



*Nebraska Broadband  
eSolutions Benchmarking Report*

*Utilizations and Impacts of  
Broadband for Nebraska Businesses*

*January 31, 2014*

*Prepared for:*

*The Nebraska  
Broadband Initiative*



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NOTE: Figures 1, 3 & 4 show the distribution of business responses by region, including a comparison of survey results to each region’s share of the state population. The economic development districts in Nebraska are used as approximate guides for the regions described in this report. However, for this study Dakota County is included with the Northeast Nebraska district. And, Lancaster County was sampled separately to approximate the Lincoln metropolitan area (See Map on Page 8). The distribution of survey responses generally mimics the actual regional distribution of businesses across the state, with the largest number of responses coming from the Metropolitan Area Planning Agency (MAPA) area, Lancaster County and the Northeast region. This report does not include any weighting.

# 1 Introduction

This eSolutions Benchmarking Report (eSB) is a summary of the data collection conducted for the Digital Economy Business Development Program. Strategic Networks Group (SNG) conducted the self-assessment survey on behalf of the State of Nebraska, the Lt. Governor, and The Nebraska Broadband Initiative. Lt. Governor Lavon Heidemann launched the assessment in September 2013. Businesses were asked to complete a “self-assessment” (survey) that collected information on the availability of broadband (high-speed Internet access), its uses, benefits, drivers and barriers. This eSB report provides insights into gaps and opportunities for increasing broadband utilization by businesses. These broad insights should be used as a guide for developing an overall broadband utilization strategy.

The survey was deployed as a statewide online process to document broadband utilization and connectivity among small and medium-sized businesses. In addition it should be noted that a large amount of the data collected through this initiative is available through an online platform (Nebraska Digital Economy Analytics Platform - DEAP) which is accessible by The University of Nebraska. The University of Nebraska has ownership of the raw data collected in this project.

This report is a companion, not a replacement of, or summary of the Digital Economy index (DEi) Scorecards participating in the Digital Economy Business Development Program. The Nebraska Broadband Initiative is selecting 500 businesses to receive DEi Scorecards. The DEi Scorecards are custom one-page reports for businesses to understand where they stand in relation to peer organizations as well as provide specific recommendations for revenue growth.

The report is organized in the following sections:

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

**Key Findings for Businesses** – Summary and highlights from data provided by businesses.

**Key Findings for Community Anchor Institutions** – Summary and highlights from data provided by Community Anchor Institutions (CAIs, including but not limited to libraries, educational organizations and local governments.) Note: The focus of this survey was on businesses. CAIs may have been included in the purchased business list or responded to the survey link on websites.

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

**Key Findings for the Agriculture Sector** - Summary and highlights of the farming sector.

**Methodology Overview (Appendix B)** - The core methodology is founded on primary research consisting of data collection through online surveys of businesses. Additional agriculture questions were asked when applicable.

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

- Individual businesses were invited to participate via direct email invitations sent from a large, state-wide contact list.
- In addition, organizations were encouraged through a variety of other communication channels to access a web link to the survey.

An active public outreach and awareness campaign was carried out by the Nebraska Broadband Initiative.

The study was sent to roughly 10,000 Nebraska businesses in a list procured by The Nebraska Broadband Initiative. Lt. Governor Heideman launched the survey in September. The initial email invitation was sent on September 3<sup>rd</sup> and reminder emails as well as list supplements sent on: 9/10/13, 9/17/13, 9/25/13, 10/8/13, 10/16/13, 10/22/13, 10/29/13, 11/5/13, and 11/13/13. Businesses (and CAIs) **completing the self-assessment numbered 817** with an additional 307 businesses completing enough of the survey to be “scorecard eligible.”

This Business Assessment Survey for the Digital Economy was conducted for the Nebraska Broadband Initiative. This Broadband Mapping and Planning Initiative is funded through a grant to the Nebraska Public Service Commission by the U.S. Department of Commerce’s National Telecommunications and Information Administration and aims to increase broadband adoption and utilization. Project partners include the University of Nebraska, Nebraska Department of Economic Development, Nebraska Information Technology Commission, Nebraska Public Service Commission, and the AIM Institute.

## 2 Key Findings – Businesses

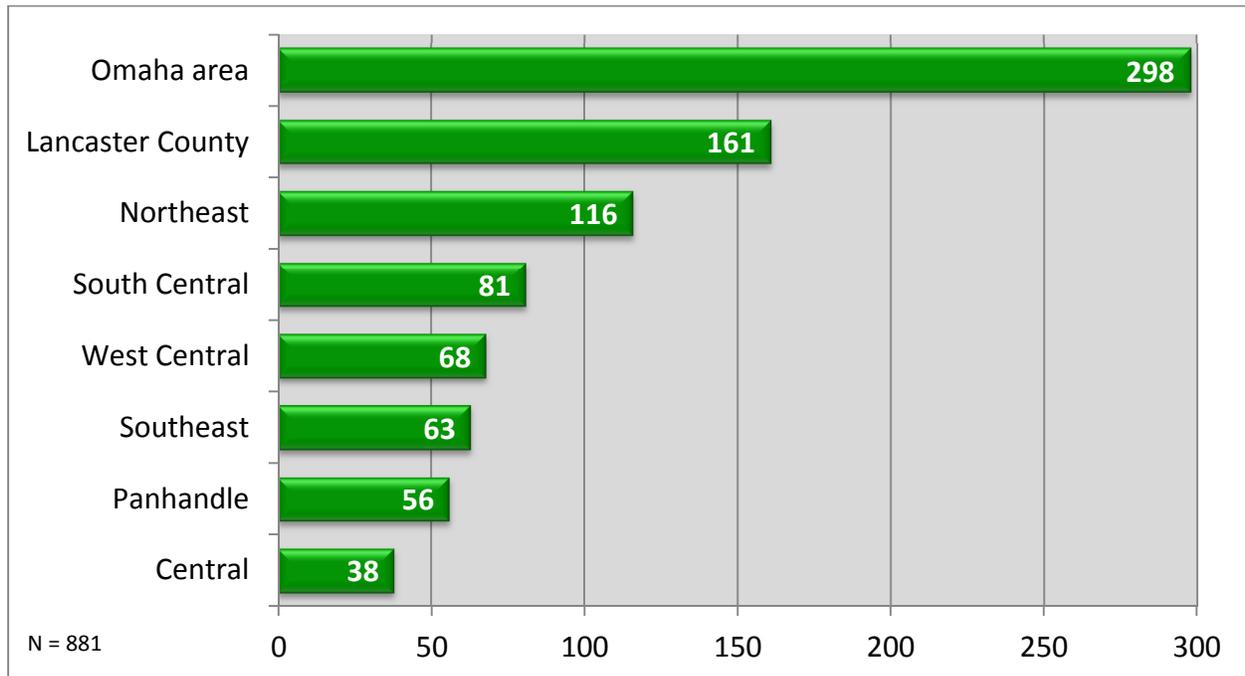
Access to and effective use of the Internet has become an essential element in the survival and success of businesses in today’s economy. This section identifies key findings related to how businesses use the Internet, what types of benefits they value most, and which barriers stand in the way of more effective use. The findings are broken down by key respondent characteristics such as industry sector, employment size, and connectivity type.

### 2.1 RESPONDENT PROFILE

The sample set outlined in this section includes data from businesses across the state. In addition, the sample includes survey responses from businesses across all 20 industries classified by NAICS.<sup>1</sup> This section 2.1 only includes respondents that identified themselves as commercial businesses.

Figures 1, 3 & 4 show the distribution of business responses by region, including a comparison of survey results to each region’s share of the state population (Figure 3). The distribution of survey responses generally mimics the actual regional distribution of businesses across the state, with the largest number of responses coming from the Omaha area (Metropolitan Area Planning Agency [MAPA] will be called “Omaha area” in this report), Lancaster County and the Northeast region. This report does not include any weighting.

**Figure 1– Number of Responses by Region**

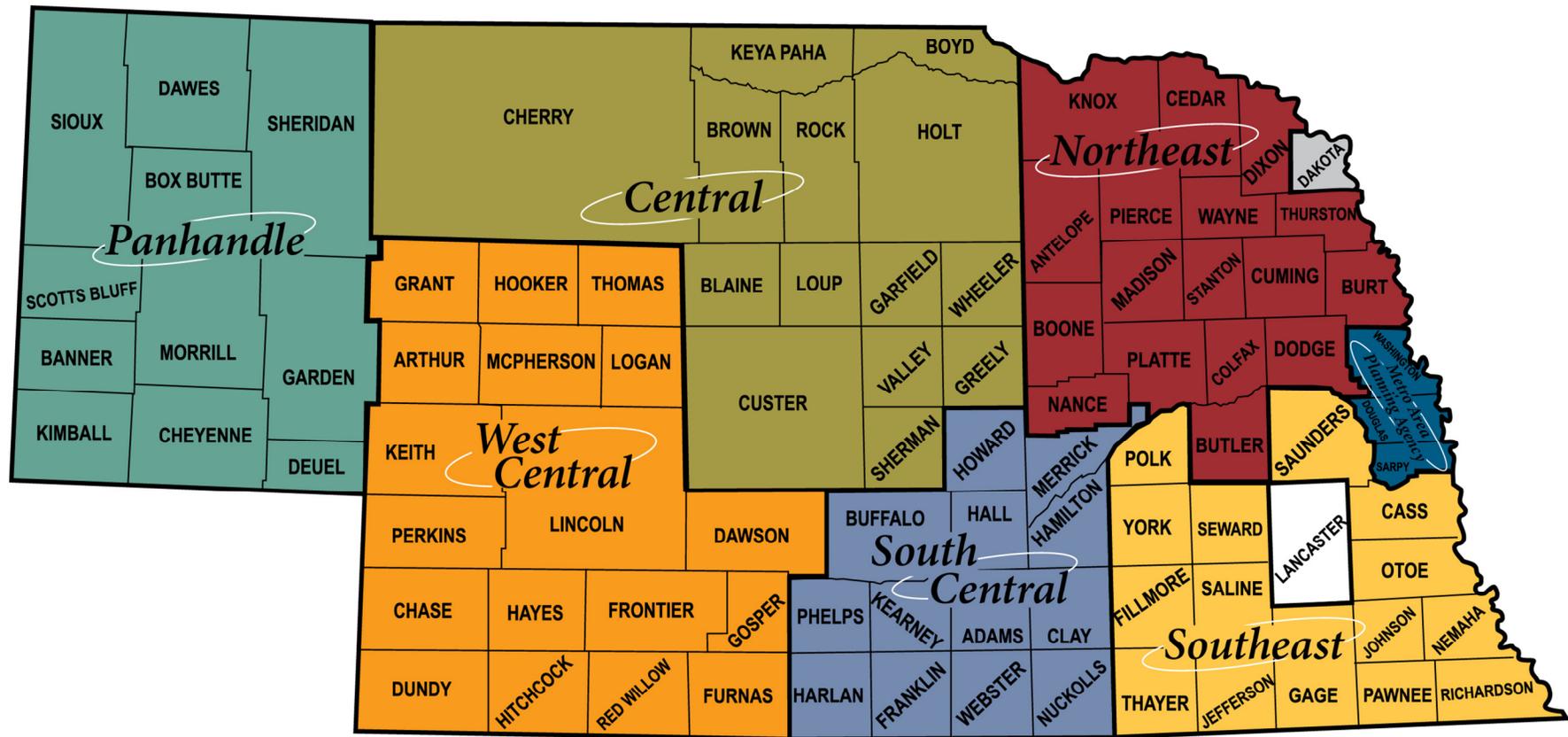


<sup>1</sup> North American Industry Classification System. Industry breakdowns are at the 2-digit NAICS code level. Some survey responses did not have an industry classification.

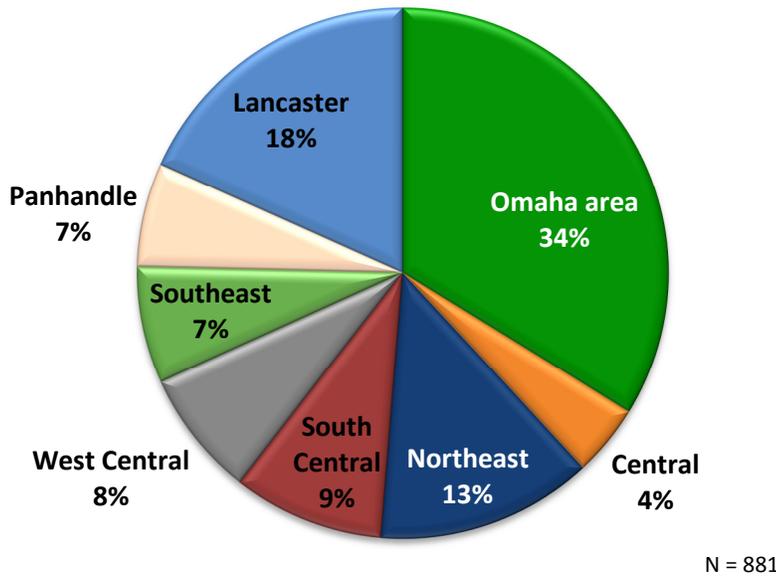
Figure 2– Map of Regions

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**Figure 3 – Percent of Responses from Each Region**



**Figure 4 – Percent of Responses from Each Region Compared to State Census Profile**

Region	# Responses	% of Survey Responses by Region	Share of All Firms in State (as per US Census)
Omaha area	298	33.8%	36.0%
Central	38	4.3%	3.7%
Northeast	116	13.2%	12.9%
South Central	81	9.2%	11.5%
West Central	68	7.7%	6.5%
Southeast	63	7.2%	9.4%
Panhandle	56	6.4%	5.0%
Lancaster County	161	18.3%	15.0%

Previous studies conducted by SNG have shown that the size of a business is correlated to how the business accesses and uses the Internet. Figure 4 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 in the survey results. Micro-enterprises (those with four or less employees) are under-represented, though they still make up over 20% of the entire sample. Low participation from micro-enterprises is common in business surveys.

**Figure 5 - Survey Responses by Size of Business (# of Employees)**

Size of Firm by # of Employees	# Responses	% of Survey Responses by Size of Firm	Share of All Firms in State (as per US Census)
1 - 4	169	20.9%	54.6%
5 - 9	159	19.6%	18.8%
10 - 19	141	17.4%	13.4%
20 - 49	166	20.5%	8.4%
50 - 99	76	9.4%	2.7%
100 - 249	58	7.2%	1.4%
250 - 499	22	2.7%	0.4%
500 or more	19	2.3%	0.2%
<b>Total</b>	<b>810</b>		

Another key variable affecting how businesses access and use the Internet is the industry sector to which they belong. Industry sectors such as the Information Sector predictably show higher and more intense use of the Internet. Figure 5 provides a comparison of survey responses to the industrial profile of Nebraska. The sample resulting from the survey is under-represented in health care, construction, accommodation and food services, and administration and support services. Survey respondents were over-represented in agriculture, information, professional & technical, and manufacturing. State profile data does not include data for Public Administration.<sup>2</sup>

<sup>2</sup> State data source: U.S. 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 6 - Survey Responses by Industry

Major Industry	# Responses	% of Survey Responses by Industry Sector	Share of All Firms in State (as per US Census)
Accommodation & food services	10	1.1%	8.2%
Administrative & Support Services	18	2.0%	5.0%
Agriculture / Forestry / Fishing	36	4.1%	0.3%
Arts, Entertainment & Recreation	12	1.4%	1.6%
Construction	48	5.4%	11.2%
Educational Services	11	1.2%	1.0%
Finance & Insurance	120	13.6%	8.1%
Health Care & Social Assistance	48	5.4%	10.0%
Information	56	6.4%	1.8%
Management of companies	1	0.1%	0.7%
Manufacturing & Processing	120	13.6%	3.6%
Mining	1	0.1%	0.2%
Other services (exc. public admin)	32	3.6%	11.0%
Professional & Technical Services	134	15.2%	8.5%
Public Administration	1	0.1%	N/A
Real Estate	37	4.2%	3.8%
Retail Trade	109	12.4%	14.3%
Transportation & Warehousing	23	2.6%	4.4%
Unclassified Establishments	3	0.3%	0.2%
Unidentified	2	0.2%	0.0%
Utilities	6	0.7%	0.2%
Wholesale Trade	53	6.0%	5.8%

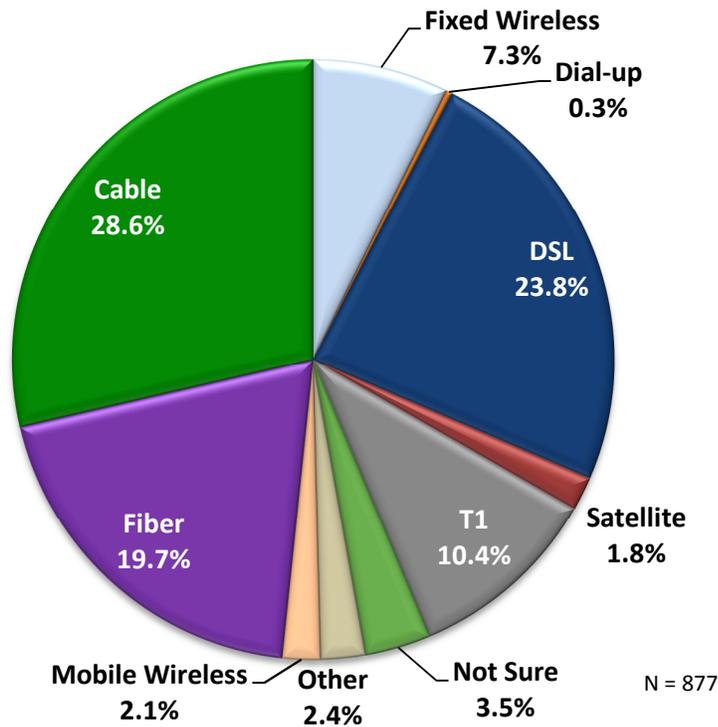
## 2.2 CONNECTIVITY CHARACTERISTICS

The speed and quality of a business' Internet connection strongly impacts many uses of the Internet, such as video-teleconferencing. As seen in Figure 6, the survey sample includes a broad mix of Internet connectivity technologies. Use of broadband services is very high across all types and locations of businesses. Over 97.9 percent of responding businesses have connectivity other than dial-up or satellite, but many still lack broadband level connections in at least one direction (broadband speeds as defined by the Federal Government – 768 kbps in at least one direction).

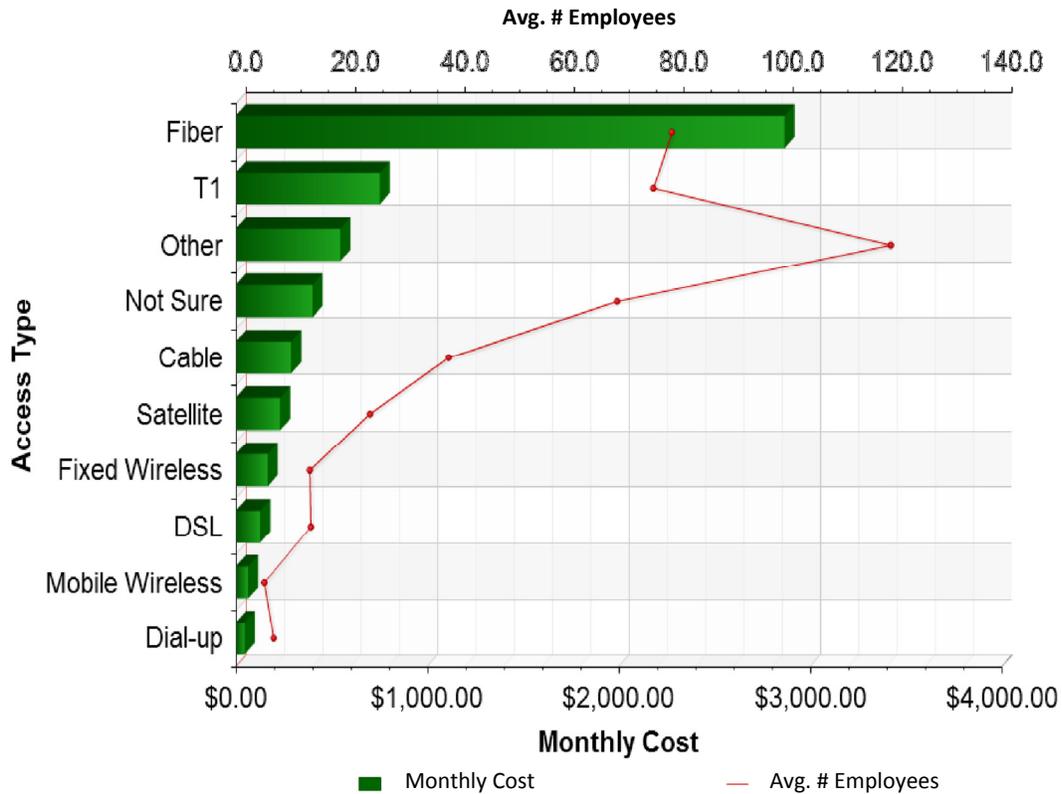
### Access Technology

1. A small percentage of businesses use dial-up (0.3 percent) and satellite (1.8 percent) connections as their primary connection. These are predominantly very small businesses.
2. Internet services using cable (28.6%), DSL (23.8%) and fiber (19.7%) are the predominant technologies. Small enterprises (less than 20 employees) are more likely to use DSL and fixed wireless. Fiber and T1 connectivity is far more common among large enterprises (Figure 7).

Figure 7 – How Businesses Connect to the Internet



**Figure 8 – Monthly Internet Costs by Type of Connectivity and Number of Employees**



The survey included an opportunity for respondents to take a live speed test that assessed their actual upload and download speeds. The speed test utilized was provided by the Nebraska Public Service Commission. Four hundred sixty-four (464) businesses took the speed test, results of which were automatically entered into the survey.

1. While connectivity speeds failed to meet the original FCC definition of broadband (768 kbps or more in at least one direction) for only 1.7 percent of respondents, a full 25.9 percent of those taking the speed test had upload speeds of less than 768 kbps. (Figure 9)
2. There were statistically significant differences in speed test results between different technologies, with fiber the winner by a wide margin. Fixed wireless, cable and T1 connections formed the second fastest tier of services, while DSL, mobile wireless and satellite recorded the slowest speeds. (Figure 10) Connection speeds are increasing rapidly for fiber, cable, and both fixed and mobile wireless, based on Strategic Network Data collected over the last four years.
3. With a few exceptions, speed test results from metropolitan areas<sup>3</sup> were consistently and notably higher than speeds from non-metro areas. This was most noteworthy in the case of fixed wireless which has the second highest speed in metropolitan areas and only average speed in non-metro areas. (Figure 11)
4. It is worth noting that Strategic Networks Group’s internal analysis shows that there is a stronger correlation between Internet utilization and upload speeds than with download speeds.

<sup>3</sup> A metropolitan area is defined by the U.S. 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.

Figure 9– Speed Test Results

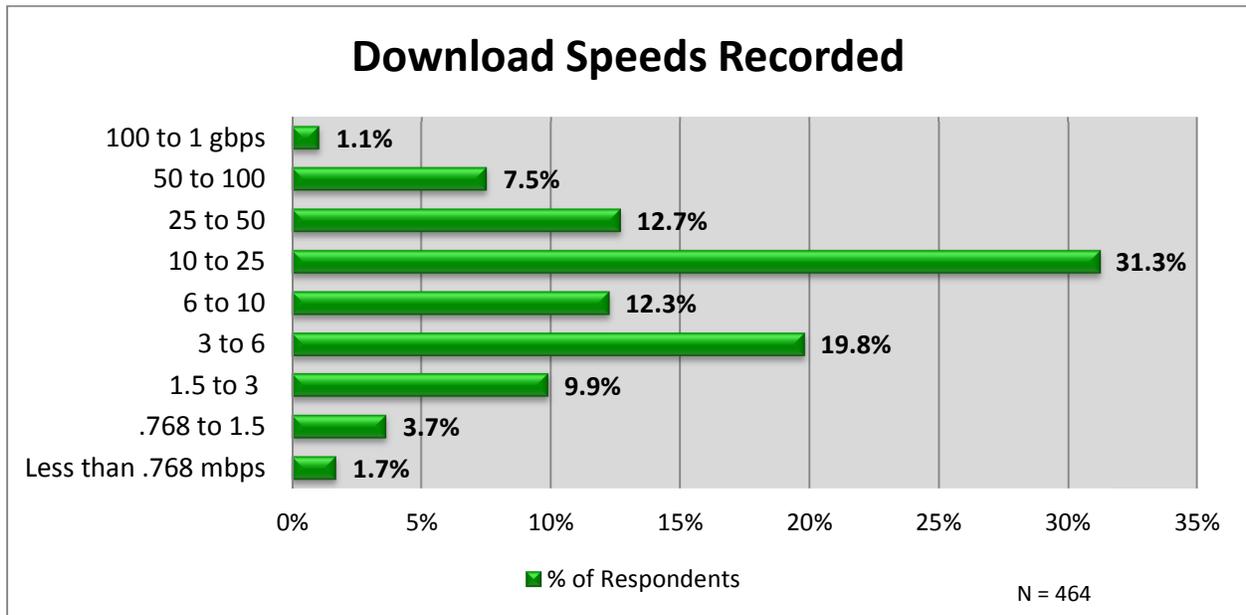
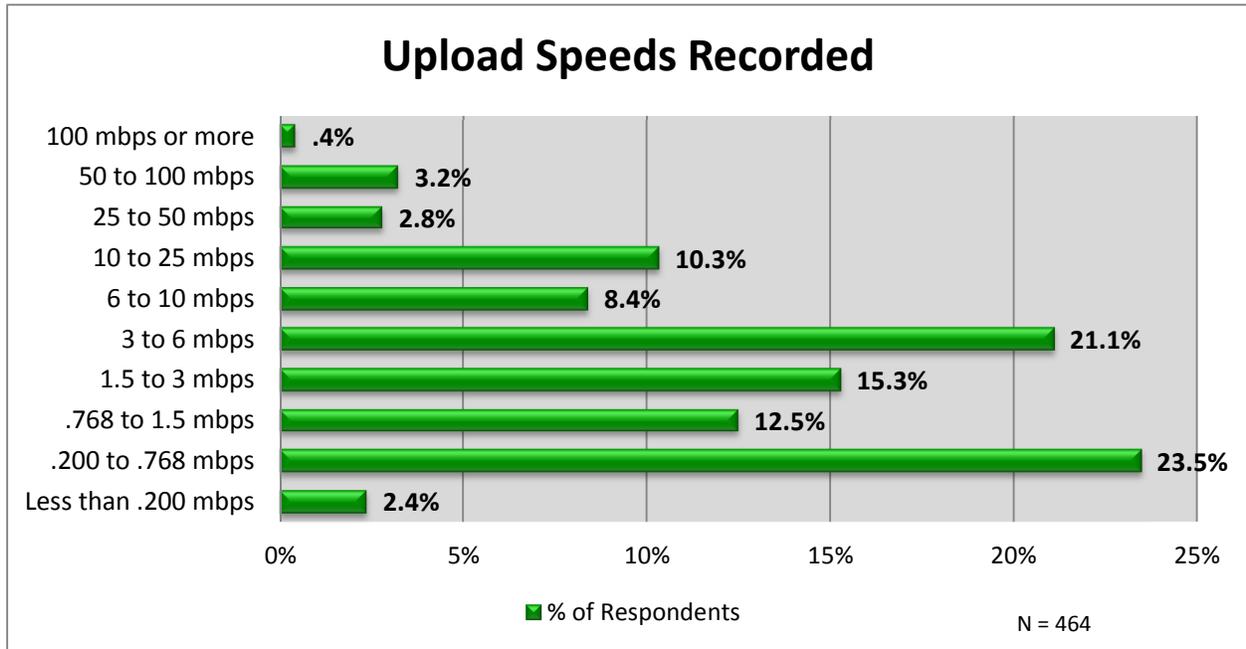


Figure 10 – Speed Test Results by Type of Connectivity

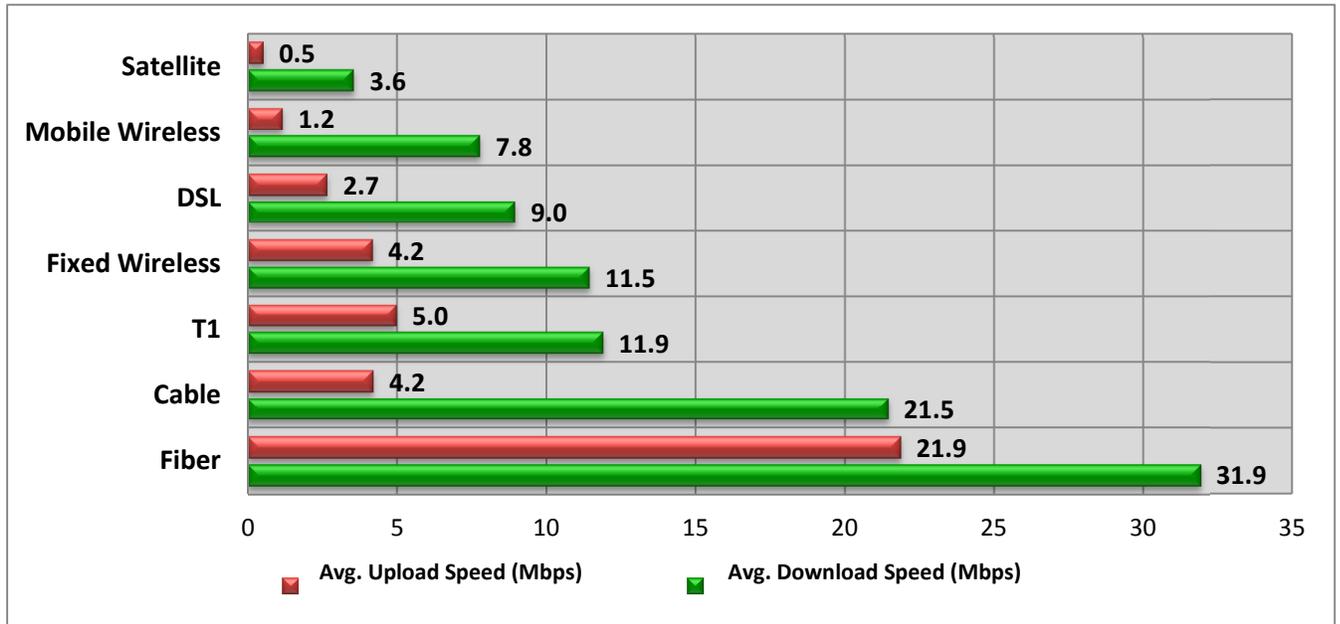
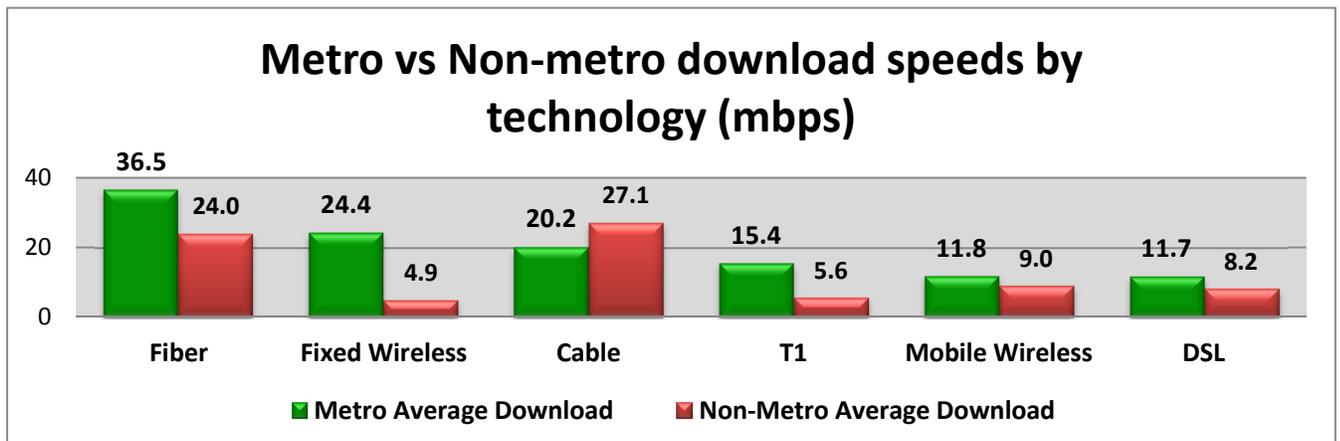
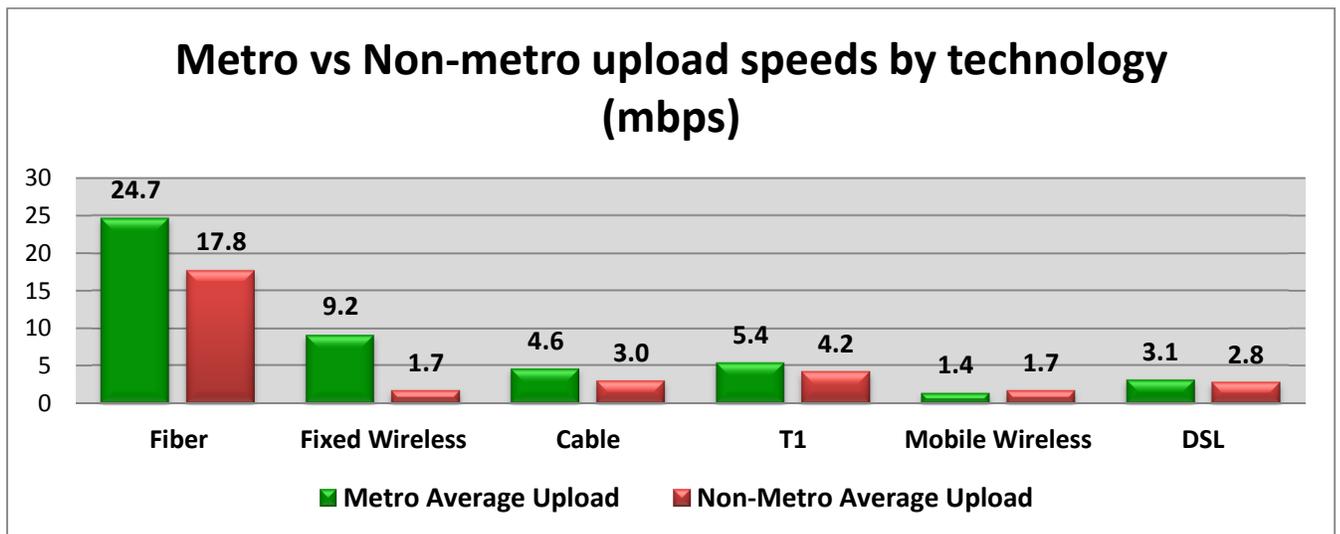


Figure 11 – Speed Test Results by Level of Urbanization



### **Cost**

1. The monthly expenditures of Internet connectivity increase with business size. Over 76 percent of very small establishments (1 – 9 employees) spend less than \$150 per month, while almost 50 percent of establishments with 250 or more employees spend \$2,000 or more per month.
2. Between 60 and 80 percent of DSL, fixed wireless, mobile wireless and satellite users spend less than \$100 per month. At the opposite end of the scale, over 25 percent of fiber users pay \$2,000 or more per month.

### **Satisfaction**

1. Of the non-dial-up technologies, fiber is considered the most reliable. Satellite was assessed as the least reliable, with 53 percent of establishments with satellite service reporting frequent or occasional problems, followed by mobile wireless.
2. While 24.9 percent of respondents felt that the value of their Internet service was poor or below expectations, this number increased to 40% percent of satellite and mobile wireless users.
3. Cable, T1, fixed wireless and DSL were closely rated in terms of reliability and value.
4. Fiber is considered the best value of all technologies despite its higher average monthly cost.

## **2.3 BROADBAND UTILIZATION AND BENEFITS**

### **2.3.1 Utilization Patterns**

The extent to which businesses use eSolutions<sup>4</sup> 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.

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<sup>4</sup> **e-Solutions** 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 the appendix for an explanation of other terms used in this report.

The survey of businesses and organizations explores the uses of the Internet in two major categories: **eCommerce** uses, which include activities related to the sales, marketing, and delivery of products and services; and **eProcess** uses, which include internal operational uses, such as supplier coordination, training and teleworking.

Figure 12 – eCommerce Uses of Broadband

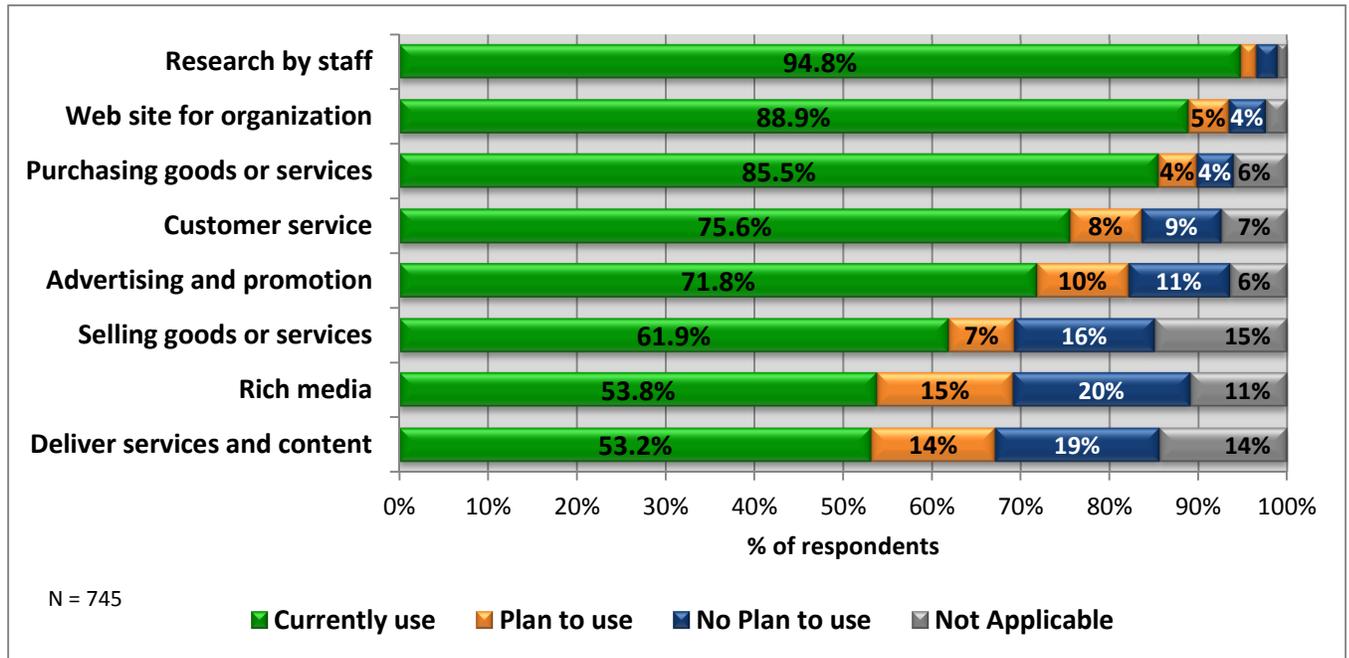
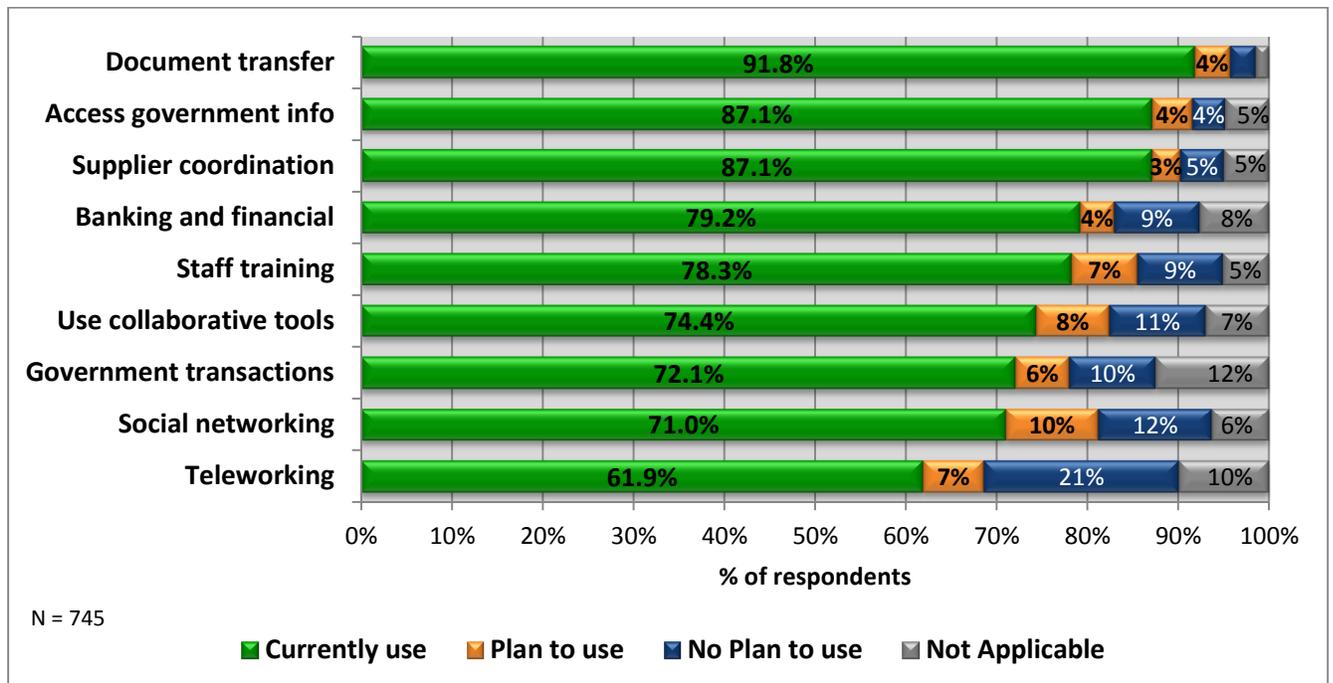


Figure 13 – eProcess Uses of Broadband



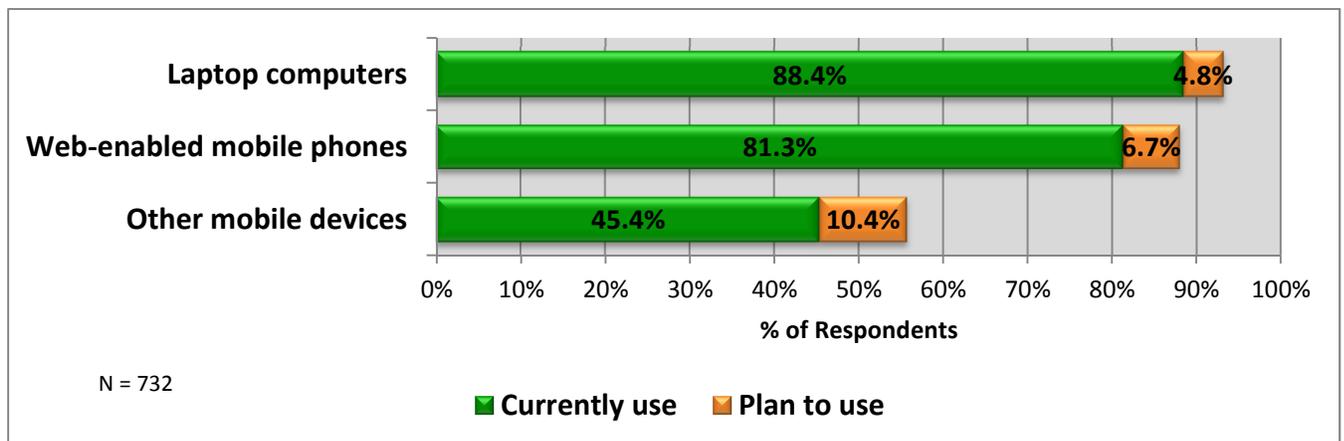
**Uses: Current**

1. Over 85 percent of businesses use the Internet to purchase goods and services online. In contrast, 61.9 percent of organizations sell goods and services online and 53.2 percent deliver services and content online.
2. Broadband offers uses that can transform how organizations conduct their operations. Over 80 percent of organizations use broadband for coordination with suppliers, while over 78 percent use broadband for employee training and another 75.6 percent for improving customer service.
3. Broadband utilization increases with employment size. Evidence for this tendency is found in Section 4.
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 Utilization of Mobility Services**

Businesses report a very high utilization of mobility devices for Internet access, which highlights the importance of mobility functions to their organizations.

**Figure 14 – Use of Web-enabled Mobile Devices**

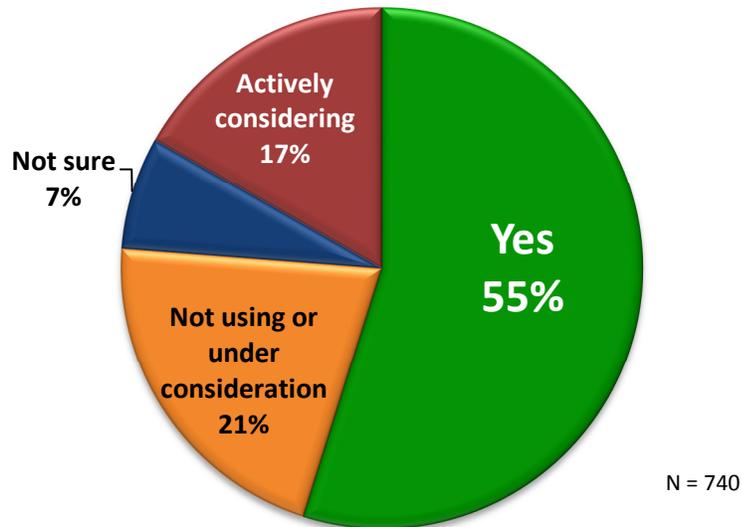


Over 88 percent of organizations use some form of web-enabled mobile device, with 84 percent using a web-enabled laptop computer, closely followed by web-enabled mobile phones (81.3 percent). There are statistically significant differences in use of mobile-web access across industry sectors. Businesses in Agriculture tend to have lower than average use of mobile web access.

### 2.3.1.2 Cloud Services

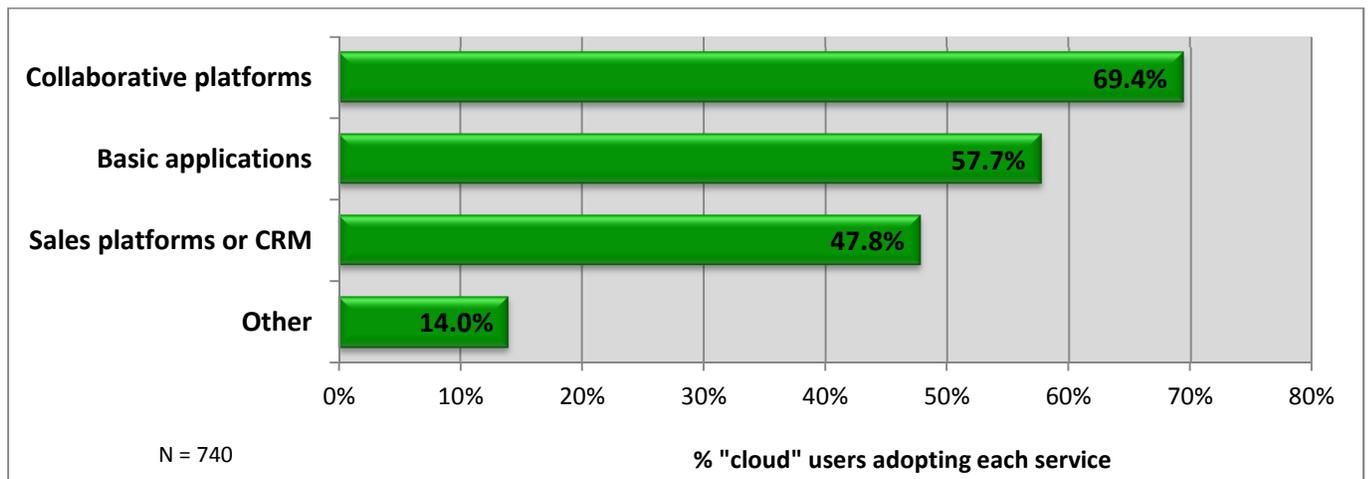
With the recent rapid growth in cloud based services, the survey probed how many businesses were using these services and for what purposes. Over one half of respondents indicated that they were already using cloud based services, with another 17 percent actively considering using.

**Figure 15 – Percentage of Businesses Using Cloud Based Services**



Collaborative platforms<sup>5</sup> were the most used cloud based type of service, at 69.4%. The second most frequent use of cloud services is for basic applications (email, word processing, etc.), at 57.7 percent.

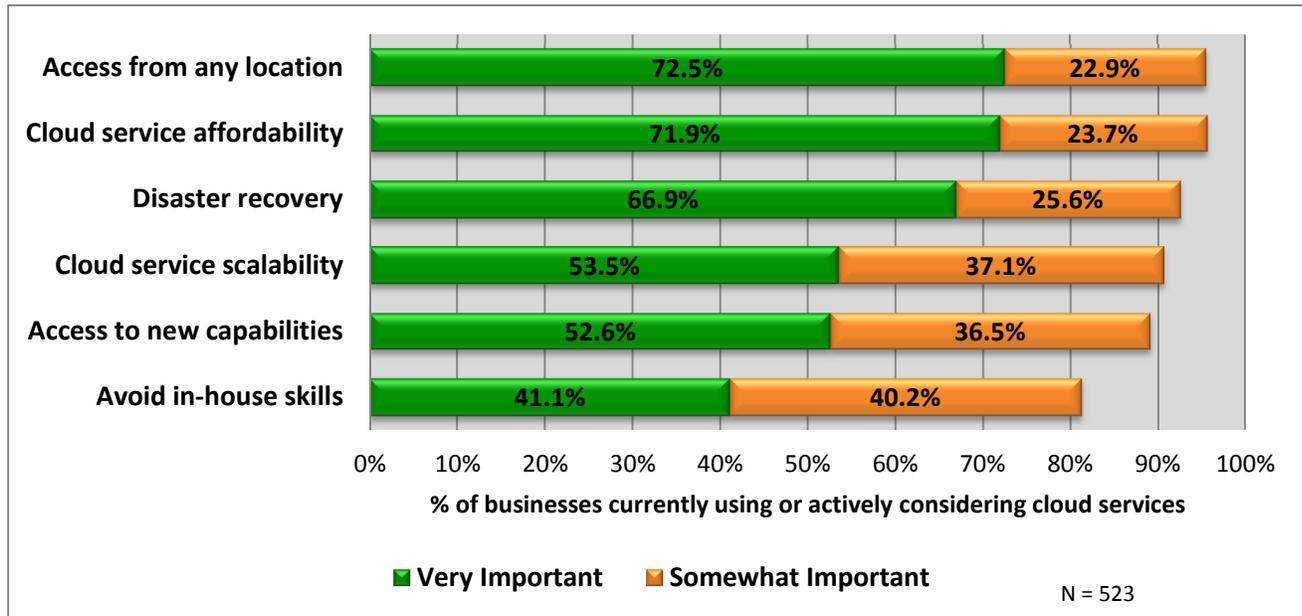
**Figure 16 – Types of Cloud Services by Frequency of Utilization**



<sup>5</sup> Collaboration 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).

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 80% of cloud services users (see 17). The two most frequently cited drivers were mobile access to the Internet and affordability.

**Figure 17 – Drivers for Adoption of Cloud Services**

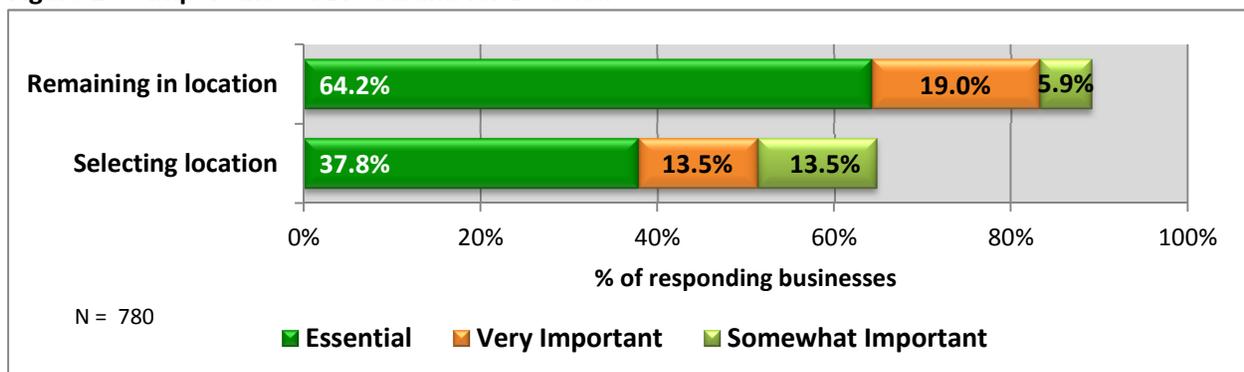


### 2.3.2 Broadband and Deciding Where to Locate

To provide a perspective on the impact of broadband, businesses 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 a business is moving, which areas it is willing to consider.

Over 37 percent of businesses say that the availability of broadband services was “essential” for selecting their business location, and over 64 percent say broadband is “essential” for remaining in their current location.

**Figure 18 – Importance of Broadband for Location**



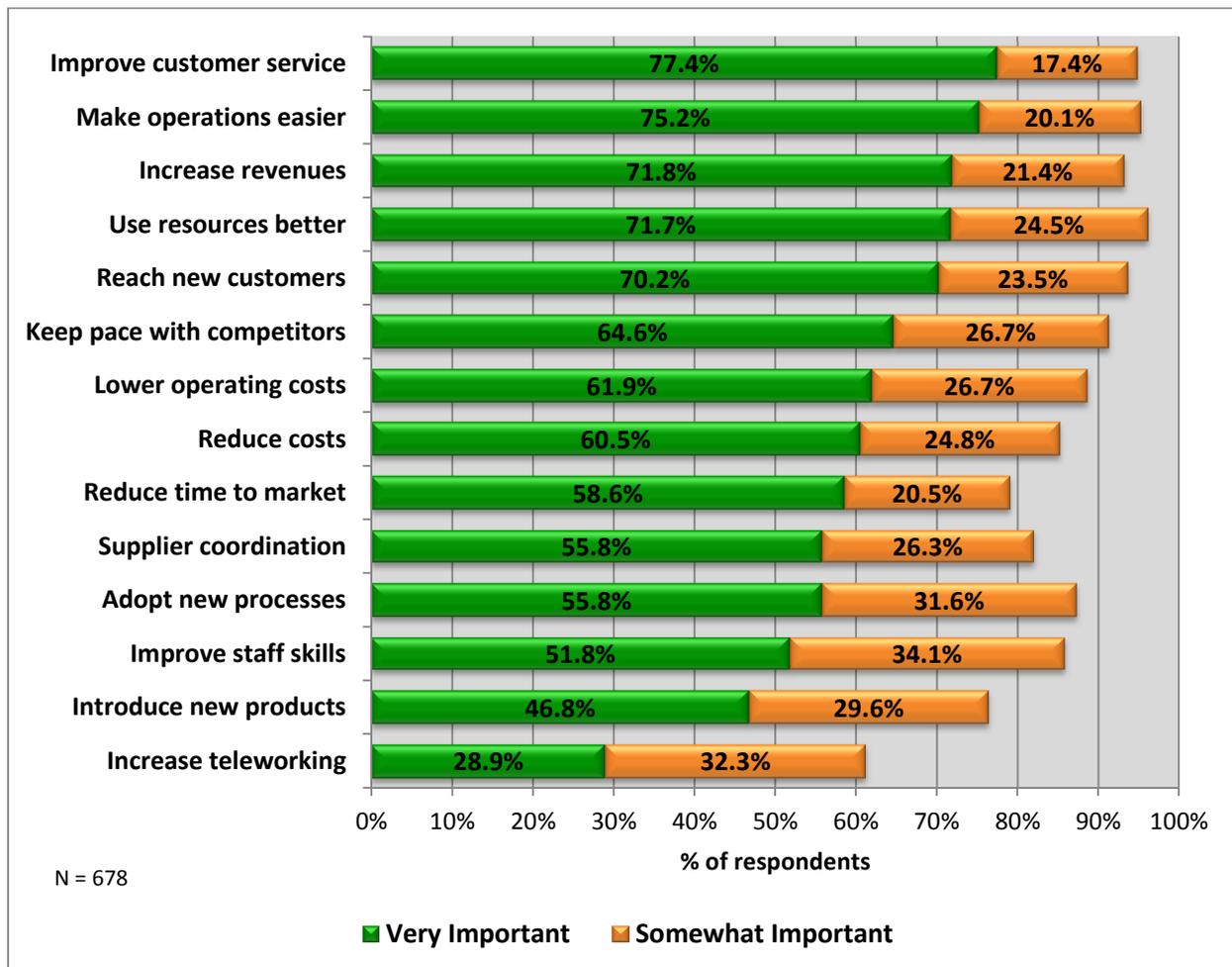
### 2.3.3 Broadband Benefits and Impacts

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 businesses recognize broadband as “very important” or “somewhat important” across all benefits dimensions (see Figure 19). The most generally recognized benefits are related to improved efficiency and productivity. The most recognized external-facing benefit of broadband is improving service to customers. Productivity-related benefits are slightly more valued by businesses 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 19 – Importance of Broadband for Business Benefits**



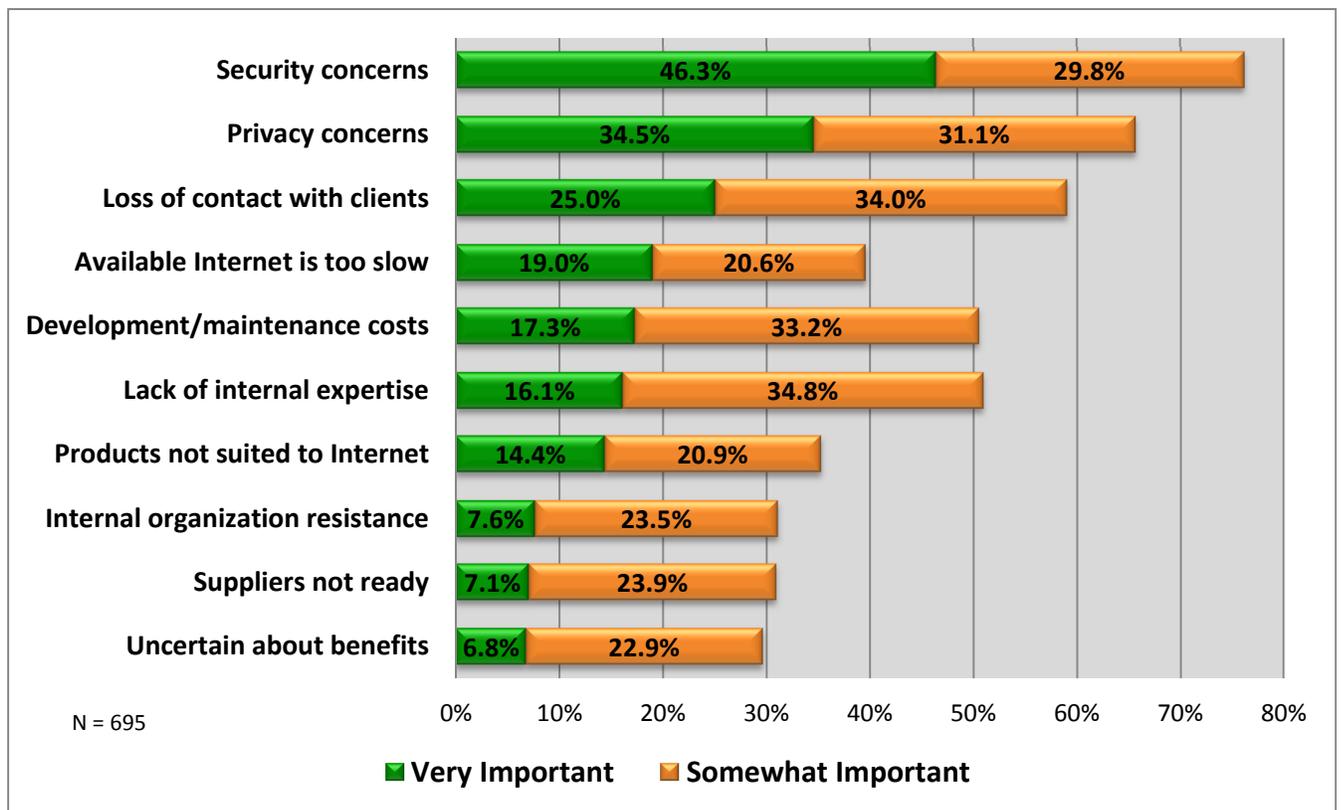
## 2.4 BARRIERS AND ADOPTION ISSUES

### 2.4.1 Barriers to Adoption

Businesses 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 and 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 more than 46 percent and 34 percent of businesses respectively.

Figure 20 – Barriers to Broadband Utilization



With regards to available speed being a barrier, small town businesses show an increasing sensitivity to slower Internet speeds. Within metro, 16% say speed is very important, 10% in micropolitan, and 25% in small towns say speed is a barrier.

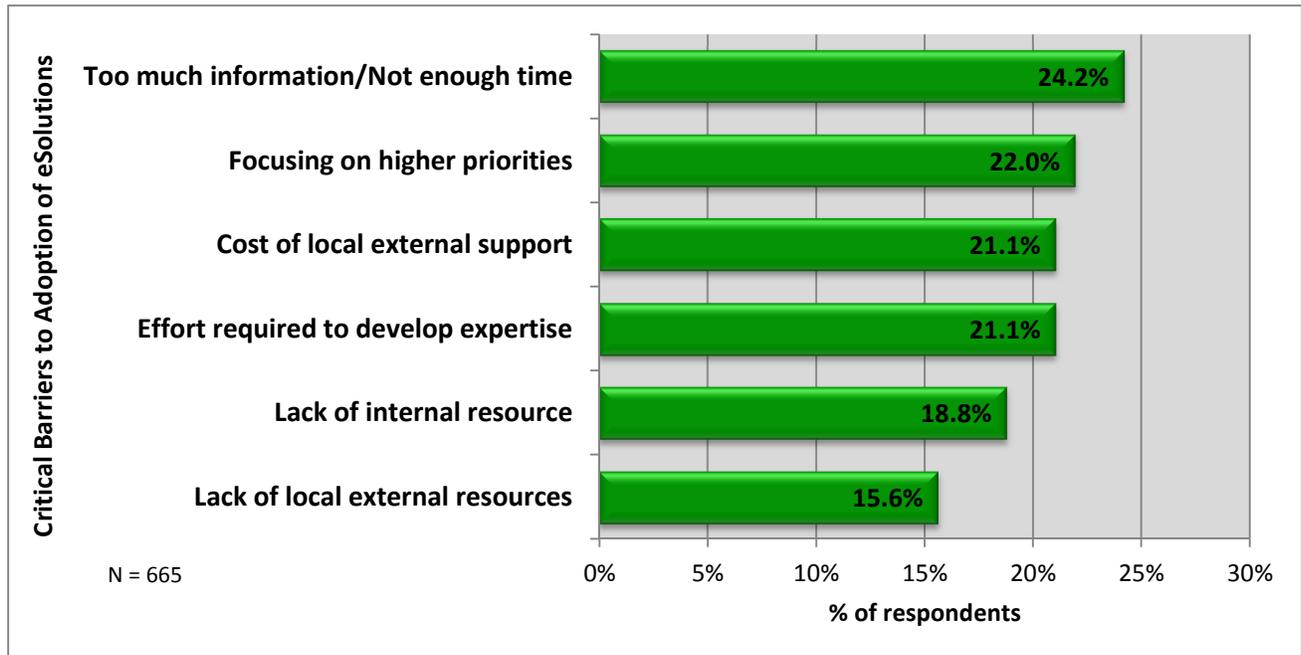
## 2.4.2 Expertise and Knowledge Issues

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 businesses may encounter in moving forward with eSolutions:

- Lack of internal resources 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
- Focusing on higher priorities

Businesses were asked to identify if these issues are: critical barriers to progress; challenging but manageable; or, not an issue for them. Overall, the lack of time and competing priorities represent the largest barriers, followed by costs and the high effort required to develop internal expertise.

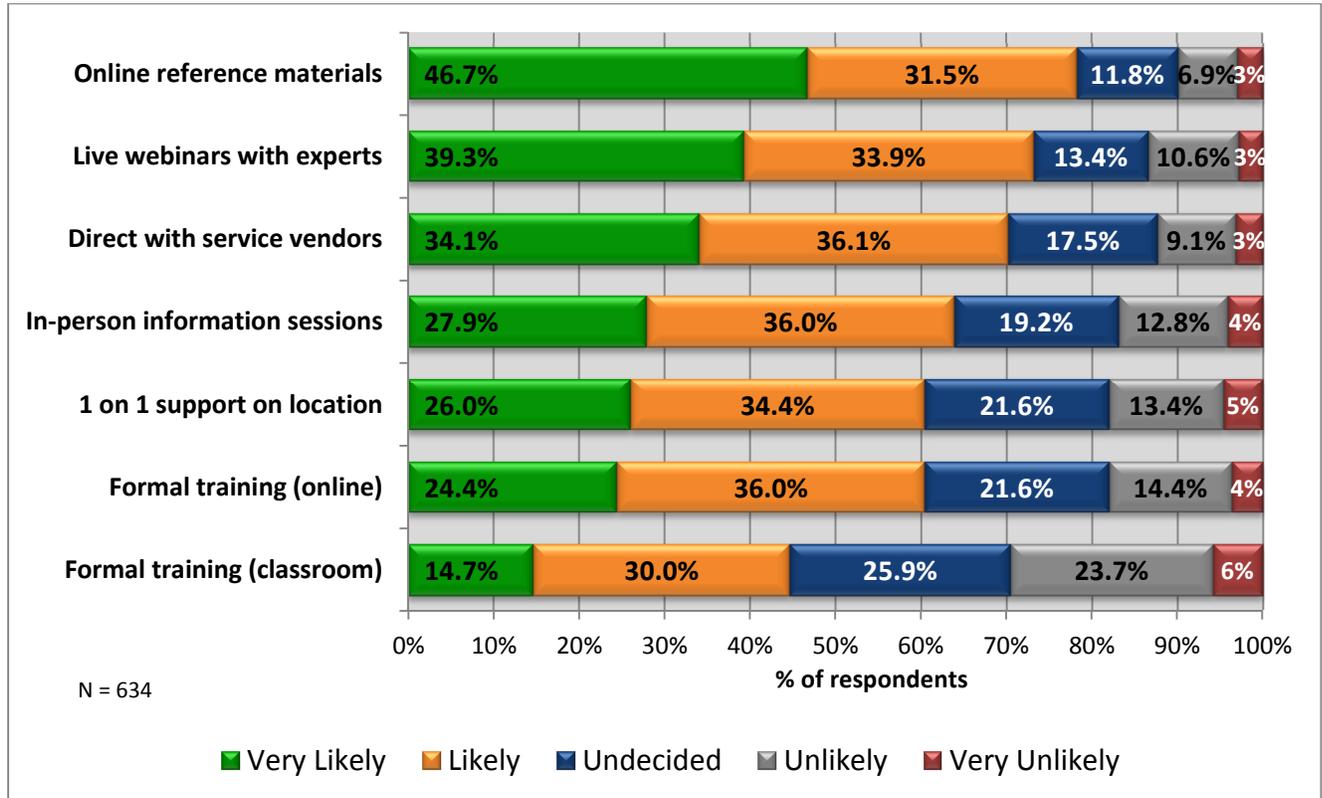
**Figure 21 – Critical Barriers to Acquiring Expertise**



### 2.4.3 Skills Acquisition

Businesses 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 22 – Preferred Methods for Acquiring Internal Knowledge**

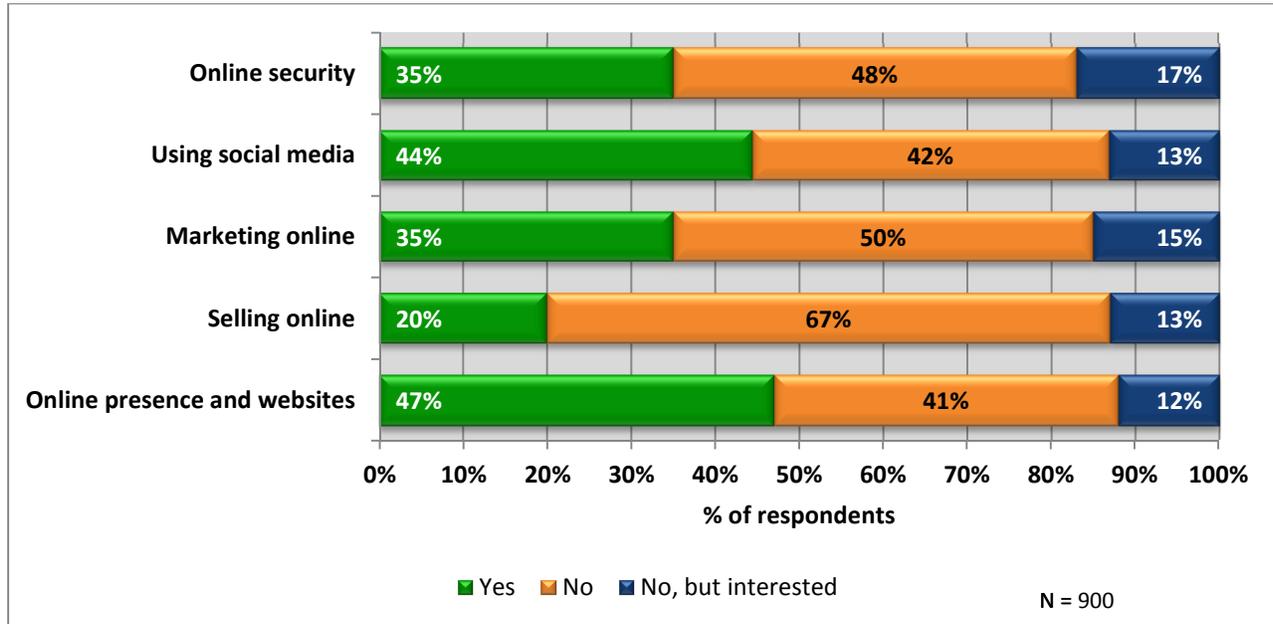


Self-directed methods of knowledge development, such as online research and webinars, are the most likely education methods to be used by the majority of businesses. Notably, formal training methods are less likely to be used, with in-person classroom training the least likely method and unlikely to be used by almost 30 percent of businesses. This information is useful in determining the most appropriate methods to support businesses in developing the expertise they require for eSolutions adoption skills.

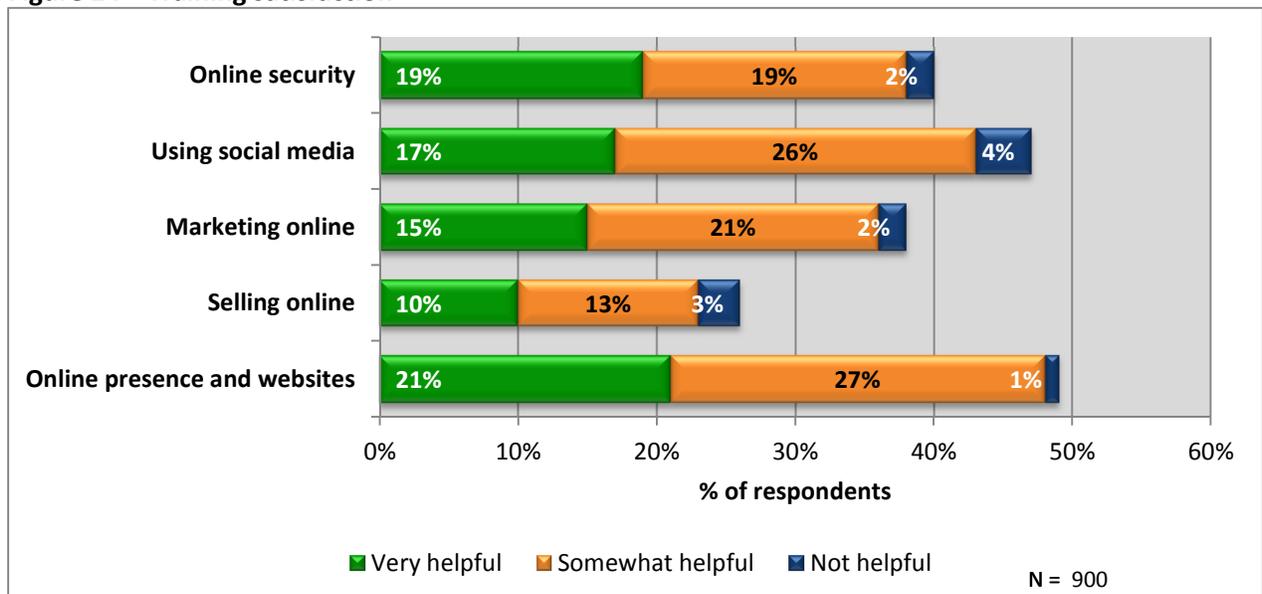
### 2.4.4 Supplemental, State-Specific Training Questions

Per Nebraska’s requests, SNG supplemented the eSB with additional questions regarding Internet training pursued by businesses, and the satisfaction with each as it is an indicator of future receptiveness.

**Figure 23 – Internet-related training taken**



**Figure 24 – Training satisfaction**



## 2.5 FINANCIAL AND EMPLOYMENT IMPACTS FROM INTERNET USE

In order to gauge the impacts of Internet use on the operations, businesses were asked to quantify how using the Internet has affected revenue generation, and 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 substantially 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 364 establishments reported data. For other metrics, 164 and 91 businesses reported data for revenues and operating cost savings related to the Internet respectively.

Businesses were asked to provide their total annual<sup>6</sup> revenues, operating costs, and current employment numbers to provide a baseline for assessment of impacts. They were also asked to provide the changes as a result of 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.

As seen in Figure 25, while over 1,732 new positions were created, reporting businesses also experienced sizeable job reductions over the preceding 12 months, resulting in a net job increase of 1,247 positions. The net job increase attributed to using the Internet (Figure 26) was 654 positions. The Internet facilitated the creation of over 40 percent of all new jobs created and constituted 52 percent of net jobs created.

**Figure 25 – Summary of Employment Impacts (part and full time combined)**

Size of Employer	# of Businesses	Current Employees	New Jobs Created in Last 12 Months	Lost Jobs	Net Jobs
0 to 19	174	1,485	224	114	110
20 to 49	90	2,807	243	83	160
50 to 99	48	3,306	269	56	213
100 to 499	44	7,829	806	82	724
500 or more	8	34,200	190	150	40
<b>TOTALS</b>	<b>364</b>	<b>49,627</b>	<b>1,732</b>	<b>485</b>	<b>1,247</b>

<sup>6</sup> Annual figures were requested for the past 12 month reporting period.

**Figure 26 – Summary of Employment Impacts Specific to Internet Use (part and full time combined)**

Size of Employer	New Jobs from Internet Use	Lost Jobs from Internet Use	Net Jobs from Internet Use	New Jobs from Internet Use as % of New Jobs
0 to 19	67	16	51	29.7%
20 to 49	79	26	53	32.5%
50 to 99	84	1	83	31.2%
100 to 499	334	7	327	41.4%
500 or more	140	0	140	73.7%
<b>TOTALS</b>	<b>704</b>	<b>50</b>	<b>654</b>	<b>40.6%</b>

In terms of the impact of the Internet on generating both revenues and cost savings, 80.8 percent of revenues from 164 companies were generated through the Internet. However, this high percentage of revenues was skewed by two large companies with over 500 employees that reported 100 percent of their revenue from the Internet. A more typical percentage of 25 to 45 percent was reported across the other size ranges. Cost savings were reported as 4 percent.

**Figure 27 – Revenues and Cost Savings from Internet Utilization**

<b>Annual Revenue Impacts</b>				
	# Establishments	Total Annual Revenue (\$M)	Annual Revenue from Internet (\$M)	Pct. Internet Revenue
<b>All Businesses</b>	164	\$14,853	\$11,994	80.8%
<b>Less than 500 Employees</b>	154	\$4,752	\$1,894	39.9%

<b>Annual Operating Cost Impacts</b>				
	# Establishments	Total Annual Operating Cost (\$M)	Cost Saving from Internet (\$M)	Pct. Cost Saving
<b>All Businesses</b>	91	\$298	\$12	4.0%
<b>Less than 500 Employees</b>	87	\$298	\$12	4.0%

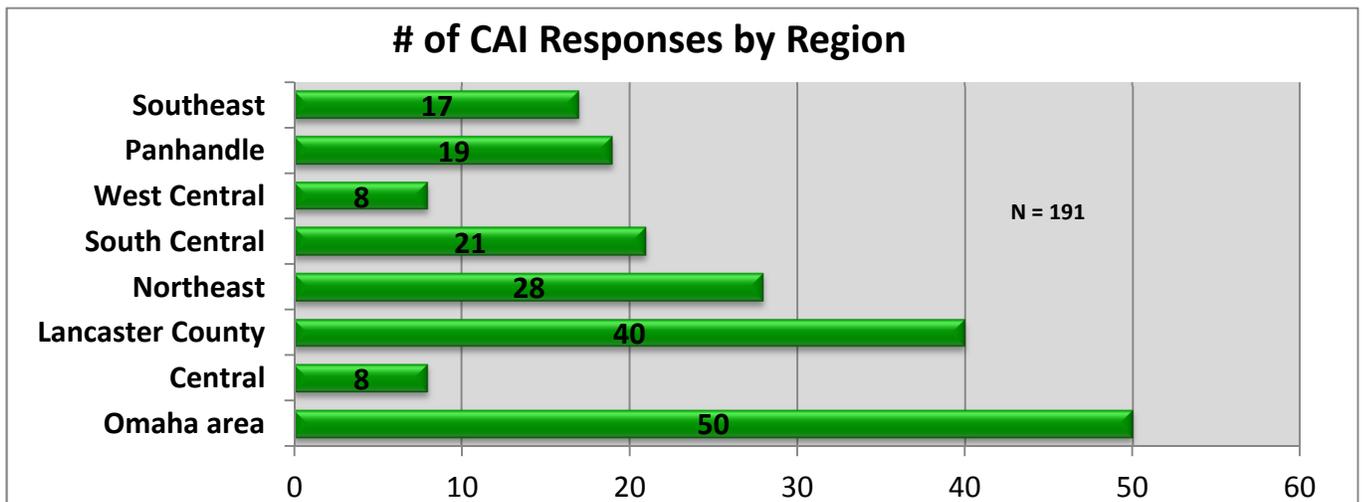
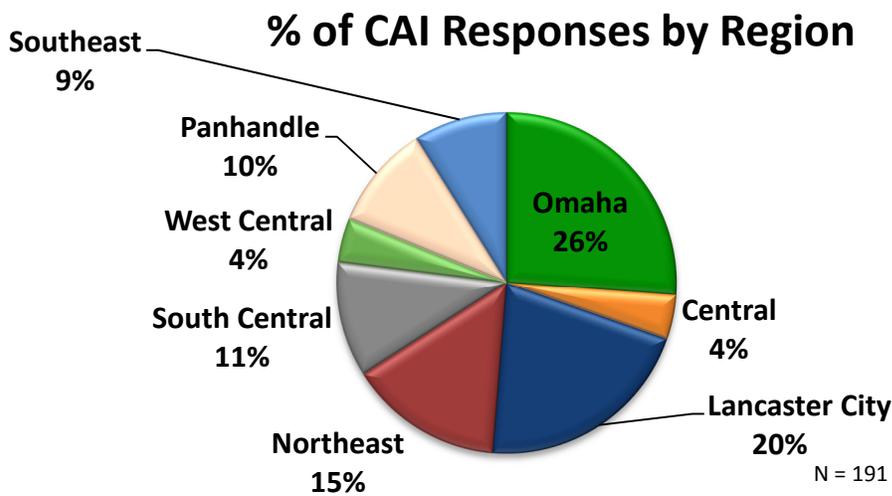
### 3 Key Findings – Community Anchor Institutions (CAIs)

While the target for this study was, in fact businesses – the purchased list included community anchor institutions (see Figure 28 for composition). Had we targeted these organizations, the sample size would be larger. Access to and use of the Internet also has an important impact on the operations and effectiveness of non-commercial organizations. Among the most important of these non-commercial organizations are those considered to be “community anchor institutions” (CAIs), such as educational organizations, governments, and health institutions. This section reviews key findings from CAI respondents related to their Internet usage, benefits, and barriers.

#### 3.1 RESPONDENT PROFILE

The sample set outlined in this report includes data from CAIs across the state. Figure 28 shows the distribution of organizational responses by region.

Figure 28 – CAI Responses by Region



Responses were received from a diversity of types of community anchor institutions, as seen in Figure 29.

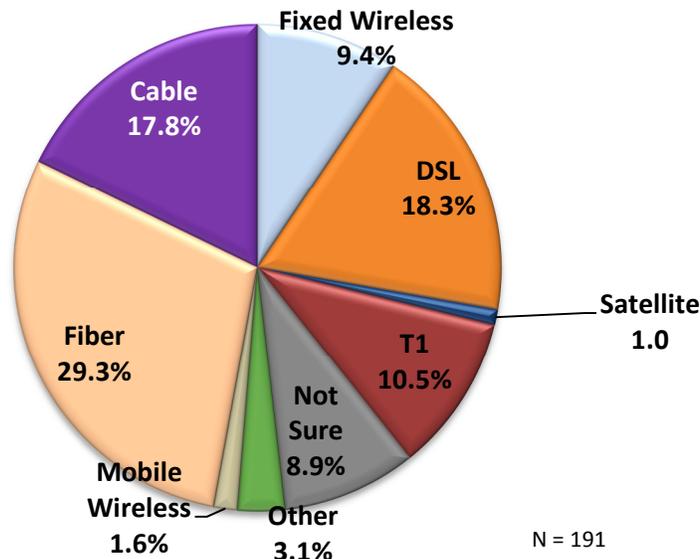
**Figure 29 – CAI Responses by Type of Institution**

Type of CAI	# of Responses
College	13
University or Trade School	15
Other Community Service	37
K - 12 School	9
Health Care Provider	55
State or Federal Government	6
Library	13
Economic Development Agency	26
Local Government	11
Public Safety	6
	<b>191</b>

### 3.2 CONNECTIVITY CHARACTERISTICS

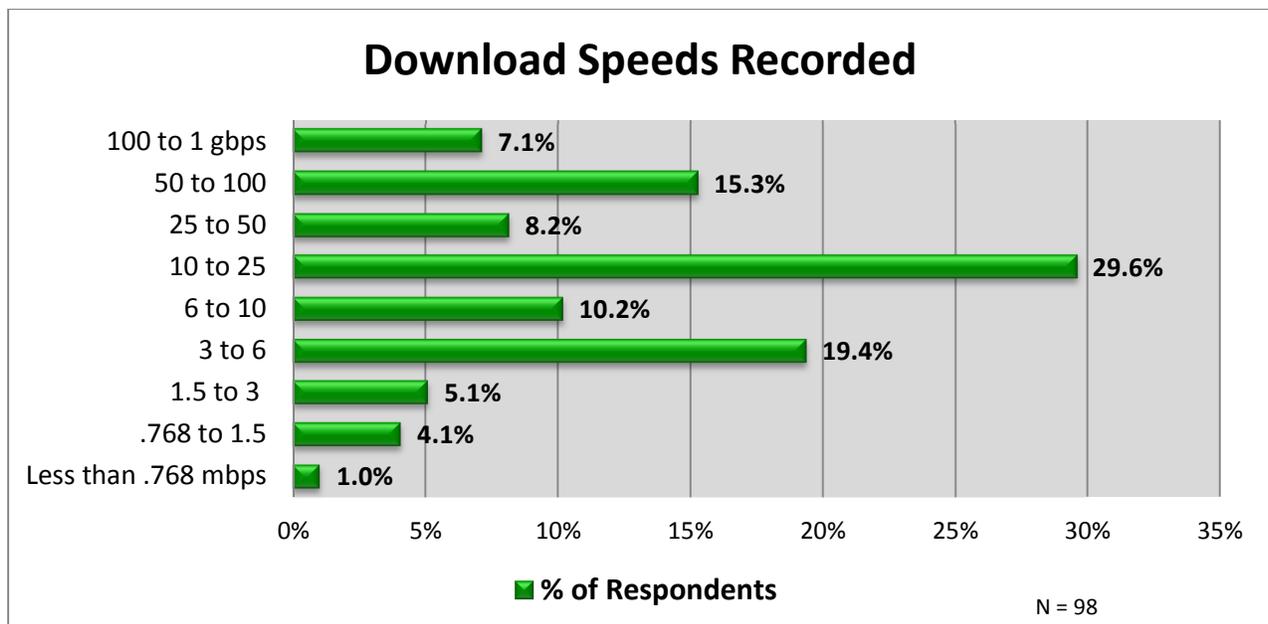
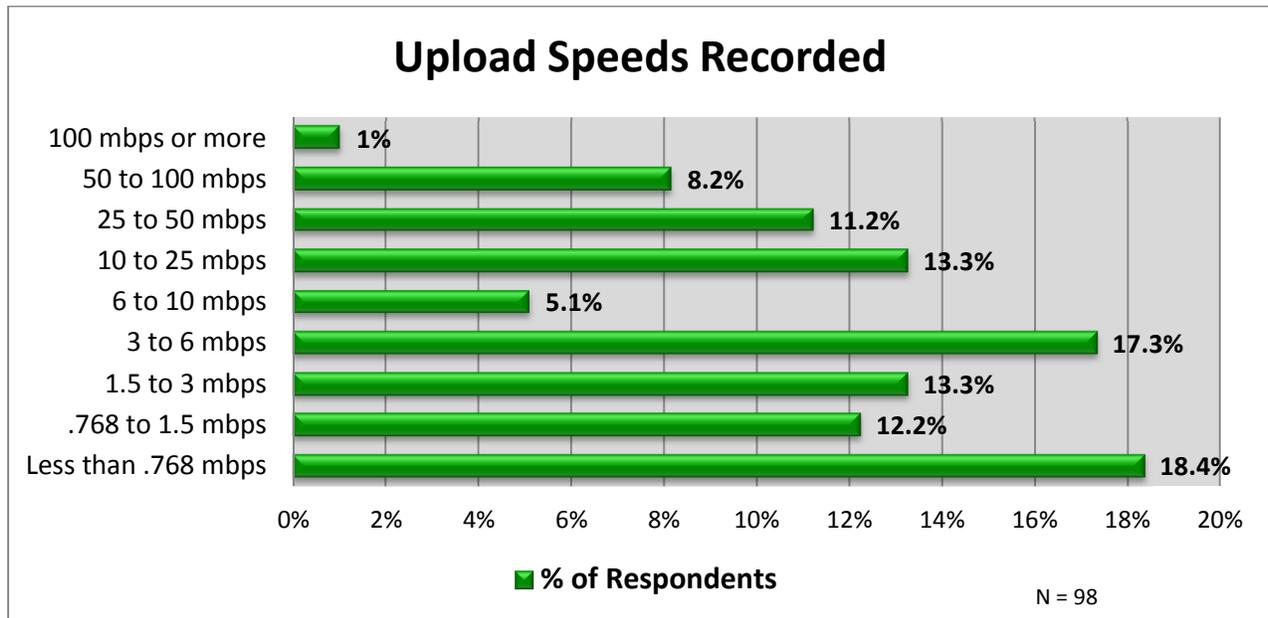
The CAIs responding to the survey use a broad mix of Internet connectivity technologies, as seen in Figure 30. Fiber, at 29.3 percent, is used more than any other technology. However, other important Internet services are DSL (18.3%), cable (17.8%), T1 (9.4%) and fixed wireless (9.4%). The use of fiber Internet technologies increases steadily with business size and is the predominant technology for organizations with more than 250 employees.

**Figure 30 – How CAIs Connect to the Internet**



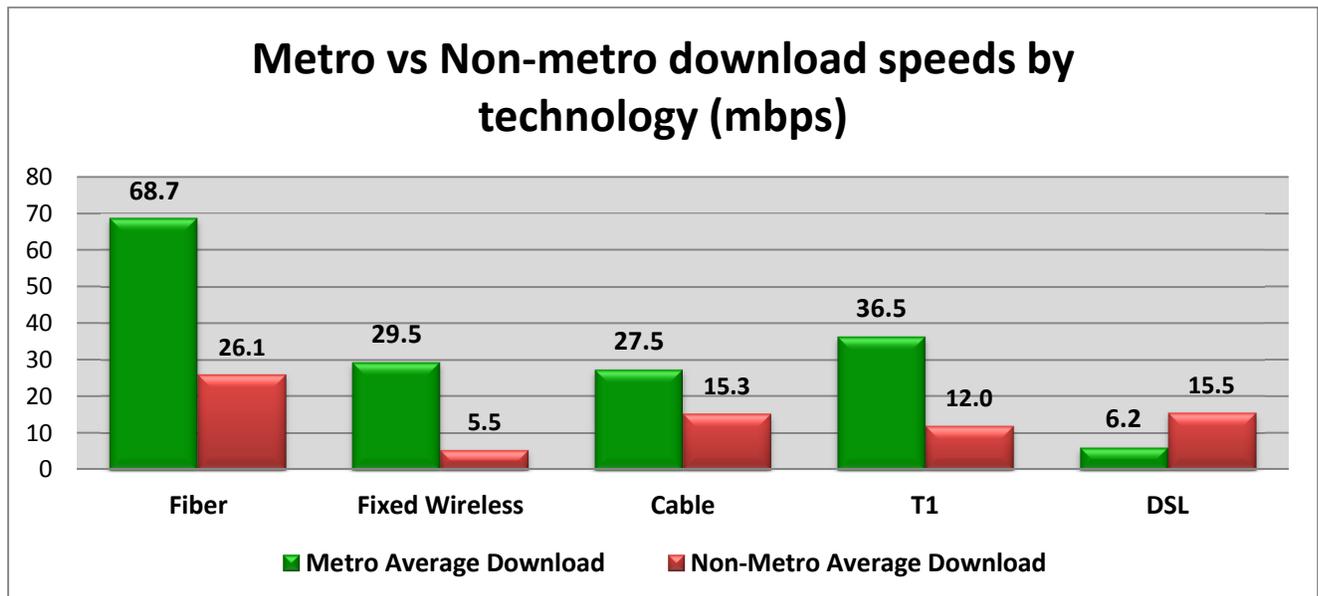
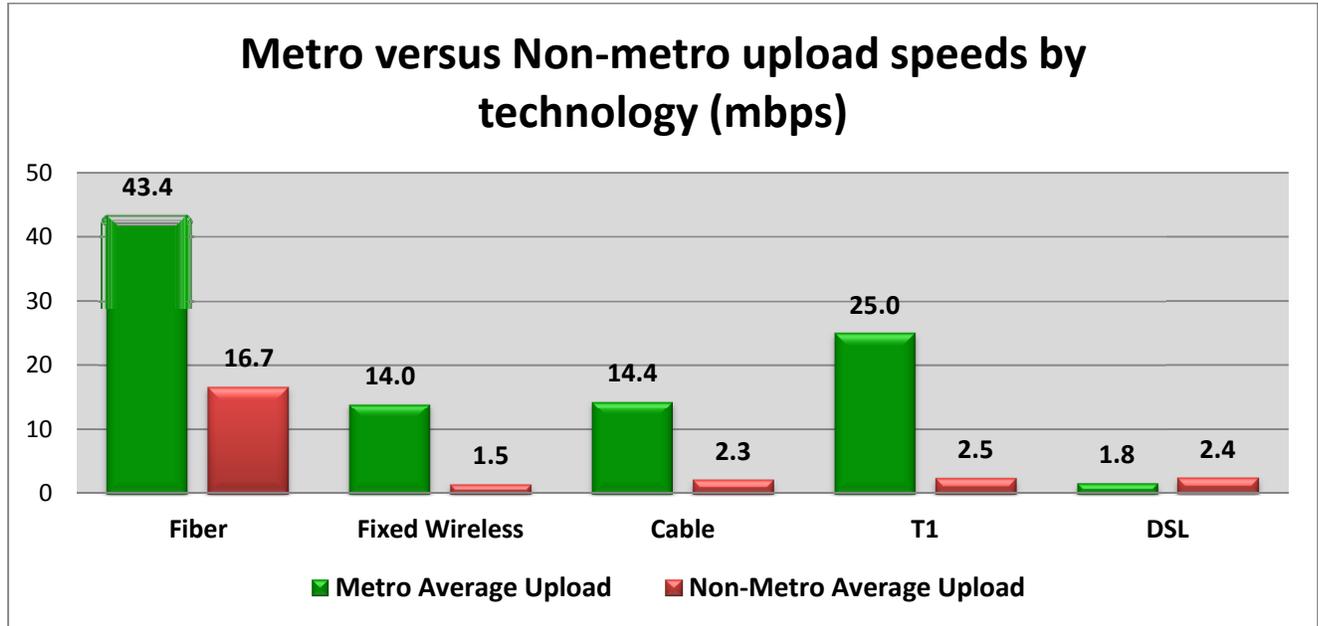
The survey included an opportunity for respondents to take a live speed test that assessed their actual upload and download speeds. Ninety-eight CAIs took the speed test, results of which were automatically entered into the survey. While connectivity speeds failed to meet the FCC definition of broadband (768 kbps or more in at least one direction) for only 1 respondent, 18 percent of those taking the speed test had upload speeds of less than 768 kbps. There were significant differences in speed test results between different technologies, with fiber the winner by a wide margin. Fixed wireless, cable and T1 connections formed the second fastest tier of services, while DSL and satellite recorded the slowest speeds.

**Figure 31 – Speed Test Results – Community Anchor Institutions**



As in the case for businesses, there is a very noticeable difference in Internet connection speeds between metropolitan and non-metropolitan areas. As seen in Figure 32, this difference is largest in terms of upload speeds for fixed wireless, cable and T1 connections.

**Figure 32 – Speed-Test Results by Type of Connectivity and Level of Urbanization**



**Satisfaction:** There was a generally high level of satisfaction among respondents regarding the reliability, speed and value of their Internet service. Less than 15 percent of respondents reported dissatisfaction with reliability, speed, or value. The only type of technology with notable levels of dissatisfaction was DSL, with 30.7 percent of DSL users stating they had frequent or occasional reliability problems and 34.6 percent stating that their DSL service was a poor value.

### 3.3 BROADBAND UTILIZATION AND BENEFITS

#### 3.3.1 Utilization Patterns

The extent to which CAIs use eSolutions provides an indication of their engagement in the digital world and in delivery of digital services. 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 transactional processes come “online,” and more current technologies spawn enhanced or new process capabilities.

Figures 33 and 34 show the extent to which CAIs use or plan to use eSolutions in two major categories: **eCommerce** uses, which include activities related to the sales, marketing and delivery of products and services. While a number of the uses in this category are less applicable to some types of community anchor institutions, most CAIs are involved in some form of commercial activity; and, **eProcess** uses, which include internal operational uses, such as supplier coordination, training, and teleworking.

#### Uses: Current

1. Over 77 percent of CAIs use the Internet to purchase goods and services online. In contrast, only 54.8 percent of CAIs deliver any services or content online. Over a third of CAIs use the Internet to sell their services.
2. Broadband offers uses that can transform how organizations conduct their operations. Over 76 percent of CAIs use online collaborative tools, 70 percent use broadband for coordination with suppliers, while over 85 percent use broadband for employee training and another 63.5 percent for improving customer service.

Figure 33 – eCommerce Uses of Broadband

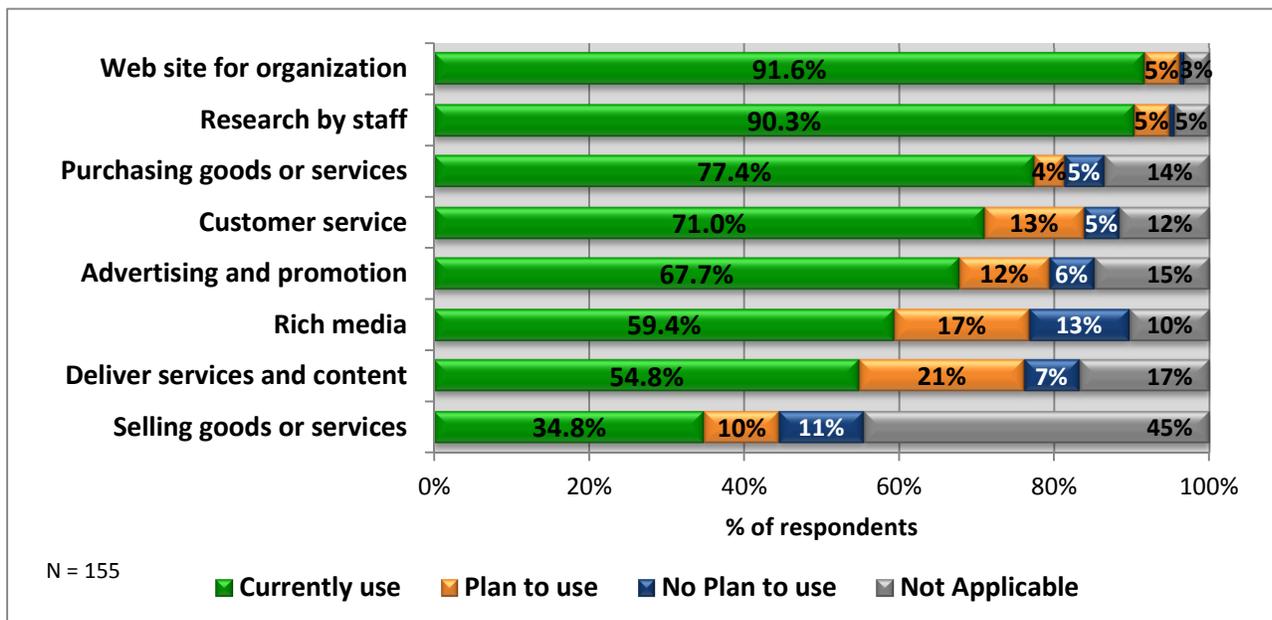
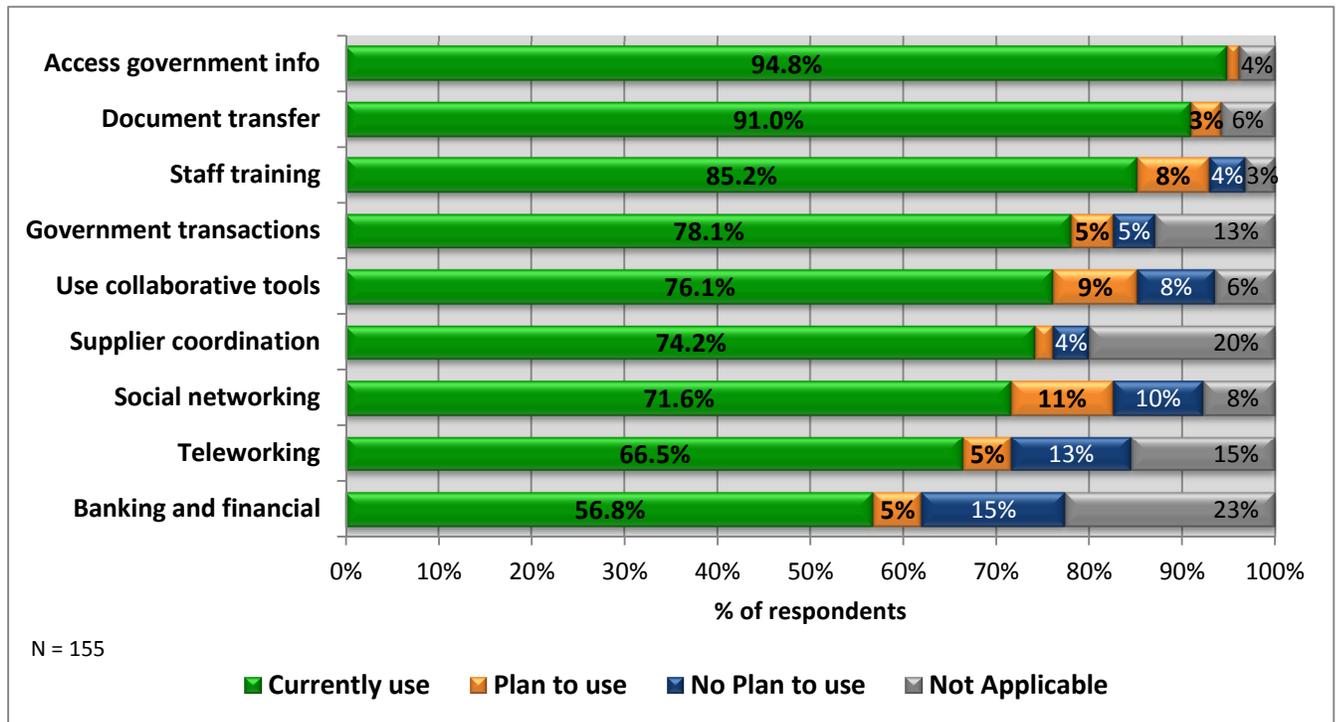


Figure 34 – eProcess Uses of Broadband

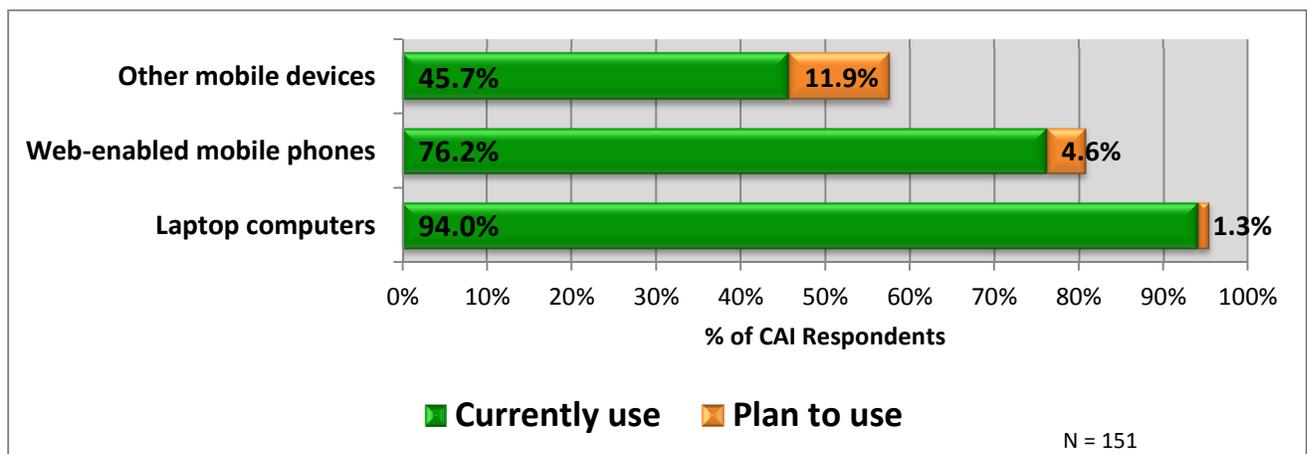


Two of the areas with lowest current utilization (service delivery and rich media content) also have the highest level of planned use.

### 3.3.1.1 Utilization of Mobility Services

CAIs have a very high use of mobility devices for Internet access, highlighting the importance of mobility functions to their organizations. As shown in Figure 35, the vast majority of CAIs use some form of web-enabled mobile device, with 94 percent using a web-enabled laptop computer, closely followed by web-enabled mobile phones (76.2 percent).

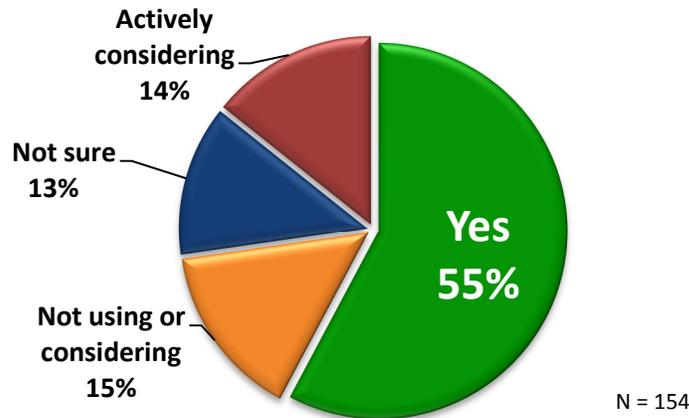
Figure 35 – Use of Web-enabled Mobile Devices



### 3.3.1.2 Cloud Services

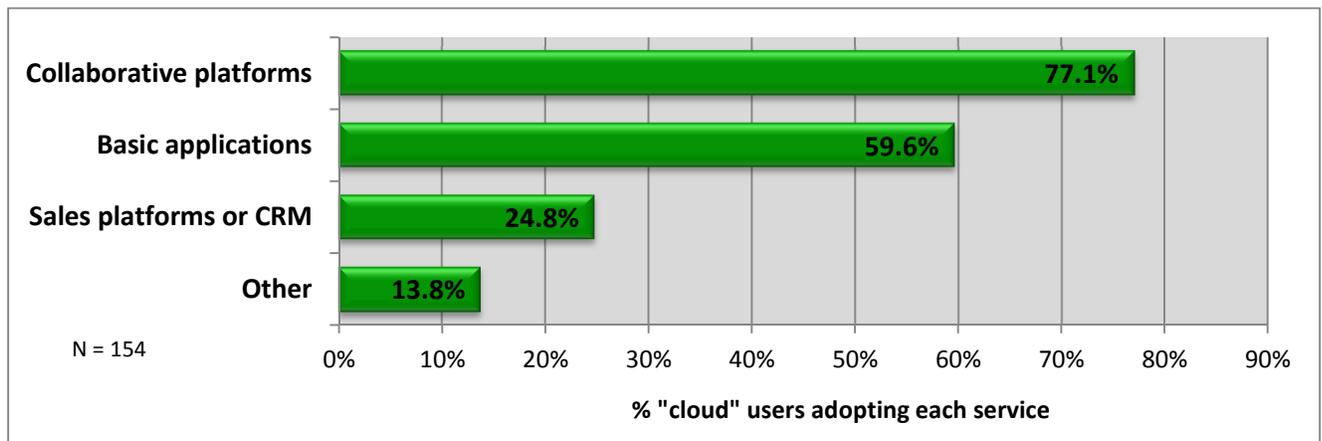
The survey probed how many CAIs were using these services and for what purposes. Adoption rates of cloud services were identical to businesses, with 55 percent of CAIs reporting that they already use cloud services. Another 14 percent are actively considering them.

**Figure 36 – Percentage of CAIs Using Cloud Based Services**



Cloud based services are most frequently used to establish or access collaborative platforms<sup>7</sup>, while basic applications (email, word processing, etc.) was the second most frequent type of cloud service.

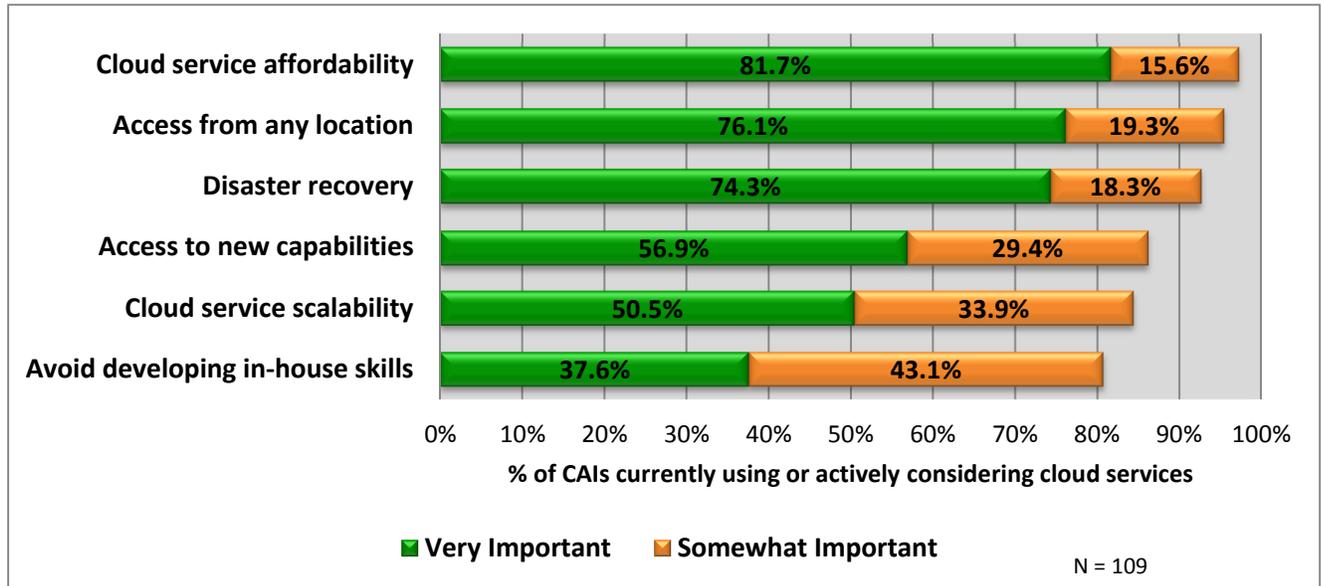
**Figure 37 – Types of Cloud Services by Frequency of Utilization**



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 75% of cloud services users (see Figure 38). The three most frequently cited drivers were affordability, mobile access to the Internet, and disaster recovery.

<sup>7</sup> Collaboration 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).

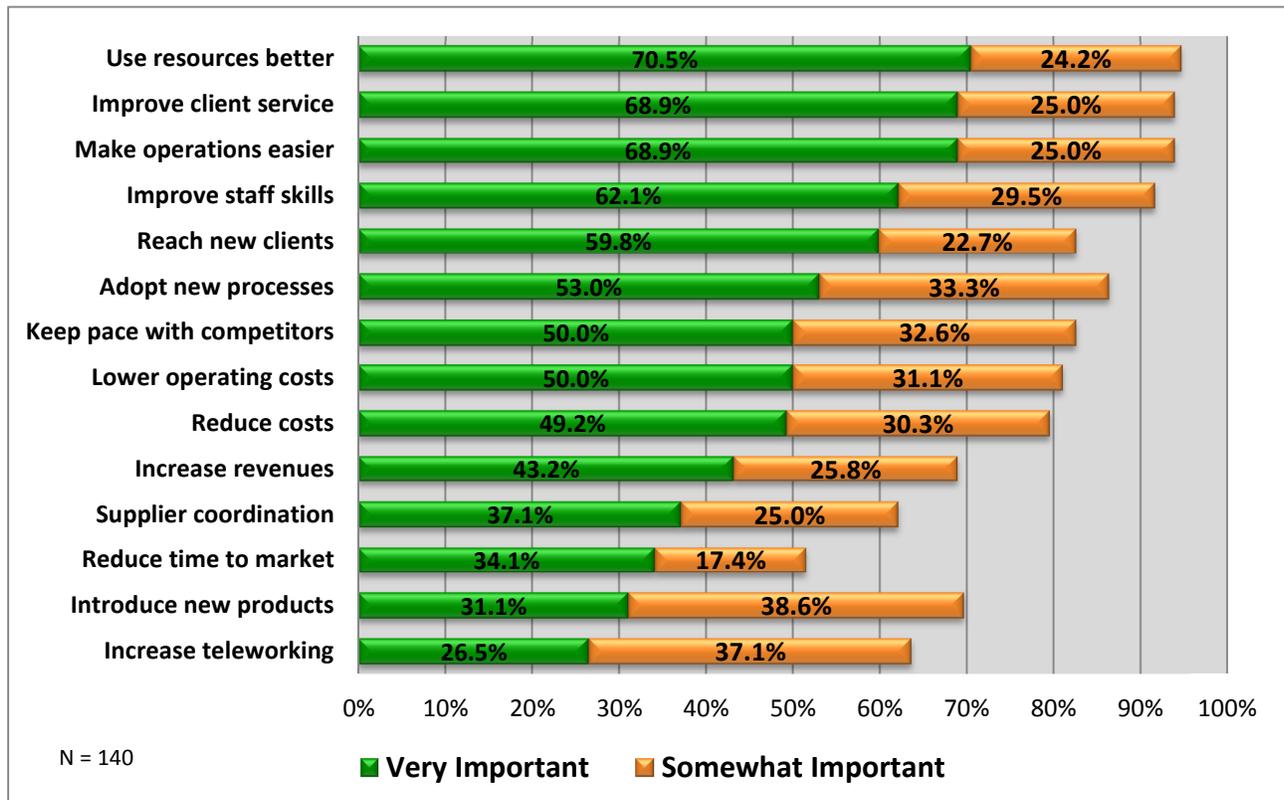
**Figure 38 – Drivers for Adoption of Cloud Services**



### 3.3.2 Broadband Benefits and Impacts

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

**Figure 39 – Importance of Broadband for Organizational Benefits**



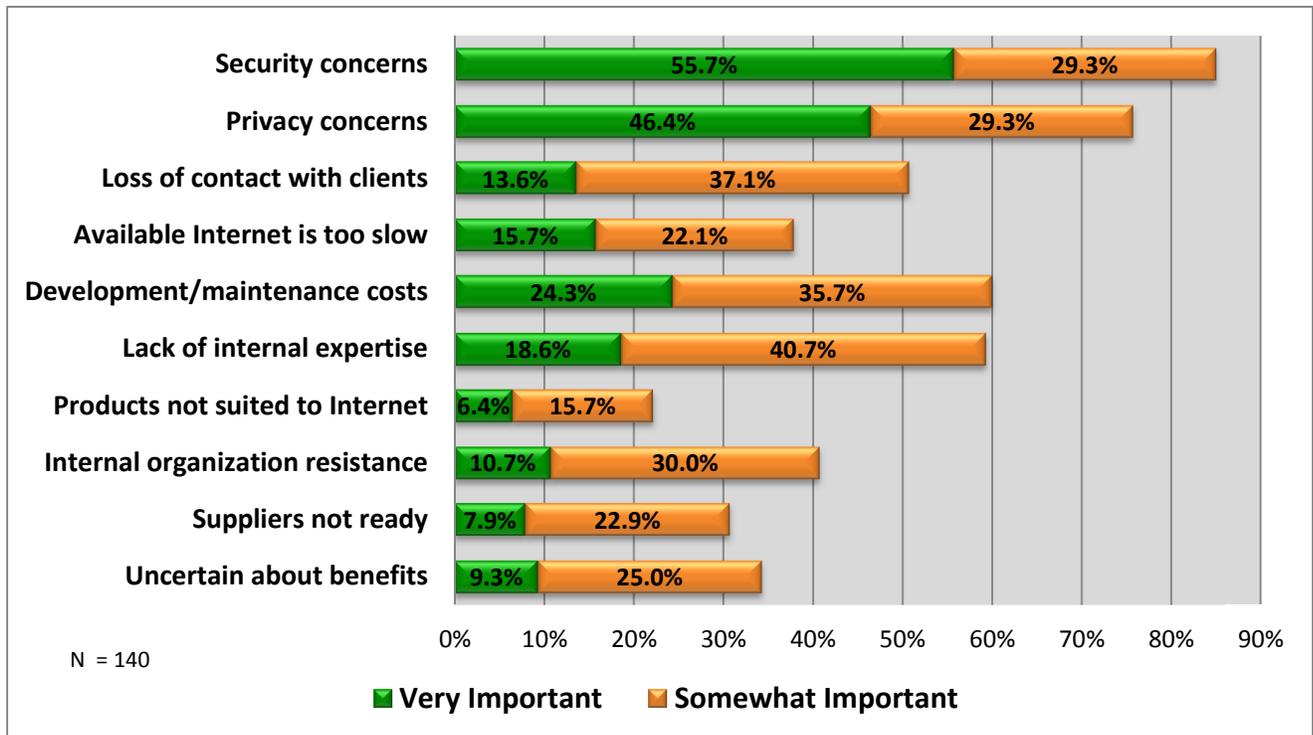
Overall, the majority of CAIs recognize broadband as “very important” or “somewhat important” across all benefits dimensions (see Figure 39). The most frequently recognized benefits are related to improved efficiency and productivity. The most recognized external-facing benefit of broadband is improving service to clients. CAIs also highly value use of the Internet for staff training.

### 3.4 BARRIERS AND ADOPTION ISSUES

#### 3.4.1 Barriers to Adoption

CAIs were asked to rate the significance of various barriers to effectively using Internet in their operations. These barriers tend to inhibit the adoption of eSolutions and need to be recognized to overcome if CAIs are to fully benefit from their Internet connection. The two barriers that rate the highest in importance are security and privacy concerns, considered very important by more than 55.7 percent and 46.4 percent of CAIs respectively.

Figure 40 – Barriers to Broadband Utilization



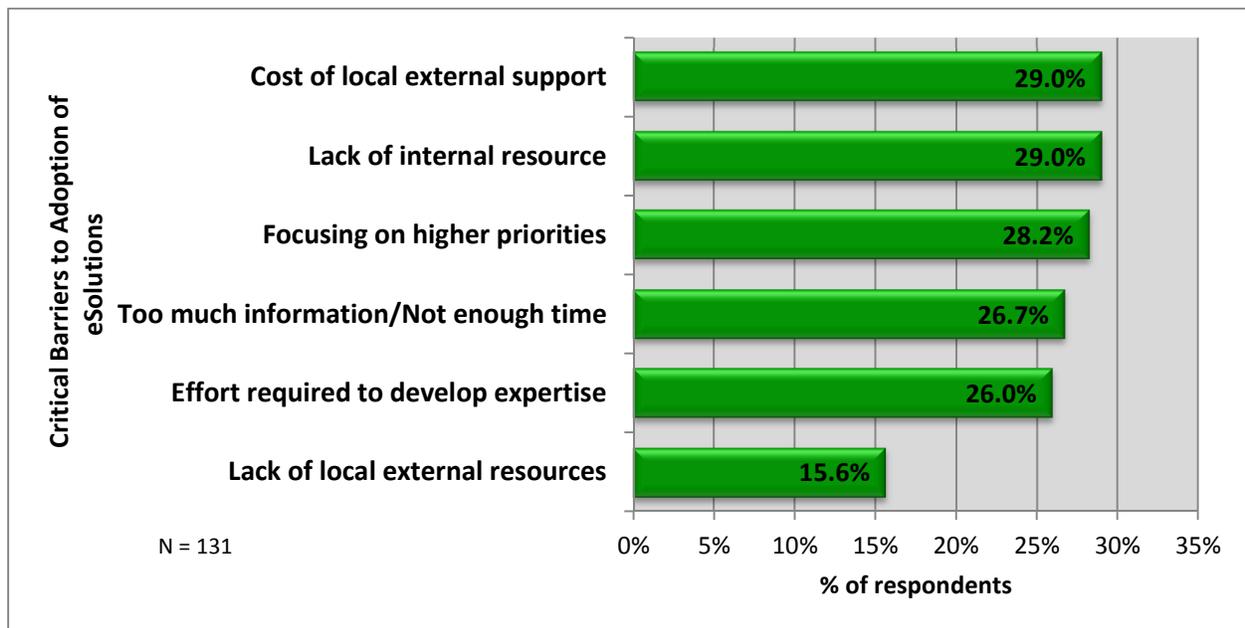
### 3.4.2 Expertise and Knowledge Issues

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 resources 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
- Focusing on higher priorities

CAIs were asked to identify if these issues are: critical barriers to progress; challenging but manageable; or not an issue for them. Unfortunately, CAIs identified five barriers as equally critical barriers, making it difficult to identify one or two clear priorities.

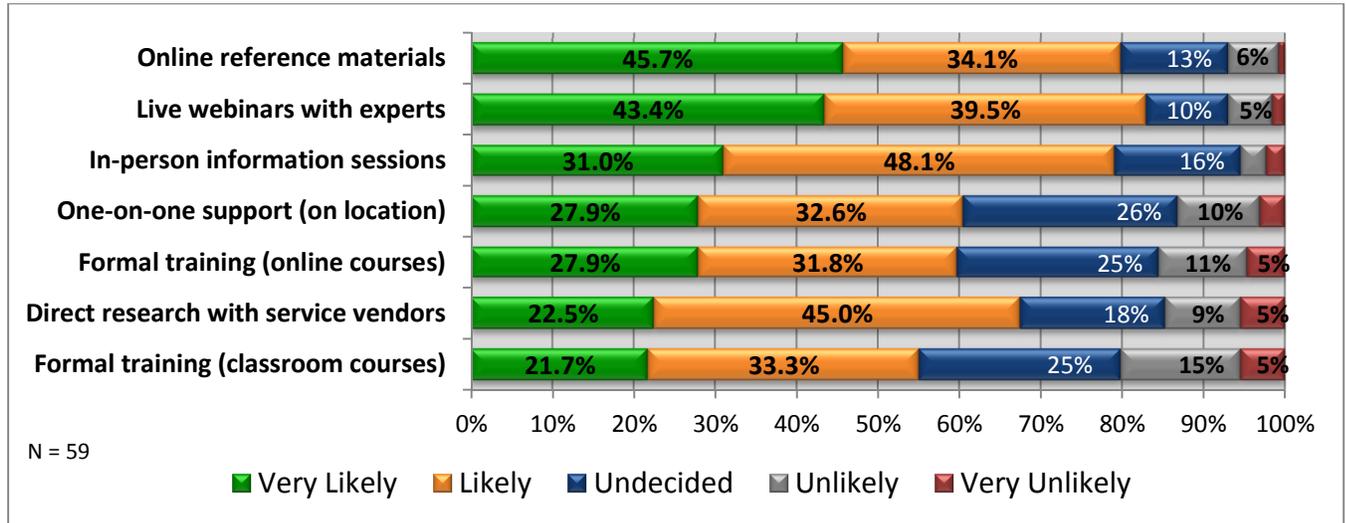
**Figure 41 – Barriers to Acquiring Expertise**



### 3.4.3 Skills Acquisition

To understand how CAIs acquire expertise and knowledge for eSolutions, respondents were asked to identify the preferred skill development method for their organization.

**Figure 42 – Preferred Methods for Acquiring Internal Knowledge**



Like businesses, 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 the least likely method. CAIs are less likely than businesses to use service vendors as a means of acquiring knowledge and skills needed for resolution adoption. This information is useful in determining the most appropriate methods to support organizations in developing the expertise they require for eSolutions adoption skills.

## 4 Benchmarks and Regional Overview

This report includes comparisons of Internet use between regions by various characteristics, such as industry and business size. 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 (SNG) 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 a business' or organization's utilization of 17 different Internet applications and processes. These applications and processes (eSolutions) are listed on the following page. Based on the number of applications currently being used by a business, a composite score is calculated that summarizes how comprehensively each business uses Internet-enabled eSolutions. The DEi can be used to compare organizations, regions, or industry sectors.



*DEi Meter from dashboard of the Digital Economy Analytics Platform.*

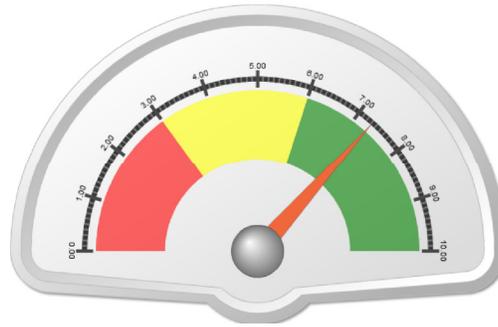
A business' DEi score (from 0 to 10) captures their utilization of eSolutions, with 10 being the highest possible use. DEi scores are averaged across groups of users by various categories: e.g. a sector's DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison 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 businesses and CAIs. On the next page is a list of the utilization categories (eSolutions) used to track how organizations use their Internet and broadband connections.

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. e-Solutions encompass not only product delivery and payment transactions (ecommerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

<b>eSolutions Categories for Businesses and CAIs</b>	
<i><b>eCommerce Related</b></i>	<i><b>eProcess Related</b></i>
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

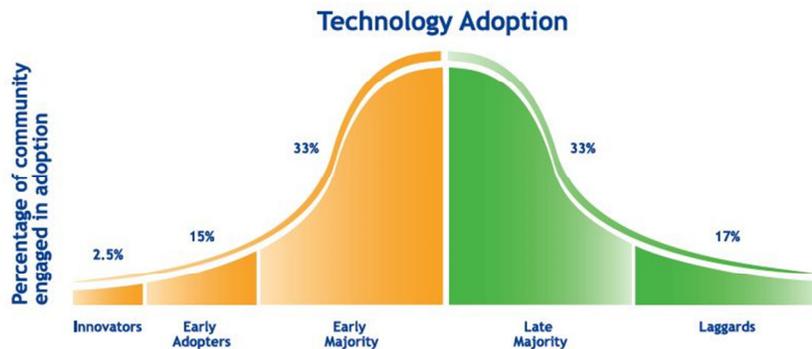
## 4.2 BUSINESS BENCHMARKS AND REGIONAL BREAKDOWN



Average DEi Score	Sample Size	Median DEi Score
7.32	881	7.77

This report uses both mean average and median as benchmarks. For organizations in Nebraska, the mean average was 7.32 while the median average was 7.77.<sup>8</sup> In practical terms these scores indicate that a middle-of-the-road (median) business in Nebraska was using 13 of the seventeen eSolutions noted on the previous page.

Studies among businesses in numerous states have enabled us to correspondingly apply a DEi score to each of these categories to further illustrate the “technology personality” of businesses.



Nebraska’s innovators are substantially higher than the SNG benchmark states while correspondingly the number of laggards is lower than in the other states surveyed (see Appendix A for the names of those states).

**Figure 43 – Percentage of Businesses in Each of the Technology Life Cycle’s Categories**

DEi Score	SNG Benchmark States	Nebraska	Technology Adoption
0 – 3.9	17%	10%	Laggards
4 – 6.4	33%	24%	Late Majority
6.5 – 8.9	33%	39%	Early Majority
9 – 9.9	14%	13%	Early Adopters
10	3%	14%	Innovators

<sup>8</sup> 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.

As can be seen in Figure 44, the Omaha area and Lancaster County have higher than average (SNG has data from 2012 & 2013 to compare Nebraska to from Georgia, Illinois, Kentucky and Virginia) DEi scores, while the Southeast, Panhandle and Central have lower than average DEi scores. The “average” business in the Omaha area uses three or more eSolutions than the “average” business in the Panhandle. SNG research conducted outside the scope of this project indicates that these three are likely to be such “slow-to-adopt” processes as rich media, delivering services online, and selling online. The last two of these eSolutions are closely related to generating revenues from the Internet.

**Figure 44 – Utilization Benchmarks (DEi) for Businesses by Region**

Utilization (DEi) by Region			
Region	Median DEi	Ave. DEi Score	# Establishments
Omaha area	8.1	7.6	298
Lancaster County	8.0	7.7	161
South Central	7.7	7.3	81
Northeast	7.6	7.1	116
West Central	7.5	7.0	68
Southeast	7.2	6.9	63
Panhandle	7.2	6.9	56
Central	6.0	6.0	38
			881

Related to the difference among regions, Figure 45 shows that more urban areas have higher Internet utilization levels than less urban areas (as measured by DEi). Using U.S. Census Bureau categories, the data shows that businesses in isolated small towns<sup>9</sup> have a median DEi score that is 1.5 less than businesses in Metropolitan areas (equal to approximately 2.5 eSolutions).

**Figure 45 – Utilization Benchmarks (DEi) for Businesses by Level of Urbanization**

Utilization (DEi) by Level of Urbanization			
Region	Median DEi	Ave. DEi Score	# Establishments
Metropolitan	8.1	7.7	469
Micropolitan	7.8	7.5	145
Small Town	7.3	7.1	99
Isolated Small Town	6.6	6.5	114
			827

<sup>9</sup> A metropolitan area is defined by the U.S. 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.

The benchmarking process also reveals that smaller businesses consistently perform at lower levels than larger organizations (Figure 46), which is not a surprise given their access to greater resources. The gap in Internet utilization is most pronounced among micro businesses with 4 or less employees.

**Figure 46 – Utilization Benchmarks (DEi) for Businesses by Size of Firm**

Utilization (DEi) by Size			
Employment Range	Median DEi Score	Ave. DEi Score	# of Firms
1 - 4 employees	7.3	7.0	169
5 - 9	7.7	7.3	159
10 - 19	8.0	7.5	141
20 - 49	7.9	7.5	166
50 - 99	8.5	8.1	76
100 - 249	8.5	7.8	58
250 - 499	8.5	8.5	22
500 or more	9.2	8.5	19
			810

Lastly, the benchmarking process identifies difference in Internet utilization among industry sectors. As seen in Figure 47, the leading adopters of Internet solutions are unsurprisingly Education Services, Information, Professional and Technical, Manufacturing, and the Financial Services sectors. This is consistent with similar data obtained in other jurisdictions over the last few years. More surprising is the above average performance of the retail sector. The lowest level of Internet utilization is found within the Agricultural sector, where levels of Internet utilization are dramatically lower than for other business sectors such as Transportation and Construction.

**Figure 47 – Utilization Benchmarks (DEi) by Industry Sector**

Utilization (DEi) by Sector			
Major Industry	Median DEi Score	Ave. DEi Score	# of Firms
Educational Services	8.8	7.8	10
Information	8.3	7.9	50
Professional & Technical Services	8.1	7.7	123
Finance & Insurance	8.1	7.5	109
Retail Trade	8.1	7.4	99
Utilities	8.1	7.9	6
Manufacturing & Processing	8.0	7.4	106
Real Estate	7.7	7.4	35
Construction	7.7	7.3	45
Other services (exc. public admin)	7.5	7.4	26
Wholesale Trade	7.4	7.4	48
Arts, Entertainment & Recreation	7.1	6.8	9
Health Care & Social Assistance	7.1	6.7	43
Administrative & Support Services	7.0	7.0	16
Transportation & Warehousing	6.9	7.2	21
Accommodation & food services	6.2	6.5	7
Agriculture / Forestry / Fishing	4.7	4.9	34

### 4.3 CAI BENCHMARKS AND REGIONAL BREAKDOWN

In applying the benchmarking process to community anchor institutions, some similar patterns appear as shown below.

**Figure 48 – Utilization Benchmarks (DEi) for CAIs by Region**

Utilization (DEi) by Region			
Region	Median DEi	Ave. DEi Score	# Establishments
Lancaster County	8.1	8.0	40
Omaha area	8.1	6.8	50
Northeast	7.5	7.0	28
Southeast	7.4	6.5	17
West Central	7.3	7.2	8
South Central	7.2	6.7	21
Panhandle	6.6	6.4	19
Central	6.3	7.4	8
			191

Geographic location, defined either by region or level of urbanization, goes hand-in-hand with lower average Internet utilization by CAIs (as measured by DEi). The Panhandle and Central regions lag considerably behind Lancaster County and the Omaha area. Similarly, community anchor institutions in more rural areas on average lag behind those in more urban areas.

**Figure 49 – Utilization Benchmarks (DEi) for CAIs by Level of Urbanization**

Utilization (DEi) by Level of Urbanization			
Region	Median DEi	Ave. DEi Score	# Establishments
Metropolitan	7.9	7.3	91
Micropolitan	7.3	7.2	29
Small Town	6.5	6.9	29
Isolated Small Town	6.5	6.7	23
			172

While sample sizes are small, the report includes the benchmark scores for the different types of CAIs. Not surprisingly, educational institutions lead the way, with public safety organizations, local governments and economic development agencies lagging behind.

**Figure 50 – Utilization Benchmarks (DEi) for CAIs by Type of Institution**

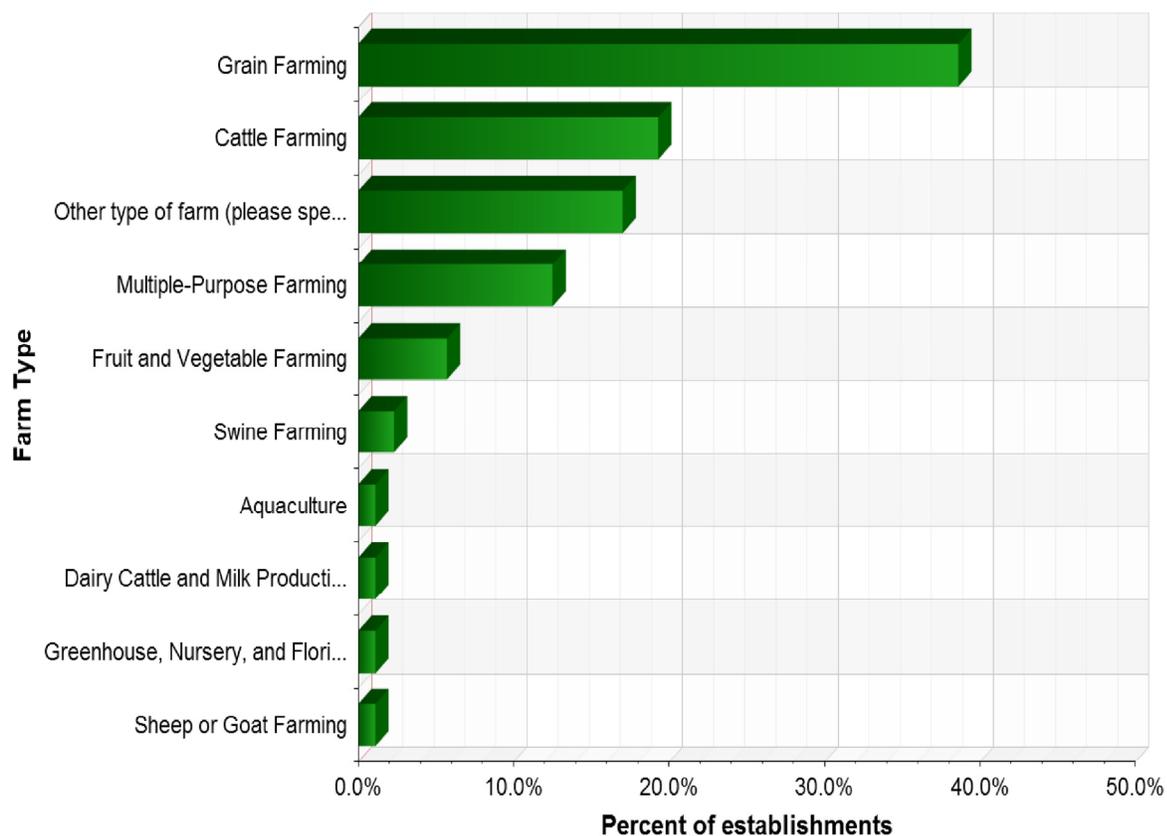
Utilization (DEi) by Sector			
Region	Median DEi	Ave. DEi Score	# Establishments
College	9.6	8.6	13
University or Trade School	8.8	7.8	15
Other Community Service	7.8	7.2	37
K - 12 School	7.5	7.4	9
Health Care Provider	7.3	7.0	55
State or Federal Government	7.2	6.3	6
Library	6.6	6.6	13
Economic Development Agency	6.5	6.9	26
Local Government	6.3	6.4	11
Public Safety	4.1	4.6	6
			191

## 5 Sector Analysis - Farms

Seventy-five respondents identified themselves as operating a commercial farm. The majority of farmers operated cattle or grain farms (Figure 51).

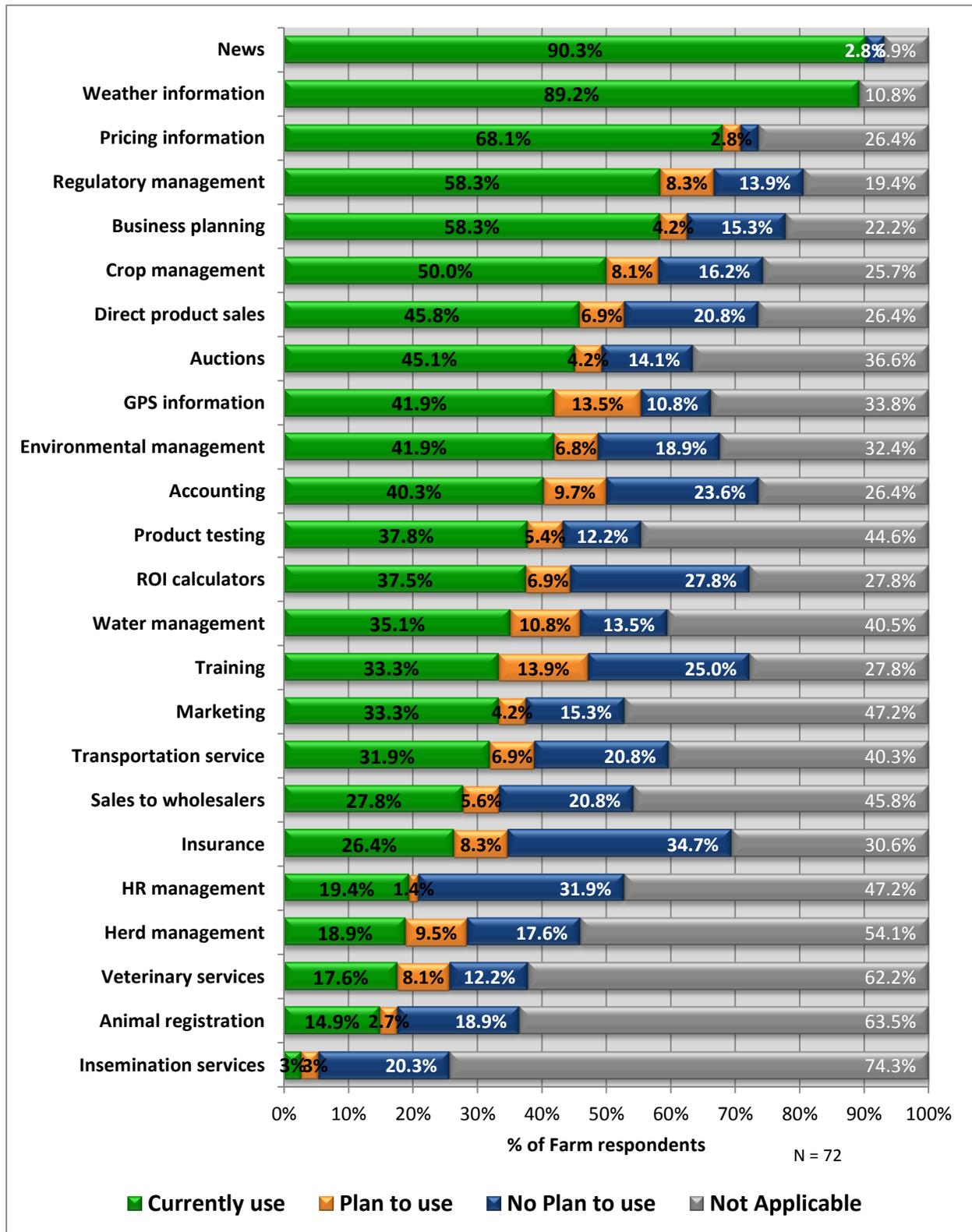
One notable development within this sector that while the entire study received 14% participation from respondents who found the survey online (a web link rather than an email) while nearly a fourth (24%) of farmers participating came from web links. This can be attributed to the increased outreach within this sector.

**Figure 51 - Percent of Responses by Type of Farm**



As seen in Figure 52, the leading farm specific uses of the Internet focus on background information (weather, news, regulations, prices) and business management. Direct market sales through the Internet falls roughly in the middle of eSolutions currently being used by farmers. Areas identified most frequently for future use were GPS, training, and water management.

Figure 52 – Use of Internet for Farm Operations



The main benefits of the Internet reported by farmers related to timely access to information, increased efficiency, and higher prices received.

**Figure 53 – Benefits of Internet for Farm Operations**



## Appendix A - National Comparisons

To provide Nebraska with a better understanding of how it “stacks up” in comparison with other states, SNG has compiled data we have collected in 2012 and 2013 from Georgia, Illinois, Kentucky, and Virginia. These are labeled as “SNG Benchmark States” and show the differences between Nebraska and a selection of the Country.

In order to compare “apples to apples,” the comparisons were made only among commercial businesses with 100 or less employees.

**Figure 54 – How Businesses Connect to the Internet**

Primary Internet Connection	Nebraska	SNG Benchmark States
Cable	31.8%	28.9%
Dial-up	0.3%	0.7%
DSL	24.6%	34.2%
Fiber	18.6%	5.3%
Fixed Wireless	6.8%	6.8%
Mobile Wireless	1.5%	2.8%
Not Sure	2.7%	2.8%
Other	2.4%	1.8%
Satellite	1.0%	2.0%
T1	10.3%	14.7%

**Figure 55 – eCommerce Uses of Broadband - Organizations Currently Using**

Utilization Category	Nebraska	SNG Benchmark States
Selling goods or services	62.2%	56.0%
Purchasing goods or services	86.7%	83.7%
Web site for organization	91.1%	81.6%
Advertising and promotion	72.0%	64.0%
Deliver services and content	53.9%	39.3%
Customer service and support	76.3%	68.3%
Research by staff	94.9%	87.4%
Rich media or service creation	53.8%	41.2%

**Figure 56 – eProcess Uses of Broadband - Organizations Currently Using**

Utilization Category	Nebraska	SNG Benchmark States
Banking and financial	80.3%	76.5%
Electronic document transfer	92.1%	88.0%
Supplier communication and coordination	87.5%	80.9%
Access government information	87.2%	80.7%
Government transactions	72.0%	62.9%
Staff training and skills development	78.8%	62.5%
Teleworking	62.2%	49.2%
Accessing collaborative tools	75.3%	62.3%
Social networking	70.7%	62.8%

**Figure 57 – Use of Web-enabled Mobile Devices - Organizations Currently Using**

Type of Mobile Device	Nebraska	SNG Benchmark States
Laptop computers	89.0%	81.1%
Web-enabled mobile phones	81.0%	71.7%
Other mobile devices	45.0%	34.2%

**Figure 58 – Importance of Broadband for Location - Essential to Very Important**

Importance of Broadband	Nebraska	SNG Benchmark States
Selecting location	53.1%	55.3%
Remaining in location	85.3%	78.6%

**Figure 59 – Barriers to Broadband Utilization - Very Important to Somewhat Important**

eSolutions Barriers	Nebraska	SNG Benchmark States
Products not suited to Internet sales	35.7%	37.0%
Loss of personal contact with clients	59.3%	56.3%
High cost of development/maintenance	52.0%	50.1%
Lack of internal expertise and knowledge	53.2%	49.5%
Privacy concerns	65.9%	64.6%
Security concerns	76.3%	65.1%
Internal organization resistance	32.2%	26.8%
Suppliers not ready	32.6%	32.5%
Available Internet is too slow	40.4%	47.1%
Uncertain about benefits	30.8%	31.3%

**Figure 60 – Critical Barriers to Acquiring Expertise**

Issues for Acquiring eSolutions Expertise	Nebraska	SNG Benchmark States
Time and effort required to develop expertise	20.9%	21.0%
Lack of internal resource with necessary skills	20.5%	19.1%
Too much information - not enough time to research	25.0%	21.6%
Lack of local external support resources	16.2%	17.7%
Affordability of local external support resources	21.8%	23.8%
Higher priorities to focus on	22.9%	22.3%

**Figure 61 – New Jobs from Internet Use as % of New Jobs (part and full time combined)**

Size of Employer	Nebraska	SNG Benchmark States
0 to 19	29.7%	28.8%
20 to 49	32.5%	27.1%
50 to 99	31.2%	34.7%
TOTALS 0 to 99	31.2%	30.2%

**Figure 62 – Revenues and Cost Savings from Internet Utilization**

Impacts	Nebraska	SNG Benchmark States
Pct. Internet Revenue	37.1%	34.6%
Pct. Cost Saving	3.9%	5.3%

**Figure 63 – Utilization Benchmarks (median DEi score) for Businesses by Level of Urbanization**

Region	Nebraska	SNG Benchmark States
Metropolitan	8.0	6.8
Micropolitan	7.7	6.6
Small Town	7.3	6.4
Isolated Small Town	7.2	6.2

**Figure 64 – Utilization Benchmarks (median DEi score) for Businesses by Size of Firm**

Employment Range	Nebraska	SNG Benchmark States
1 - 4 employees	7.3	6.0
5 - 9	7.7	6.8
10 - 19	8.0	7.0
20 - 49	7.8	7.4
50 - 99 employees	8.4	7.6

**Figure 65 – Utilization Benchmarks (median DEi score) by Industry Sector**

The following table only includes industries with a relevant sample size for Nebraska.

Major Industry	Nebraska	SNG Benchmark States
Construction	7.77	6.07
Finance & Insurance	7.96	7.38
Health Care & Social Assistance	6.99	5.63
Information	7.86	8.06
Manufacturing & Processing	7.91	6.70
Professional & Technical Services	8.16	6.99
Real Estate	7.67	7.28
Retail Trade	8.16	6.70
Wholesale Trade	7.28	6.60

## Appendix B - Data Collection Methods and Results

The core methodology is founded on primary research via data collection through online surveys of businesses and CAIs. In addition to the main set of questions that all organizations were asked, those respondents identifying themselves as farm operators were provided with a set of questions specific to internet uses related to farming.

The businesses and CAIs survey is 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, time of Internet use, etc.

**Internet Utilization** – the current and planned uses of the Internet across multiple categories relevant to how businesses and CAIs 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 businesses and CAIs assess the benefits of using the Internet.

**Barriers** - information on the importance of factors that prevent or inhibit businesses and CAIs from taking full advantage of the Internet.

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

- Individual businesses and CAIs were invited to participate via direct email invitations sent from a large, state-wide contact list.
- In addition, businesses and CAIs were encouraged through a variety of other communications channels to access a link to the survey through numerous websites including:  
<http://broadband.nebraska.gov/>.

An active public outreach and awareness campaign was carried out by The Nebraska Broadband Initiative. This campaign included press releases from the Lt Governor, University, media interviews, and engagement of stakeholder organizations (requesting that they endorse and promote the survey through their networks).

Email invitations were sent directly to 10,700 organizations in Nebraska. The Nebraska Broadband Initiative purchased two contact lists from a national list provider. Surveys were deployed using direct email invitation providing access to online surveys. The initial email invitations were sent on September 3<sup>rd</sup>, 2013 and the surveys were closed on November 30, 2013.

**Completed surveys numbered 817** with an additional 307 businesses completing enough of the survey to be “scorecard eligible.” For overall survey sample size of 1,124 the overall error margin for statistical analysis is +/- 2.9 percent (with a 95 percent Confidence Interval)<sup>10</sup>. 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 95 percent of any random sample of the population. The sample error margin is calculated based on the sample size, the

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<sup>10</sup> 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%].

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:

- 61.9 percent of organizations use the Internet for selling goods or services online.
- The sample size for organizations reporting Internet utilization is 745, providing a sample error margin of +/- 3.6 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 58.3 percent and 65.5 percent (61.9 percent +/- 3.6 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, the sample errors for each sample must be considered to determine if the difference is significant.

Where the higher end of a statistic (X percent + error margin) for sample A is less than the lower end of the same statistic (Y percent – error margin) for sample B, the difference can be considered statistically significant. 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 C - Glossary

**Nebraska eSolutions Benchmarking Report:** This report presents the results of survey-based research carried out for the State of Nebraska. The surveys collected information from businesses and community anchor institutions (CAIs) 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 businesses and CAIs.

**Digital Economy Analysis Platform (NE- 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 (when applicable) 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.

**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 (eCommerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

**eProcess:** uses of the Internet which include internal operational uses, such as supplier coordination, training and teleworking.

**eCommerce:** uses of the Internet which include activities related to the sales, marketing and delivery of products and service.

**Nebraska Digital Economy Index (NE-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 utilization of 17 Internet applications and processes. Based on the number of applications currently being used by a business or CAI, a composite score is calculated that summarizes how comprehensively each business 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 (when applicable) 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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