



Teleworking and Broadband: Linking Nevadans to Jobs



June 2012

As broadband and mobile technologies become more widespread, many Nevadans and Nevada businesses are using these tools to build a stronger and more flexible workforce. From entrepreneurs designing mobile apps to corporations that use videoconferencing to bring together clients from around the world, the connectivity that broadband empowers is making an impact on the workforce. One important way that broadband is helping shape Nevada's business landscape is by providing the opportunity for employees to telework.

Teleworking, which can be defined as "any arrangement in which an employee regularly performs officially assigned duties at home or other work sites geographically convenient to the residence of the employee," is a growing trend in the United States.¹ In December 2010, President Barack Obama signed the Telework Enhancement Act, requiring federal agencies to develop teleworking policies and increase the number of employees who are eligible to take advantage of these policies.² Businesses across the nation are following this lead and increasingly allowing their employees the flexibility to perform work outside of the office.

There are numerous benefits to teleworking. Teleworking can help decrease the amount of carbon emissions caused by traditional commuting by car. It can also reduce the demand for office space and reduce workplace operating costs. Employees who telework can help enable an organization to continue operations during emergency situations, such as natural disasters. Teleworking can help improve employee morale and decrease stress, and it can help employers recruit and retain employee.³ Teleworking also has an impact on worker productivity – a recent study by Stanford University found a 12% increase in performance among employees who work from home.⁴

The geography of Nevada represents a unique challenge for connecting qualified employees to jobs. The state is physically large; its 109,806 square miles ranks it as the seventh-largest state in the U.S.⁵ However, it ranks only 35th in terms of population size and 44th in terms of population density.⁶ Almost 73% of the population is concentrated in Clark County, the home of Las Vegas, leaving the remaining population dispersed over a wide geographic area.⁷ Nevada is also close to several potential job markets outside of the state, including the San Francisco Bay Area, Los Angeles, and Salt Lake City. Teleworking could help connect qualified workers to good jobs, regardless of location.

As part of its 2011 Business and Residential Technology Assessments, Connect Nevada examined how both businesses and residents in the state use teleworking.

1 <http://archive.teleworkexchange.com/pdfs/The-Benefits-of-Telework.pdf>

2 <http://fcw.com/articles/2010/12/09/telework-bill-signed-by-president-obama.aspx>

3 <http://archive.teleworkexchange.com/pdfs/The-Benefits-of-Telework.pdf>

4 <http://www.stanford.edu/~nbloom/WFH.pdf>

5 <http://www.worldatlas.com/aatlas/infopage/usabysiz.htm>

6 <http://2010.census.gov/2010census/data/apportionment-dens-text.php>

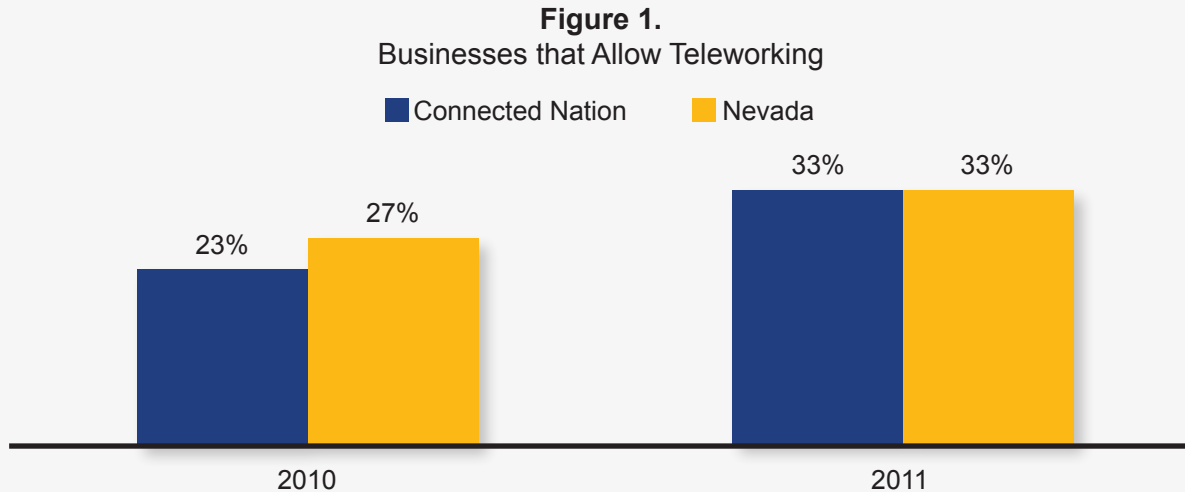
7 <http://nvdemography.org/data-and-publications/estimates/estimates-by-county-city-and-unincorporated-towns/>

Among the findings from this survey:

- Across the state of Nevada, **one-third of businesses** allow employees to work from a home office. This equates to 20,000 businesses in the state that allow teleworking.
- Over **three out of five** home-based businesses allow teleworking.
- Approximately **16%** of employed Nevadans (186,000 Nevadan adults) work from a home office instead of commuting.
- Only **28%** of rural businesses in Nevada allow teleworking, and only **9%** of employed rural Nevadans are teleworkers.
- Approximately **316,000** Nevadans who do not work report they would enter the workforce if allowed to telework.
- Nevadan employees who work from a home office full-time on average each save an estimated **\$1,480 per year** in travel expenses and prevent **6,070 lbs. of CO₂** emissions from entering the atmosphere. This equates to a total savings by full-time teleworkers in Nevada of over \$108 million and 440 million lbs. of CO₂ emissions. This CO₂ savings is more than the total annual household CO₂ emissions estimated for Carson City, Nevada.
- Full-time teleworkers in Nevada gain over **200 hours** of time, or over **8 full days each year**, by not commuting.

Nevada Businesses that Allow Teleworking

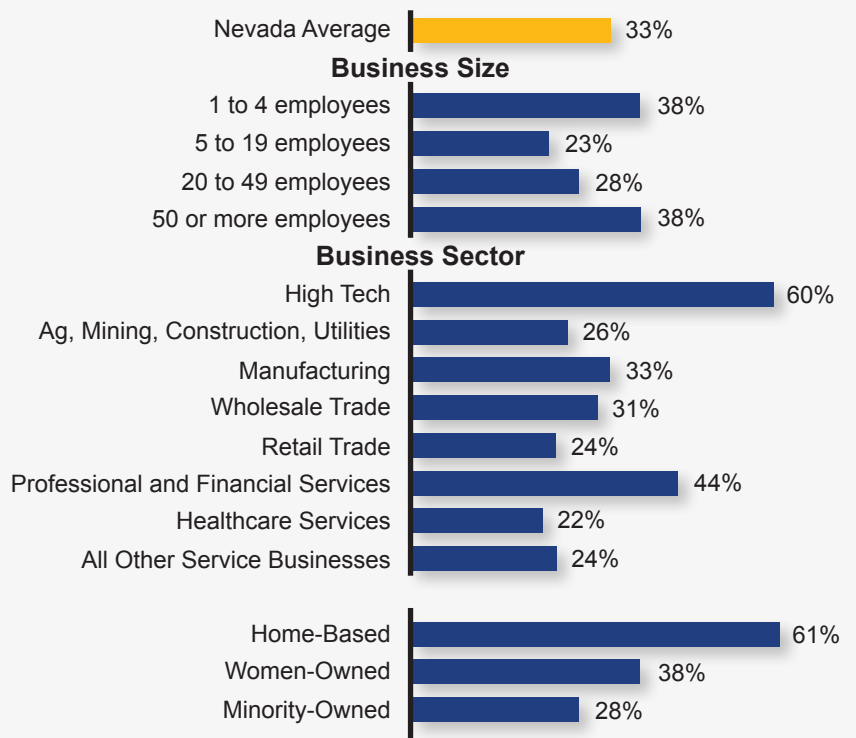
One out of three Nevada businesses, or nearly 20,000 business establishments across the state, allow their employees to work from a home office. This is on par with the Connected Nation average of 33% (Figure 1).⁸ This is a significant year-over-year increase of 22% in teleworking from 2010, when only 27% of Nevada businesses allowed employees to telework.



An examination of businesses that allow teleworking by size and sector shows some notable trends. Both the largest and smallest businesses in the state have the highest teleworking rates. Statewide, 38% of businesses that have fewer than five employees allow teleworking, a percentage that is equal to the teleworking rate for businesses that have 50 or more employees (Figure 2).

Businesses in the High Tech and Professional Services sectors are the most likely to allow teleworking. Three out of five (60%) High Tech businesses allow teleworking, while more than two out of five (44%) businesses in the Professional Services sector allow teleworking. In contrast, businesses in sectors where employee presence is key to completing work tasks, such as the Healthcare Services (22%) and Retail Trade sectors (24%), are the least likely to allow employees to telework.

Figure 2.
Nevada Businesses that Allow Teleworking



⁸ Connected Nation conducted similar surveys in 9 states in 2011: Alaska, Florida, Iowa, Michigan, Minnesota, Nevada, South Carolina, Tennessee, and Texas.

A particularly high percentage of home-based businesses, which represent approximately 22% of the businesses surveyed in Nevada, are using teleworking to empower their workforce. Over 8,000, or 61% of these businesses, allow their employees the flexibility to work from their own homes. These businesses, which often do not have a traditional office or storefront in which employees work, may be a component of a growing movement in Nevada towards business innovation in commuting and other workplace policies. In addition, 38% of women-owned businesses and 28% of minority-owned businesses also allow their employees to telework, allowing them to recruit the best employees in the state, regardless of location.

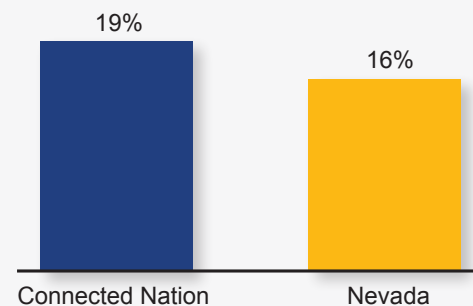
Businesses that empower their employees through teleworking also tend to be more likely to use broadband for a wide variety of purposes. Businesses that allow teleworking are significantly more likely to use the Internet to communicate with their customers, accept online payments, sell their products or services, provide customer support, and bid on contracts. In the current economic climate, with more businesses looking for ways to increase employee productivity and reduce operational costs, increased online work processes and teleworking can provide mutually beneficial time and cost savings to employers and employees alike.

Nevada Residents who Telework

Broadband plays an important role in whether individuals in Nevada are able to telework. Over nine out of ten teleworkers (93%) subscribe to broadband service at home. The importance of broadband is supported by the fact that 27% of Nevadan teleworkers who have broadband service first subscribed because they needed it to conduct business online. Computer ownership is also critical to teleworking in Nevada. Nearly all teleworkers (97%) own a computer, highlighting the fact that technology is a key component to many teleworkers' jobs.

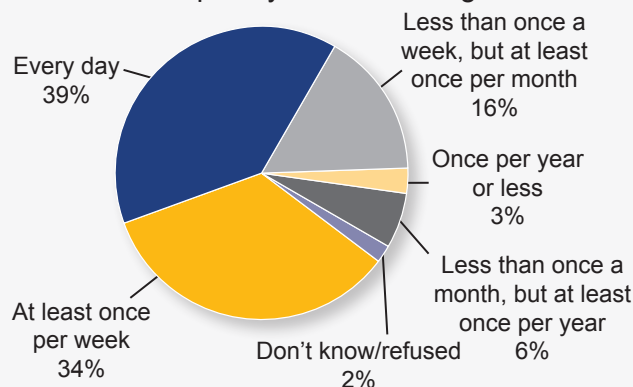
Across the state of Nevada, 16% of employed adults report that they work from a home office using an Internet connection instead of commuting to their workplace, which represents over 186,000 adult Nevadans (Figure 3).⁹ While this represents a large portion of the Nevadan workforce, it is still below the Connected Nation average of 19%. This is probably due at least in part to the large share of Nevada's tourism- and service-based industries, which tend to have lower teleworking rates overall.

Figure 3. Percentage of Employees who Telework



While Nevada has one of the lowest teleworking averages of all states surveyed by Connected Nation, Nevadan teleworkers are the most likely to say that they telework every day. Approximately 73,000 Nevadan adults, or 39% of teleworkers in Nevada, work from home every day, and nearly nine out of ten Nevadan teleworkers work from home at least once per month (Figure 4).

Figure 4. Frequency of Teleworking



⁹ Connected Nation conducted similar surveys in ten states in 2011: Alaska, Florida, Iowa, Michigan, Minnesota, Nevada, Ohio, South Carolina, Tennessee, and Texas.

Demographics of Teleworkers

Table 1 provides an analysis of who teleworks in Nevada.

- Teleworkers in Nevada overwhelmingly have a college education (89%). Almost four out of ten have a college degree and nearly three out of ten have an advanced degree.
- Three out of four teleworkers in Nevada are Caucasian; by comparison, the United States Bureau of Labor Statistics reports that 80% of the entire employed workforce in Nevada is Caucasian.¹⁰
- More than three-quarters of Nevada's telework force are between the ages of 25 and 54, with a median age of 43.
- Almost two-thirds of teleworkers are male.
- Nearly one-half of teleworkers have children at home, meaning that approximately 88,000 Nevada parents have the opportunity to spend more time with their family instead of commuting.
- Nearly one-half of teleworkers in Nevada have annual household incomes of \$75,000 or more. In fact, the average annual household income reported by teleworkers in Nevada is \$77,100, more than \$15,000 above the average household income reported by employed non-teleworkers (\$61,800).

Table 1.
Demographic Profile of Teleworkers

Gender	
Male	62%
Female	38%
Age	
18 to 24	4%
25 to 34	20%
35 to 44	27%
45 to 54	30%
55 to 64	17%
65 or older	1%
Refused	1%
Presence of Children	
Children at home	48%
No children at home	52%
Race/Ethnicity	
Caucasian	75%
African American	6%
Asian or Pacific Islander	4%
American Indian, Eskimo, or Alaska native	4%
Hispanic	8%
Refused	3%
Education	
No college	10%
College Education	89%
Some college education	22%
College degree	39%
Advanced degree	28%
Refused	1%
Annual Household Income	
Less than \$35,000	7%
\$35,000 to less than \$75,000	31%
\$75,000 or more	47%
Refused	15%

¹⁰ <http://www.bls.gov/lau/ptable14full2011.pdf>

Geography of Teleworking

Rural Nevada residents are less likely to be teleworkers. Just 9% of employed Nevadans in rural counties report that they are teleworkers, compared to 17% of employed adults in urban and suburban counties (Figure 5). Additionally, only 28% of rural businesses allow teleworking, while 33% allow teleworking in urban and suburban areas of Nevada.

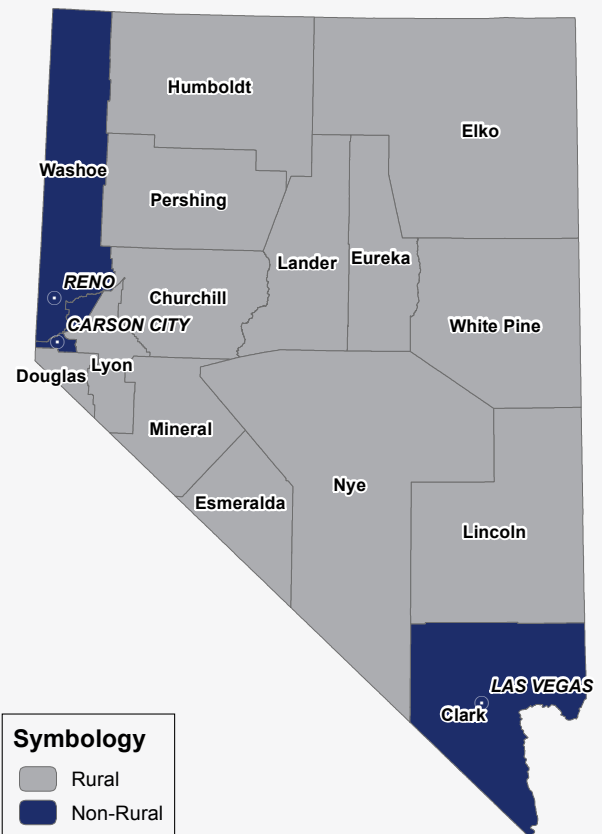
Increased teleworking opportunities could potentially benefit these rural residents who often have to move or face long commutes in order to find good jobs. Many residents in rural parts of Nevada express a strong interest in teleworking. Over 34,000 employed rural Nevadans (28%) who do not telework report that they would be interested in doing so if their employers allowed it, and 19,000 rural Nevadans (38%) who are not working (including unemployed adults, retirees, homemakers, students, and those who are not working due to a disability) would enter the workforce if they were able to work from a home office.

The Impact of Current and Potential Teleworkers

The 39% of Nevadan teleworkers who work from home every day represent 73,000 Nevadans who are not accumulating travel expenses or adding to CO₂ emissions due to daily travel for their jobs. The average American commutes 32 miles per day.¹¹ By eliminating this commute distance, full-time teleworkers are each saving approximately \$1,480 each year in travel expenses (gas, maintenance, and tires) and preventing approximately 6,070 lbs. of CO₂ emissions from entering the atmosphere.¹² This equates to a total savings by full-time teleworkers in Nevada of over \$108 million and 440 million lbs. of CO₂ emissions. This CO₂ savings is more than the total annual household CO₂ emissions estimated for the state capital, Carson City, Nevada.¹³

These full-time teleworkers are also experiencing large savings in time by working from home offices. With an average travel time to work of 23.6 minutes in Nevada, full-time teleworkers gain over 200 hours of time, or over 8 full days each year, by not commuting.¹⁴ This additional time could be used to increase productivity in both work and personal endeavors.

Figure 5.
Rural and Non-Rural
Counties in Nevada



¹¹ <http://abcnews.go.com/Technology/Traffic/story?id=485098&page=2#.Tt5FAlaqfXs>

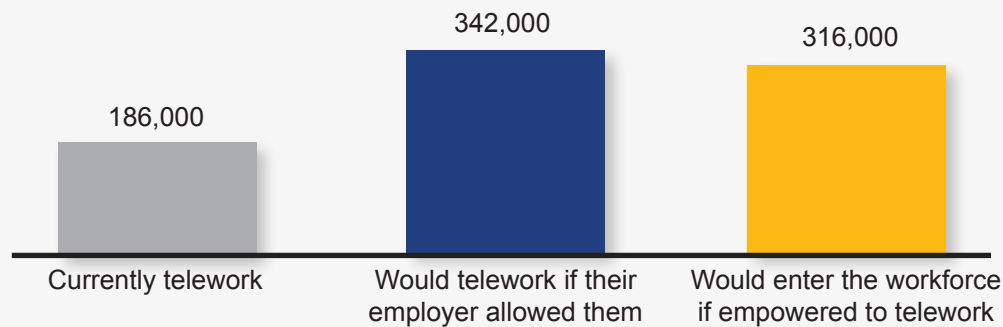
¹² Based on each teleworker commuting 260 days per year, 32 miles round-trip (<http://abcnews.go.com/Technology/Traffic/story?id=485098&page=2#.Tt5FAlaqfXs>), with an average automobile operating cost of 17.74 cents per mile (<http://newsroom.aaa.com/wp-content/uploads/2011/08/YourDrivingCosts2011.pdf>), and an average automobile efficiency of 26.6 mpg (<http://www.futurepundit.com/archives/004903.html>) producing 19.4lbs. of CO₂ emissions per gallon of fuel consumed (<http://www.epa.gov/climatechange/emissions/downloads/GHGCalculator.xls>)

¹³ The total number of households in Carson City is 21,427 (U.S. Census Bureau, 2010). "Typical" annual CO₂ emissions are 14,796 pounds per household, assuming approximately 900 kWh per month http://www.epa.gov/climatechange/emissions/ind_assumptions.html

¹⁴ Based on each teleworker in Nevada commuting 23.6 minutes to and from work (47.4 minutes total), 260 days per year (U.S. Census, Means of Transportation to Work by Selected Characteristics, 2006-2010 American Community Survey 5-Year Estimates <http://factfinder2.census.gov>).

While the 186,000 Nevadans who telework represent a substantial portion of the workforce, even larger numbers of Nevadans are potential teleworkers. Approximately 342,000, or over one-third (36%) of employed Nevadans who do not telework, report that they would telework if allowed to do so by their employer (Figure 6). Additionally, 316,000, or 38% of Nevadans who are not working, report that they would enter the workforce if provided the opportunity to telework. This includes 39% of homemakers and 19% of retirees. If each of these 316,000 potential teleworkers were to become employed and made just the minimum wage in Nevada, they would increase annual statewide revenues by over \$4.7 billion.¹⁵

Figure 6.
Current and Potential Teleworkers in Nevada



Conclusions

Nevada is a geographically large state with a relatively low population density compared to other states in the U.S., leaving many potential workers scattered throughout the state. Teleworking in Nevada has the potential to help connect businesses to better qualified employees and to provide residents of the state with better jobs. While the state is on par with the Connected Nation average in terms of businesses that allow teleworking, many residents are not taking advantage of this opportunity. In particular, fewer than one in ten rural employees are teleworking. Increasing computer ownership, broadband availability, and improving the quality of existing broadband may enable more Nevadans to telework. As 342,000 employed Nevadans and 316,000 unemployed Nevadans express an interest in teleworking, more opportunities to work from home could provide many environmental and economic benefits to the state.



¹⁵ Based on a minimum wage of \$7.25 per hour <http://www.dol.gov/whd/minwage/america.htm#Nevada> for 8 hours a day for 260 work days a year

Methodology and Definitions

2011 Business Technology Assessment

Between October 4 and October 25, 2011, Connect Nevada conducted a telephone survey of 804 Nevada business establishments. Data were collected by Thoroughbred Research Group, located in Louisville, KY. The purpose of this survey was to measure trends in technology adoption; measure barriers to technology adoption; determine how Nevada businesses are using broadband as an engine of economic growth; and measure the average price and speed of broadband service among business establishments across the state. On average, these surveys took approximately nine minutes to complete.

Sample quotas were established by company size (5 brackets) and industry sector (8 sectors). Within these 40 cells, a randomly-drawn sample of businesses listed with Dun & Bradstreet was contacted for the survey. Altogether, this sample included 98 businesses with 50+ employees, 156 businesses with 20-49 employees, 281 businesses with 5-19 employees, and 269 businesses with 1-4 employees. In cases where the respondent's information regarding the number of employees at the establishment differed from the information provided by Dun & Bradstreet, the respondent's answer was used in determining business size quotas. Connect Nevada intentionally over-sampled large businesses to ensure a sample that was large enough to analyze and compare to smaller businesses.

In addition to the size and sector quotas, the data was subsequently weighted to ensure that the sample was representative of all employer business establishments statewide, with targets determined according to the 2009 United States Census Bureau's County Business Pattern report, the most recent data that was available at the time the survey was conducted. Weighting of the survey data and research consultation were provided by Lucidity Research LLC, located in Westminster, MD.

This sample provides a margin of error of $\pm 4.5\%$ at the 95% confidence level for the total sample of 804 businesses. This sample error accounts for sample weighting, using the effective sample size. As with any survey, question wording and the practical challenges of data collection may introduce an element of error or bias that is not reflected in this margin of error.

The Nevada Business Technology Assessment was conducted as part of the State Broadband Initiative (SBI) grant program, funded by the National Telecommunications and Information Administration (NTIA). The complete survey results were peer reviewed, and these analyses will be utilized by Connect Nevada and Nevada stakeholders to help increase adoption and use of broadband by Nevada businesses. The SBI grant program was created by the Broadband Data Improvement Act (BDIA), unanimously passed by Congress in 2008 and funded by the American Recovery and Reinvestment Act (ARRA) in 2009.

2011 Residential Technology Assessment

Between June 29 and August 16, 2011, Connect Nevada conducted random digit dial telephone surveys of 1,202 adults across the state. Of the 1,202 respondents randomly contacted statewide, 202 were called on their cellular phones, and 1,000 were contacted via landline telephone.

Of the 1,202 respondents surveyed in 2011, 649 respondents reported having full-time or part-time jobs, and 102 of those were identified as teleworkers. "Teleworkers" are defined as respondents who report being employed full-time or part-time and say that they work from home using the Internet instead of commuting to their workplace. The results of this survey have been compared to similar surveys that Connected Nation conducted across ten states in 2011 (Alaska, Florida, Iowa, Michigan, Minnesota, Nevada, Ohio, South Carolina, Tennessee, and Texas). Altogether, Connected Nation surveyed 12,004 residents across these ten states in 2011 for this study, including 1,202 teleworkers. The survey results were subsequently peer reviewed by experts at the Center of Resource Economics at the University of Nevada, Reno.

Multiple attempts were made to each working telephone number on different days of the week and at different times of the day to increase the likelihood of contacting a potential respondent. To ensure a representative sample quotas were set by age, gender, and county of residence (rural or non-rural), and the results were weighted to coincide with 2010 United States Census population figures. For the purpose of setting quotas and weighting, “rural” respondents are defined as living in a county that is not a part of a Metropolitan Statistical Area (MSA), as designated by the United States Office of Management and Budget. Weighting and design consultation were provided by Lucidity Research.

Surveys were conducted by Thoroughbred Research Group in Louisville, KY. On average, the survey took approximately 12 minutes to complete after the respondent agreed to participate. Based on the effective sample size, the margin of error = $\pm 3.24\%$ at a 95% level of confidence for the entire population and $\pm 4.39\%$ for the sample of all employed. As with any survey, question wording and the practical challenges of data collection may introduce an element of error or bias that is not reflected in this margin of error. Weighting and research consultation were provided by Lucidity Research LLC.

APPENDIX A: Select Sample Sizes

2011 Connect Nevada Business Technology Assessment

	<i>n</i> All Respondents	<i>n</i> Rural Respondents	<i>n</i> Urban/Suburban Respondents	<i>n</i> Allow Employees to Telework
Total Respondents	804	132	672	255

2011 Connect Nevada Residential Technology Assessment

	<i>n</i> All Respondents	<i>n</i> Rural Respondents	<i>n</i> Urban/Suburban Respondents	<i>n</i> Employed
Total Respondents	1,202	378	824	649
Into which of the following employment groups do you fall? Are you . . .				
Employed or self-employed full-time or part-time	649	226	423	649
Not working	517	140	377	

	<i>n</i> All Respondents	<i>n</i> Employed
Which of the following describe the way you work from home, when you do so? (Among employed adults who report working from home)		
Work at home using an Internet connection, instead of commuting to usual workplace (teleworkers)	102	102
Do not telework	1,100	547