective on the overall importance of broadband, households were asked: ***"Assuming you could never get broadband service, how likely is it that you would leave to relocate to a community that offers broadband?"*** At least 18 percent of households would definitely relocate to another community in order to access to broadband services. An additional 20 percent would consider relocation very likely.

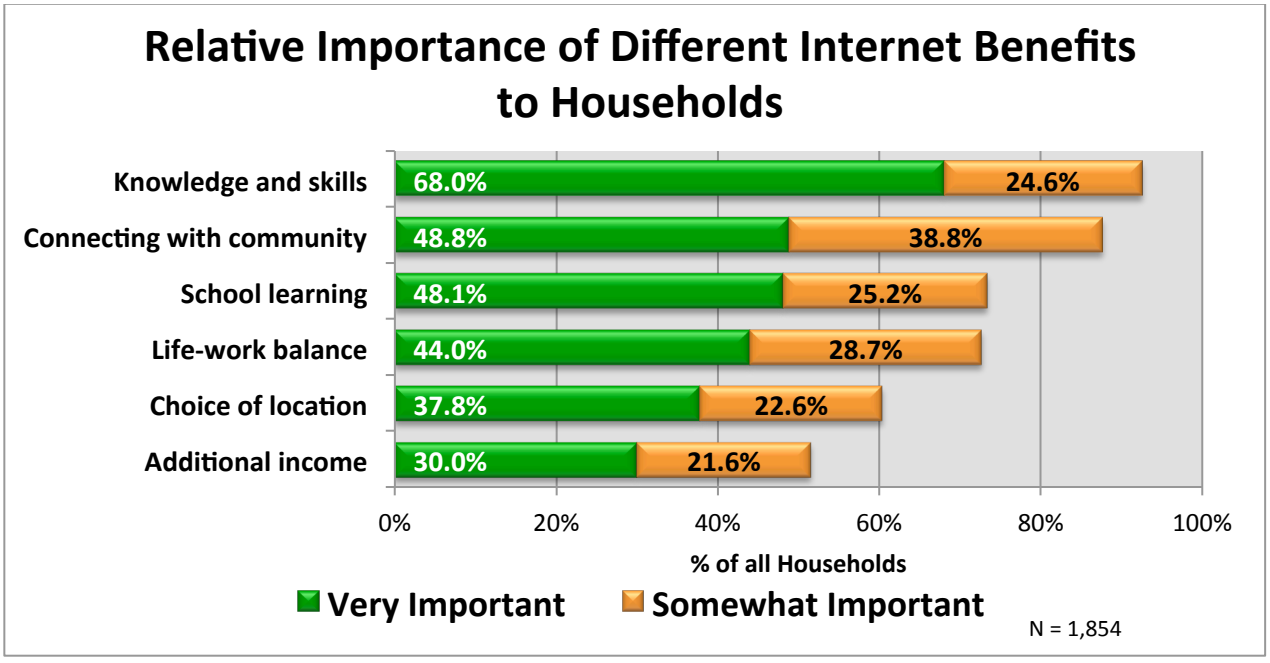
The fact that **overall between 18 percent and 38 percent of households would seriously consider relocation for broadband service** is an important factor with significant implications for communities, both in retaining and attracting residents.

Households were asked to rate the significance of the Internet for achieving the following household benefits:

- Improves knowledge and skills (through online education and/or research)
- Enhances ability to earn additional income
- Enhances school learning (through research and study)
- Enhances awareness of what is happening in the community
- Supports better balance of personal and work time
- Supports choice of living location (e.g., for selecting or remaining in your community)

The following figure shows the benefits of using the Internet for households using broadband connectivity.

Figure 36 – Significance of Broadband for Household Benefits



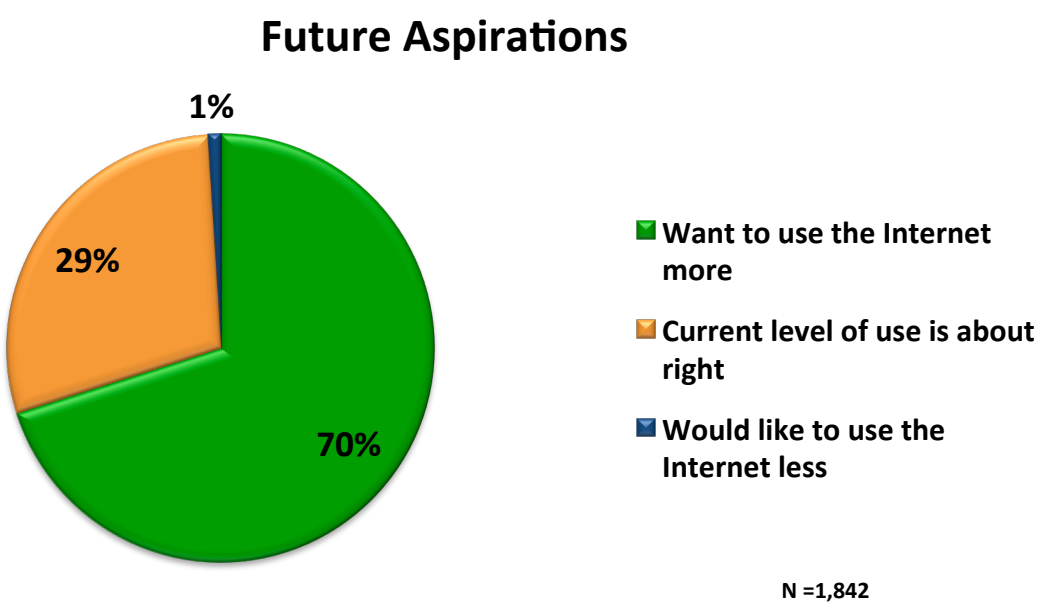
One of the benefits for which broadband is most frequently cited as "very significant" is **improving knowledge and skills** (68%) through online education or research. Being **more connected with the community** is seen as very significant by over 48 percent of households. Broadband is considered very important for the **ability to earn additional income by over 30 percent of households**. This is a level similar to that of households that currently telework or have a home-based business.

3.3 Barriers and Adoption Issues

Data collected addresses how households can get the most out of broadband by looking at their aspirations, barriers to achieving those aspirations, and how they can acquire the skills to overcome those barriers.

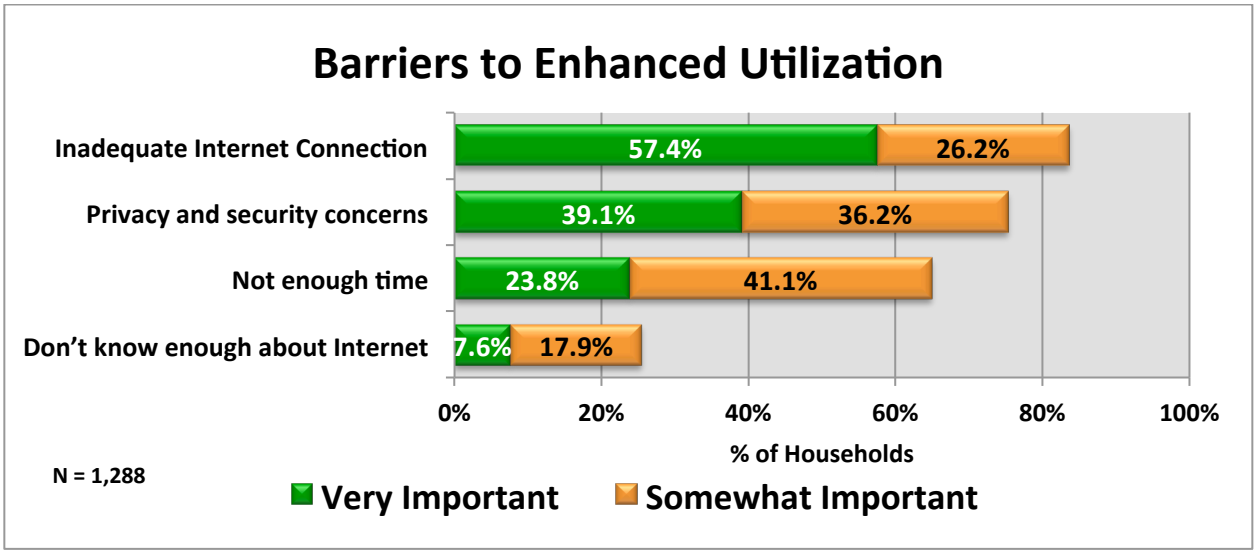
The first question is whether households are satisfied with their current level of Internet use, including the level of benefits they derive from using the Internet. As seen in Figure 37, 70 percent of household respondents want to increase their level of Internet use. Twenty nine percent feel their current level of use is about right, while only 1 percent would like to reduce their use. For those 65 and older the percent wanting to increase their use is 73.9 percent.

Figure 37 – Household Aspirations Regarding Level of Internet Use



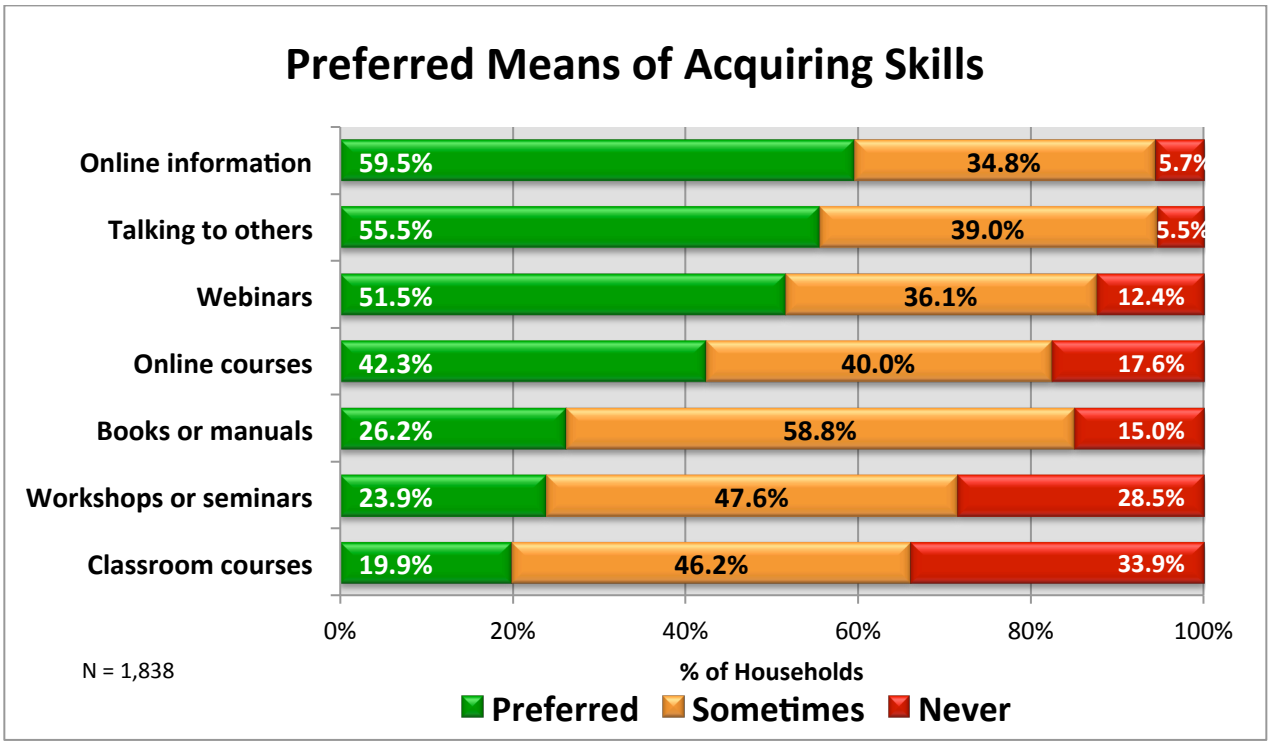
With 70 percent of households wishing to increase or improve their use of the Internet, the next question is "what barriers do they see in striving to achieve that objective". As seen in Figure 38, the two main barriers are an inadequate Internet connection (57% of households say this is a very important barrier), followed by concerns over privacy and security (39%). Lack of skills or knowledge impacts a far smaller group.

Figure 38 – Barriers to Enhanced Use of the Internet



A critical question to those households wishing to learn more about using the Internet is their preferences for different learning methods. As seen in Figure 39, the preferred methods are self-directed, either by accessing online resources or talking with other people who have experience. The least favored methods are formal classroom training or workshops and seminars. These statistics should be considered in any initiatives designed to deliver training and support to households for increasing broadband utilization. In particular, providing access to online information, webinars, and training courses would be favored by over 80 percent of households, while also being a cost-effective method for delivering information and support for using broadband services.

Figure 39 – Preferences for Learning about Using Broadband

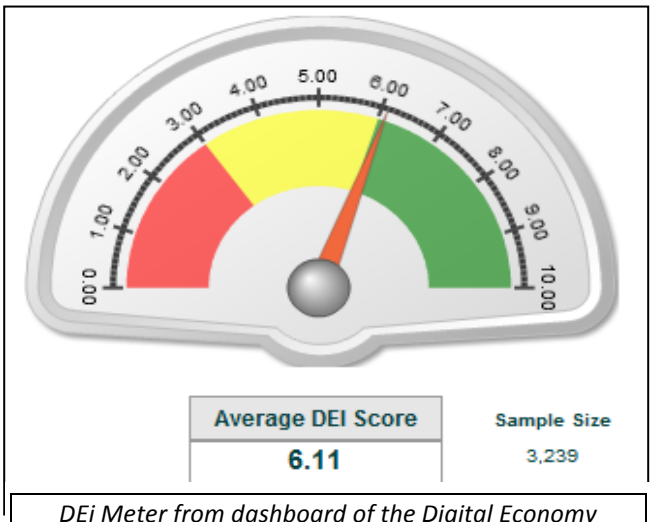


4 BENCHMARKS AND REGIONAL OVERVIEW

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

4.1 Introducing the Digital Economy index (DEi)

The Digital Economy index (DEi) reflects an organization's or household's utilization of a range of Internet applications and process – 17 for organizations and 30 for households. These applications and processes (eSolutions) are listed on the following page. Based on the number of applications currently being used by an organization or household, a composite score is calculated that summarizes how comprehensively each organization or household uses Internet-enabled eSolutions. The DEi can be used to compare organizations, regions, or industry sectors. A separate DEi is used to compare how different types of households use the Internet.



DEi Meter from dashboard of the Digital Economy Analytics Platform

An organization's or household's DEi Score (from 0 to 10) captures their utilization of eSolutions, with 10 being the highest possible use. DEi Scores are averaged across groups of users by various categories: e.g., a sector's DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying variations in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households. On the next page is a list of the utilization categories (eSolutions) used to track how organizations and households use their Internet and broadband connections.

Highest
2
3
4
5
6
Lowest
Insufficient Data

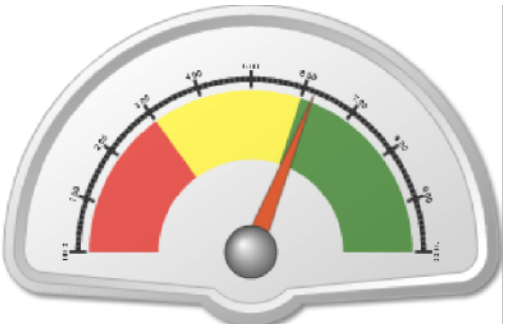
The Color Coding for DEi Scores: To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (**green**) to lowest (**red**) to highlight how DEi Scores compare. **The color coding** (**green to red**) allows one to quickly compare groups based on how utilization varies.

eSolutions refer to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. eSolutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

eSolutions Categories for Organizations	
e-Commerce Related	***e-Process Related***
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

eSolutions Categories for Households	
Communication	***Transactions***
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
Productivity	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	***Research***
Recreation	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

4.2 Organizational Benchmarks and Regional Breakdown



Average DEi Score	Sample Size	Median DEi Score
6.47	7253	**6.70**

This report uses both mean average and median as benchmarks. For organizations in Illinois, the mean average was 6.47 while the median average was 6.70.[14] As can be seen in Figure 40, Chicagoland and the Northern, and North Central Regions have significantly higher than average median DEi Scores than the other regions.

Figure 40 – Utilization Benchmarks (DEi) for Organizations by Region

Region	Average DEi Score	Median DEi Score	Sample Size
Chicagoland	6.71	6.99	3,781
North Central	6.47	6.7	508
Northern	6.37	6.6	388
Northeast Central	6.4	6.41	318
Central	6.08	6.41	479
Southwest Central	6.11	6.31	344
Southern	6.21	6.21	379
West Central	6.05	6.21	309
Northwest	6.18	6.16	437
Southeast Central	5.96	6.16	310
Illinois	***6.47***	***6.7***	***7,253***

Figure 41 shows how different sized organizations in the different regions perform relative to the state benchmarks. The benchmarking shows that smaller organizations consistently perform at lower levels than larger organizations.

[14] The terms **mean** and **average** refer to the sum of all values divided by the total number of values. The **median** is the central point of a data set. To find the median, you would list all data points in ascending order and simply pick the entry in the middle of that list.

Figure 41 – Utilization Benchmarks (DEi) for Organizations by Region and Size of Firm

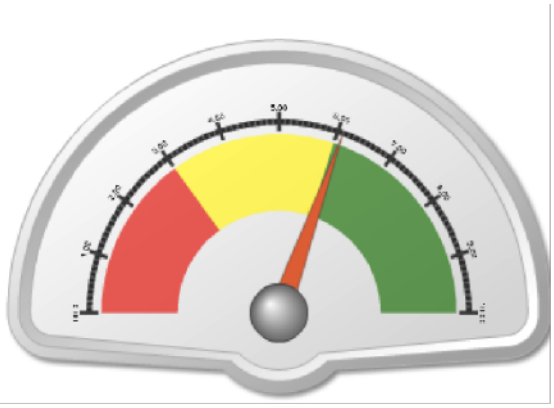
Organization Size by Number of Employees	0 - 19	20 - 49	50 - 99	100 or more
Central	5.80	6.44	6.76	7.07
Chicagoland	6.50	6.96	7.25	7.44
North Central	6.22	7.10	6.85	6.77
Northeast Central	6.16	6.76	6.90	7.19
Northern	6.11	6.28	7.20	6.73
Northwest	5.99	6.09	7.32	7.52
Southeast Central	5.57	6.56	6.48	6.90
Southern	6.20	5.60	6.23	7.28
Southwest Central	5.82	6.08	7.56	6.89
West Central	5.79	6.62	6.61	7.41
Illinois	***6.25***	***6.70***	***7.06***	***7.23***

In comparing the government, commercial and non-profit sectors, it is apparent that the commercial sector (with a median DEi of 6.80) utilizes a broader range of eSolutions than either the non-profit sector (6.70) or government sector (6.31). This is partly explained by the less frequent use of such commercial eSolutions as selling online. Benchmarking with the DEi also allows comparisons between different industry sectors, as outlined in Figure 42.

Figure 42 – Utilization Benchmarks (DEi) by Industry Sector

Major Industry Category	Average DEi Score	Median DEi Score	Sample Size
Information	6.84	7.38	504
Arts, Entertainment and Recreation	6.89	7.33	170
Finance and Insurance	6.79	7.28	440
Professional, Technical and Scientific Services	6.69	7.09	992
Real Estate	6.71	7.09	222
Utilities	6.57	6.99	43
Transportation and Warehousing	6.57	6.84	162
Manufacturing / Processing	6.67	6.80	574
Retail Trade	6.67	6.80	558
Administrative and Support Services	6.38	6.70	230
Educational Services	6.48	6.70	829
Wholesale Trade	6.60	6.70	337
Accommodation and Food Services	6.46	6.60	142
Other services (except public administration)	6.32	6.51	502
Construction	6.09	6.21	346
Health Care and Social Assistance	6.09	6.21	513
Agriculture / Forestry / Fishing	5.53	5.73	56
Government (public administration)	5.38	5.44	531

4.3 Household Benchmarks and Regional Breakdown



Average DEi Score	Sample Size	Median DEi Score
6.29	2129	6.54

For households in Illinois, the mean average was 6.29 while the median average was 6.54. As can be seen in Figure 43, the Chicagoland, North and Northwest Regions have significantly higher than average median DEi Scores than the remaining regions.

Figure 43 – Utilization Benchmarks (DEi) for Households

Region	Median DEi Score	Diff. from Median	Average DEi Score	Diff. from Average	# Households
Chicagoland	6.86	0.32	6.65	0.37	515
Northern	6.80	0.26	6.55	0.27	84
West Central	6.73	0.19	6.35	0.07	153
Northeast Central	6.47	-0.07	6.28	0.00	150
Northwest	6.47	-0.07	6.21	-0.08	145
Southwest Central	6.47	-0.07	6.20	-0.09	197
North Central	6.47	-0.07	6.18	-0.11	190
Southern	6.47	-0.07	6.05	-0.24	271
Central	6.35	-0.19	6.20	-0.09	203
Southeast Central	6.06	-0.48	5.88	-0.40	221
Illinois	6.54		6.29		2,129

The DEi Scores indicate that residents of the Chicagoland, Northern and West Central regions utilize the Internet more effectively on average than residents of other regions. This variance between the regions may be explained to some degree extent by the younger average age, higher income and educational make-up of the Chicagoland and Northern regions, though the West Central Region results are less easy to explain. Compared to the overall sample, respondents from the West Central region tended to be older, with above average education and average income. Typically, the younger, wealthier and better educated a person or household, the more effectively they use the Internet. The older, poorer and less well educated, the less effectively (on average) they are likely to use the Internet. In addition, residents of rural areas also tend to have lower utilization (DEi Score) than metropolitan residents.

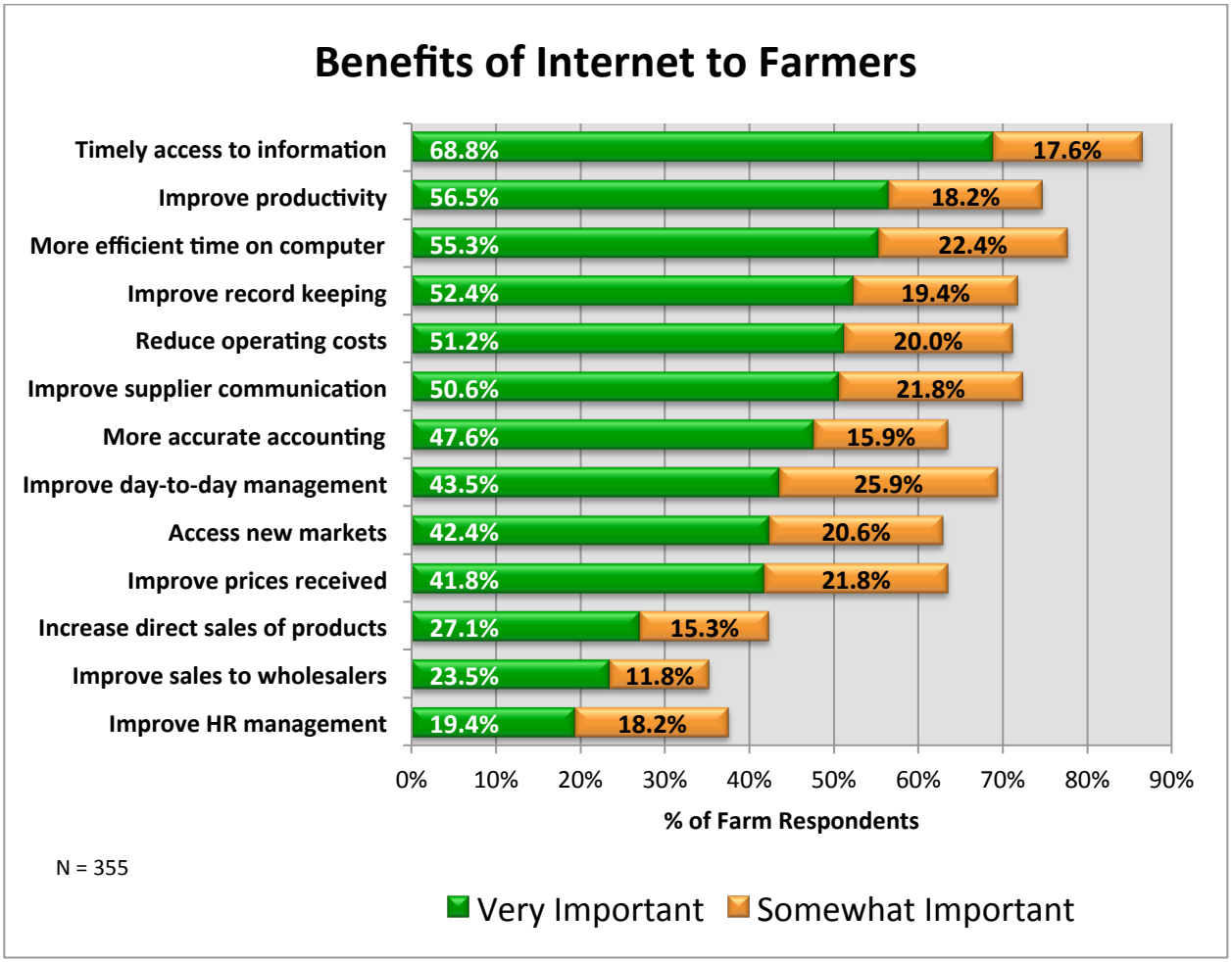
5 SECTOR ANALYSIS

The data collection effort for Illinois included specific questions for respondents who identified themselves as belonging to a group that was of special interest to broadband planning. These included farms and six types of community anchor institutions (CAIs): public Internet access sites, health, education, local government, economic development agencies and libraries. CAIs were asked if they provided public access to the Internet, and if so in what manner. CAIs in the five categories noted above were each asked as small number of questions regarding Internet uses specific to their area. This section summarizes the responses of this sub-set of respondents to their area specific questions.

5.1 Farms

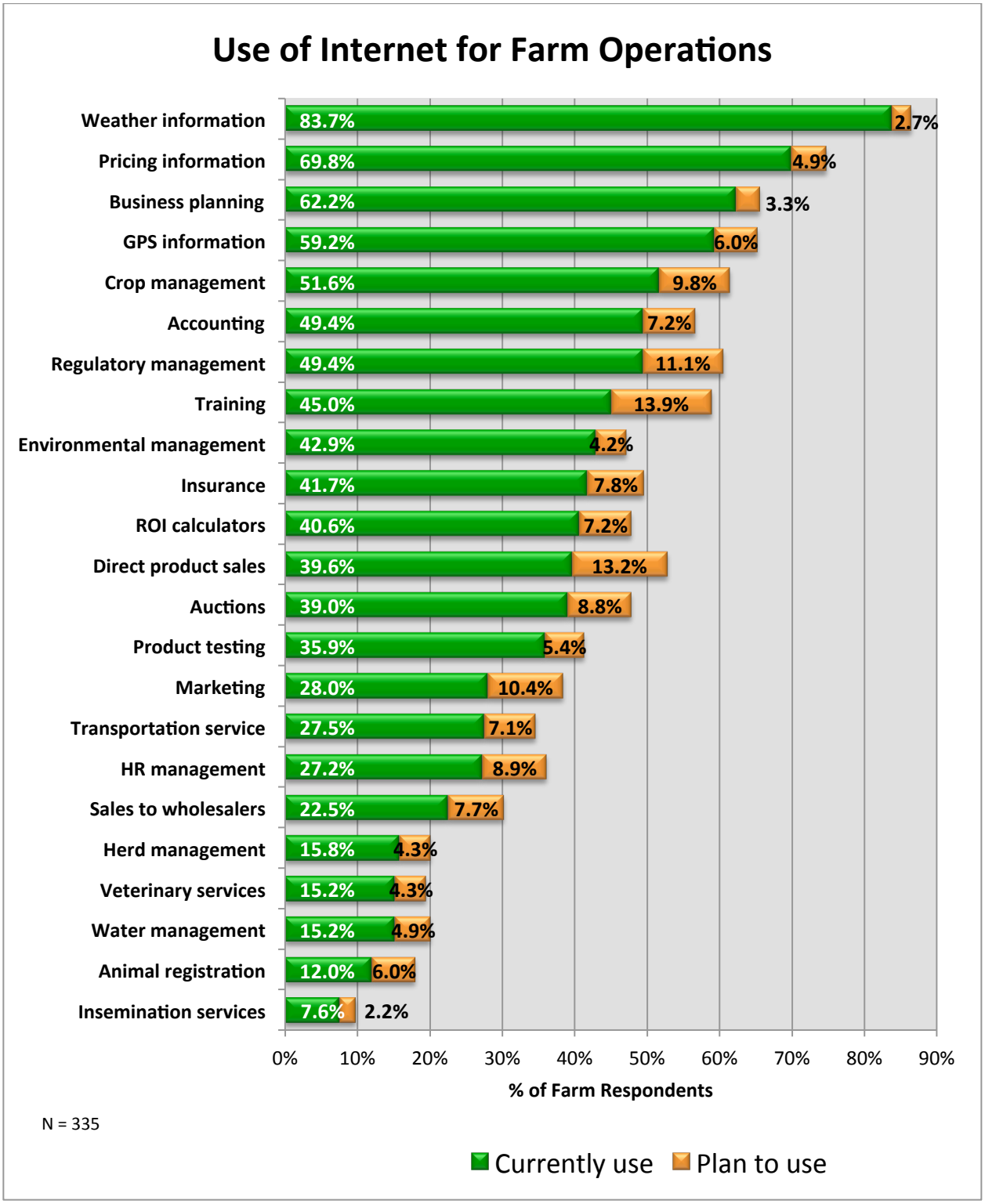
One hundred, eighty six respondents identified themselves as belonging to the farm sector. Their use of the core Internet solutions, as measured by DEi, was moderately lower than the state average (DEi = 6.27, versus 6.47 for the state). As seen in Figure 44, the main benefits of the Internet reported by farmers related to operational factors, with increased sales and revenues less frequently cited.

Figure 44 – Benefits of Internet to Farmers



The leading farm specific uses of the Internet (Figure 45) focus on information (weather, GIS, prices) and business management. Direct market sales through the Internet falls roughly in the middle of eSolutions currently being used by farmers, but was the highest rated for future growth together with training.

Figure 45 – Use of Internet for Farm Operations



5.2 Public Internet Access at Community Anchor Institutions

Two thousand, two hundred and seventy eight (2,278) respondents identified themselves as a public or non-profit entity that could be considered to a Community Anchor Institution. Of these, 684 (30%) reported that they provided some form of public Internet access. The most common types of access included public Internet terminals (98.2%) and public access Wi-Fi (70.5%). Over 50 percent of these organizations also provided Internet training.

The availability of public access Internet is greatest during the work day, with over a third of public Internet facilities closed during evenings and weekends. Libraries represent the most consistent public service during evenings and weekends, though a surprising number of other organizations, such as schools and local governments, provide access outside of work hours. Just over a quarter of public access facilities indicate that they plan to expand the number of public terminals.

Figure 46 – Public Internet Access Services

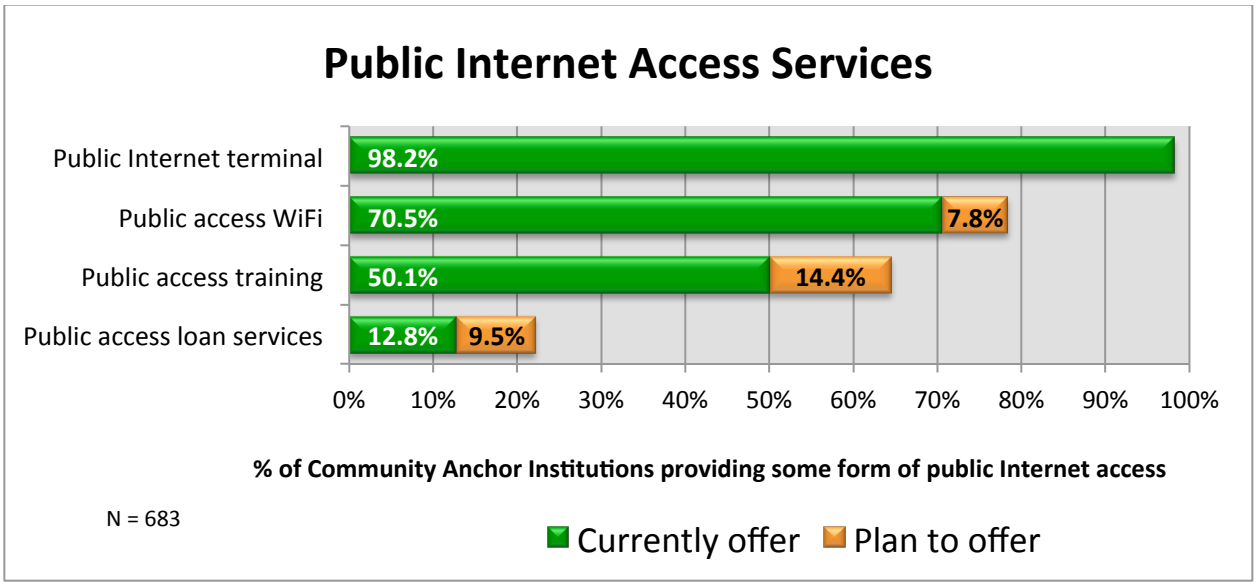


Figure 47 – When Public Internet Access is Available

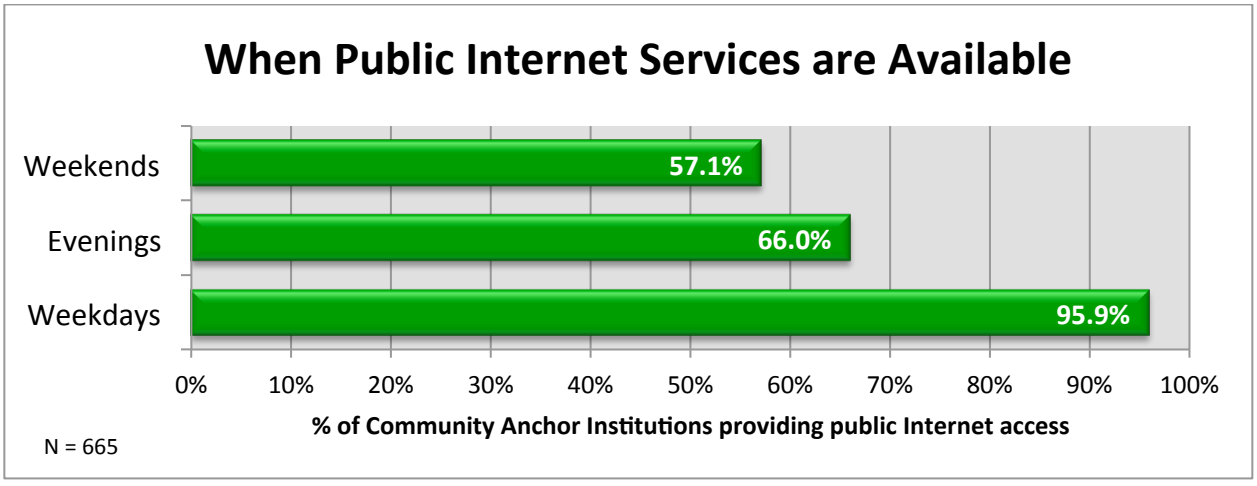


Figure 48 – Library Internet Access Capacity by Time of Week

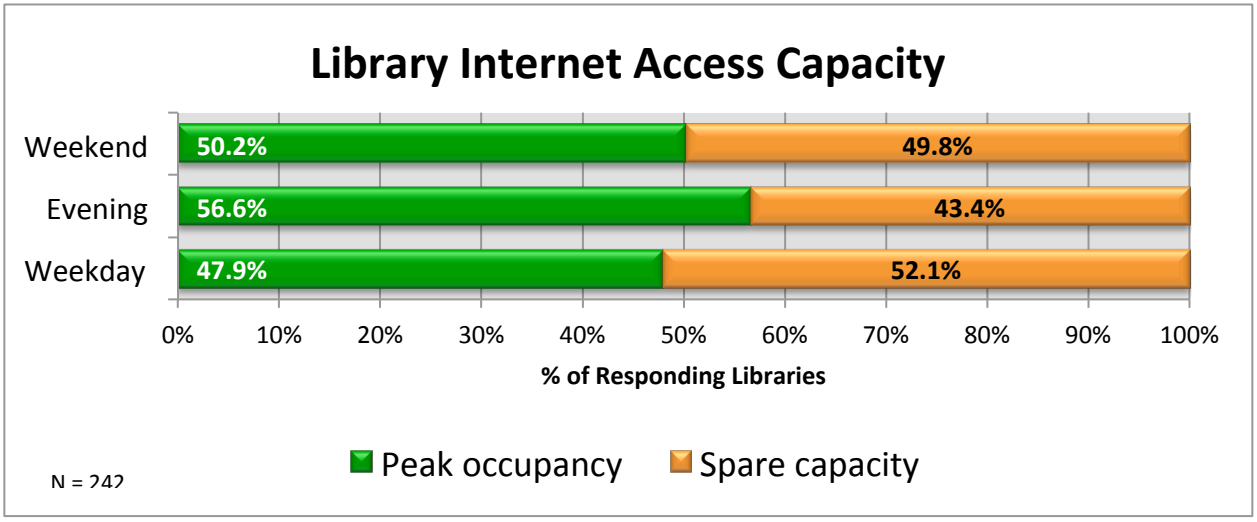
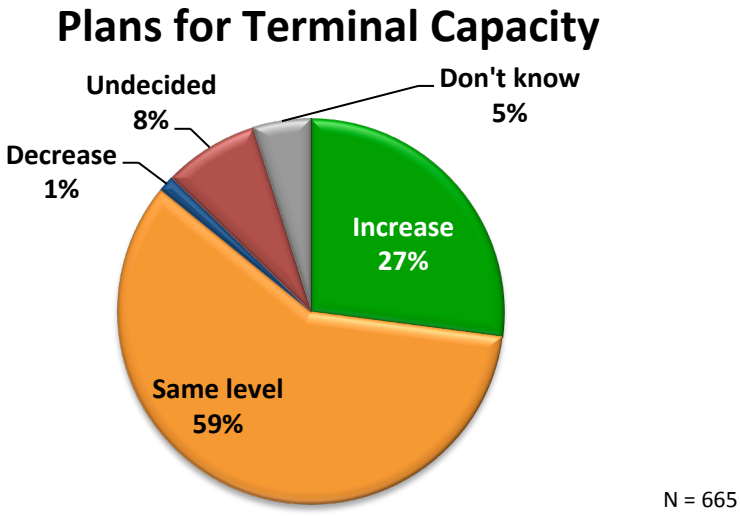


Figure 49 – Plans for Terminal Capacity

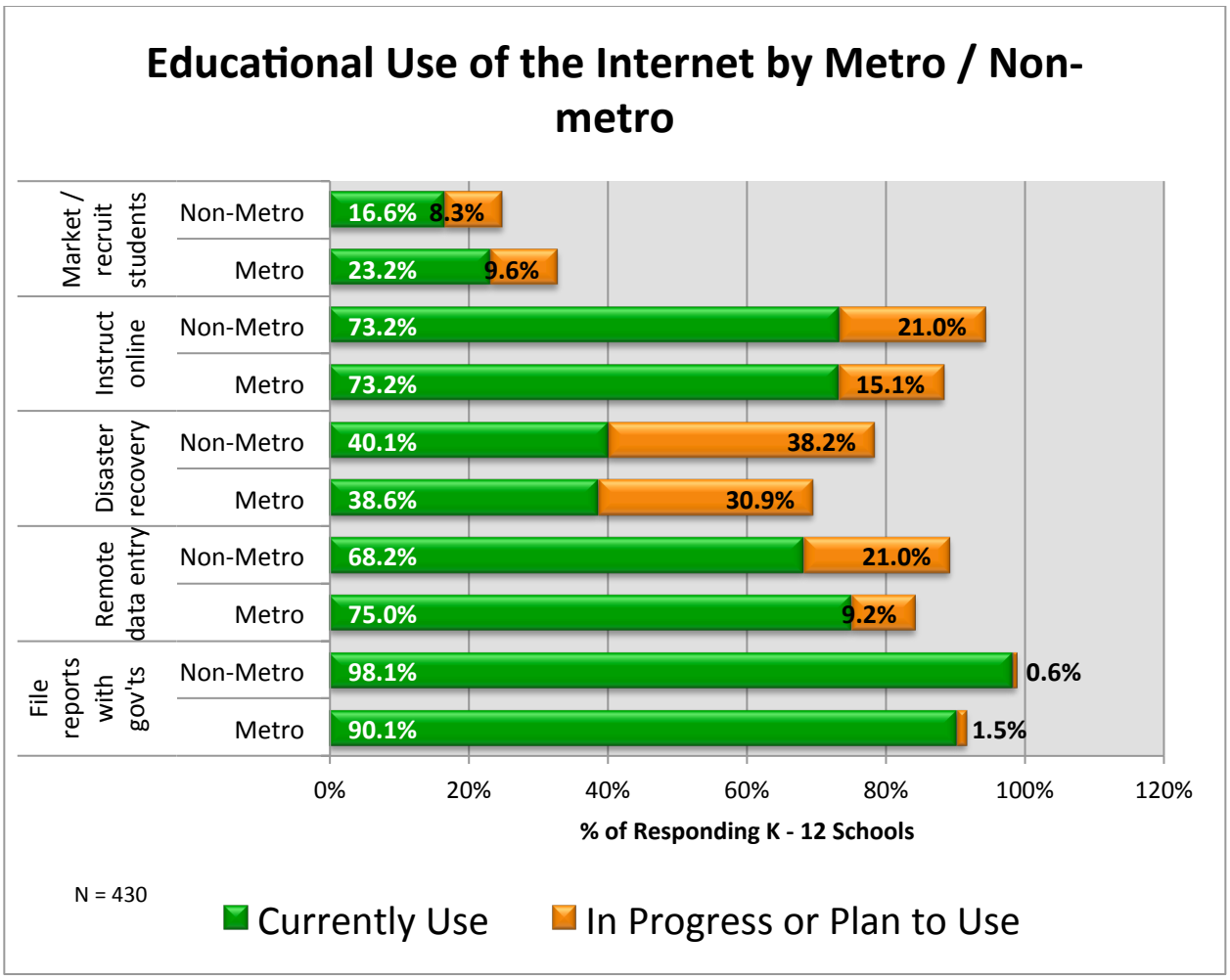


5.3 K – 12 Schools

A total of 682 organizations identified themselves as K-12 schools. These schools have an Internet utilization level below that of the organizational average for the state: 6.24 versus 6.47. Within the group, a significance difference in utilization of generic Internet applications and processes appears between metro and non-metro K-12 schools, with metro schools (communities with over 50,000 population) having a DEi of 6.39, compared to non-metro schools with a DEi of 5.97. However, when looking at Internet uses specific to the educational sector, differences between metro and non-metro schools virtually disappear.

As can be seen in Figure 50, the main difference between the metro and non-metro schools occurs in the marketing and recruiting of students through the Internet.

Figure 50 – Educational Uses of the Internet by K – 12 Schools (metropolitan and non-metropolitan)



5.4 Public Safety Organizations

One hundred and sixteen responding organizations identified themselves as public safety organizations (see break down by type in Figure 51). These organizations were asked three supplementary questions related to their use of the Internet. One question related to the quality and capability of their Internet connectivity. Approximately 42 percent of respondents indicated that their broadband connectivity was sufficient, while 39.6 percent stated that it was insufficient or inadequate. The majority of organizations reporting inadequate connectivity were non-police services (911 – Dispatch, ambulance and fire). However, the number of respondents is too small to draw any conclusions.

Figure 51 – Breakdown of Public Safety Respondents by Type of Service

Public Safety Role	# Respondents	Share of Public Safety Respondents
Police	60	51.7%
Fire	41	35.3%
911 dispatch	12	10.3%
Ambulance	3	2.6%
	116	100.0%

Public safety organizations were asked to rate the level of compatibility of their communication systems, both within their jurisdiction, as well as with agencies outside their jurisdiction. Figure 52 shows that within a given jurisdiction, compatibility tends to be moderate to high, with only 8 percent reporting low compatibility. However, when asked to assess the level of compatibility of communications with agencies outside their jurisdiction, 16 percent reported low levels of compatibility.

Figure 52 – Compatibility of Public Safety Communications within their Area of Jurisdiction

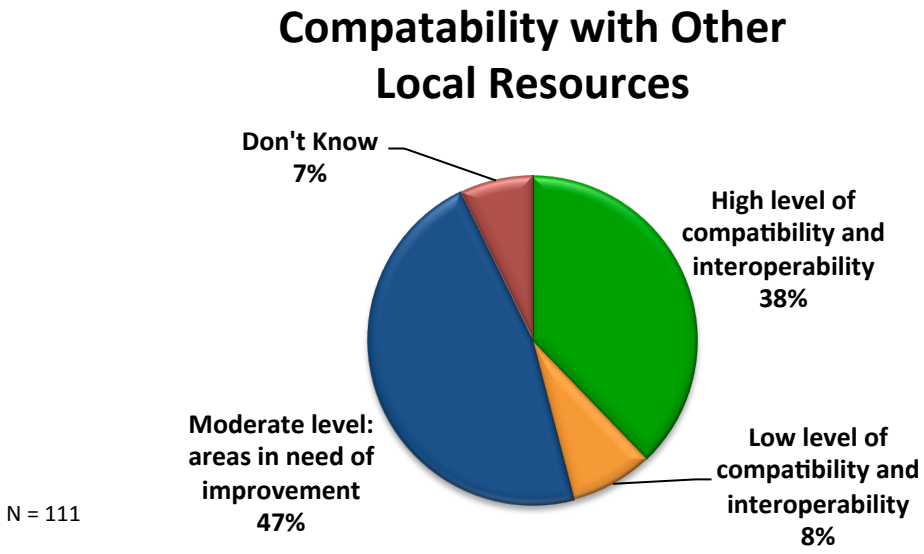
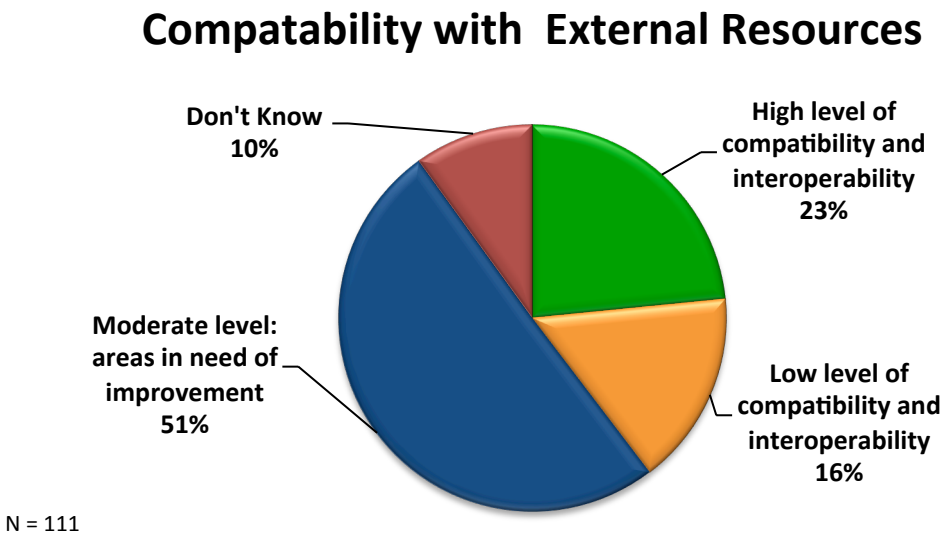


Figure 53 – Compatibility of Public Safety Communications outside their Area of Jurisdiction

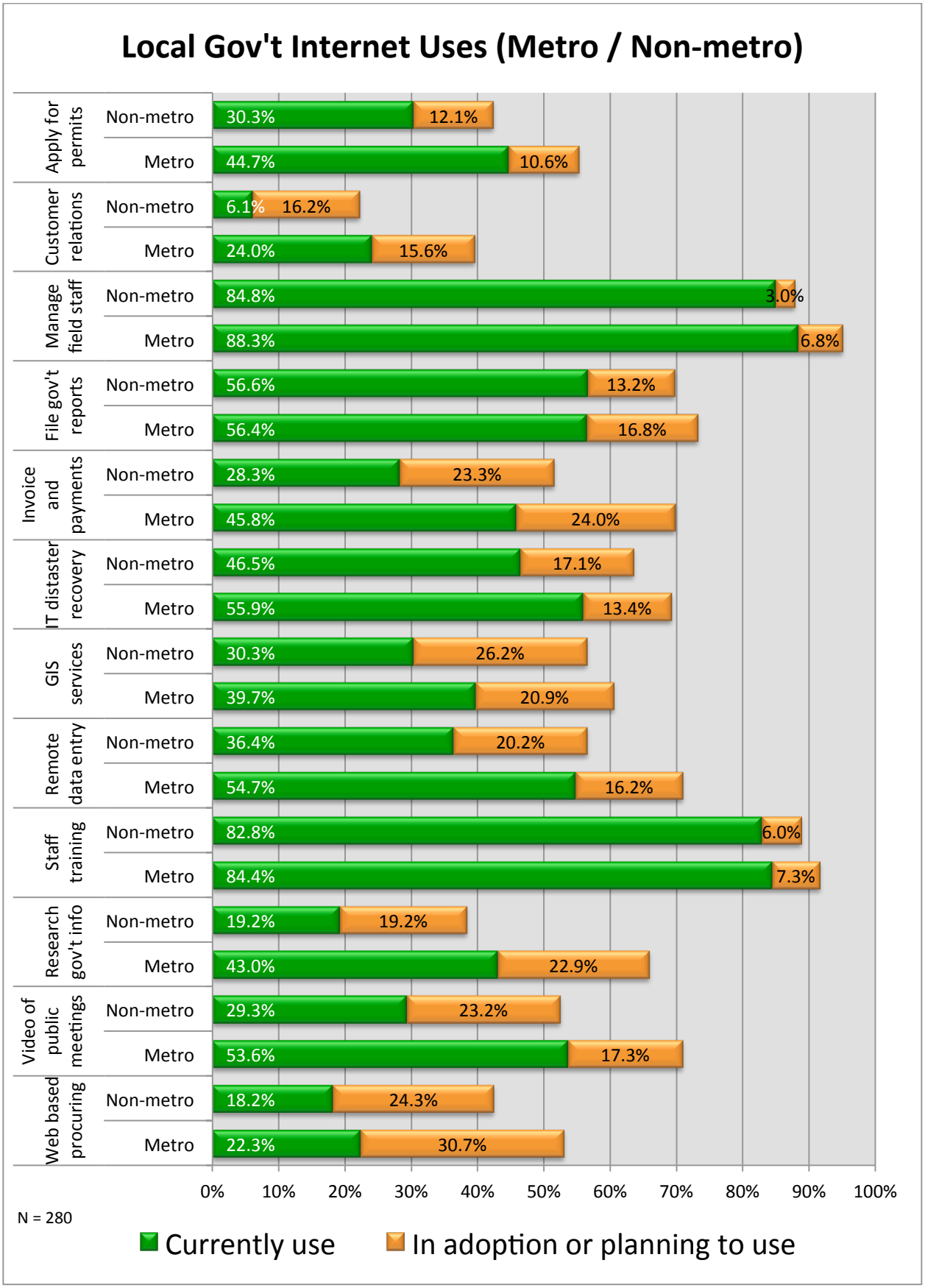


5.5 Local Government

Two hundred and eighty five local government organizations responded to the survey, providing information on Internet utilization, including uses specific to local governments (Figure 54). Generally local governments have low levels of utilization of generic Internet applications and processes, with an average DEi of 5.88 compared to 6.47 for organizations in Illinois overall.

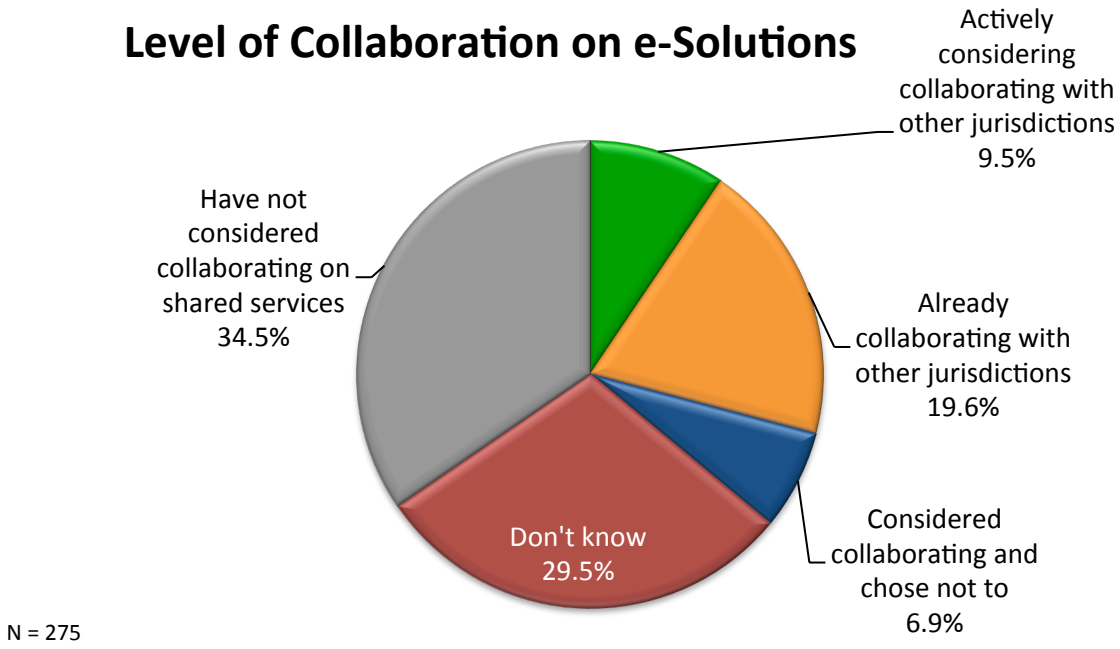
Local governments in metropolitan areas (populations in excess of 50,000) have noticeably higher utilization than those outside metropolitan areas, with DEi Score of 6.35 compared to 5.04. This indicates that local governments outside of metropolitan areas use on average two less Internet applications than local governments from metropolitan areas. A separate index was created to compare utilization of 12 eSolutions specific to local governments. Again, a large variation appears between non-metropolitan entities and metropolitan entities. With 10 signifying use of all 12 eSolutions, local government entities located in non-metro areas had an average score of 4.38 compared to those based in metropolitan areas which had 5.85. ESolutions with the greatest variation in use between metro and non-metro areas were: customer relations, coordination of field staff, invoicing and receipt of payments, remote data entry, web-based procurement, and videos of public meetings.

Figure 54 – Local Government Uses of the Internet



Local governments were also asked about the degree to which they collaborate or have considered collaborating on eSolutions. Collaborating on eSolutions can be a means of addressing both cost issues and lack of internal expertise. Current levels of collaboration are low at 19.6 percent. This could indicate an opportunity that many governments could pursue to improve their use of Internet applications and processes.

Figure 55 – Local Government Use of Collaboration on eSolutions



5.6 Economic Development Agencies

Seventy seven respondents identified themselves as economic development agencies. These respondents provided information on Internet issues related to their mandate.

One issue on which these respondents were asked to comment related to how often they encountered businesses that either left the area or chose not to locate there because of the type of Internet services available. The actual questions asked were:

- In the past 12 months, how often have businesses chosen not to locate in your community because of the broadband services available?
- In the past 12 months, how often have businesses relocated away from your jurisdiction due to the type of broadband services available?

While not a common occurrence, one quarter of economic development agencies said that businesses not locating in their area due to the type of broadband was either a frequent or occasional occurrence.

Figure 56 – Locational Decisions by Businesses in Relation to Quality of Broadband

Impact of Broadband on Location Decisions	Frequently	Occasionally	Rarely	Never
Businesses choosing not to locate due to available broadband	5.2%	20.8%	24.7%	49.4%
Businesses leaving area due to available broadband	0.0%	20.8%	28.6%	50.6%

Economic development agencies were also asked to identify the level of interest by businesses in training and support services related to broadband. There is a strong estimated level of interest in training and assessment in relation to use of the Internet by businesses. Nonetheless, only 25 percent of respondents stated that they provided such services.

Figure 57 – Estimate of Interest by Businesses in Broadband Training and Support

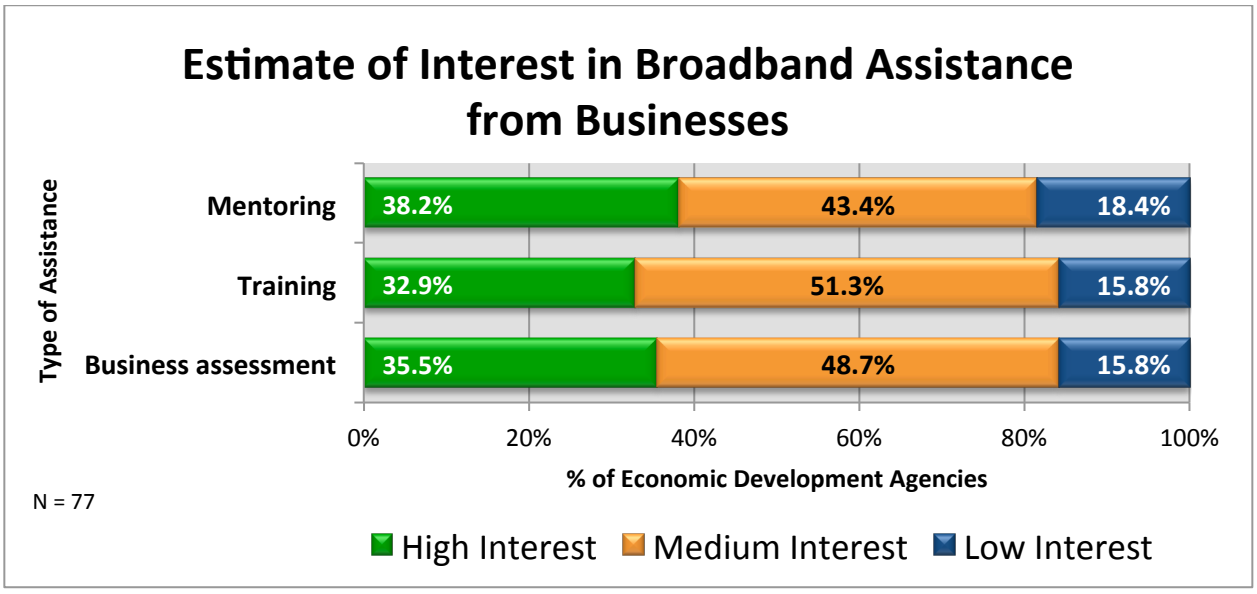
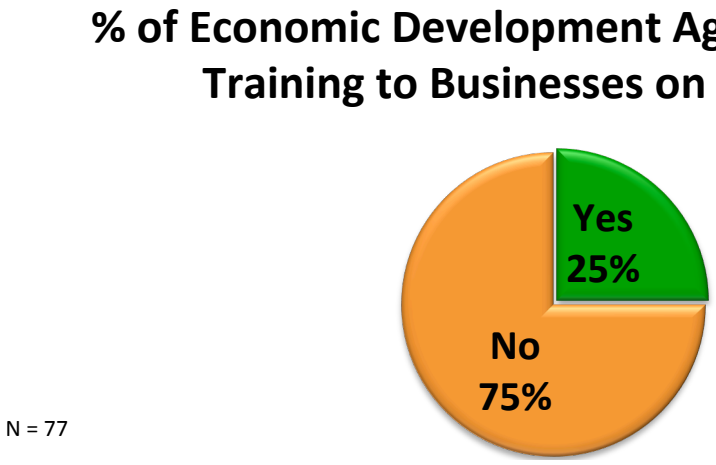


Figure 58 – Percent of Economic Development Agencies with Broadband Training and Support



5.7 Libraries

Two hundred and forty seven respondents identified themselves as libraries.

As can be seen in Figure 59, libraries play a very active and consistent role in providing the public with access to training and to government services offered over the Internet. The fact that 63.3 percent of responding libraries provide one-on-one training and almost 75 percent assist patrons in accessing e-government services highlights the role that libraries play in supporting individuals with limited or no Internet skills. This is of particular importance to seniors who are the group with the lowest Internet skills and adoption rates. It is worth noting that there is only a very slight difference between metropolitan based libraries and those based outside larger urban areas.

Figure 59 – Services Offered by Libraries

e-GOV Support Roles	% of Libraries	# Libraries
Assist access to e-GOV services	74.9%	185
Assist completing e-GOV forms	62.8%	155
Develop guides to e-GOV services	23.9%	59
Have staff with e-GOV expertise	32.0%	79
Training Modes Offered	**% of Libraries**	**# Libraries**
Formal classes	48.8%	121
One-on-one training	63.3%	157
Point-of-use assistance	92.7%	230
Online materials	56.9%	141
No training	3.6%	9

For members of the public who are already actively using the Internet, libraries provide an important source of access, with 95.1 percent of libraries providing public access Wi-Fi. Over 70 percent of libraries reported that public use of their Wi-Fi services had increased in the last year. To further attract those already using the Internet, libraries are actively using social media. Almost 80 percent of libraries use social media with three common uses being communications, video sharing and photo sharing. Metropolitan libraries are more likely to use social media than libraries in small towns.

Concluding Comments

The findings in this eSB Technical Report provide a solid foundation for evidence-based planning and decision-making. These findings and their implications must be filtered through the values and priorities of the region and its communities.

Appendix A - Data Collection Methods and Results

The core methodology is founded on primary research via data collection through online surveys of businesses, organizations and households. Due to the distinct nature of the uses and benefits of different categories of Internet users, separate and distinct surveys are used for organizations and for households. While the nature and purpose of the question sets are parallel for each survey, the questions are formulated in contexts specific and relevant to each of these basic user categories.

In addition to the main set of questions that all organizations were asked, a number of small "modules" (consisting of four to 10 questions) were added to those respondents identifying themselves as belonging to one the following key sectors: farming, K-12 schools, libraries, colleges, health care, public safety, and local government.

Both the business survey and the household survey are designed to collect information directly from Internet users in the following categories:

User Profile – information that characterize each respondent for purposes of statistical analysis based on user characteristics, e.g., organization size by employment, household income, time of Internet use, etc.

Internet Utilization – the current and planned uses of the Internet across multiple categories relevant to how organizations and households may use the Internet. The primary type of Internet connection used is also identified for selected cross tabulations with other response data.

Internet Benefits – information on how organizations and households assess the benefits of using the Internet.

Barriers - information on the importance of factors that prevent or inhibit organizations and households from taking full advantage of the Internet.

The surveys are made available for online access through one of two means:

- Individual organizations and households were invited to participate via direct email invitations sent from a large, state-wide contact list.
- In addition, organizations and households were encouraged through a variety of other communications channels to access a link to the survey through the website of the Partnership for a Connected Illinois/ (PCI).

An active public outreach and awareness campaign was carried out by the Partnership for a Connected Illinois, the Illinois Institute for Rural Affairs, and Strategic Networks Group. This campaign included press releases from the governor, media interviews, and engagement of stakeholder organizations (requesting that they endorse and promote the survey through their networks).

E-mail invitations were sent directly to 44,652 households and 106,814 organizations in Illinois. Strategic Networks Group purchased two contact lists from a national list provider. Surveys were deployed using

direct email invitation to households and organizations providing access to online surveys. The initial email invitations were sent on February 8th, 2012, followed by reminder emails. The surveys were closed on October 17th, 2012.

A total of 7,253 organizations and 2,129 households contributed to the broadband benchmarking effort. The organizations consisted of 4,620 commercial businesses, 1,497 government entities and 1,136 non-profit organizations. For these survey sample sizes the overall error margin for statistical analysis are +/- 1.2 percent for organizations, 1.4 percent for commercial businesses, and +/- 2.1 percent for households (with a 95 percent Confidence Interval)[15]. The sample error margin indicates the accuracy of the statistics derived in relation to how they represent the larger population. Using a 95 percent Confidence Interval, a statistic should fall within the error margin for any random sample of the population 95 percent of the time. The sample error margin is calculated based on the sample size, the population size, and the confidence interval. For 95 percent confidence interval and for populations much larger than the sample, the sampling error is 0.98 divided by the square root of N, where N is the sample size. For this report all population sizes are much larger than the sample sizes.

The following is an example for interpretation of statistics provided in this report:

- 45.9 percent of organizations use the Internet for selling goods or services online.
- The sample size for organizations reporting Internet utilization is 6,190, providing a sample error margin of +/- 1.2 percent with a 95 percent confidence interval.

This means that any similar sample of the population of organizations across the state will result in a statistic for selling goods or services between 44.7 percent and 47.1 percent (45.9 percent +/- 1.2 percent) 95 percent of the time. The statistic would fall outside this range 5 percent of the time for other random samples of the population. In practical terms the sampling error can be taken as the accuracy of the statistic as it applies to the entire population.

Smaller sample sizes result in larger sampling errors. When comparing statistics between two independent samples, e.g., the same statistic for broadband users vs. dial-up users, the sample errors for each sample must be considered to determine if the difference is significant.

Example – Households accessing the workplace online:

- Dial-up household sample size = 73, with a sample error of +/- 11.4 percent
- Broadband household sample size = 1,912 with a sample error of +/-2.2 percent
- Dial-up statistic is 16.4 percent +/- 11.4 percent, or between 5.0 percent and 27.8 percent, 95 percent of the time.
- Broadband statistic is 56.4 percent +/- 2.2 percent, or between 54.2 percent and 58.6 percent, 95 percent of the time.

[15] The error margin at 95% Confidence Interval is often referred to as +/- X% accuracy, 19 times out of 20. Error margins increase for detailed analysis that uses subsets of the overall sample. Where applicable, sample sizes and sample error margins are indicated – example: N= 1,428 [2.6%].

While the error margin for the dial-up sample is relatively large, the ranges of the statistics do not overlap, i.e. the higher end of the dial-up statistic (27.8 percent) is less than the lower end of the broadband statistic (54.2 percent), the difference can be considered statistically significant. The difference between the statistics can be taken as given, i.e. 56.4 percent – 11.4 percent = 45.0 percent, or more conservatively as 54.2 percent – 27.8 percent = 26.4 percent. Where the difference between statistics is within the sampling error margin ranges, then such differences may not be real or significant for other random samples of the same sizes. For simplicity of reporting the statistics are stated as given with sample sizes and sampling error margins provided for interpretation.

Appendix B - *Broadband Illinois* Digital Economy Analytics Platform (DEAP) Overview

The survey collected data on the utilization of the Internet by businesses, organizations, and households through eSolutions Benchmarking and Impact Tracking services. Data is collected through an online survey that provides information on Internet utilization and impacts directly from those using the Internet. This approach sources data that provides direct attribution of the benefits and impacts of Internet use from the user perspective, as well as barriers and drivers for using the Internet. The primary goal of this data collection is to inform clients on the level of utilization of broadband and the benefits and impacts that are derived from broadband utilization.

The DEAP has been developed as an online resource that provides clients with access to the data collection results and the ability to customize their analysis based on their own priorities, sector or geographic region. Application of the DEAP for new and deeper data analysis has value to the following groups:

- **Businesses and organizations** seeking to improve their understanding of how to use e- solutions and seeking to optimize the productivity and efficiencies gains from applying eSolutions;
- **Economic development agencies** seeking to improve the competitiveness and health of local and regional industry sectors.
- **Industry associations** seeking to improve the competitiveness and health of industry sectors;
- **Universities and research institutes** using the DEAP as a support for research and analysis.

Digital Economy Analytics Platform Content

The DEAP is an online capability that provides the power of a Business Intelligence engine to analyze datasets based on specific topics of interest, enabling users to develop insights and statistics in answer to specific questions as needed. The following sections provide an overview of the categories of data available for analysis and how the results are organized and presented within the DEAP.

Digital Economy Database Overview

Data is collected for separate datasets for businesses / organizations and households through two distinct questionnaires. While individual questions are tailored to each of these distinct user segments the data collected in both cases consist of the following categories.

- **Utilization** – How users are currently using or plan to use broadband in their business operations or household. This information informs on the current state of utilization for identification of gaps and opportunities for increasing eSolutions adoption.
- **Drivers** – The importance of factors that motivate users to utilize broadband and to implement eSolutions. This information aids in focusing the value of broadband and eSolutions.

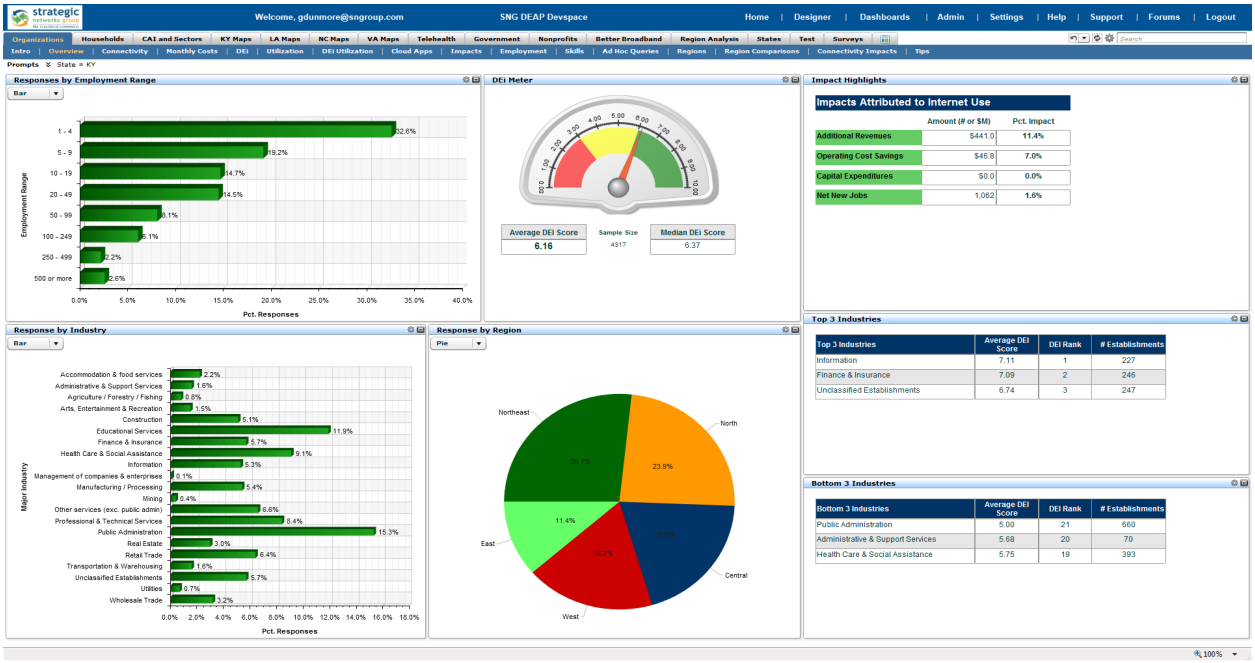
- **Barriers** – The importance of factors that inhibit or prevent users from adopting eSolutions. This information can be used to develop strategies and initiatives to overcome barriers leading to increased broadband utilization and eSolutions adoption.
- **Benefits** – The importance of broadband for creating positive impacts realized by users. Understanding of benefits achieved reinforces the value of broadband and eSolutions utilization.
- **Impacts** – The quantification of benefits in terms of employment, organization revenues, and cost efficiencies for businesses/organizations, and online spending by households. Translating the benefits from broadband and eSolutions utilization into tangible numbers that demonstrate value and provide measurement of broadband impact.
- **Profile Data** – Information about user characteristics and their Internet connectivity for analysis by various dimensions. Organizations are characterized by sector, industry, and employment size. Households are characterized by income, employment status, and age groups. Connectivity method, time of broadband use, and Internet costs are also available both as results and dimensions for analysis. All data contains location based information for geographical analysis, including long/lat. coordinates, state/province, county, and region as well as rural and non-rural designations. When combined with the eSolutions datasets this information enables focus on different market segments to increase utilization and benefits from eSolutions.
- **Digital Economy index (DEi)** - digital economy participation of individual businesses, organizations, and households is assessed using a Digital Economy index (DEi). The DEi is used to measure how eSolutions are being utilized, the benefits derived, and value that could be realized with further utilization. By providing organizations with benchmarking against other businesses and organizations within their own industry, they see the effect utilization gaps are having on their business. This has a significant impact on driving eSolutions usage.

Within these categories additional data is collected in specific focus areas and user segments. Data subsets may include information specific to organizations in Community Anchor Institution sectors, government, non-profit, and health sectors. Household datasets include information specific to teleworking and home business uses.

Digital Economy Analytics Platform Organization

The DEAP is accessed online by authorized users. Users are presented with **dashboards** for businesses and for households. Each dashboard is organized around a series of **pages** focused on specific topics, e.g., Connectivity, Utilization, DEi, Impacts, etc. Within each page is a set of predefined **reports** that present a chart and/or table of processed results from the datasets. The reports display results based on the full set of data being made available to the user.

Dashboard Example – Organizations Overview Page



See "**Digital Economy Analytics Platform Reports**" later in this section for details on each of the reports in the above DEAP Overview Dashboard.

Each dashboard page includes a set of prompts used for filtering the reports in various dimensions, used individually or in combination. Prompts allow users to drill into the data results for exploring specific areas of interest, for example seeking results for organizations in specific industries, employment size, and regions. All reports on the selected page are automatically filtered based on applying the prompt settings selected by the user.

Users may examine reports using combinations of various dimensions using some of the following examples (of many):

- Type of Internet connectivity by establishment employment size
- Digital Economy Index (DEi) by region
- Household utilizations of the Internet by income
- Revenue impacts by DEi
- Employment impacts by establishment size and region

The wide variety of reports and dimensions available for filtering the data provides users with the means to answer virtually any question regarding Internet use and impacts.

Any report may be expanded to fill the web page view when desired. Individual data point information is presented by moving the cursor over the data point. Chart reports may be switched to table view to view the dataset results upon which the chart is based. In addition, some charts may be switched to a different format, e.g., column, bar, pie, depending on the user preference. All reports may be exported to Excel, PowerPoint, or PDF. Prompt settings may be bookmarked for later use by the user to quickly go back the views of particular interest.

Prompt Set Example – Organization Connectivity Page

Over 60 predefined reports are available for each dashboard (Organizations and Households) focusing on the most meaningful and useful results for providing insights on utilization and impacts and to provide sufficient flexibility for the user to query the dataset along the most important dimensions. An additional page/report is provided in each dashboard called “Ad Hoc Queries” to enable users to view all of the information collected based on category and topic that may not be included in individual reports.
For descriptions of the dashboard reports and user prompts currently available in the DEAP please refer to the section below.

Appendix C - Glossary

***Broadband IL* eStrategy Report:** This report examines how organizations and households in Illinois differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how different industry sectors and household types compare to each other, especially between and within regions. The report provides insights and hard evidence that allows regions, businesses, and households to assess where they stand. The report provides recommendations on strategies for improving their Internet performance and benefits.

***Broadband IL* eSolutions Benchmarking Technical Report:** This report presents the results of survey-based research carried out for the State of Illinois. The surveys collected information from businesses, organizations and households on the availability of broadband (high speed Internet access) and its uses, benefits, drivers and barriers. This largely descriptive report results provide insight into gaps and opportunities for increasing broadband utilization by organizations and households. The policy, planning and program implications for Illinois and its regions are dealt with in a separate report: the *Broadband IL* e-Strategy Report.

Digital Economy Analysis Platform (IL- DEAP): The DEAP has been developed as an online resource that provides clients with access to the data collection results and the ability to customize their analysis across a range of variables, including industry sector or geographic region. The DEAP is accessed online by authorized users. Users are presented with **dashboards** for businesses and for households. Each dashboard is organized around a series of **pages** focused on specific topics, e.g., Connectivity, Utilization, DEi, Impacts, etc. Within each page is a set of predefined **reports** that present a chart and/or table of processed results from the datasets.

eStrategies: e-Strategies are high level plans for achieving one or more goals related to improved access to and utilization of broadband Internet. eStrategies define a course of action that is most likely to successfully address opportunities, challenges or barriers related to Internet use. Strategies are usually seen as distinct from detailed action plans which deal with specific issues of "who, what, when and how".

eSolutions: refers to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. eSolutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

e-Process: uses of the Internet which include internal operational uses, such as supplier coordination, training and teleworking.

e-Commerce: uses of the Internet which include activities related to the sales, marketing and delivery of products and services; and,

Illinois Digital Economy Index (IL-DEi): The Digital Economy index (DEi) is part of the benchmarking process and provides reference points against which the performance of any individual or group can be compared. The DEi summarizes an organization's or household's utilization of a range of Internet applications and process – 17 for organizations and 30 for households. Based on the number of applications currently being used by an organization or household, a composite score is calculated that summarizes how comprehensively each organization or household uses Internet-enabled eSolutions. The DEi can be used to compare organizations, regions, or industry sectors.

Utilization refers to the third stage in the broadband development process. The first stage is providing a community, household or organization with access (availability) to the Internet. The second stage is adoption or the process whereby a person or organization starts to actually use the Internet. The third stage is utilization whereby a person or organization uses their Internet connection to create value. Many people and organizations have access and have adopted the Internet, but are relatively ineffective in how they use and derive benefits from the Internet. The field of analysis labeled "utilization" explores patterns of Internet use and how these patterns can be enhanced.

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