



Custer County Broadband Impact and Market Assessment Report

Final Report

July 23, 2018

Prepared for:

**Custer County Colorado
Board of County Commissioners**



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1. EXECUTIVE SUMMARY

Custer County Economic Development Corporation (CCEDC) is concerned about the future employment opportunities and economic viability of Custer County. CCEDC is in the process of gathering data and conducting analysis in order to develop a plan for digital infrastructure and economic development that addresses the needs of Custer County in the context of economic realities and opportunities.

As a small, rural county with an aging population in natural population decline, Custer County, Colorado, must have net inward migration to avoid social and economic decline. Even with significant annual inward migration (i.e. 3.6% per annum¹) the county will remain relatively small and rural (3.6% is an increase of 150 in Custer County population per year).

Attracting new employers into the county will be a challenge based on distance from major urban centers, addressable consumer market, and available workforce. In order to maintain and grow the local economy in a managed way, Custer County must leverage its assets and opportunities to attract the following demographic groups:

- Younger, mobile professionals, especially those with families – who can work remotely and choose to benefit from the quality of life Custer County offers
- Affluent retirees or those close to retirement (already a significant demographic for Custer County)

Key to attracting these populations is the ability for them to telework, conduct home-based businesses that they bring with them, or that they start up in Custer County.

Broadband² that is the same or better in terms of quality, rates, and customer service that they are used to is essential to attracting people to Custer County. This will not only maintain and grow the tax base, but enhance the vitality of Custer County. These people include:

- Professionals who require reliable broadband and must have it for teleworking, or home businesses.
- Existing and new retirees who need access to on-line shopping, remote health services, and social media to maintain their relationships with family, friends, and associates.
- Families who need broadband for access to educational resources, new job opportunities, as well as staying connected in an increasingly online world.

Broadband is the most important differentiating infrastructure today and is critical to the economic competitiveness of Custer County. Foremost, broadband retains existing residents. Not having to relocate out of Custer County for work is a significant benefit as broadband enables new, or supplemental income opportunities through telework, new business startups, home-based business growth, etc. Broadband also improves access to health services for an aging population, educational and

¹ Colorado State Demographic Office; Community Profile for Custer County; Print Date 05/07/2018

² Broadband refers to high-capacity, reliable internet access meeting the FCC's definition (minimum rate of 25 Mbps download and 3 Mbps upload). This is how the term 'broadband' is defined and used in the rest of this document.

workforce development opportunities, access local, State and Federal services, etc. Conversely, the lack of reliable broadband is currently having negative consequences on local businesses and residents – see Sections 3 and 4 on household and business connectivity.

Section 5 of this report assesses the economic impacts broadband is already having on Custer County. Quantified are the potential impacts of a broadband investment to expand coverage to 80% (see Appendix C), versus continuing with the status quo.

There may be concerns that broadband enables local dollars to be spent elsewhere, taking money out of Custer County. However, this is already happening. Individuals choose where and how to spend their money to get the best value for them. Rather than trying to prevent, or slow down the outflow of local dollars from buying online in an increasingly online economy (e.g. buying from Amazon), Custer County needs an economic development strategy that views an online economy as opening new markets for Custer County. What are those new markets and opportunities? Which ones should local businesses and residents focus on for sustainable economic and community development? This is discussed in Section 6 where the benefits of broadband are personalized for key demographic groups in Custer County.

1.1 Connectivity and Utilization in Custer County – Key Findings

Based on the data collected by SNG in April and May 2018 from households and businesses in Custer County:

- Adequate broadband is not available:
 - 8% of households meet the FCC service standard.
 - 25% of households get 10 Mbps/1 Mbps level of service (2014 FCC standard).
 - Average service speeds are lower than other rural areas.
 - Average speeds for businesses are one-half of other rural areas.
- Local residents want broadband
 - 75% say it is the top priority goal for the community NOW.
 - 90% say that reliability is their highest priority for connections, yet 61% are dissatisfied with the reliability of their current connections.
 - 70% say that connection speed is a high priority, yet 59% are not satisfied with the current speed of service.
 - 63% agree that online education provides access to more learning opportunities and more affordable learning
- Local businesses want broadband
 - 80% say it is the top priority goal for the community NOW.
 - 91% say that reliability is their highest priority for connections, yet 67% are dissatisfied with the reliability of their current connections.
 - 66% say that connection speed is a high priority, yet 61% are not satisfied with the current speed of service.

Broadband is essential infrastructure. Without it, communities face population and business losses, higher costs in providing civic services, stalled business attraction, and limited economic growth. As part of a larger community vision, digital infrastructure is a platform to improve the quality of life for citizens and the economic prospects for businesses. However, just like roads, benefits from broadband networks

are realized when they are used. An unused highway has no value. Teaching people to drive and showing them where they can go is just as important in the use of online applications and digital technologies. SNG defines this as the digital maturity of businesses, organizations, and households and the higher the level of digital maturity (i.e. utilization) the greater the economic and community benefits to be realized from investments in broadband infrastructure.

In Custer County, 59% of business respondents are underutilizing online applications, i.e. they have a [Digital Economy index](#) (DEi) score under 7. SNG's data and research shows that financial impacts to businesses are realized by businesses when DEi scores are greater than 7. There are significant opportunities for new and managed growth (without investing in more capital) to help businesses more effectively use digital technologies to better deliver services – which drives local economic growth, spurs new business startups, and expands local workforce opportunities. An example of this is the [Small Business Growth Program](#) that provides support and training to local businesses in order to raise their awareness about what it takes to be relevant online and providing them technical assistance to drive meaningful use of internet enabled applications.

Benefits to households can also be increased by raising awareness and helping them access online services (health, education, government) that can improve their quality of life, as well as enable them to work together in new ways to achieve community goals.

1.2 Implications of Connectivity Findings for Custer County

With broadband:

- More households can telework, aiding population retention and augmenting household income.
- With local economic growth come additional, better paying employment opportunities.
- New individuals will be attracted into the county, especially in the younger, higher income age brackets supporting managed and sustainable growth. Specifically, mobile professionals and other home-based business operators can successfully locate into the county, attracted by the quality of life Custer County offers.
- Younger demographics and those with young families can access online education opportunities.
- Retired persons, or those about to retire, can transition into the county without giving up employment or home business.
- Remote health care options can supplement local health services for the aging population.

Without broadband:

- Risk of additional outward migration of population – 21% to 45% of households at risk of relocating if they do not have the broadband they need.
- Reduces the ability to attract high-value population due to the increasing importance of broadband for selecting a place to live or conduct business.

- New arrivals expect to be able to telework, since local job opportunities in Custer County are limited. The opportunity to attract mobile working-age population is severely constrained if they do not have the ability to telework.
- Work-at-home professionals and other internet-dependent home businesses will not locate into the county, including retiring professionals who often want to work part-time or stay connected with the family and friends.

1.3 Going Forward – Insights and Recommendations for Custer County

Custer County needs to be relevant and competitive as a place to live and work, or risk decline. Data collected from SNG’s research confirms that Custer County is currently underserved with broadband in terms of reliability, speed, and subscriber satisfaction.

If Custer County wishes to maintain, let alone grow the county’s tax base, it needs to catch-up with other areas that have natural amenities and quality of life, but have readily available and reliable broadband. Most people (90%) are happy living in Custer County, but some changes are needed. Even though the “unhappy” segment is small, it can lead to outward migration that Custer County can ill-afford.

Going Forward – what these findings mean

Using findings from the April-May 2018 data collection and combining them with Department of Labor data, SNG has worked with Custer County Economic Development Corporation (CCEDC), a not for profit organization, to develop six topologies that represent the most significant demographic groups for Custer County – currently and going forward. The six topology groups are listed below with analyses in Section 6 on what broadband could and should mean to each of them, i.e. personalizing the value of broadband to their needs and wants:

1. Retirees / Second Home Owners
2. Teleworkers
3. Home Businesses
4. Increased income and new income opportunities for Custer County residents
5. Tourism
6. Agriculture / Ranching / Farming

Please see Section 6 for further details on how Custer County can benefit from broadband.

1.4 Economic and Job Impacts from Broadband

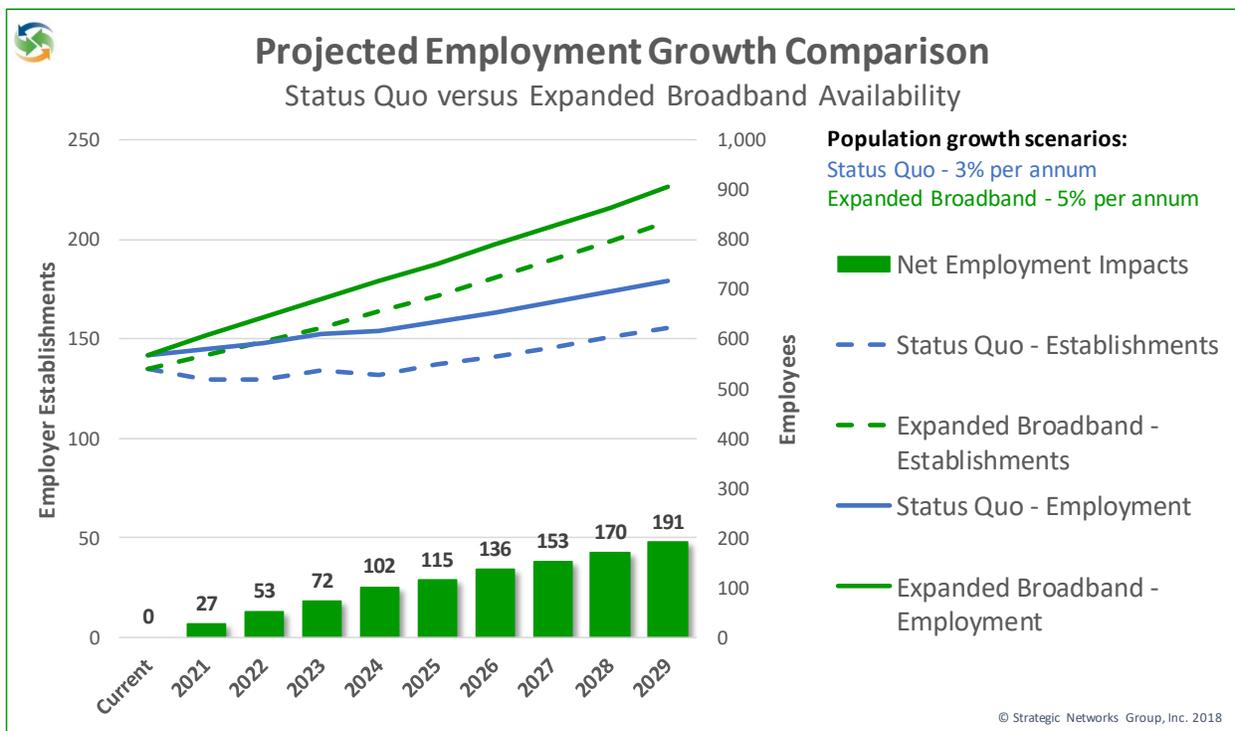
The availability of broadband and expanded coverage throughout Custer County will retain existing residents and businesses, as well as have a positive stimulus to inward migration. A stable population will help keep existing businesses and tax base, which supports existing public services. Population growth can drive demand for the creation of new businesses, which in turn create new employment opportunities and an expanded tax base. However, growth needs to be planned and managed to achieve sustainable community development goals.

SNG has calculated the employment impacts from expanded broadband access for Custer County using SNG’s [Economic Impact Estimator](#)³ and population growth from Colorado State Demographic data. The following chart provides a projection of the potential growth in employers and employment based on two population growth scenarios⁴:

- Status Quo represents an annual population growth of 3%
- Expanded Broadband Availability represents an annual population growth of 5%, stimulated by greater attractiveness of relocating to Custer County due to broadband connectivity.

The difference in population growth between the two scenarios reaches 19% by year 2027. This is considered reasonable based on SNG research that shows a strong influence of broadband on location selection by 19% of households.

The net employment impact of having broadband availability is projected to be **191 jobs (FTE) by 2029**. The “Status Quo” scenario includes expected business and job losses (as reported) without broadband. The “Expanded Broadband Availability” scenario includes the estimated job increases for existing businesses.



³ SNG’s Economic Impact Estimate for Custer County can be found in Appendix A. See also SNG’s white paper on [Economic Impacts through Broadband](#).

⁴ In both scenarios it is assumed that other current factors remain constant over time, such as the ratio of businesses to population and the average jobs per business. While these factors may vary, keeping these constant provides for a comparison of overall employment impacts without the influence of other variables.

The following table breaks down the projected job growth for 3, 6, and 9 years with sensitivity analysis based on different projected population growth rates.

Timeframe	Job Impacts for Expanded Broadband Availability Population Growth Rate		
	4% per annum	5% per annum	6% per annum
3-years	55	72	93
6-years	39	64	85
9-years	25	55	93
Total	119	191	271

The above table shows that there are significant job impacts for Custer County, even with variable population growth rates.

1.4.1 Teleworker and Home Business Job Impacts

Expanded broadband availability provides an opportunity for Custer County to increase inward migration of younger working age people with families who are able to telework. In addition, the same demographic that may be self-employed, or operate a home-based business cannot have broadband availability as a barrier to relocating into Custer County.

As with the employer-based employment projections, the following charts project the increase in teleworkers and non-employer establishments, i.e. those self-employed and with a home business. The projections compare the Status Quo and Expanded Broadband Availability scenarios, with 4%, 5%, and 6% population growth respectively. Increased use of teleworking and a higher percentage of non-employer establishments is assumed as a basis for the higher population growth with expanded broadband availability.

Teleworker Impacts Estimated Teleworker Impacts from Expanded Broadband Population Growth Rate			
Timeframe	4% per annum	5% per annum	6% per annum
3-years	98	114	131
6-years	114	142	170
9-years	136	174	218
Total	348	430	519

Home Business Impacts			
Home Business Employment Impacts from Expanded Broadband			
Population Growth Rate			
Timeframe	4% per annum	5% per annum	6% per annum
3-years	159	185	212
6-years	207	250	297
9-years	269	338	412
Total	635	773	921

The projection for 2029 shows an additional 430 teleworkers and 773 non-employer establishments with expanded broadband availability. This represents a significant additional source of employment and household income as a result of broadband over and above the employer-based employment.

Key Takeaways

The impacts of providing expanded broadband availability to the existing population and businesses within Custer County include:

- The net employment impact of having expanded broadband availability is projected to be **191 jobs (FTE) by 2029**
- The projection for 2029 shows an **additional 430 teleworkers and 773 non-employer establishments (home businesses)** with expanded broadband availability
- Ability to attract target populations for stable, managed growth, such as:
 - Younger, mobile professionals, especially those with families who can work remotely and choose to benefit from the quality of life Custer County offers
 - Prosperous retirees, or those close to retirement
- Retention of current populations who require reliable broadband
- Improvement in access to services (health, education, government) that improve quality of life for residents
- With local business growth, local employers move employees from part-time to full-time, or hire new staff (e.g. from year-round business, rather than only from tourism seasons). In addition to these new income opportunities, there are health benefits full-time employees can receive. As Custer County has many small businesses that often pay minimum wage with no benefits, this is a significant benefit for those businesses to retain and attract workers.

The impacts of **NOT expanding** broadband availability include:

- 20 businesses with 29 jobs likely to close or relocate out of the county within the next 3 years (reported). This is likely to be more when considering the entire business population
- Reduced ability to attract population and businesses to Custer County as broadband is increasingly seen an essential service
- About 20% of the population is not happy and a real likelihood of relocation without changes

In 2016, the latest population growth rate for Custer County, was 3.6%. DOLA preliminary 2017 information documented a population growth rate for Custer County in excess of 6 %. Due to the significant variation from recent history, it cannot be determined if this rate can be sustained – which has implications on the local tax base and the ability to ensure a level of local infrastructure and services.

In consideration of these recent population growth rates, the leadership, businesses, and residents of Custer County need to consider whether in 2018 and going forward those people interested in moving to Custer County will actually move without reliable, sustainable broadband?

Definition of Terms

For the benefit of readers, below are some of the abbreviations for key terms used in this report:

CCEDC – Custer County Economic Development Corporation

SNG – Strategic Networks Group, Inc.

DEi – SNG’s Digital Economy index¹⁰ on broadband utilization by households or businesses

FTE – Full Time Equivalent

Teleworker / Teleworking – Employment using the internet to regularly access the workplace all or part of the time.

DOLA – Colorado State Department of Local Affairs

USCB – US Census Bureau

DED – SNG’s Digital Economy Database¹¹ of multi-year research of households and businesses

SDGs – Sustainable Development Goals

FCC – US Federal Communications Commission

EDA – US Economic Development Administration

FT – Full-time job/employment

PT – Part-time job/employment

T/S - Temporary or Seasonal job/employment

About Strategic Networks Group (SNG)

Founded in 1998, Strategic Networks Group (SNG) helps communities and regions address the economic, social, and connectivity challenges of broadband, digital infrastructure and smart community services. Today SNG is globally recognized as the leader in helping clients assess the value and then drive economic and community benefits from investing in digital infrastructure. We work with communities and regions across North America and internationally, as well as agencies at a federal, state, and regional level working on advancing economies in a digital world.

SNG is recognized as the world leader in the econometrics of digital infrastructure and maximizing the benefits from online applications, which include smart community services. Applying our expertise and proven methodologies across the globe, we help countries, states, counties, and municipalities maximize the impacts of investments in digital infrastructure and service transformation.

Learn more about SNG at www.sngroup.com.

2. Custer County: Situational Analysis and Key Findings

Broadband is the most important differentiating infrastructure today and is critical to the economic competitiveness of Custer County, Colorado, its businesses, and the well being of its residents and businesses. Moreover, education, healthcare, business operations, workforce training and readiness, and smart community services all rely upon advanced broadband networks.

The Custer County Economic Development Corporation (CCEDC) contracted Strategic Networks Group, Inc. (SNG) in April 2018 to conduct a Broadband Impact Assessment of Custer County. The scope of SNG's work was expanded to collect data on expected job impacts if Custer County were to receive an additional \$1 million in Federal Economic Development Administration funding for the six new wireless towers that would increase the broadband service footprint to nearly 80% of county addresses. The project scope was expanded for SNG to include collection of market assessment data based on the commitment and support of CCEDC. Furthermore, SNG was impressed by the foresight and planning with which CCEDC has approached broadband and digital infrastructure and the progress achieved to date (See Appendix C for details about Custer County Broadband Infrastructure Plan).

SNG worked with CCEDC between March and June 2018 to gather input locally on how local businesses, organizations, and households are connecting, using, and benefitting from the internet. The survey campaign was promoted as – “We asked and we listened”.

In April and May of 2018, 742 households and 709 organizations were emailed. Responses from 164 households and 80 organizations were received, which represents approximately 8.5% of Custer households and 10% of Custer businesses. Those results are compared to the SNG Digital Economy Database (DED) for rural areas, representing 10,600 households and 5,900 organizations.

This broadband research uses SNG benchmarks to compare current Custer County capacity and utilization. This report uses the FCC definition of broadband as 25 Mbps download and 3 Mbps upload to assess broadband availability. To evaluate and analyze Internet utilization, this research uses the Digital Economy index⁵.

⁵ The Digital Economy index (DEi) reflects an organization's or household's utilization of a range of Internet applications and processes. Based on the number of applications currently being used by an organization, a composite score is calculated that summarizes how comprehensively each organization or household uses the Internet. In areas where DEi is lower than average, indicating lower utilization, an opportunity to increase utilization and benefits to businesses and non-commercial entities exists. For more information about the DEi, please see: <http://sngroup.com/dei/>

2.1 Context and Situational Analysis of Custer County

The following provides some background and situational analysis for context in the challenges and needs of Custer County:

- Rural county – small population, low population density
 - Small rural population base, which makes it difficult to attract traditional businesses and employers
 - Current internet connectivity choices are limited, with incomplete coverage, because of small, rural population base
 - Traditional economic activities (e.g. mining and railroads) that established Custer County have disappeared and new economic opportunities are needed

- Custer County’s population is aging
 - Median age is 56.8 years compared to state median of 36.4 years (DOLA – Colorado Department of Local Affairs)
 - 31% of population is over 65 years compared to 13.4% for the state (USCB – United States Census Bureau)
 - Under 18 population is 14.2% compared to 22.8% for the state (USCB)
 - Natural population growth is declining (births – deaths) (DOLA)

- County assets
 - Rural, friendly environment
 - Natural beauty and attraction for tourism and seasonal residents
 - Relatively low property values and taxes

- For Custer County to maintain and grow their tax base there needs to be a net inward migration of population and businesses
 - Attract younger, working age demographic
 - Attraction has to be based on the living environment rather than local employment opportunities
 - Those who are mobile and not tied to a current employment location
 - Those who can telework and/or operate a home-based business
 - Retired or self-employed
 - Population growth can attract additional traditional businesses over time, but initial business growth is more likely to be from existing businesses and small home-business startups or inward migration

- Robust, competitive, broadband is essential to attract and retain population and enable business growth.

2.2 Community Goals and Priorities

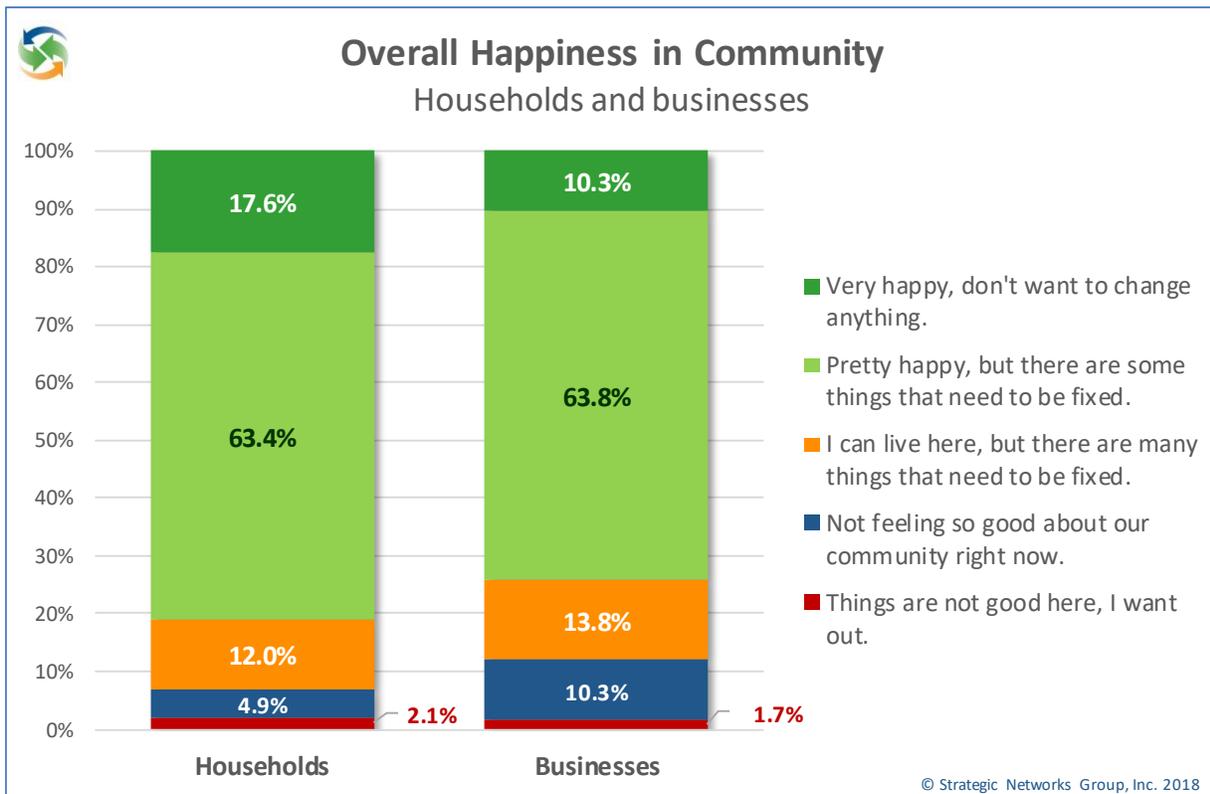
“Why?” is a question that needs to be answered from the outset for any local change or community initiative. Like with any investment, there needs to be clarity and understanding of the extent to which community benefits outweigh the costs – otherwise the case for investing time and money are difficult to justify.

For this reason, it is important to understand whether local households and businesses are happy in the community and committed to their community’s future. The happiness index below provides context and insights into motivations for undertaking changes or new initiatives, like broadband and digital infrastructure. From SNG’s research:

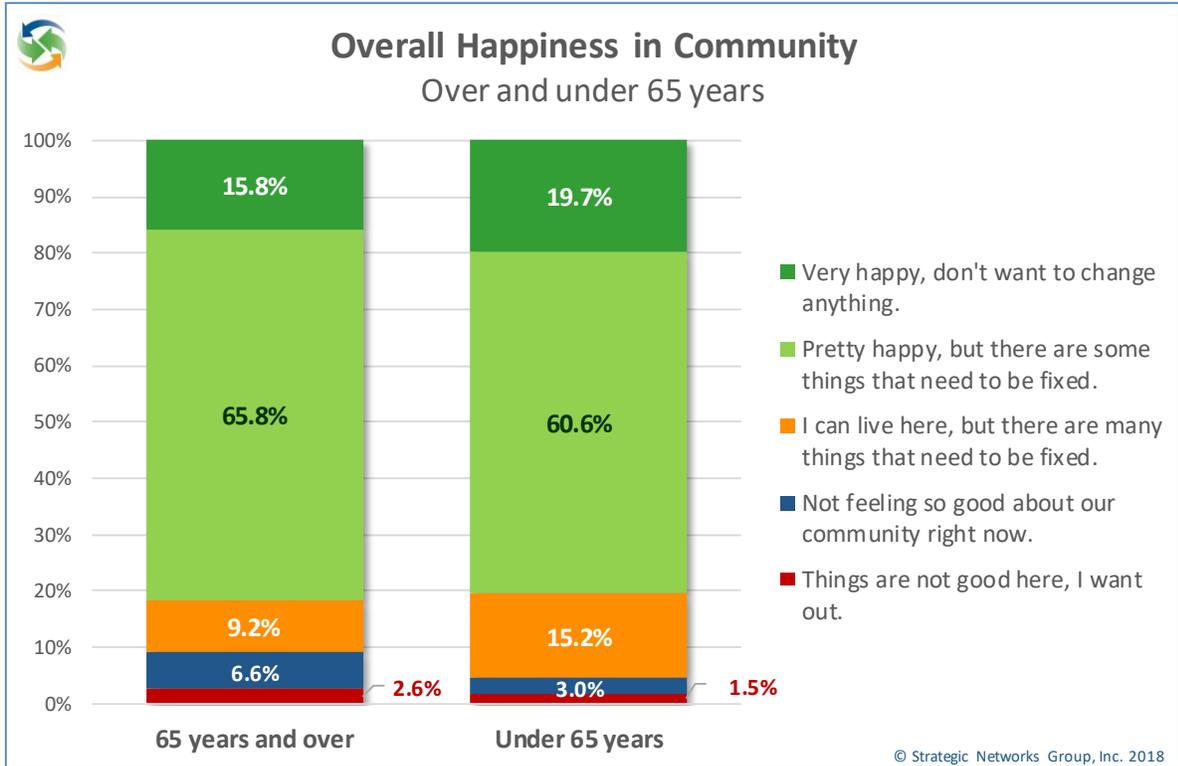
- 81% of households are very/pretty happy, but 19% are at risk of leaving without improvements
- 74% of businesses are very/pretty happy, but 26% are at risk of leaving without improvements

Happiness and Community Goals

The following charts show the overall happiness living and working in the community by businesses and households in Custer County.



The following chart compares household responses by age groups – over 65 years of age and under 65 years of age. These were grouped to understand whether the significant retired population differed in viewpoints compared to the under 65 group. This analysis has been applied to other data and charts in this report.



2.3 Investment Priorities for Custer County

With limited budgets, all communities and regions are challenged in how to allocate scarce resources among various interests – especially when those interests appear to be competing. Community and investment priorities need to be understood so that local leaders can make the best decision for their constituents. Broadband and digital infrastructure investments are now part of this process.

When the value of broadband and digital infrastructure is not clear, nor quantified in terms of community and economic development benefits, the consequence often is an under-investment. Broadband needs to be understood as an enabler, not as an end in itself. SNG’s research shows that the majority of businesses, organizations, and households do not understand the [potential value of broadband](#) and applications enabled by the internet can have. What has been missing and what is needed is a way to personalize the return on investments in digital connectivity to communities, businesses, and residents.

SNG has developed an investment [framework for broadband as an enabler of community and economic development goals](#). It is based on the United Nation’s [Sustainable Development Goals](#) (SDGs) adopted by 193 countries in the 70th UN General Assembly in 2015 for governments, businesses, civil society and the

general public to work together to build a better future for everyone. SNG has adapted a subset of the SDGs that are applicable to industrialized countries in an increasingly digital economy.

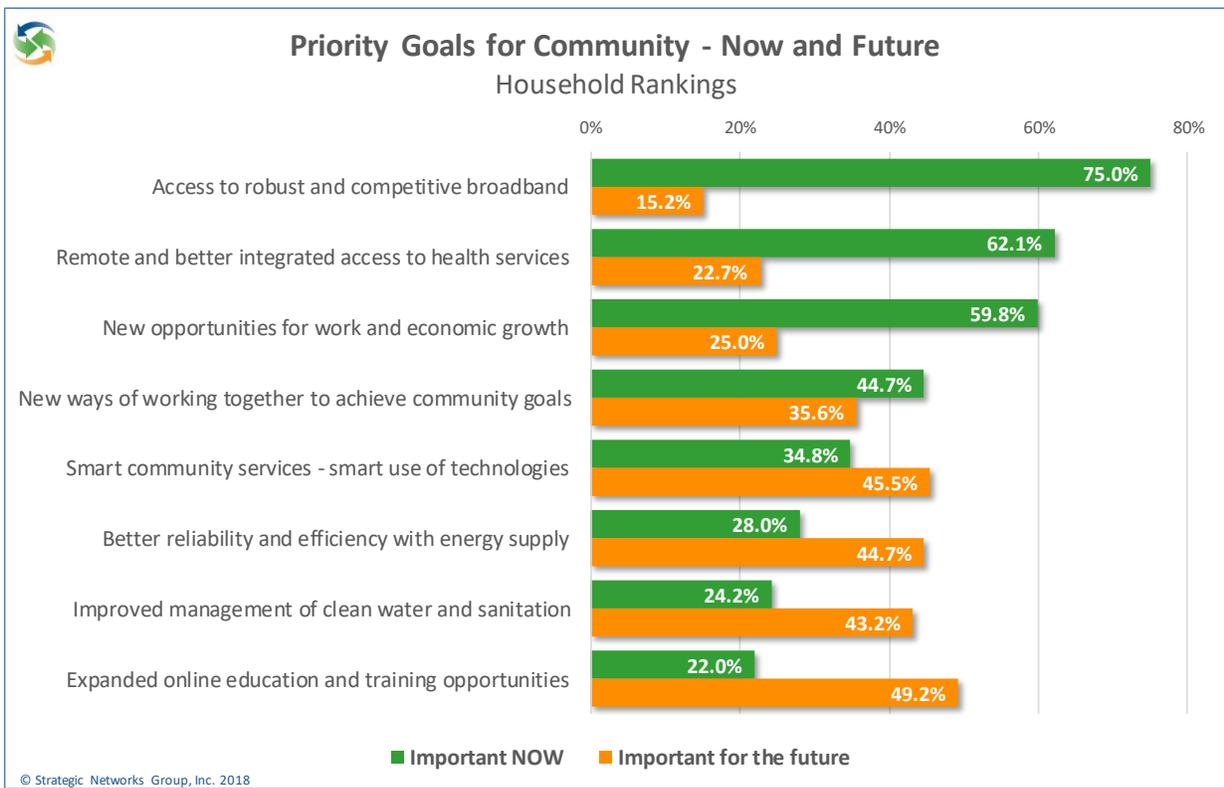
SNG asked business and household respondents to rank sustainable development goals for their community in terms of the following options:

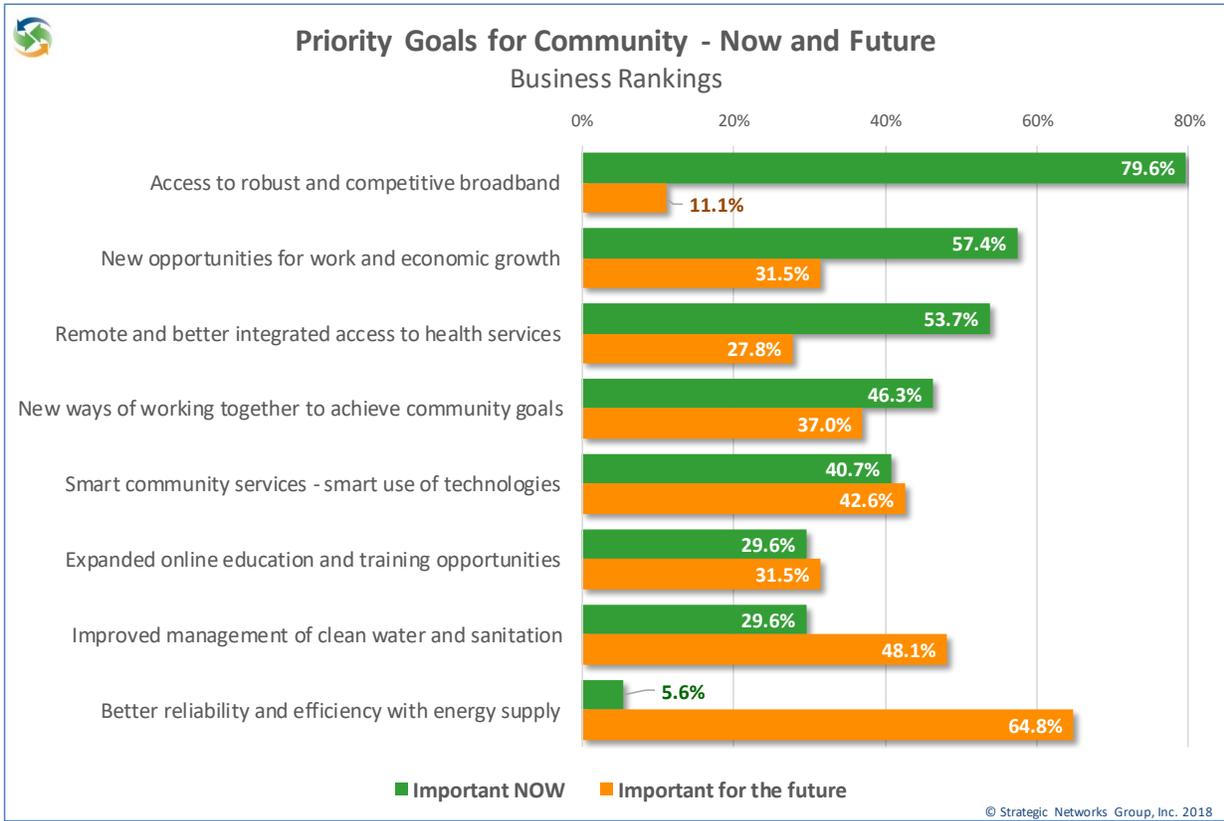
- Important NOW
- Important for the future
- Not important

Below are the responses from households and businesses in Custer County. For both segments “Access to robust and competitive broadband” is ranked as the top priority NOW by a significant margin.

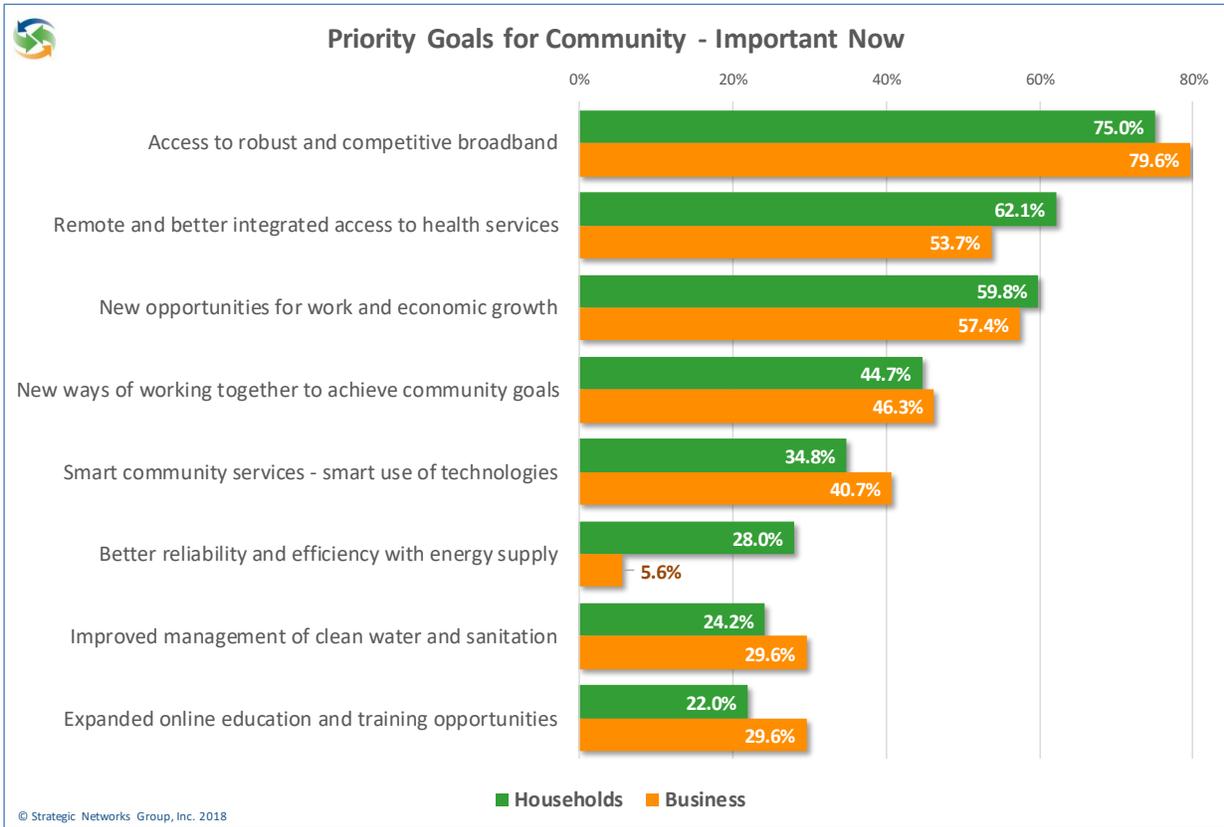
Ranking of Sustainable Development Goals for the community’s future vitality

The following charts show the priorities of households and businesses in Custer County for sustainable community goals.



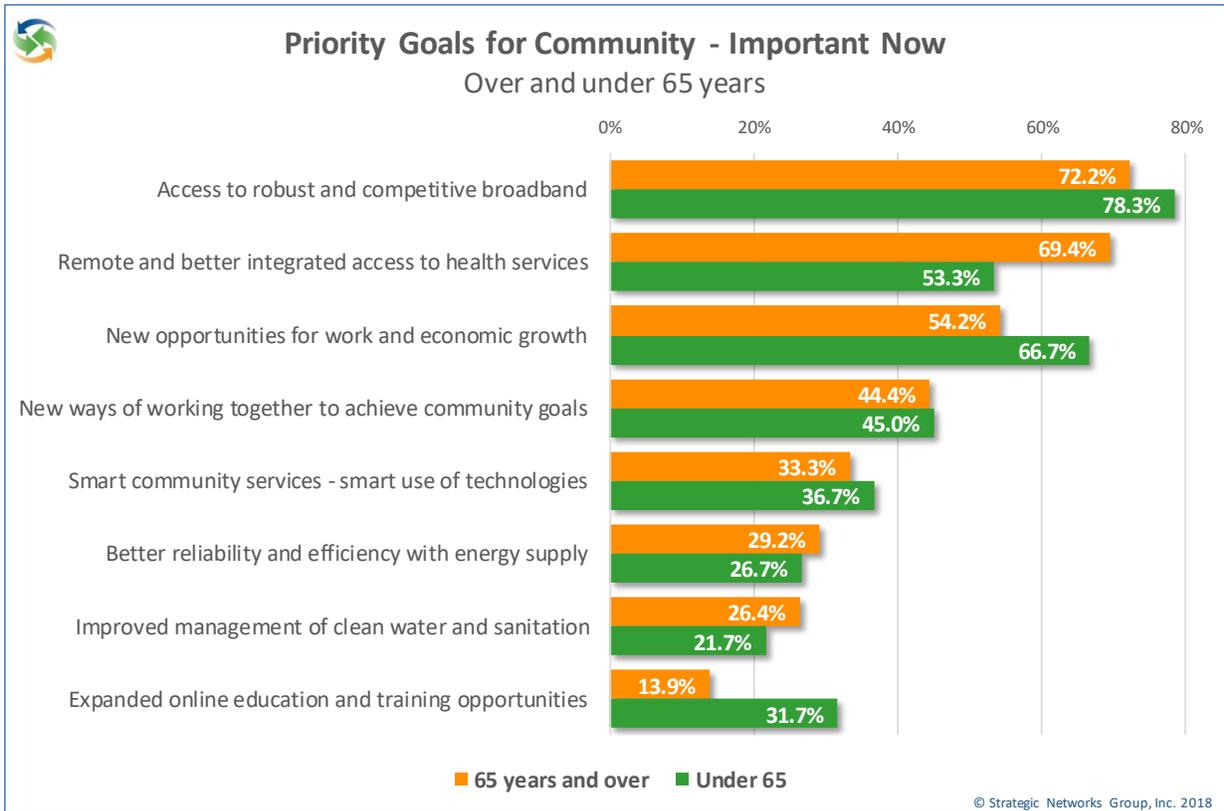


Household and business goals ranking for priority **now**:



Comparison of Priority Goals by Age Grouping

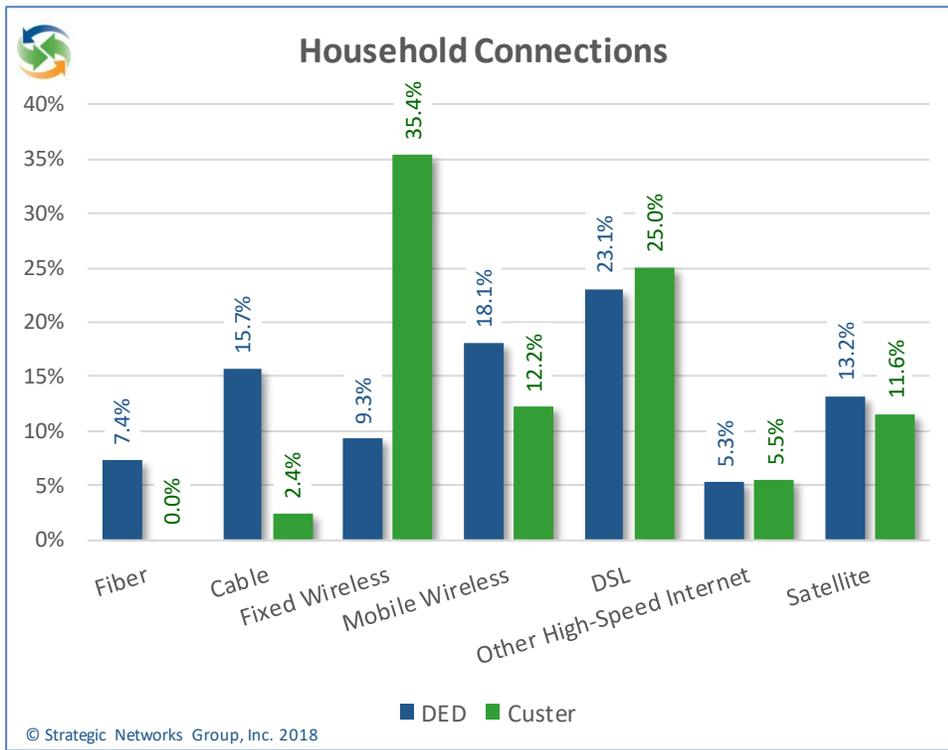
Understandably, those over 65 prioritize remote health care higher than those under 65, while the under 65 group prioritizes new opportunities for work and education higher than the over 65 group. However, both age groups rank access to broadband as the most important priority now.



3. Connectivity for Households

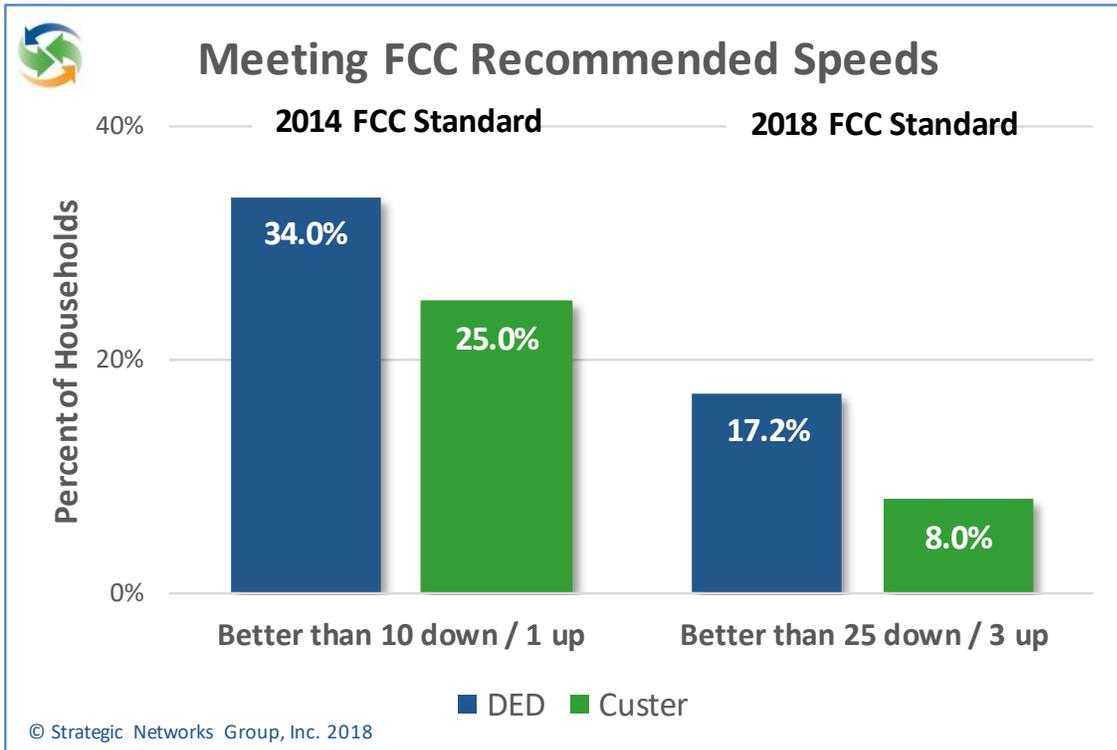
Almost 99% of household respondents use the internet on a daily basis. The majority of households are using fixed wireless (35%) or DSL (25%). DSL is most likely used in or near towns. Smaller percentages use mobile wireless or satellite.

Responses from Custer County in the chart below, and other charts in this report, are compared to SNG’s proprietary Digital Economy Database (DED)⁶ which is an industry leading database on how broadband is used and is benefitting individual businesses, organizations, and households



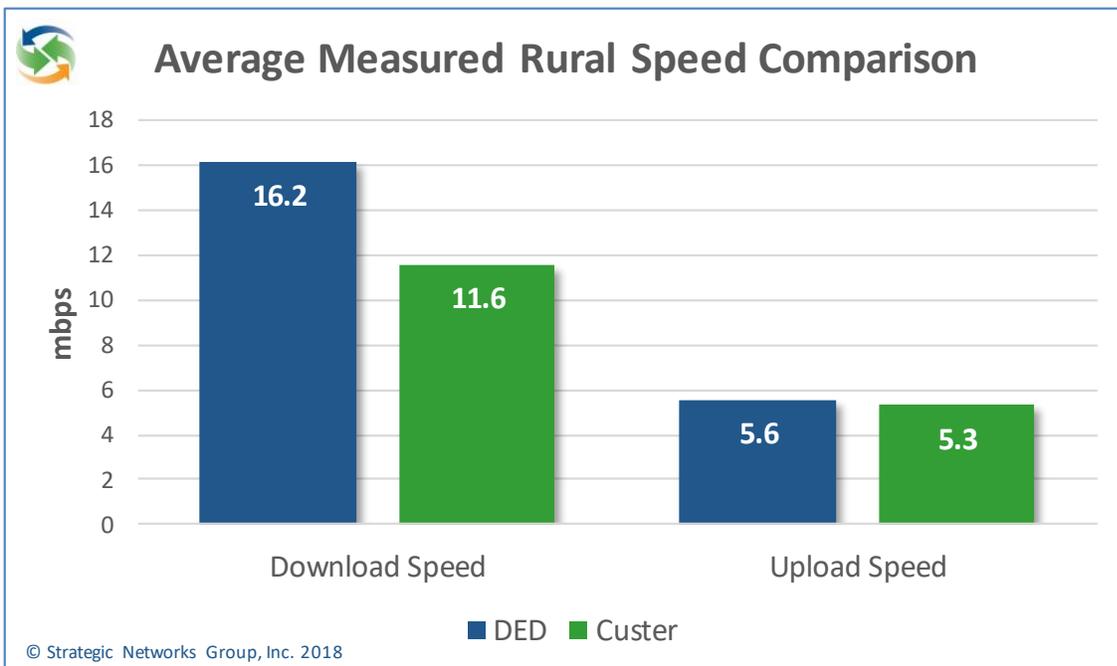
⁶ SNG has amassed an industry-unique database of more than 75,000 broadband users across North America (including statewide data for nine American states) and in Europe exploring exactly these questions. More importantly, this database has enabled the development of key insights and tools to drive local economic growth and realize community benefits from broadband. Moreover, quantifying the community returns from digital infrastructure investments focuses attention on those expected outcomes, which helps prioritize goals and becomes a driver for engaging local stakeholders and organizations.

Far fewer Custer County households currently meet current FCC standards for connection speed.

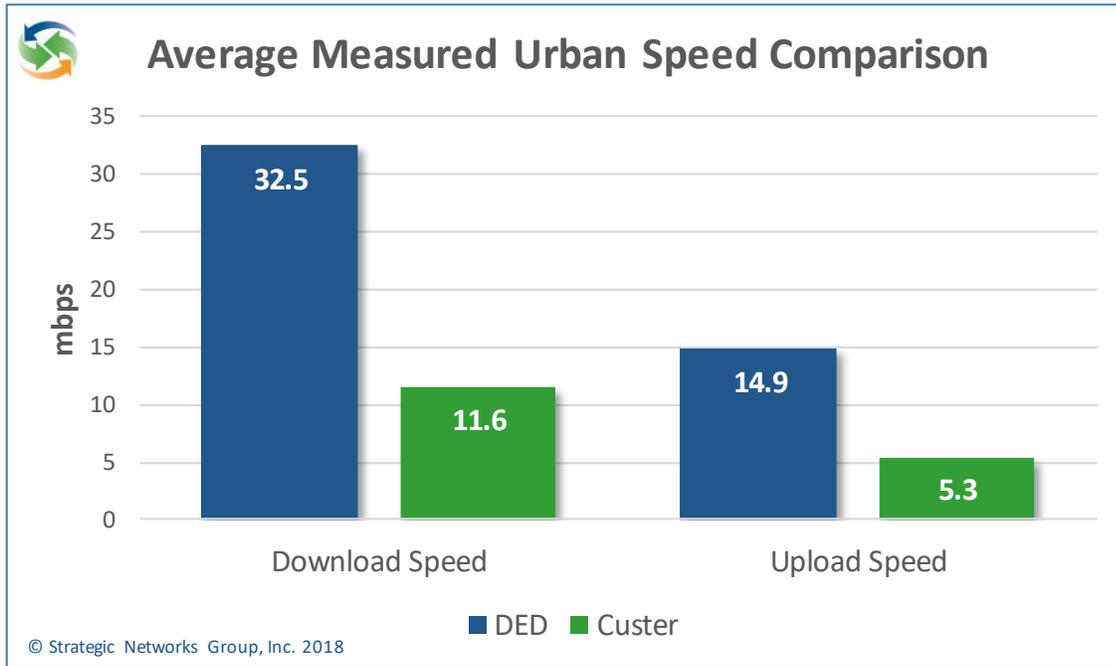


Correspondingly, the average measured speeds are similar but slightly lower than other rural areas and much lower than urban areas.

Rural speed comparison – Households

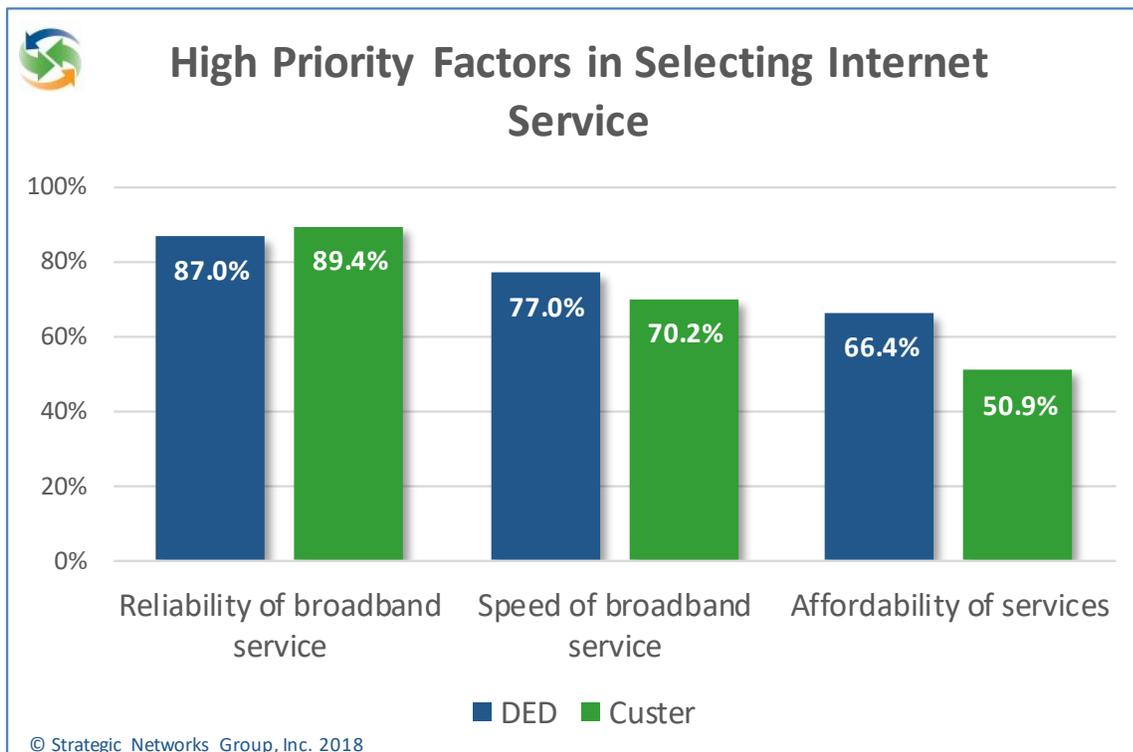


Urban speed comparison – Households

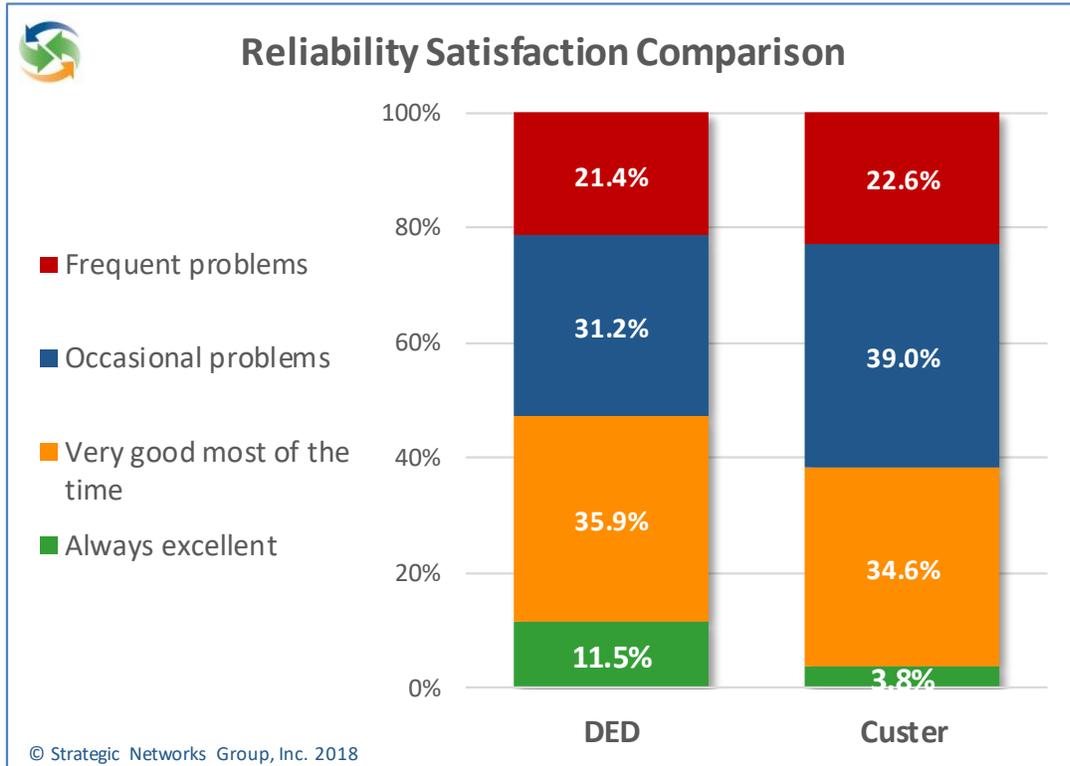


3.1 Service selection and satisfaction – Households

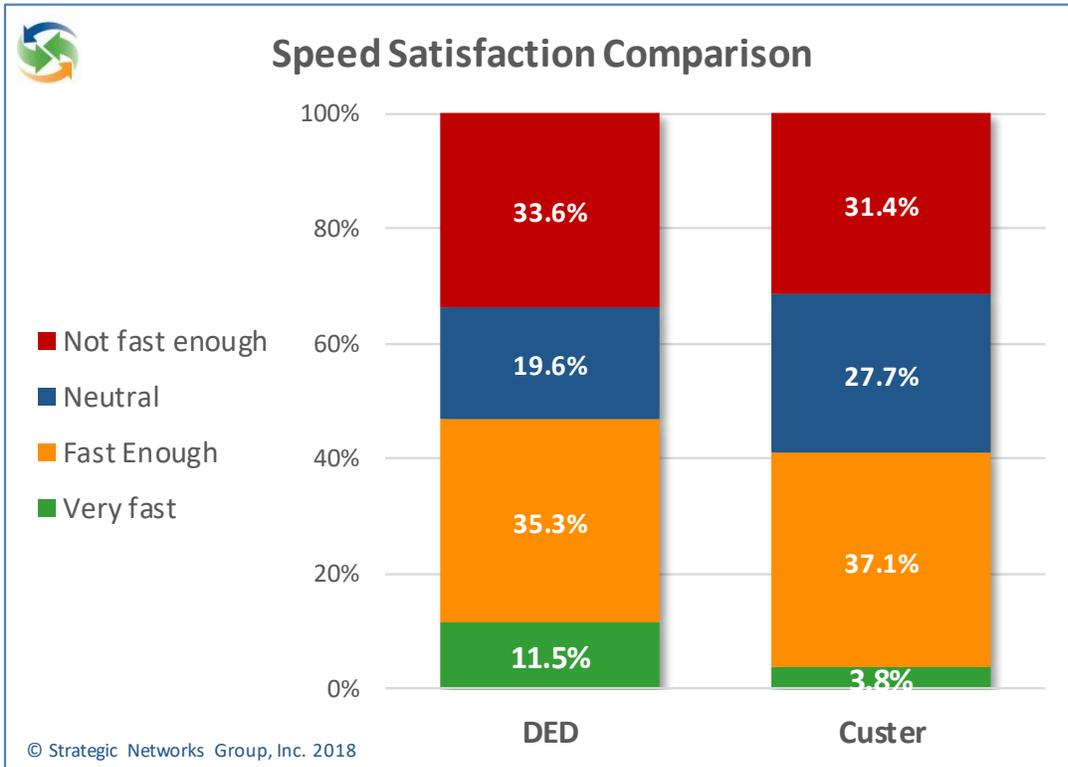
Reliability of service is the highest priority for almost 90% of Custer household respondents, and much higher priority than affordability.



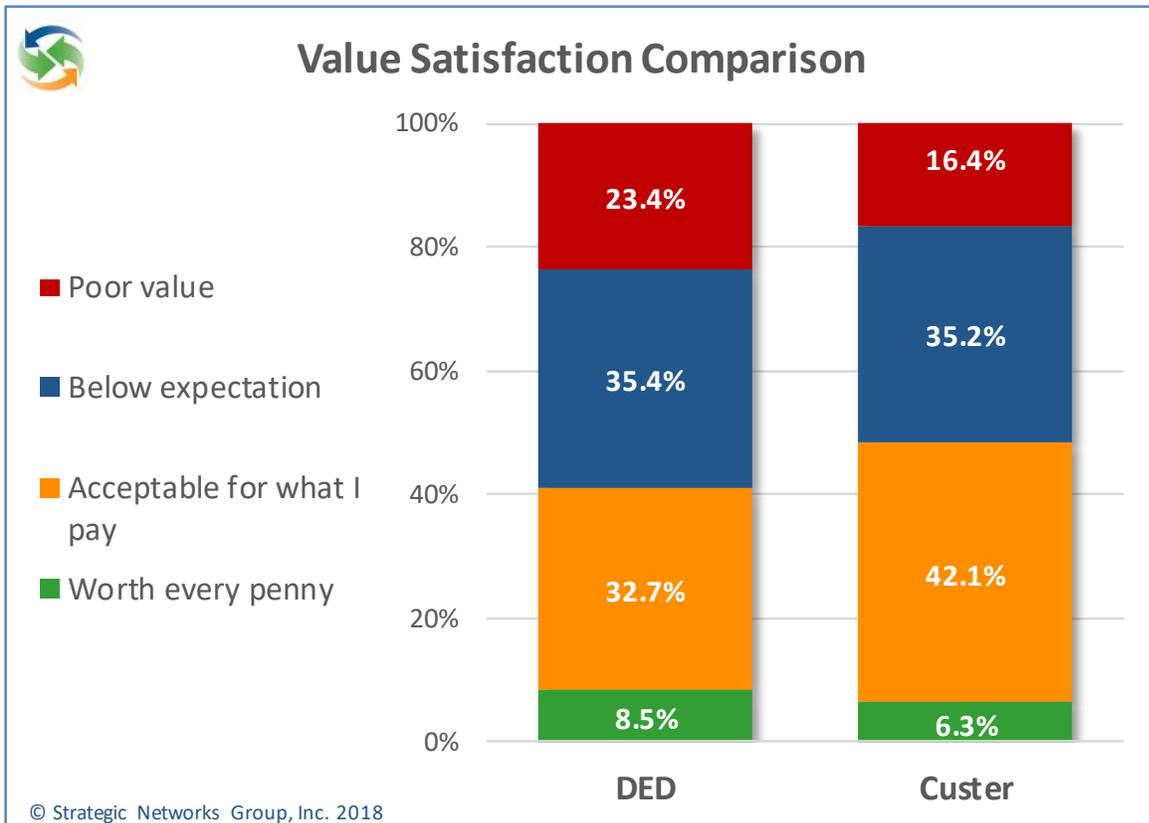
Satisfaction with current services in terms of reliability, speed, and value are similar to other rural areas. Over 61% of Custer households have reliability concerns.



Speed is at least satisfactory for only 40% of Custer households.

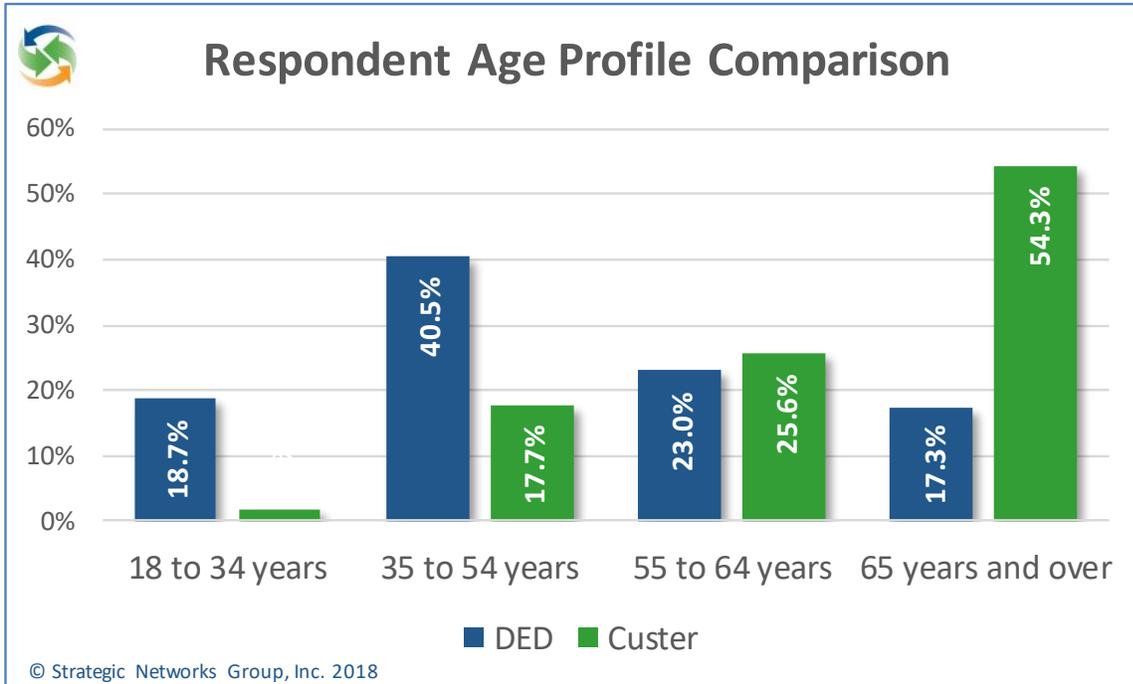


Value of current internet service is satisfactory for less than half of Custer households.

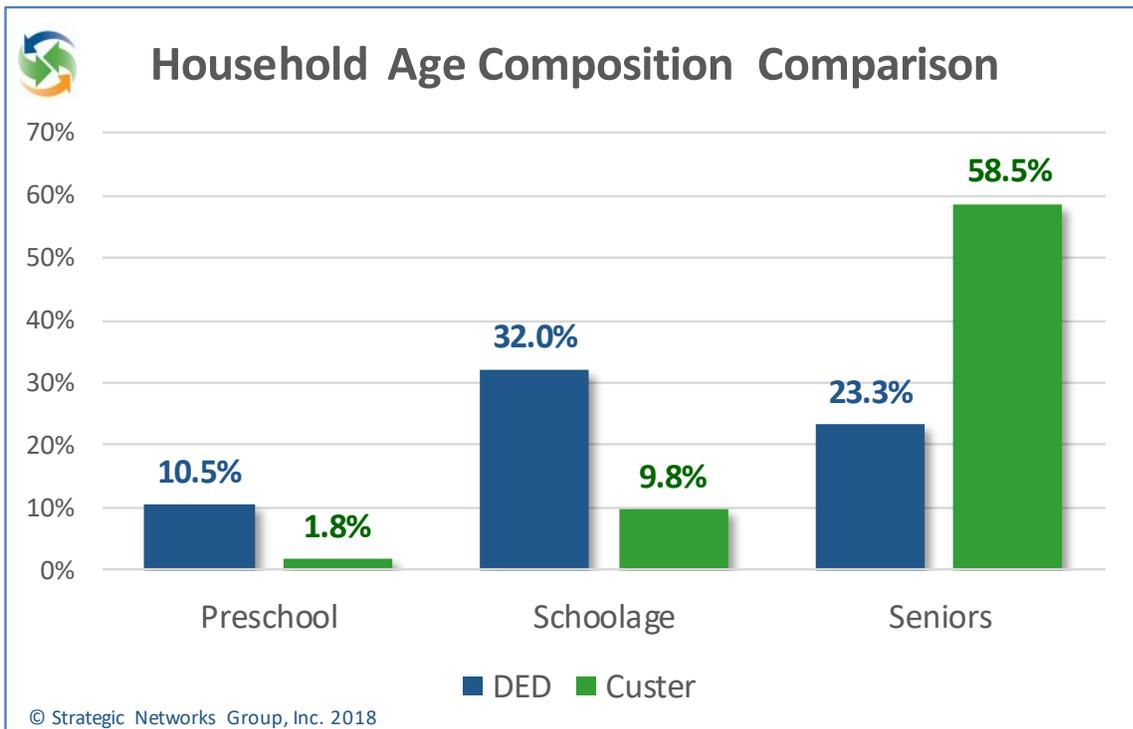


3.2 Household Profiles

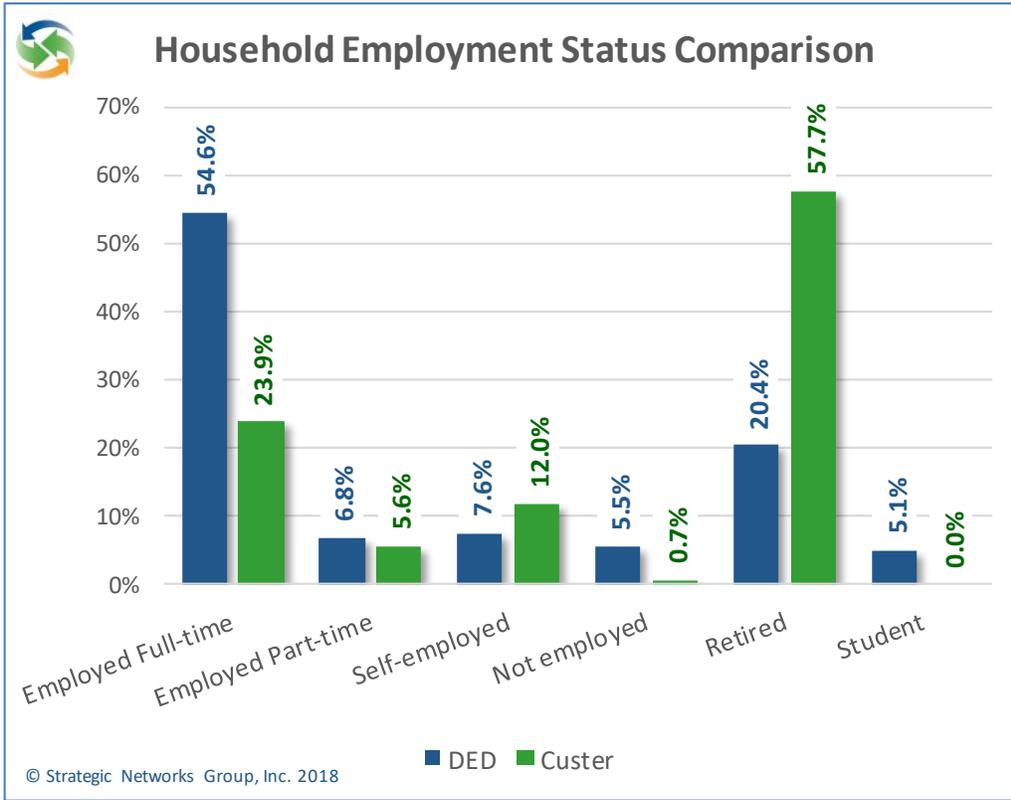
Household respondents are older than average with the majority over 65 years. This reflects the older demographic of Custer County.



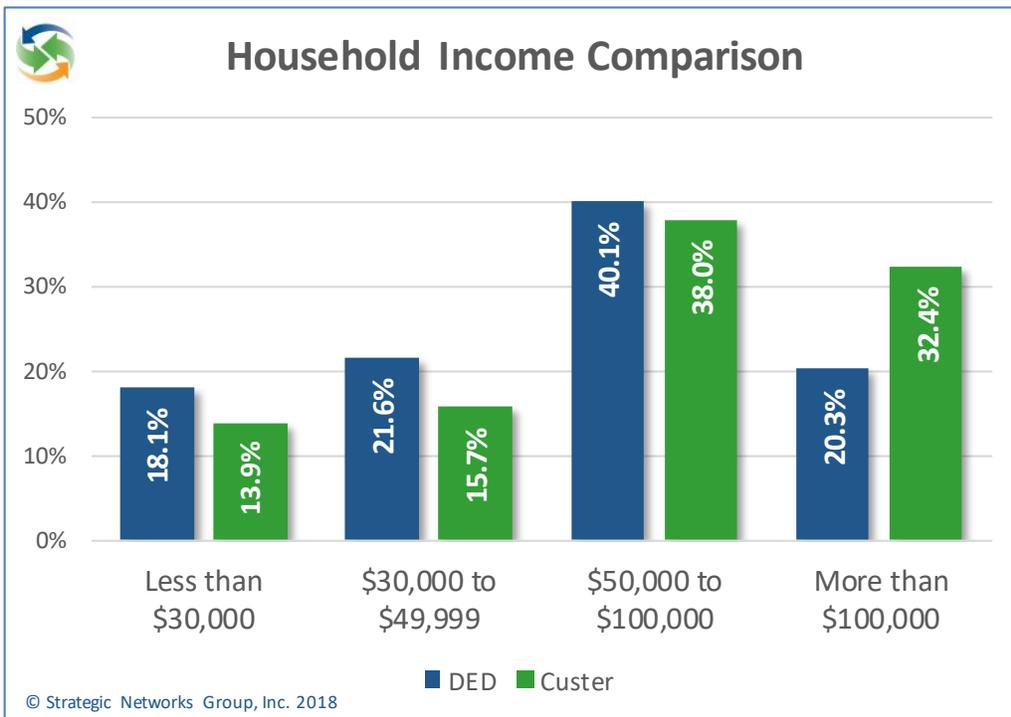
Consistent with the age distribution, the majority of household respondents are retired.

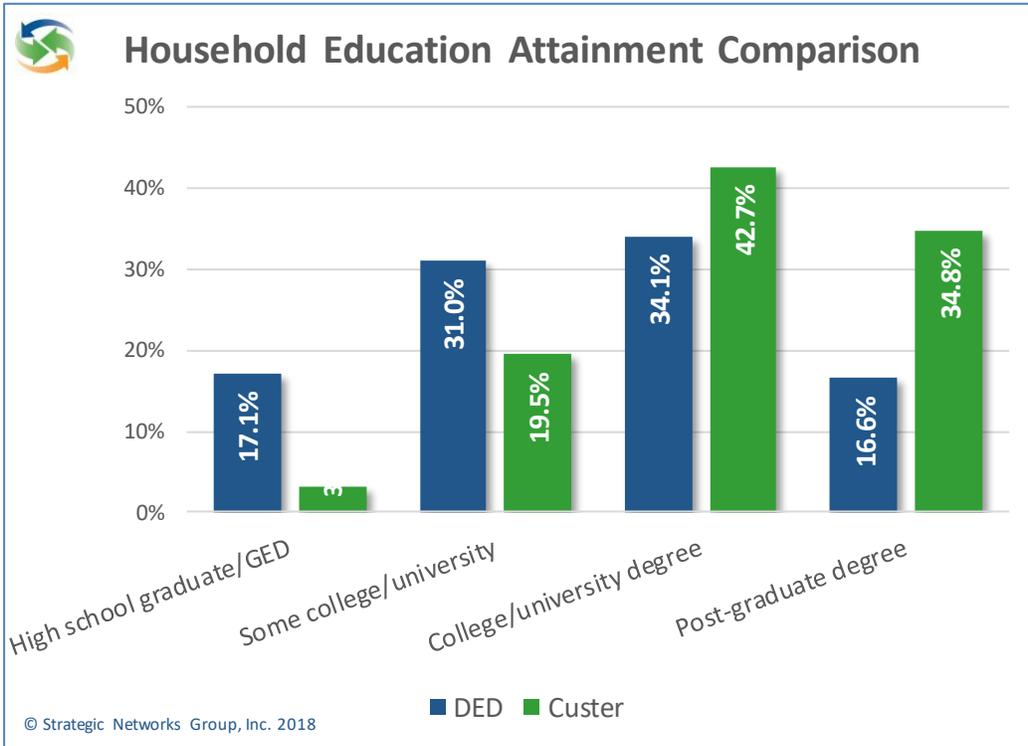


The household age composition is heavily skewed toward seniors, with implications for statistics related to education opportunities.



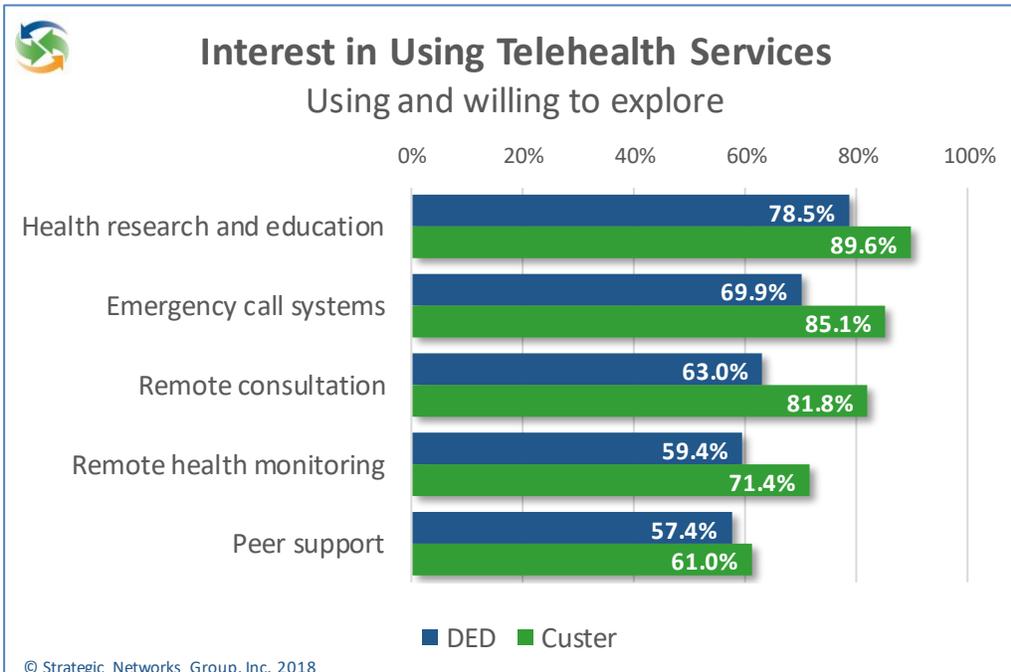
Household respondents also have higher household income and higher education attainment.



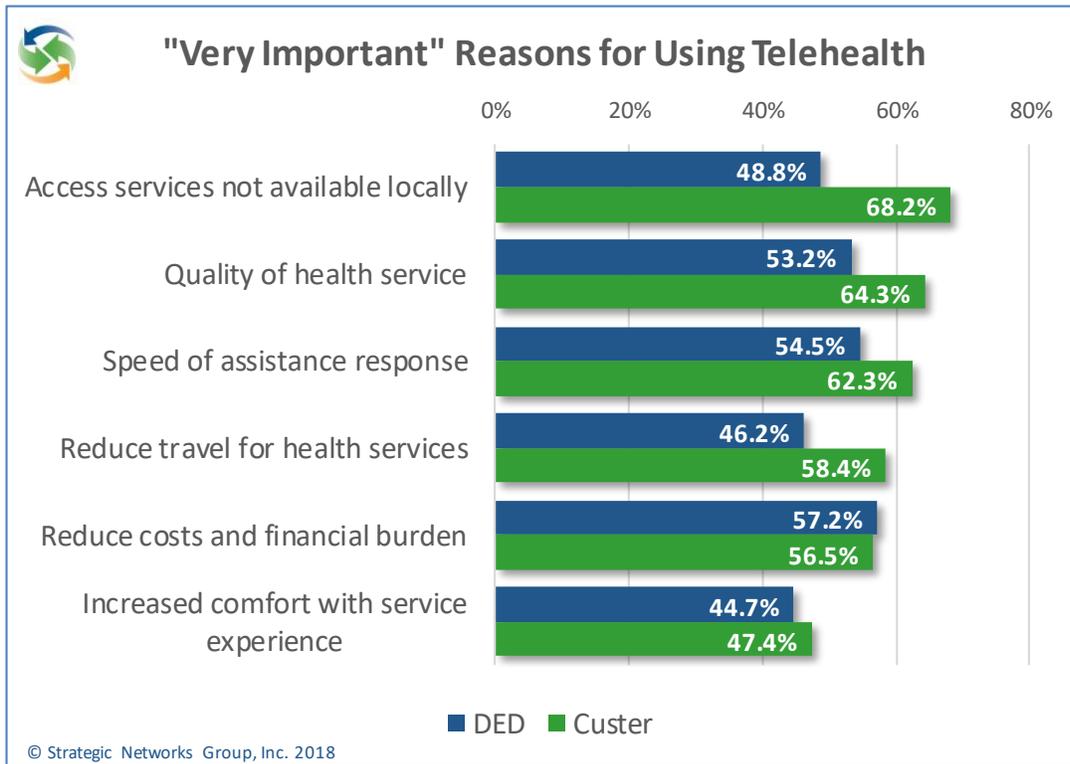


3.3 Remote Health Services

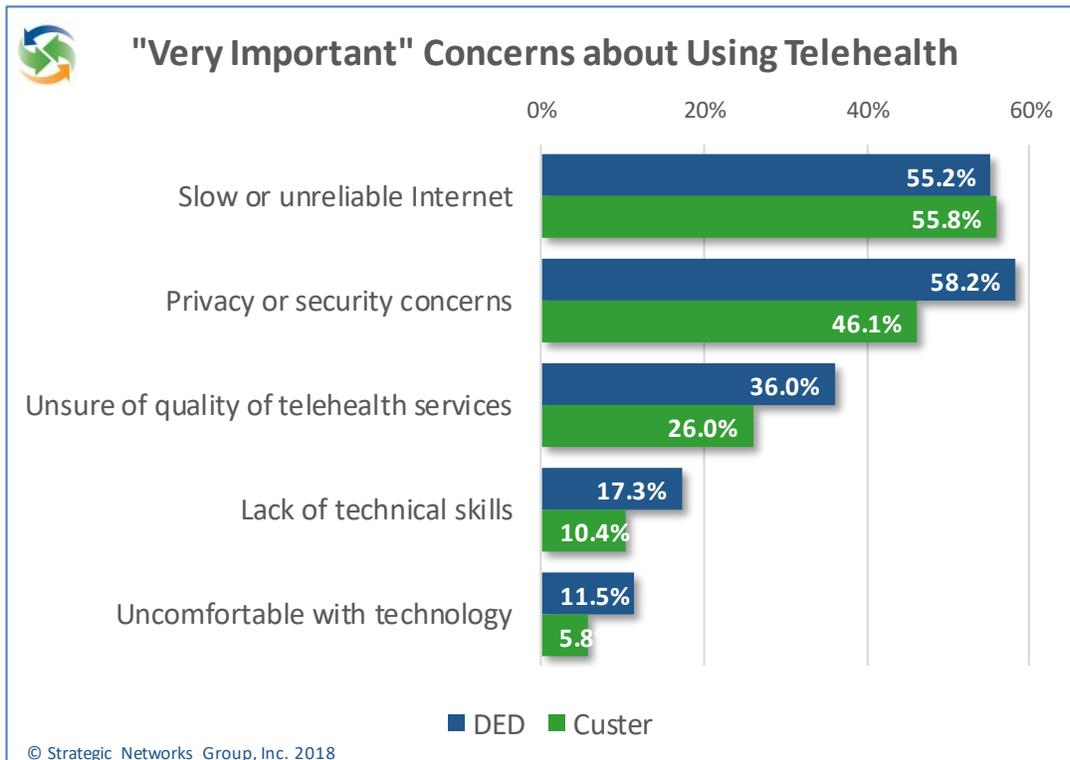
The availability of local health facilities is a challenge, as with any rural area. There is one clinic in Custer County and remote health services are a key potential solution to address gaps – especially for the significant older demographic in Custer County. This is reflected in the household response findings below. The top concern for Custer County households using telehealth is slow or unreliable internet.



Higher than average use and interest (partly due to higher age bracket of respondents).



Access to service not locally available is the top reason and much higher than other communities, as well as reducing travel for health services.

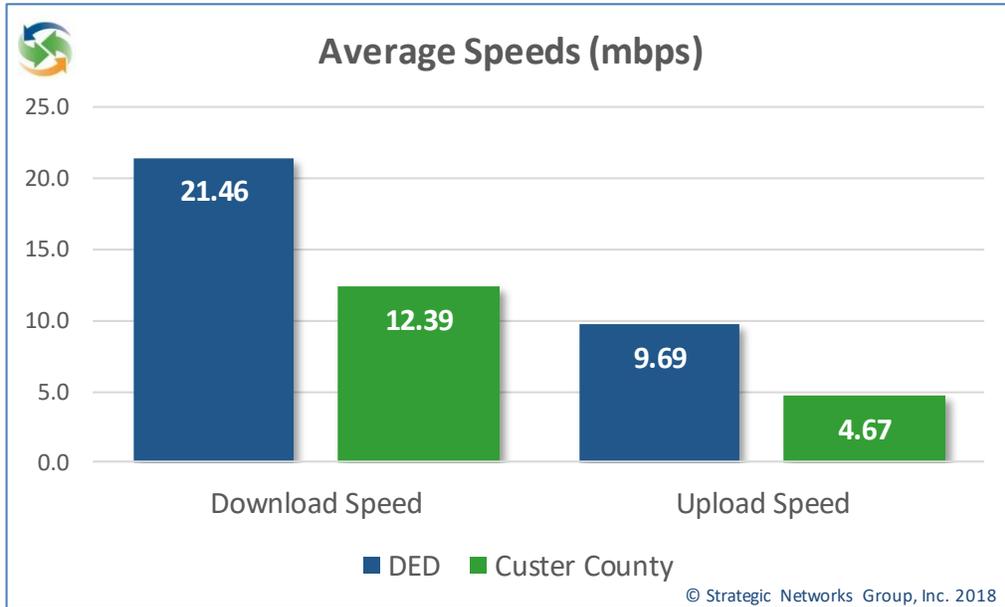


3.4 Retired / About to Retire Households

- Those in the 65 years and over age bracket also recognize the importance of broadband
 - 72% in Custer rank access to broadband as the top priority for the county NOW
 - 18% would definitely relocate without quality broadband, with another 21% very likely to relocate
- Retirees can still be actively working
 - 8% of residents over 65 either telework or have a household member who teleworks
 - 19% of residents over 65 either have a home business or have a household member who does
- 69% of those over 65 rank remote and better access to health services as the second priority for the county NOW
- A high proportion of Custer residents are either using or willing to explore telehealth services
 - Emergency call systems – 85%
 - Remote consultation – 82%
 - Remote health monitoring – 71%
- The most important reason for interest in telehealth is to be able to access health services not available locally – 68%
- The most important concern about using telehealth services is slow or unreliable internet – 56%

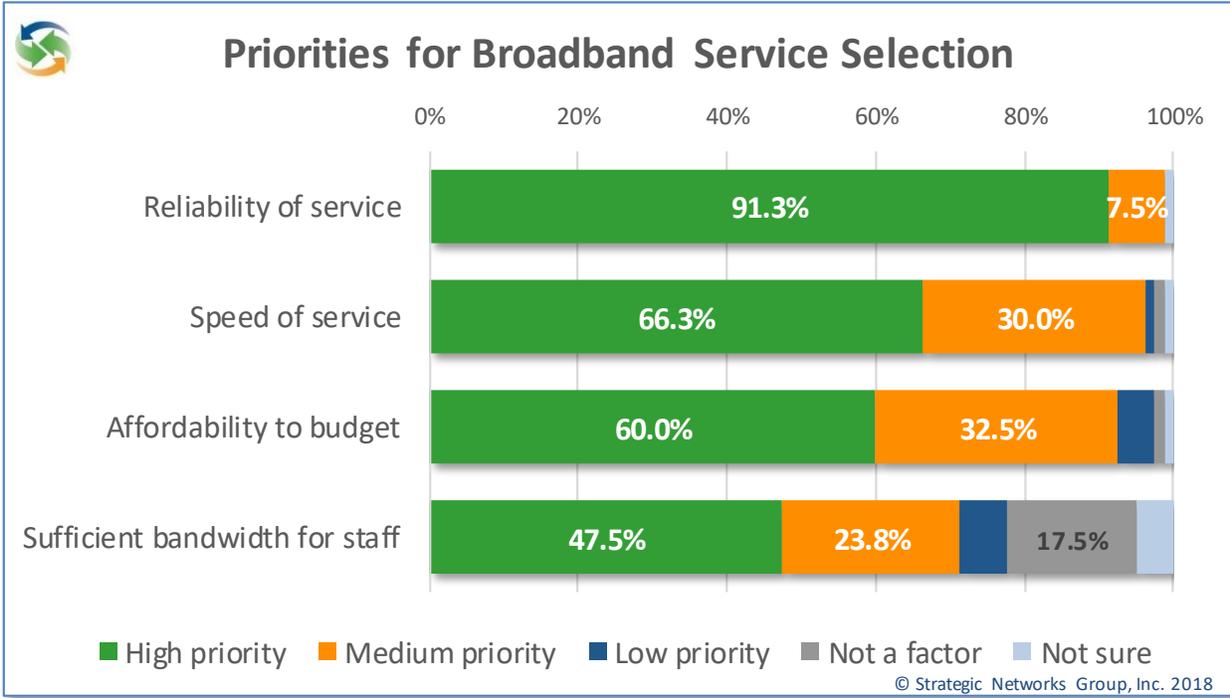
4. Connectivity for Businesses

Businesses and organizations that responded to the survey had slower upload and download speeds as compared to other rural businesses in SNG’s Digital Economy Database (DED).

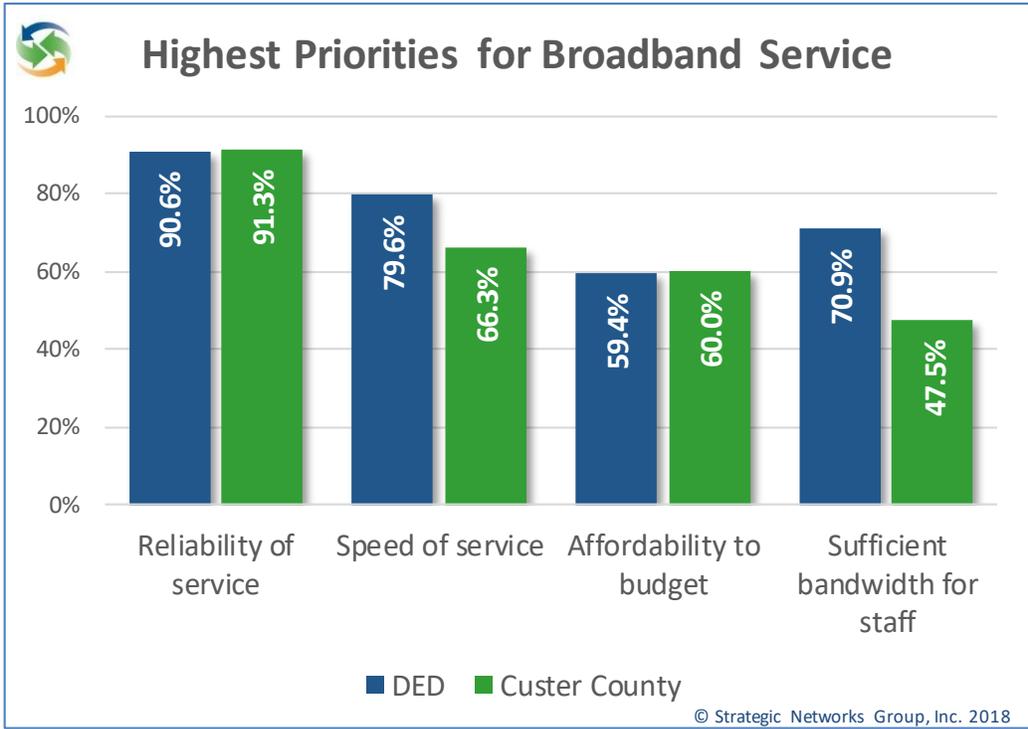


4.1 Priorities for broadband service selection by businesses

Reliability is rated as a high priority by 91% of businesses and much more than speed or affordability.

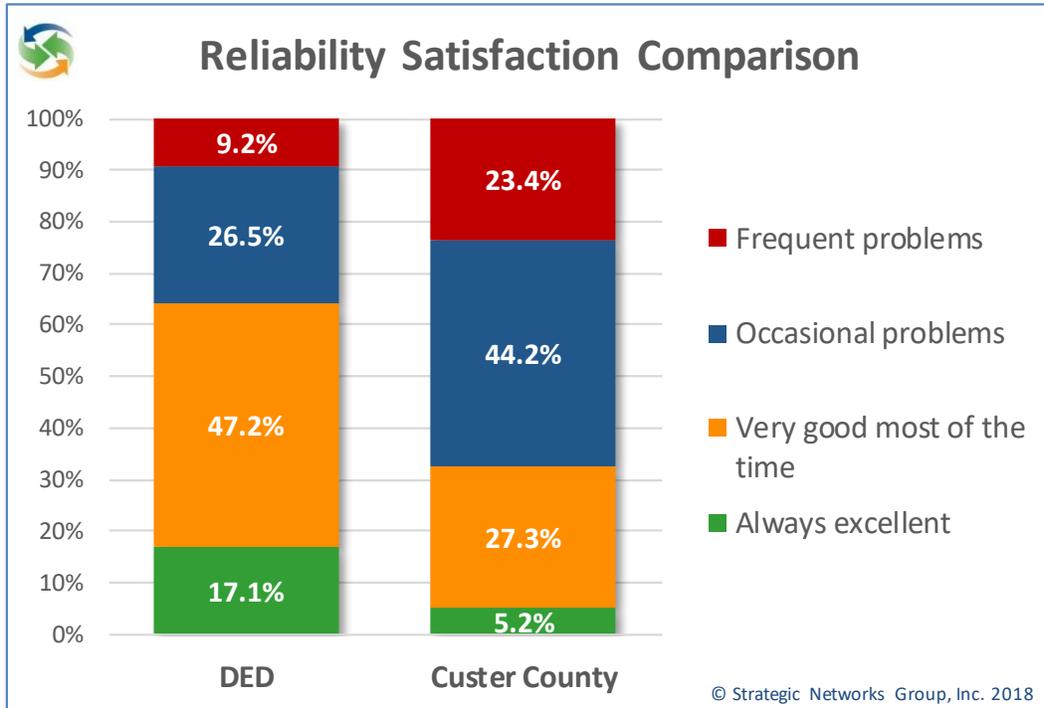


The need for reliability dominates more than for other rural areas.

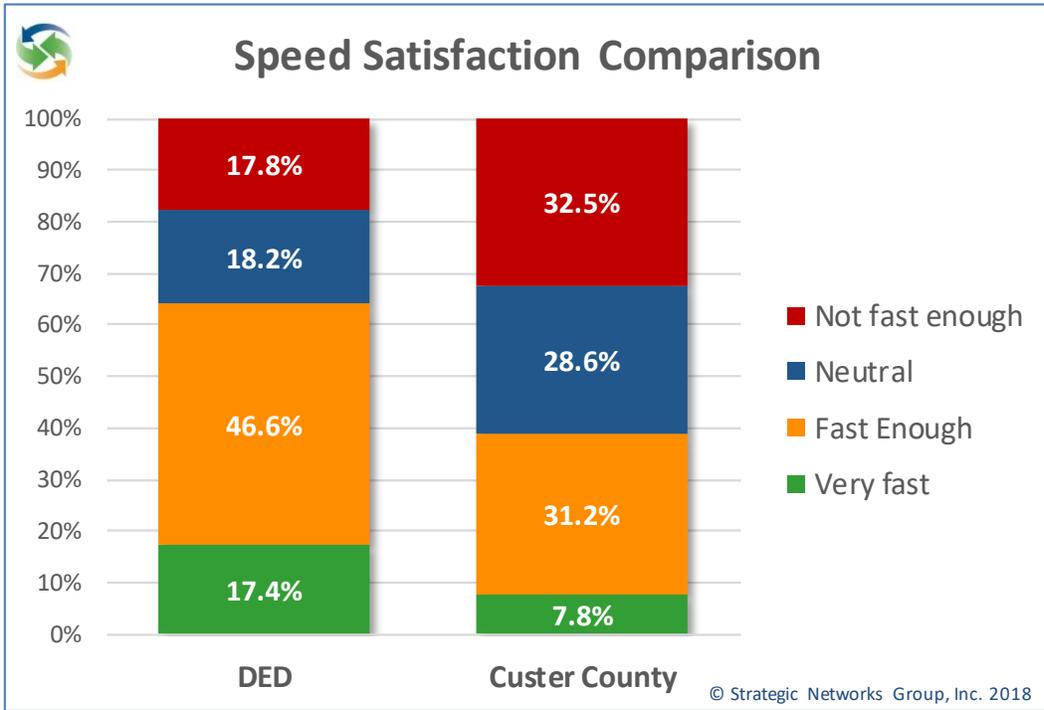


4.2 Satisfaction with Connection by Businesses

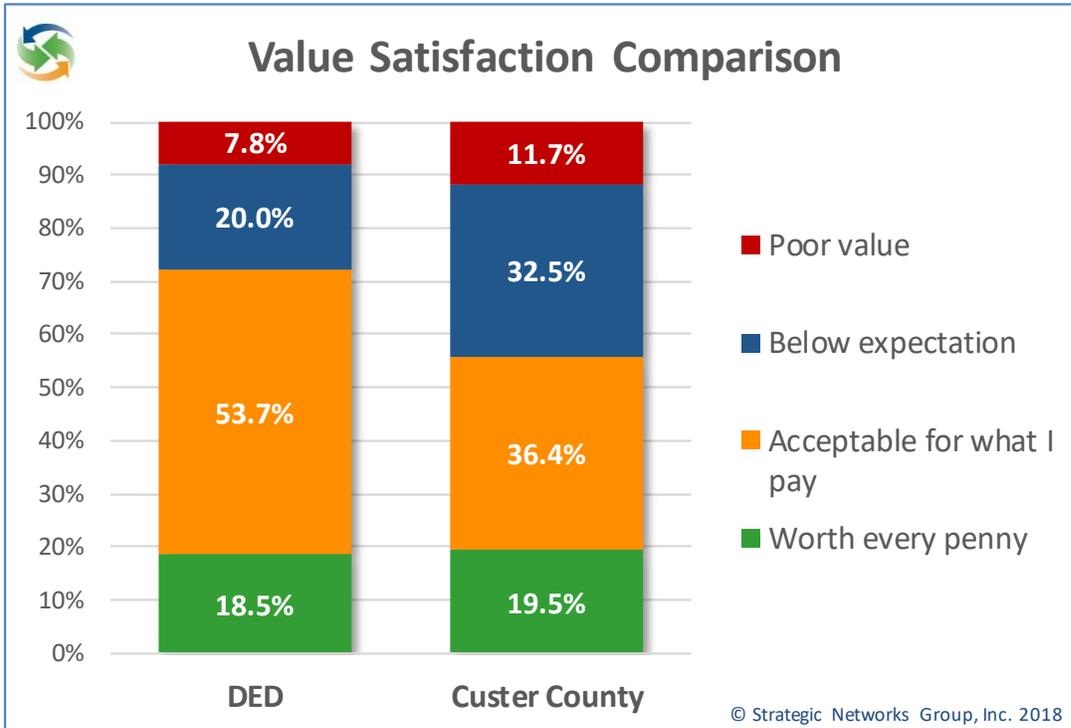
Given the business priorities for their connection, how do they view their current connections? More than two thirds are dissatisfied with reliability, which is much higher than other rural areas.



Almost one third of businesses say that speed is not fast enough for their needs, almost twice as many as other rural areas.

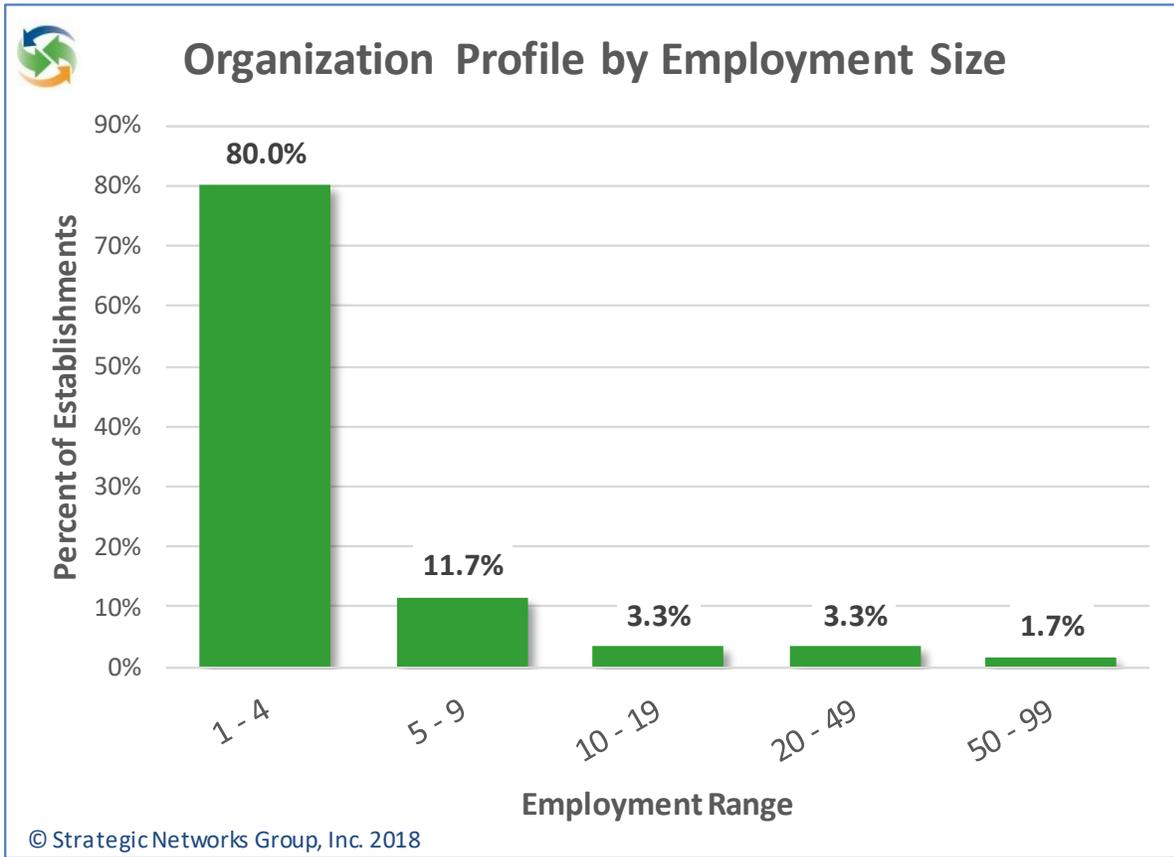


As a result, the perception of value for price is also lower than other rural areas, with a low perception of value by 44% of businesses.



4.3 Profiles of Businesses and Organizations in Custer County

All Custer respondents were under 100 employees.

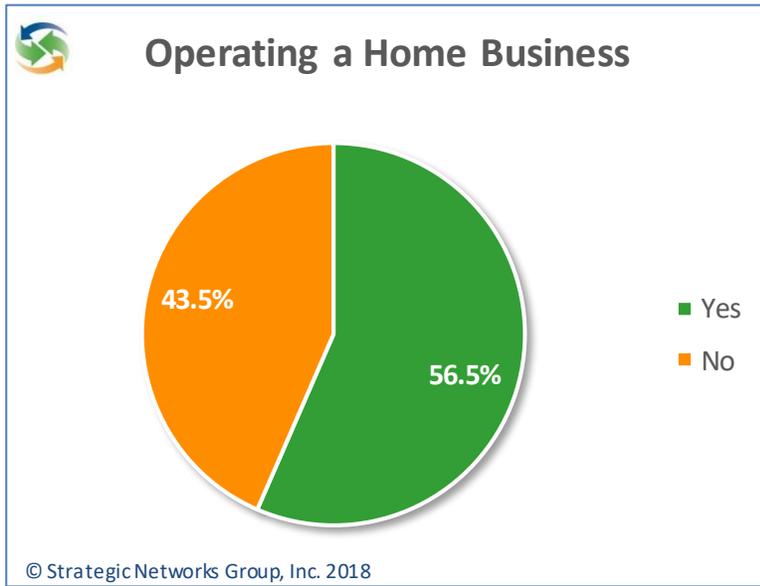


The top 10 industries reported are:

1. Retail Trade
2. Real Estate
3. Professional & Technical Services
4. Arts, Entertainment & Recreation
5. Other services (exc. public admin)
6. Construction
7. Health Care & Social Assistance
8. Information
9. Accommodation & Food Services
10. Administrative & Support Services

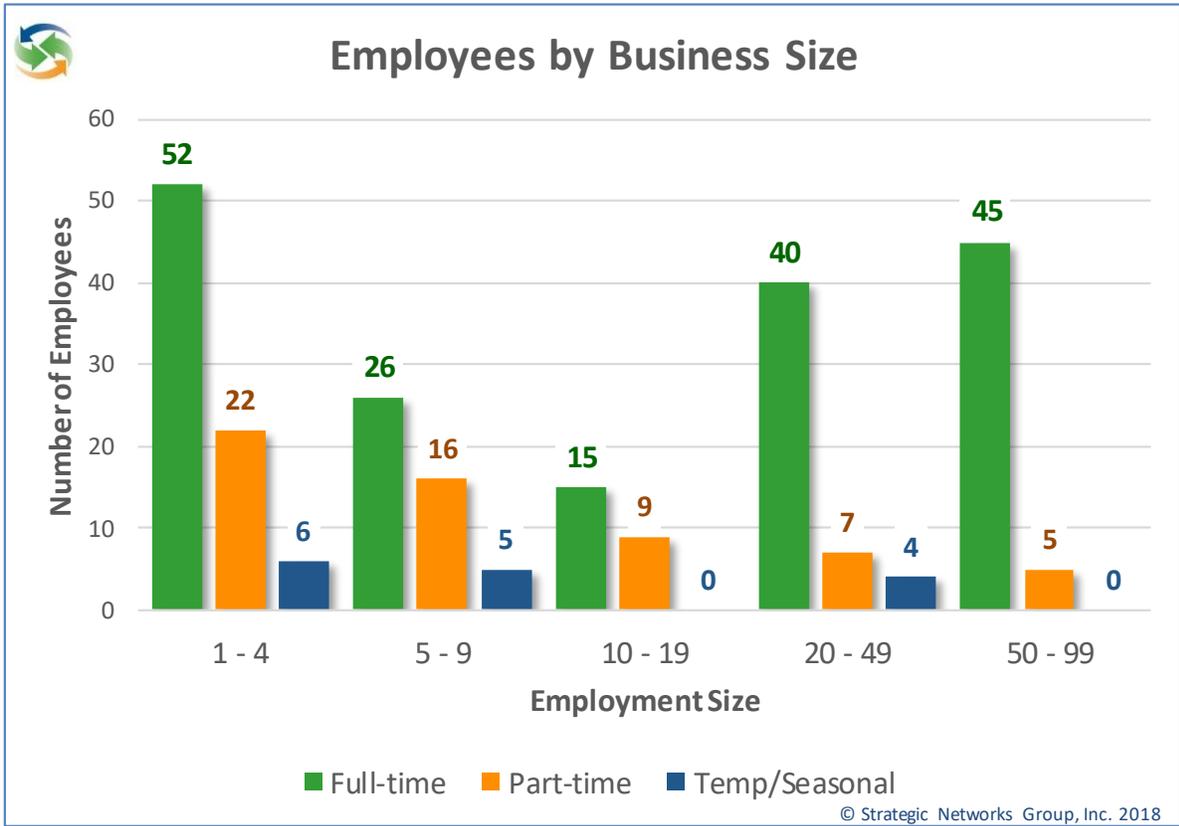
59% of businesses in Custer County have a Digital Economy index (DEi) score below 7.

More than half operate as a home-based business and virtually all of these responded on behalf of their home business.

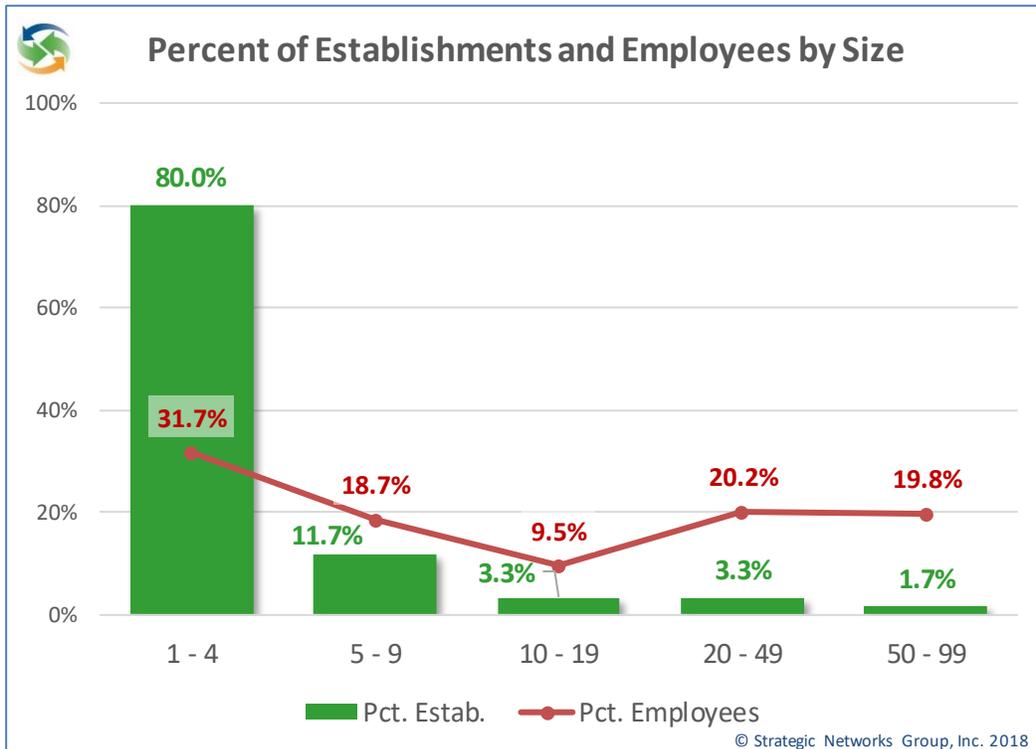


4.4 Business Employment

Of the 80 participating businesses and organizations, 60 reported employment data. These 60 respondents employ a total of 252 people.



80% of the business participants are small with fewer than 5 employees and represent almost one-third of employment for the sample.



5. Broadband Impact Findings for Custer County

5.1 Economic Impacts for Custer County

The availability of broadband and expanded coverage throughout Custer County will retain existing residents and businesses, as well as have a positive stimulus to inward migration. A stable population will help keep existing businesses and tax base, which supports existing public services. Population growth can drive demand for the creation of new businesses, which in turn create new employment opportunities and an expanded tax base. However, growth needs to be planned and managed to achieve sustainable community development goals.

SNG has calculated the employment impacts from expanded broadband access for Custer County using SNG's [Economic Impact Estimator](#)⁷ and population growth from Colorado State Demographic data. The following chart provides a projection of the potential growth in employers and employment based on two population growth scenarios⁸:

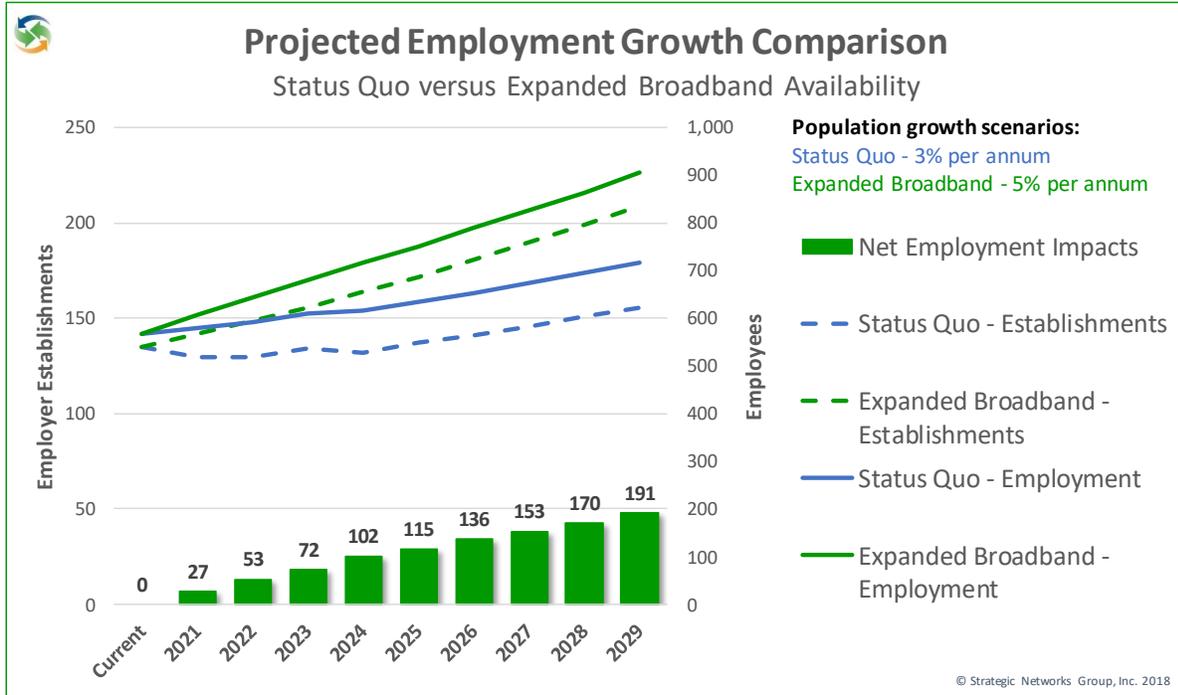
- Status Quo represents an annual population growth of 3%
- Expanded Broadband Availability represents an annual population growth of 5%, stimulated by greater attractiveness of relocating to Custer County due to broadband connectivity.

The difference in population growth between the two scenarios reaches 19% by year 2027. This is considered reasonable based on SNG research that shows a strong influence of broadband on location selection by 19% of households.

The net employment impact of having broadband availability is projected to be **191 jobs (FTE) by 2029**. The "Status Quo" scenario includes expected business and job losses (as reported) without broadband. The "Expanded Broadband Availability" scenario includes the estimated job increases for existing businesses. Job impacts are summarized in the chart below:

⁷ SNG's Economic Impact Estimate for Custer County can be found in Appendix A. See also SNG's white paper on [Economic Impacts through Broadband](#).

⁸ In both scenarios it is assumed that other current factors remain constant over time, such as the ratio of businesses to population and the average jobs per business. While these factors may vary, keeping these constant provides for a comparison of overall employment impacts without the influence of other variables.



The following table breaks down the projected job growth for 3, 6, and 9 years with sensitivity analysis based on different projected population growth rates.

Timeframe	Job Impacts for Expanded Broadband Availability		
	Population Growth Rate		
	4% per annum	5% per annum	6% per annum
3-years	55	72	93
6-years	39	64	85
9-years	25	55	93
Total	119	191	271

The above table shows that there are significant job impacts for Custer County, even with variable population growth rates.

5.1.1 Teleworker and Home Business Job Impacts

Expanded broadband availability provides an opportunity for Custer County to increase inward migration of younger working age people with families who are able to telework. In addition, the same demographic that may be self-employed, or operate a home-based business cannot have broadband availability as a barrier to relocating into Custer County.

As with the employer-based employment projections, the following charts project the increase in teleworkers and non-employer establishments, i.e. those self-employed and with a home businesses. The projections compare the Status Quo and Expanded Broadband Availability scenarios, with 4%, 5%, and 6% population growth respectively. Increased use of teleworking and a higher percentage of non-

employer establishments is assumed as a basis for the higher population growth with expanded broadband availability.

Teleworker Impacts			
Estimated Teleworker Impacts from Expanded Broadband			
Population Growth Rate			
Timeframe	4% per annum	5% per annum	6% per annum
3-years	98	114	131
6-years	114	142	170
9-years	136	174	218
Total	348	430	519

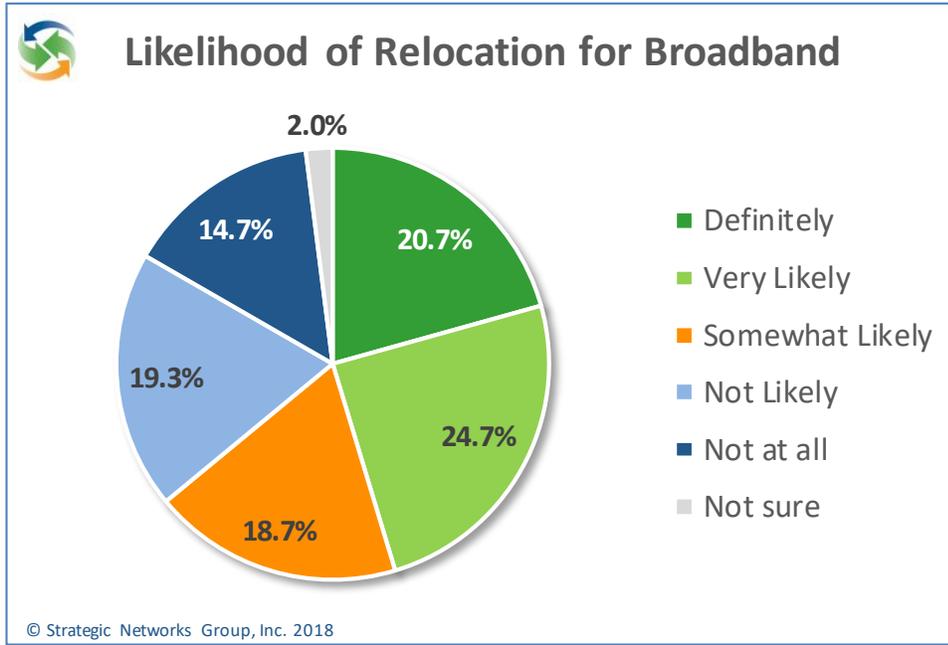
Home Business Impacts			
Home Business Employment Impacts from Expanded Broadband			
Population Growth Rate			
Timeframe	4% per annum	5% per annum	6% per annum
3-years	159	185	212
6-years	207	250	297
9-years	269	338	412
Total	635	773	921

The projection for 2029 shows an additional 430 teleworkers and 773 non-employer establishments with expanded broadband availability. This represents a significant additional source of employment and household income as a result of broadband over and above the employer-based employment.

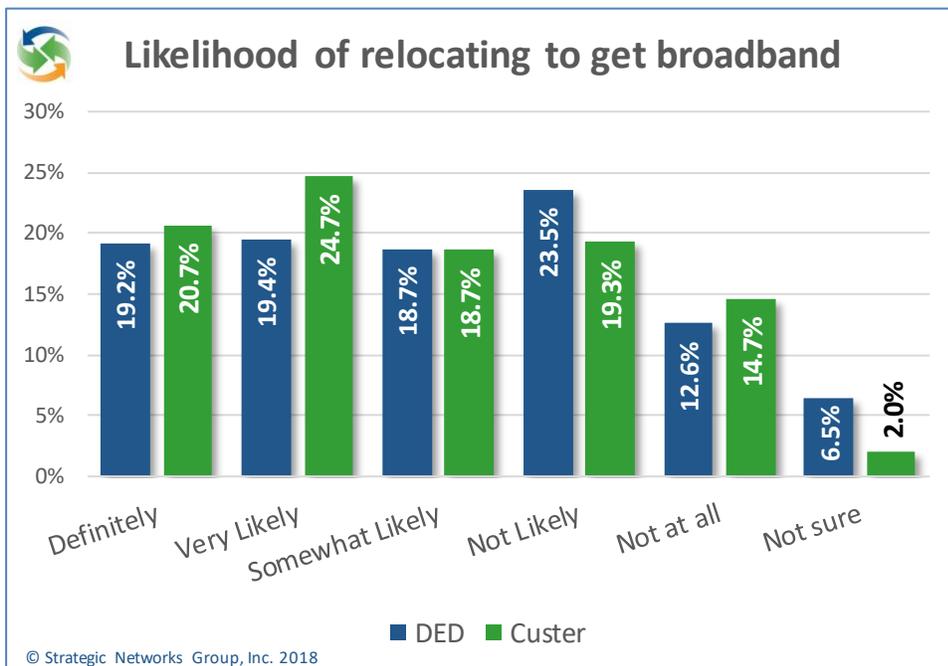
5.2 Household Impact Analysis

Importance of quality broadband for household location

Households were asked, if they could never get broadband service, how likely is it that they would relocate to a community that offers broadband

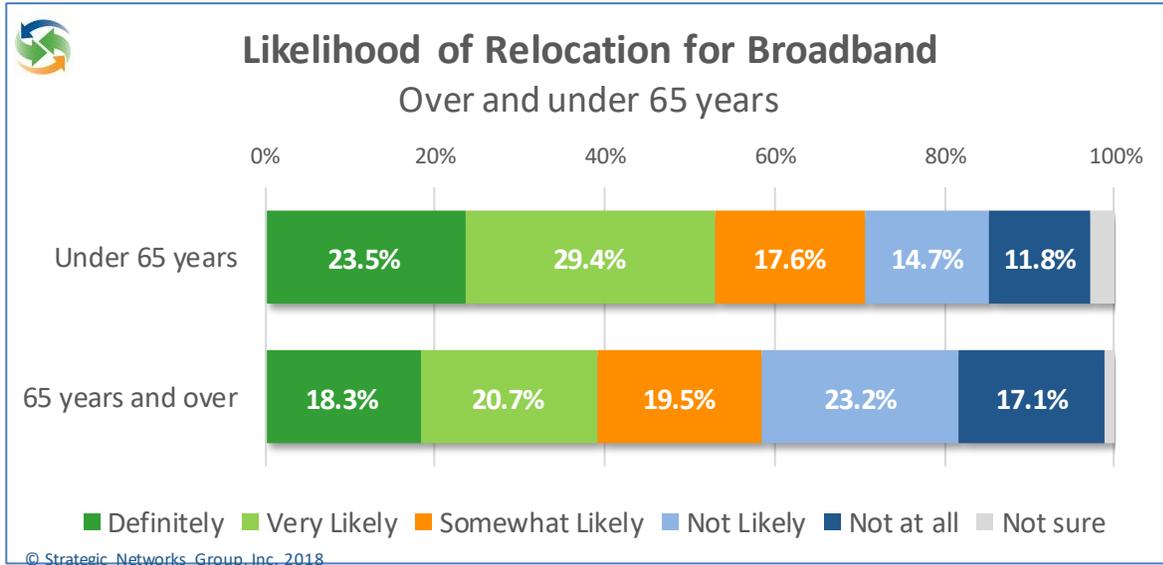


More than 45% expressed a strong likelihood that they would relocate to get quality broadband. This likelihood is higher for Custer residents than other rural areas.

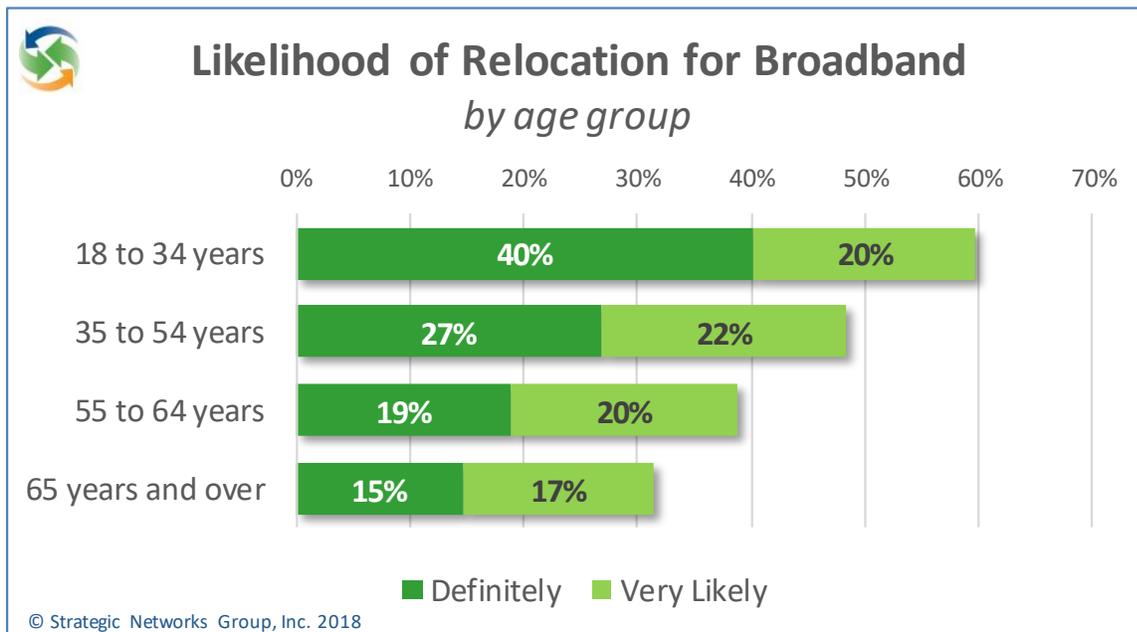


Likelihood of relocation by age group

The under 65 cohort is more likely to relocate for quality broadband compared to the over 65 age group.



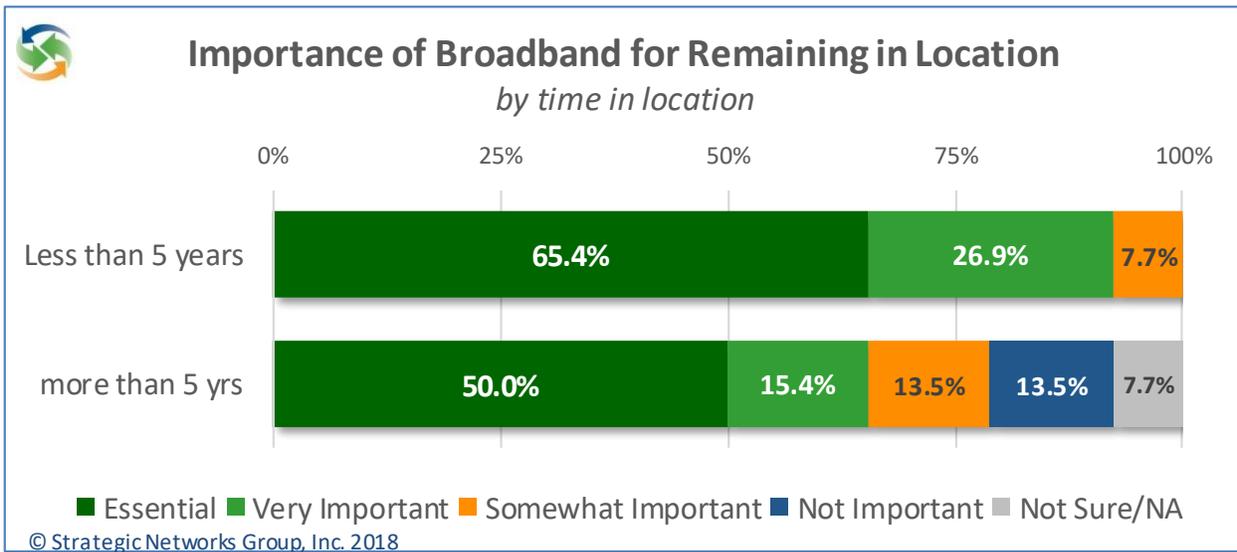
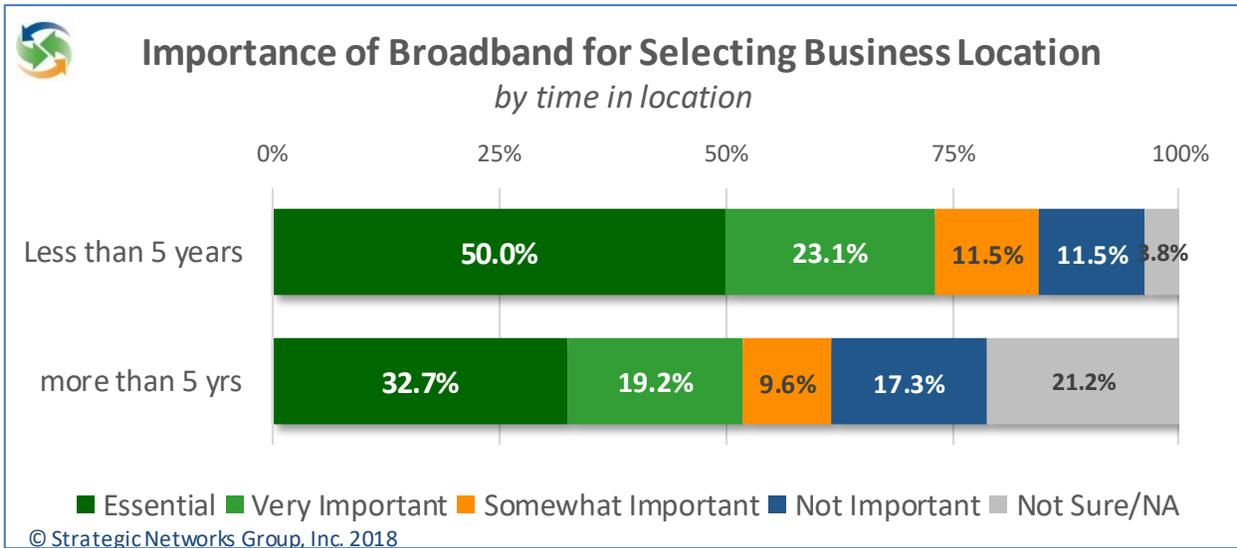
This is consistent with other DED data (below) by age groups and has implications not only for retaining the younger, working age demographic, but also for attracting these age groups to Custer County. The likelihood for these age groups to remain in a location also indicates their likelihood to relocate into a location that doesn't have quality broadband.



The lack of quality broadband will have a depressive impact on inward migration to Custer County for the important working age demographic.

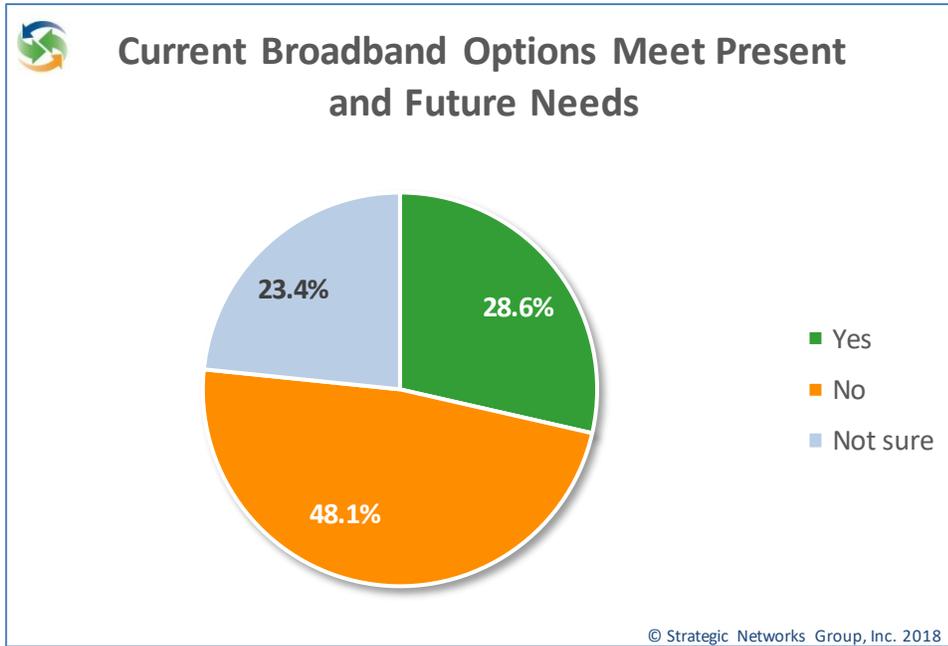
5.3 Business Impact Analysis

Importance of Broadband for Business Location – Selecting and Remaining



Broadband is considered by the majority of businesses to be essential for remaining in their location. Considering that almost 50% of businesses do not view current broadband options as being adequate and a similar percentage are dissatisfied with their current connectivity, there is a very real risk that other businesses in the county will consider relocation.

Businesses and organizations were asked if the internet connectivity options currently available would meet their current and future needs. Less than 30% felt that current options would meet their needs, while almost half said they would not.



5.3.1 Impacts of Broadband on Business Location

Those who said “No” or “not sure” about whether “Current Broadband Options Meet Present and Future Needs” were asked how the lack of quality broadband would be likely to affect them in the future.

	Close Business	Relocate out of County	Relocate within County	Stay put and make do
Most likely	3.6%	10.7%	8.9%	37.5%
A real possibility	14.3%	14.3%	23.2%	14.3%
A remote possibility	30.4%	28.6%	21.4%	19.6%
Not at all likely	25.0%	21.4%	21.4%	17.9%
Not an option	26.8%	25.0%	25.0%	10.7%

Note: Organizations could select likelihood for each outcome. Percentages are shown for likelihood of each outcome (columns add to 100%).

The most likely outcome for most organizations would be to “Stay put and make do” with what was available. Closing or relocating is not an option for some businesses and organizations, since location is integral to their operation.

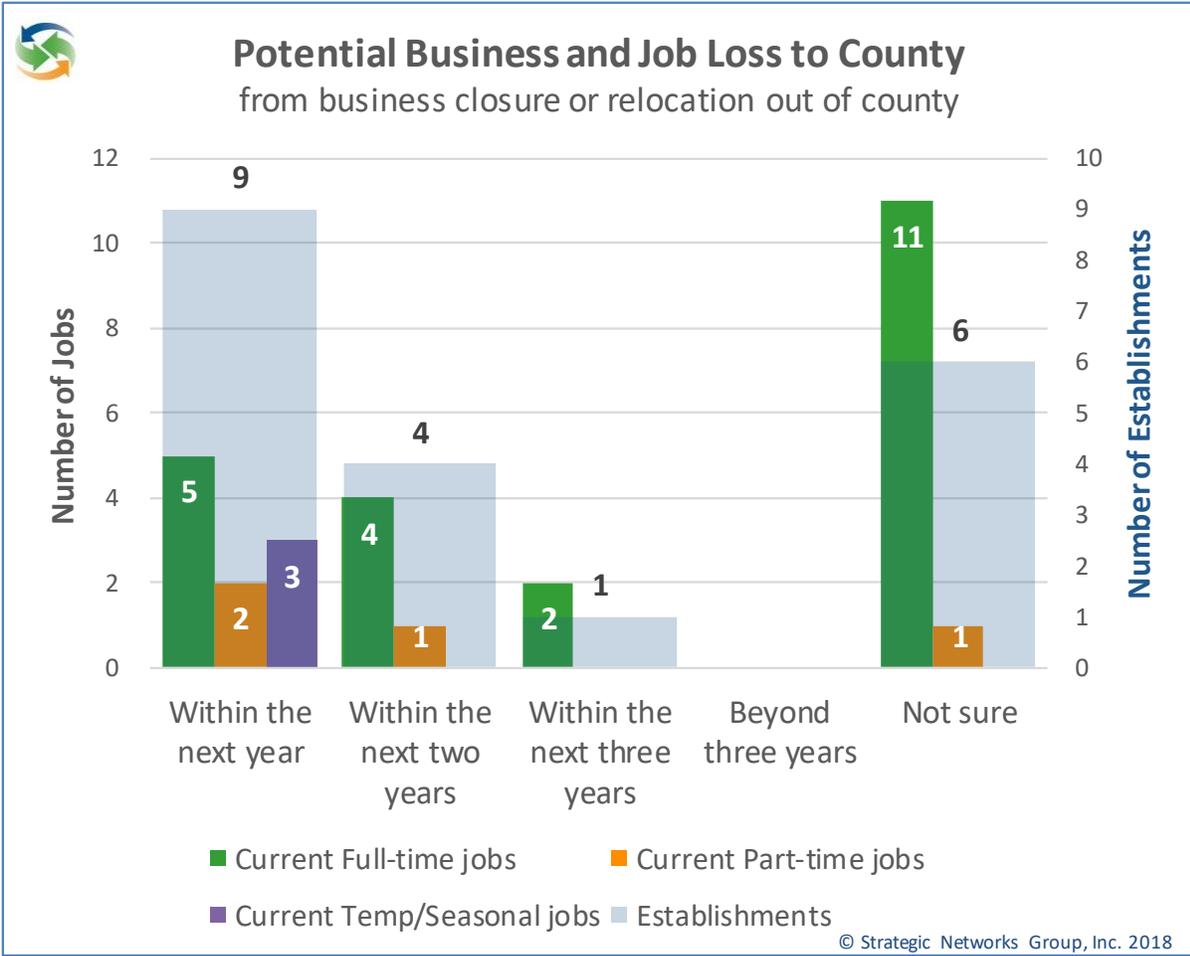
However, this table shows that there is a real possibility that some businesses would close down (18%) or relocate out of the county (25%). It is also telling that to “Stay put and make do” is not an option for about 10% of businesses.

Those who indicated a likely or real possibility of closing or relocating were asked the timeframe when that might happen. The majority responded that the timeframe would be within the next two years.

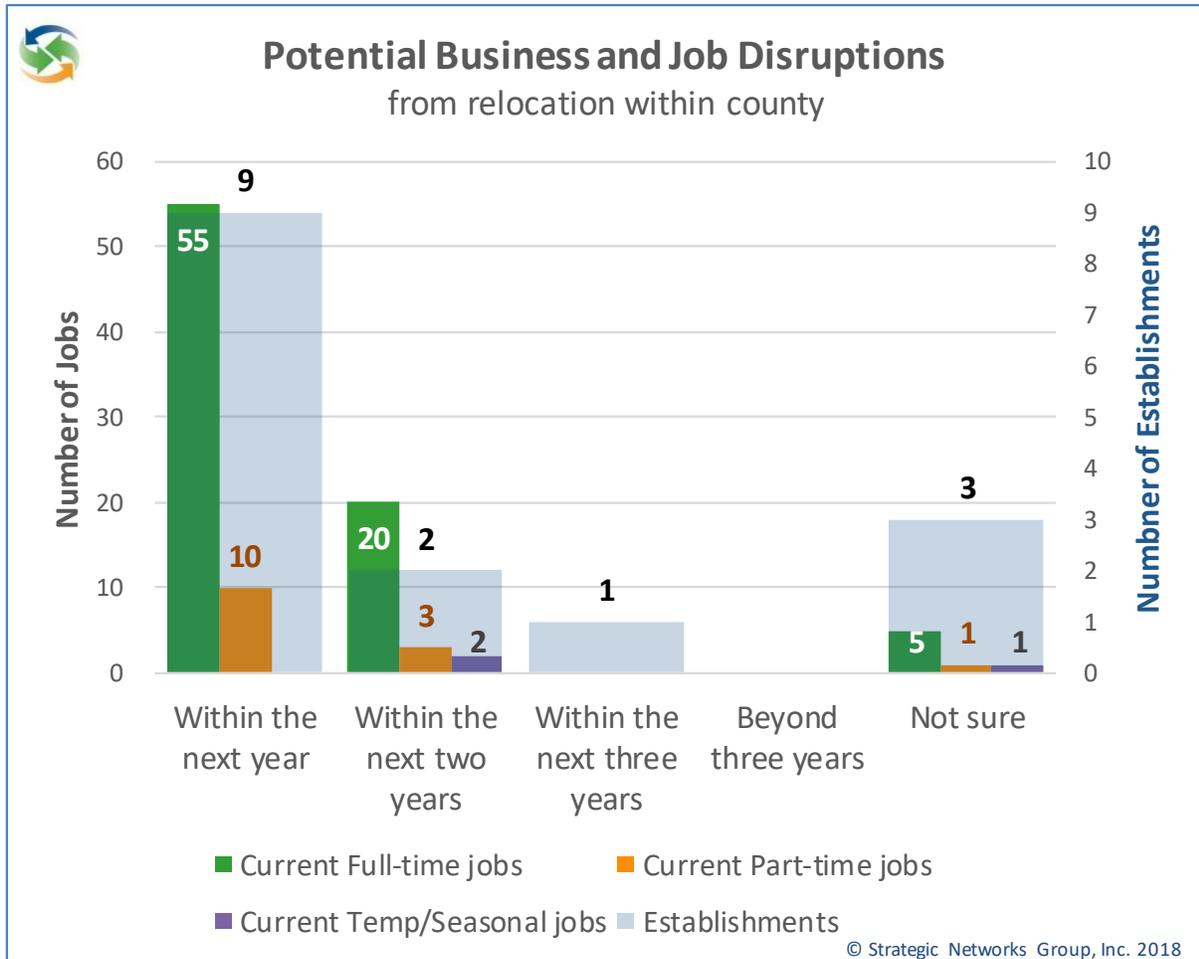
5.4 Job Losses from Not Having Broadband

The closing of a business or the relocation of a business out of the county would have a direct impact on the jobs they support. Those businesses that would relocate within the county may not create a job loss, but it would create disruption both to the business operations and the possibility that some employees would choose not to follow the business to its new location.

20 businesses with a total of 29 jobs are at risk from closing or relocation out of county.



An additional 15 businesses are facing potential disruption due to relocation within the county, adding risk to another 97 jobs.



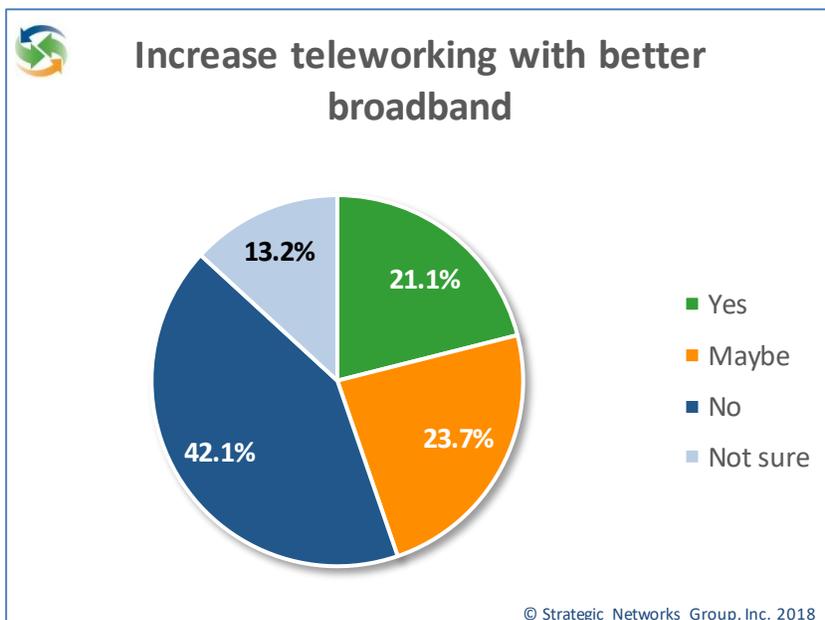
Only one business that would stay put identified a risk of downsizing staff as a result, but none indicated and expectation of job growth.

5.5 Teleworking Impacts

- People do telework
 - 20% of rural households
 - 27% for Custer
- Teleworking households have high incomes
 - 83% of rural teleworking households have income over \$50,000
 - 90% for Custer
- Teleworking helps workers and their households
 - 55% achieve their career goals through teleworking; 41% for Custer
 - 43% would not have their present job without teleworking; 48% for Custer
 - 35% avoid relocating for work because of teleworking; 52% for Custer
- Teleworking households are more likely to relocate for quality broadband than non-teleworking households
 - Definitely relocate – 39% vs. 17%
 - Very likely relocate – 24% vs. 19%
- The majority of teleworkers are in the 34 to 55-year age group – the prime income earning years.
 - 53% of teleworkers vs. 40% of non-teleworkers

5.5.1 Teleworking – Business Perspectives

51% of the organizations participating in the Custer research currently use or offer teleworking to their employees. These organizations were asked if they would increase the number of employees teleworking if sufficient, quality internet connectivity was available to them. One in five said they would with only four in five definitely saying they would not.

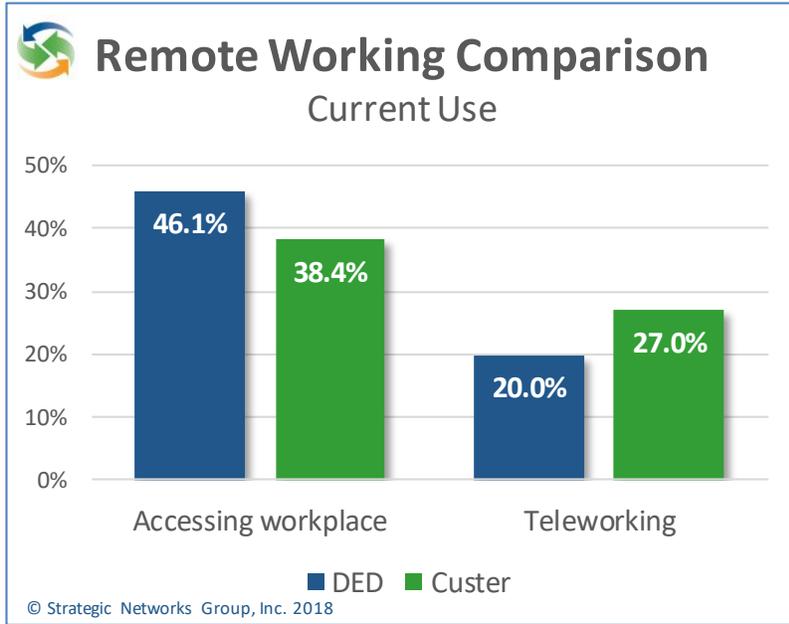


Those organization not currently offering teleworking to their employees were asked if they have employees that would be eligible to telework (e.g. based on their job requirements). Only half of those

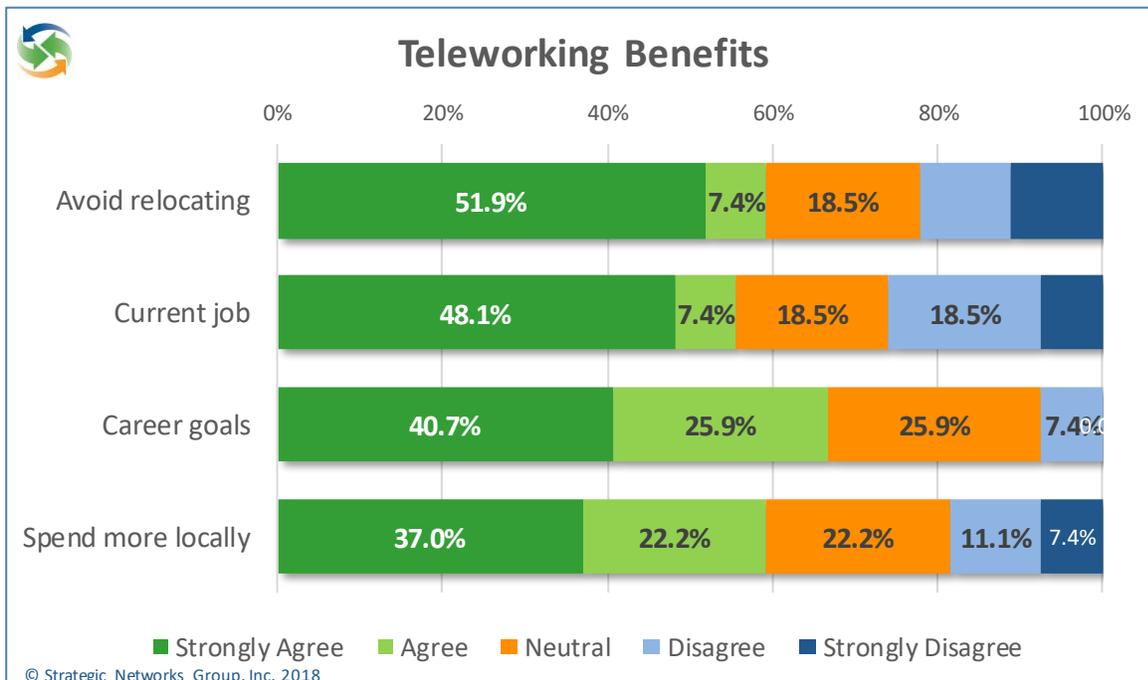
organizations have employees at all, but three out of four of those with employees feel that some employees would be eligible to telework.

5.5.2 Teleworking – Household Perspectives

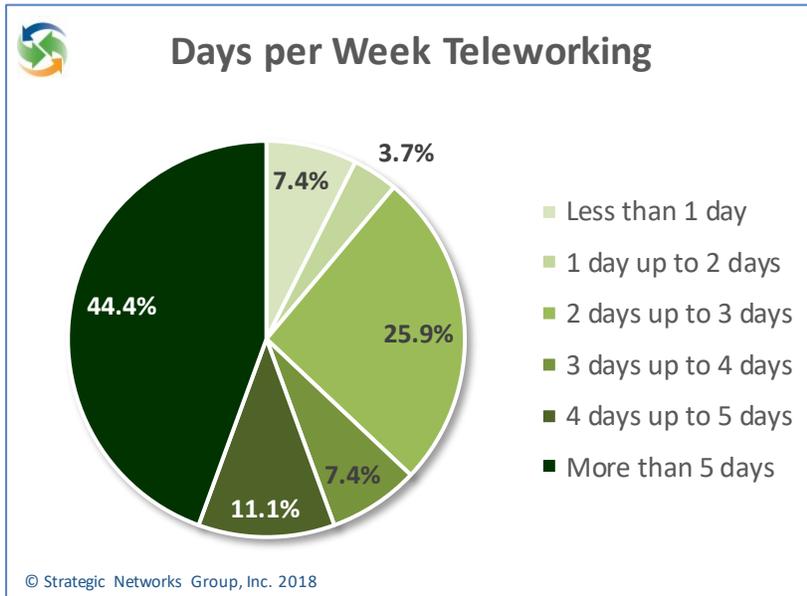
A higher proportion of Custer households telework despite the much higher proportion of retire people.



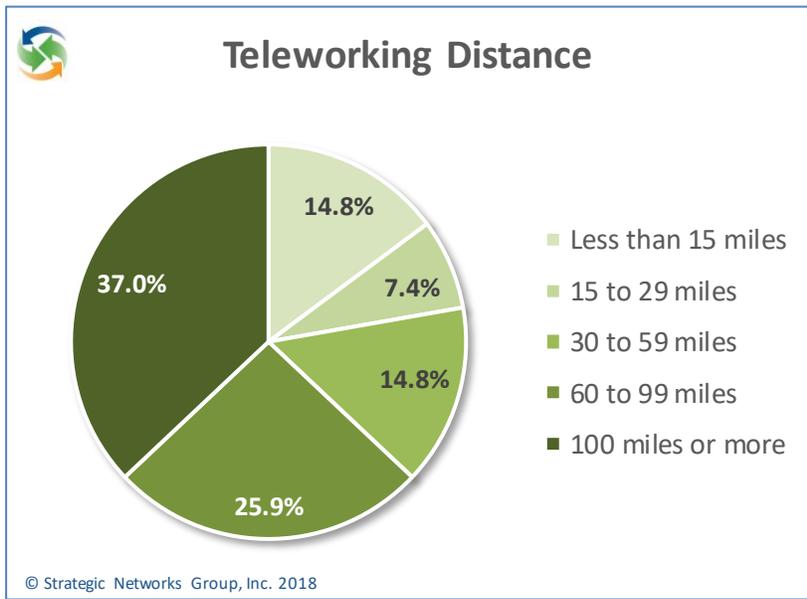
More than half of Custer teleworkers strongly agree that teleworking allows them to avoid relocating for work reasons. Almost half strongly agree that they would not have their current job without the ability to telework.



Custer teleworkers do so on average 4 days per week, with 44% teleworking full time (5 or more days per week).



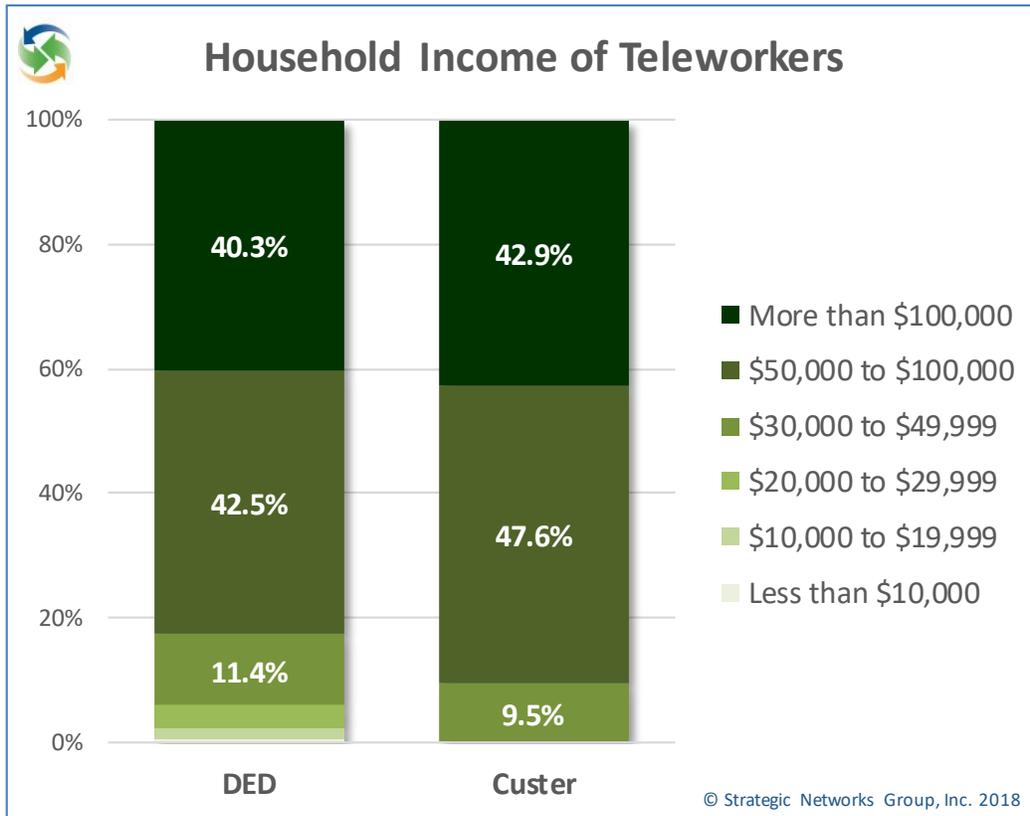
78% of Custer teleworkers avoid a daily commute of over 30 miles (one-way), with the average daily commute avoided estimated to be 86 mile (one-way).



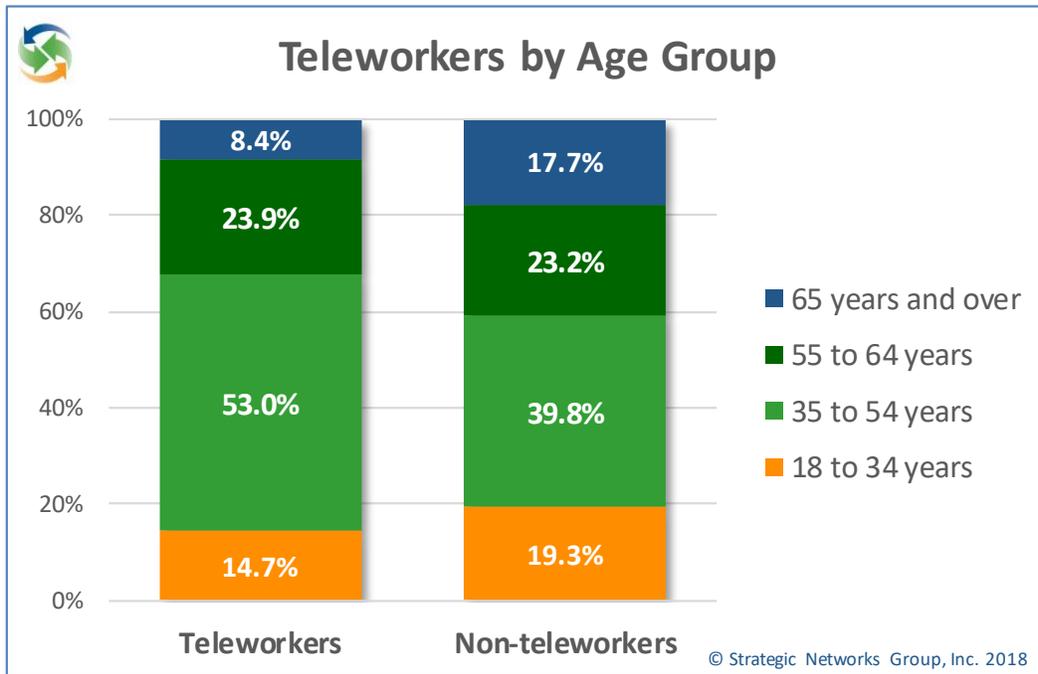
The top 5 Custer County teleworker industries are:

1. Retail Trade – 25%
2. Agriculture / Forestry / Fishing – 12.5%
3. Arts, Entertainment & Recreation – 12.5%
4. Professional & Technical Services – 12.5%
5. Real Estate – 12.5%

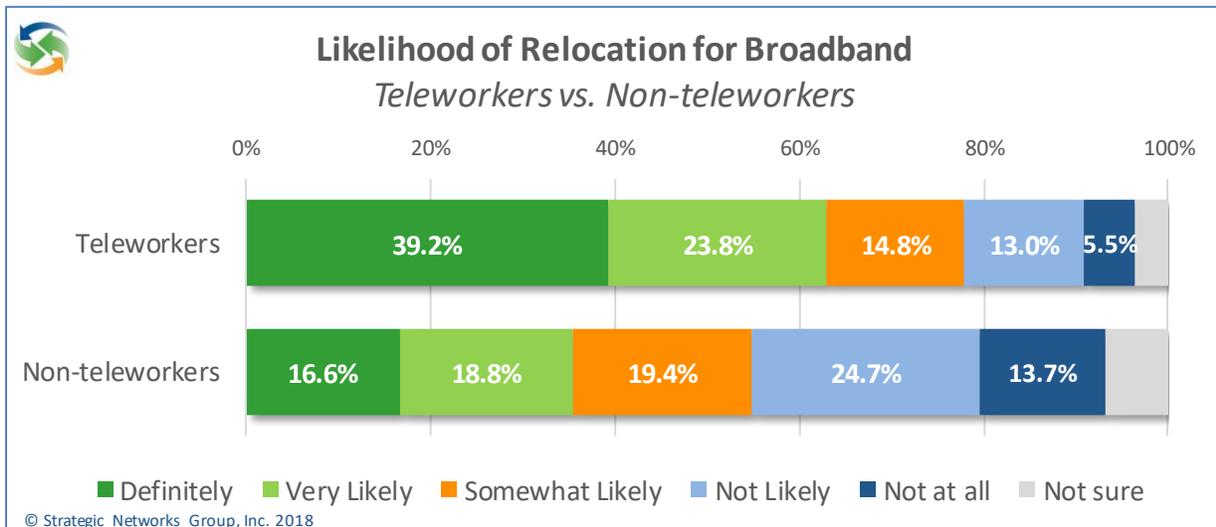
The vast majority of teleworking households are in the higher income ranges (more than \$50,000 per year), indicating that the opportunity to telework is associated with higher income employment.



Teleworkers tend to be more in the 34 to 55 year age bracket than non-teleworkers, typically the prime age group for earning.



Teleworking households are more likely to relocate for quality broadband than non-teleworking households, further indicating the importance of broadband for teleworking. This tendency has equivalent implications for attracting teleworkers to Custer County.



5.5.3 Teleworking Impacts on Costs and Environment

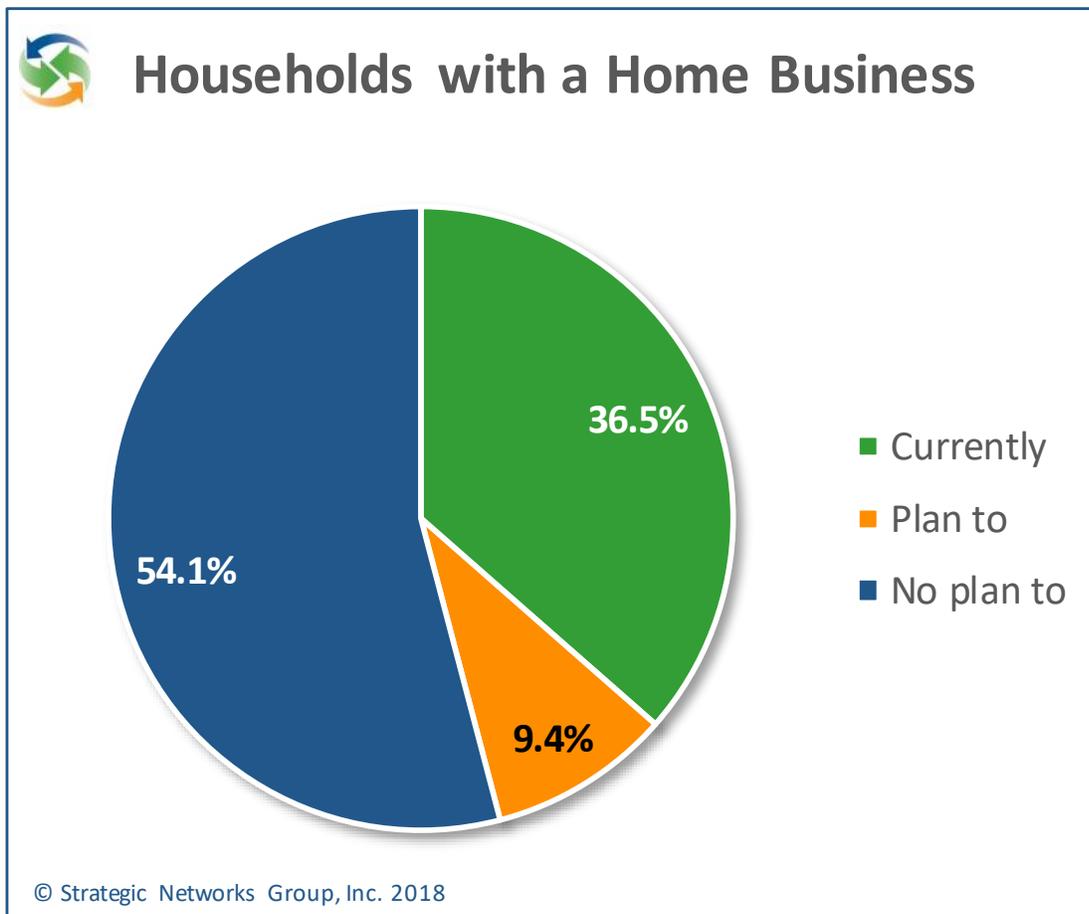
Teleworking can provide significant labor productivity benefits, as well as environmental benefits. SNG has collected data from teleworkers on trip-miles avoided and commuting hours saved to quantify the fuel costs saved and CO₂ emissions avoided.

Cost Reductions and Environmental Benefits – Assuming single passenger vehicle travel			
Dimension	Averages Per Commuter	Total	Units
Teleworkers	1	27	
Trip-miles per year (avoided)	31,306	845,250	Miles
Commuting hours per year	978	26,414	Hours
Fuel consumption per year	1,423	38,420	US gallons
Fuel cost per year	\$19,034	\$513,912	
CO ₂ emissions per year	0.24	7	Metric tons

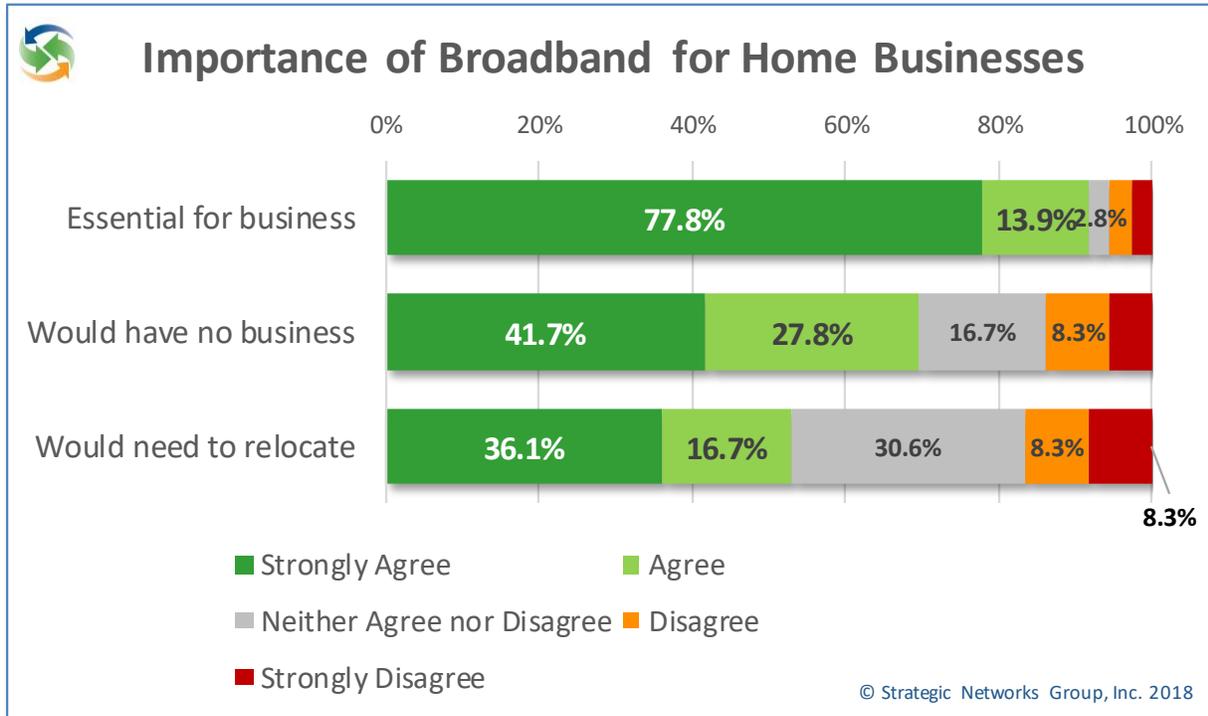
5.6 Home-based businesses

- A significant number of households have a home-based business
 - 22% of rural households, with another 14% planning to
 - 37% of Custer households, with another 9% planning to
 - 57% of businesses respondents in Custer are also home-based businesses
- Broadband is essential for most home business owners
 - 78% say broadband is essential for their business to operate effectively
 - 42% would not have a business without broadband and 36% would need to relocate without broadband
 - The top three industry categories for home businesses, representing 50% of the total, are: Retail trade, Professional and technical services, and Other services.
 - Online retail businesses and a variety of solo professional services can be operated from virtually any location with robust broadband
- 22% of rural households have either a home business, or teleworker, or both.

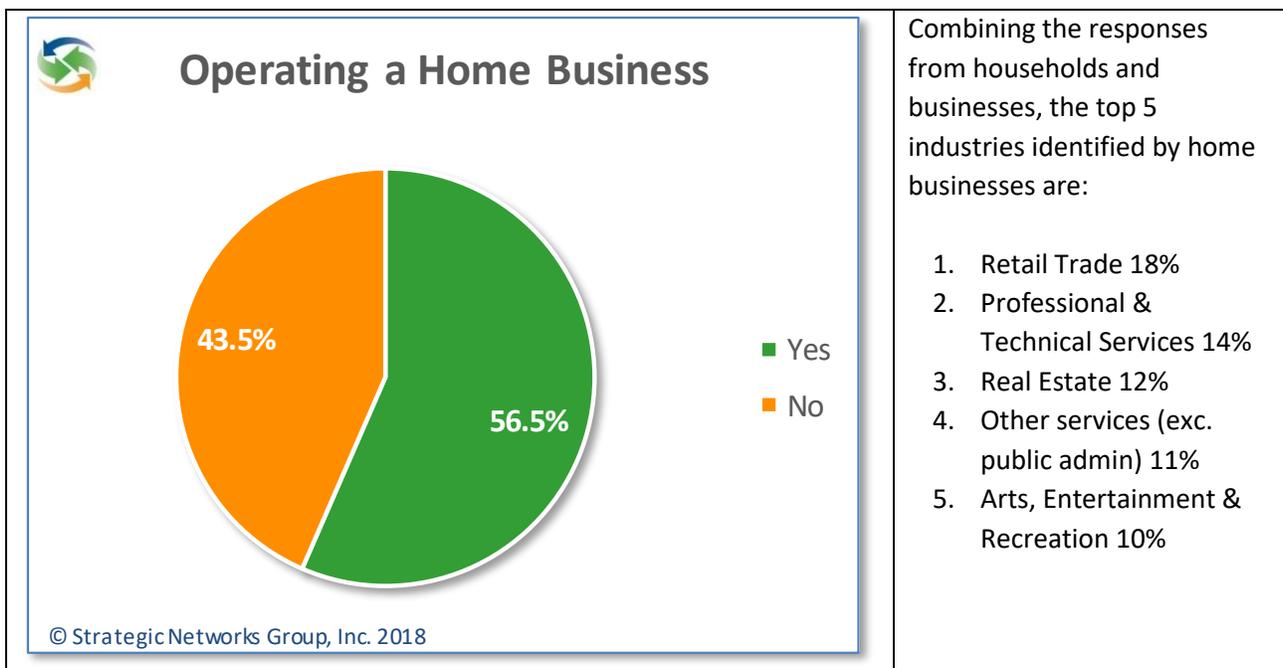
Households were asked if they operate a home-based business.



Broadband is essential for home businesses and insufficient broadband would put a significant percentage at risk. 36% (13 home businesses) strongly agree that they would need to relocate without quality broadband. This tendency has equivalent implications for attracting self-employed and home business operators to Custer County.

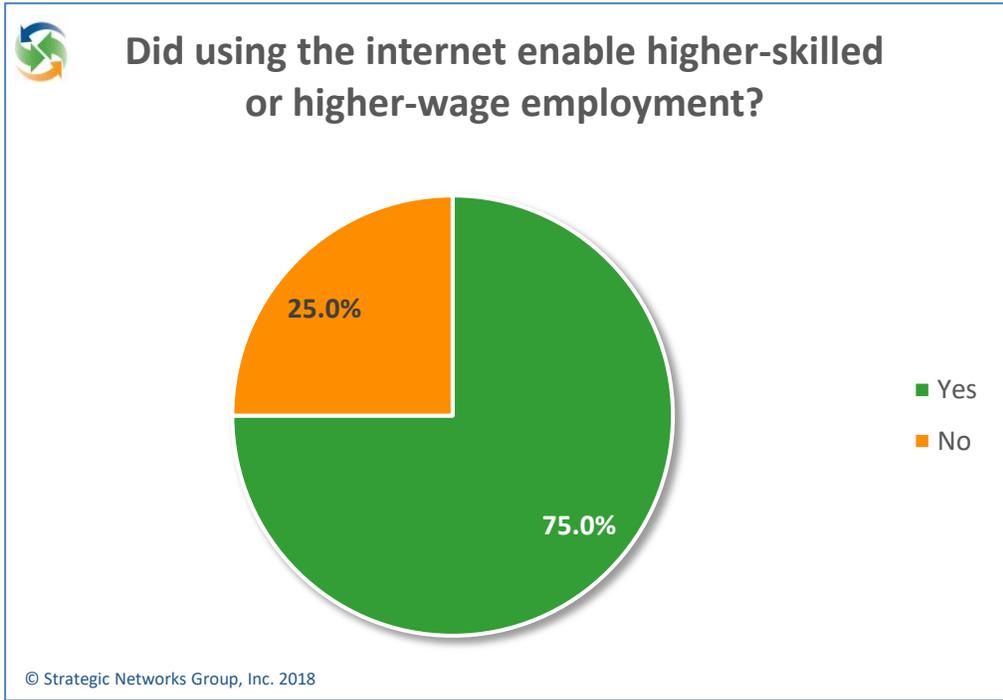
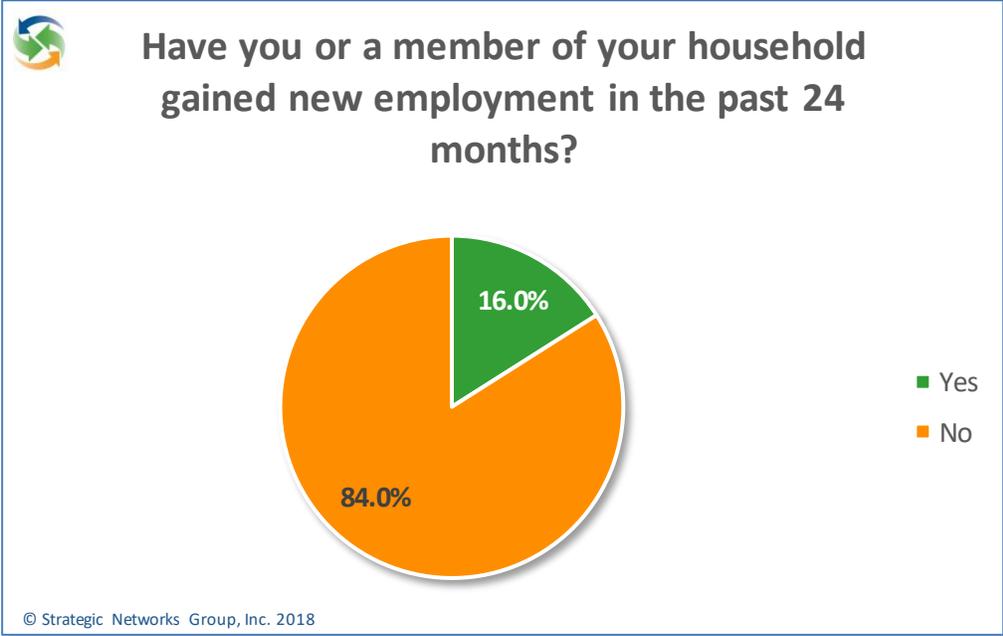


Organizations were also asked if they operate as a home-based business. All of the home businesses are small, but about two-thirds have employees.



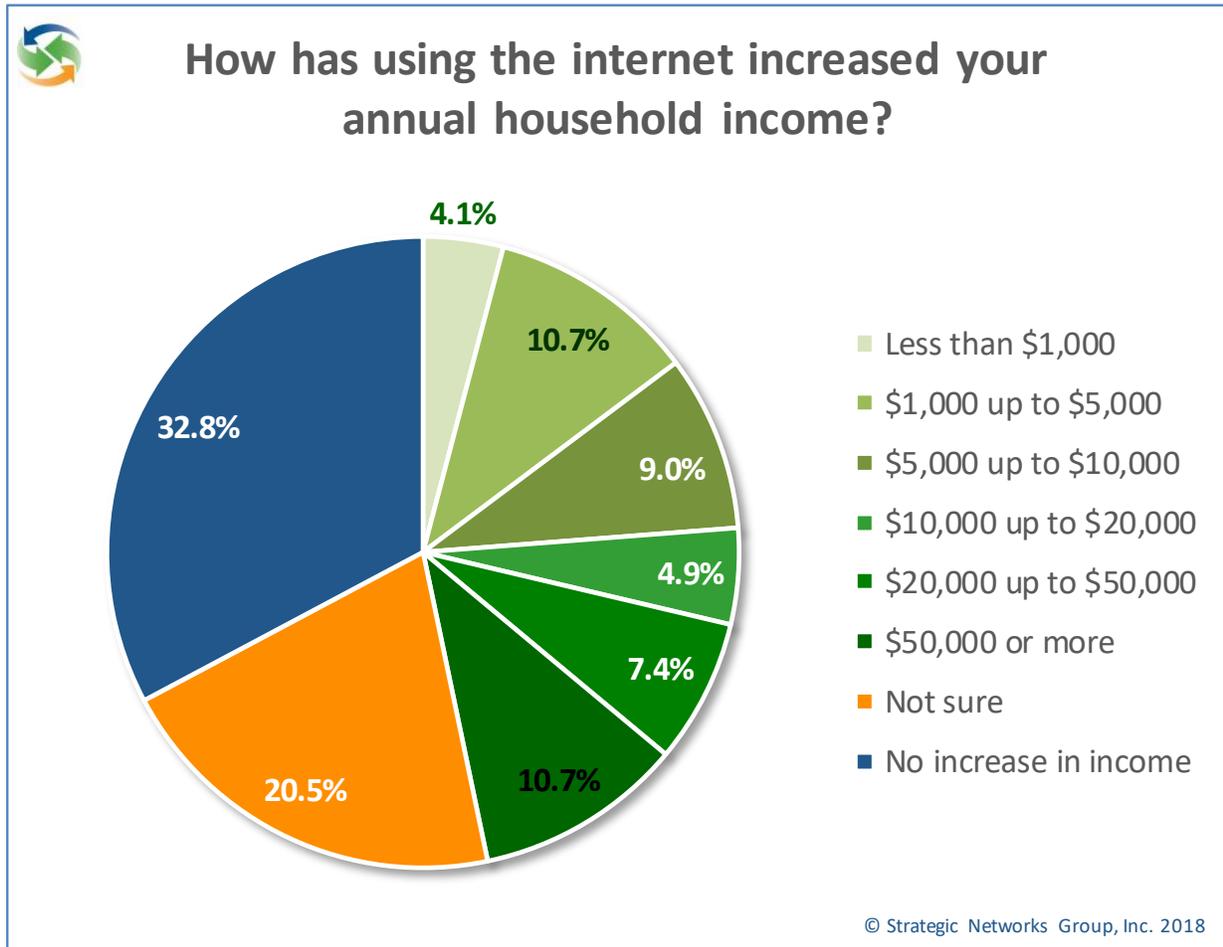
5.7 Better Employment for Custer County Residents

Using the internet can help people find and secure higher-skilled or higher-wage employment. While only 16% gained new employment in the past 24 months, 75% of those were higher-skilled or higher-wage jobs.

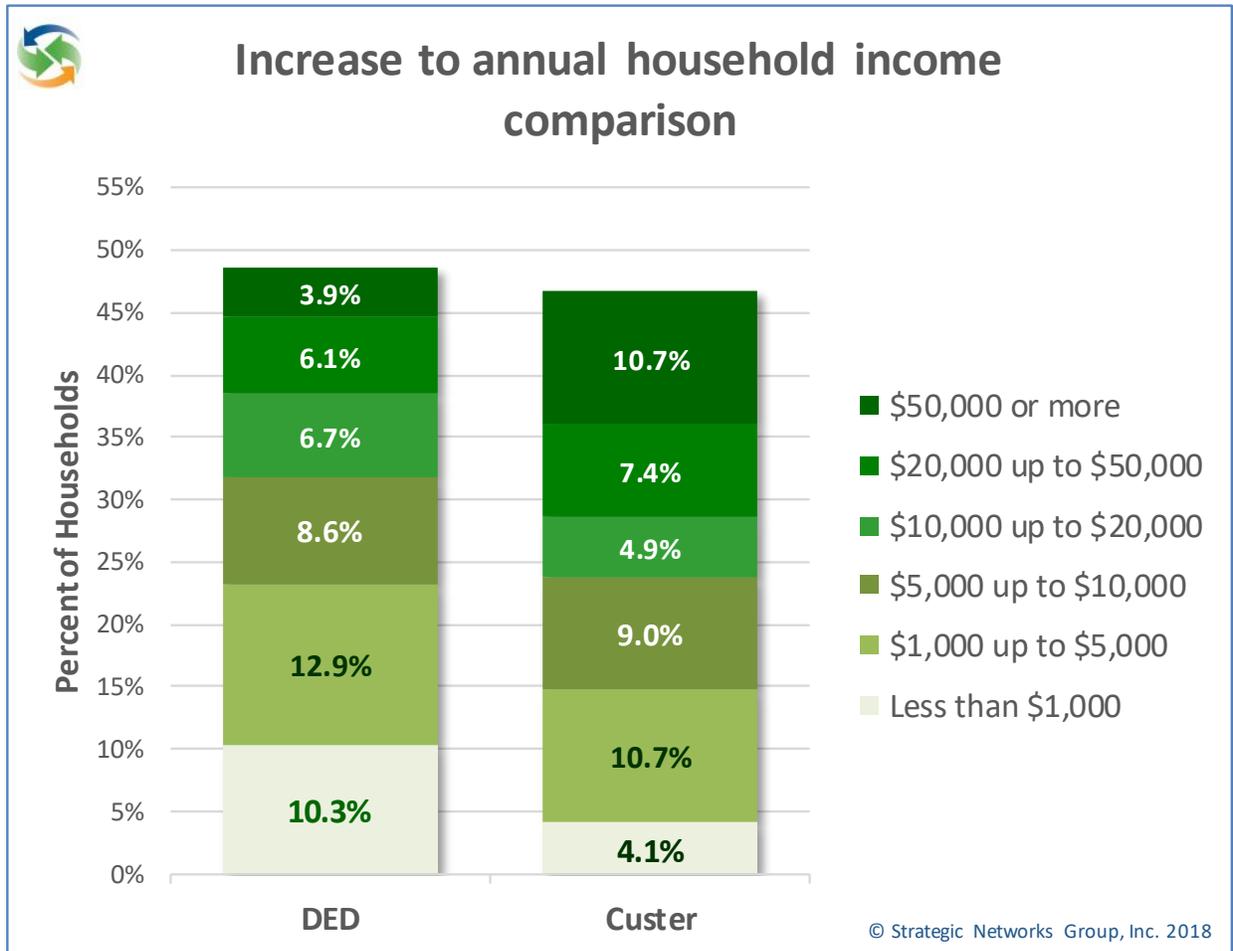


5.8 Household Income Increase from Internet Use

Households were asked to what extent their use of the internet has contributed to their household income. Over 42% reported an increase in household income from the internet.



A similar proportion of Custer households report additional income, but a higher proportion are in the higher income ranges.



6. What Broadband Means for Custer County and Next Steps

“Why should we care about broadband?” is a question that is asked less and less in communities, but needs to be answered from the outset for any broadband, or digital infrastructure initiative. As with any investment, be it public or private, there needs to be clarity and understanding of the extent to which benefits outweigh the costs – otherwise the case for investing time, money can be difficult to justify.

6.1 Key Groups for Custer County and Why Broadband Matters to Them

Using findings from the April-May 2018 data collection and combining them with Colorado Department of Labor data, SNG has worked with Custer County Economic Development Corporation (CCEDC), a not for profit organization, to develop six typologies that represent the most significant demographic groups within Custer County – currently and going forward.

The six groups are characterized below with typology analyses on what broadband could and should mean to each of them, i.e. personalizing the value of broadband to their needs and wants. Details for each analysis can be found in the body of the report.

A) Retirees / Second Home Owners

Retirees are a significant demographic for Custer County with a median age that is 20.4 years older than the state⁹ median. There is also a significant number of second home owners in Custer County with only 45.9% of their housing units occupied¹⁰ full time. Up to 50% of residential properties are used as second homes by out-of-county residents and many of these properties are used as rentals for seasonal visitors.

SNG Research profile:

- 54% of respondents from data collection are over 65 years of age, compared to 28% of county population over 65 years (Source: <https://datausa.io/profile/geo/custer-county-co/>).
- High income, well educated.
- 39% of the 65-plus age group very likely to relocate without the availability of quality broadband.

Opportunities through broadband and digital transformation

- a. Quality of life improvements for retirees through:
 - i. tele-health – access to health care and information is a top concern for an older demographic, especially in a rural county where local health care services are limited.
 - ii. social networking, etc. – to stay in contact with family and friends.
 - iii. On-line retail shopping (including a growing amount of food purchases).

⁹ Colorado State Demographic Office; Community Profile for Custer County; Print Date 05/07/2018. Custer County has a significant older demographic with median age for females 55.3 years (compared to median female age for Colorado at 37.4 years) and median age for males at 59.2 years (compared to median age of males in Colorado at 35.5 years).

¹⁰ Colorado State Demographic Office; Community Profile for Custer County; Print Date 05/07/2018

- b. Security through remote monitoring for home-owners when they are away from their Custer County properties
- c. New income opportunities for retirees and second home owners from room or house rentals through online marketplaces
- d. Second home owners can spend more time in Custer when well-connected, with more local spending.
- e. Second home owners may become full time residents with sufficient connectivity.
- f. Increase in property values when properties have broadband access

B) Teleworkers

Teleworking represents a significant income generator for Custer County households with 42.9% of teleworking households earning more than \$100,000 per year and another 47.6% of teleworking households earning \$50,000 to \$100,000 per year. 27% of households teleworking and 55.5% of teleworkers work more than 4 days per week from home.

SNG Research profile:

- Almost half of household respondents strongly agree that they would not have their current job without the ability to telework.
- 44% of respondents telework full-time (more than 5 days a week).
- 52% of teleworkers say that teleworking allows them to avoid relocating for work. Without reliable, sustainable broadband it will be difficult to keep these teleworkers as residents, let alone attract new ones who wish to live in Custer County for the quality of life but who have to earn their income outside of the county.
- 51% of the organizations participating in the Custer research currently use or offer teleworking to their employees. Asked if they would increase the number of employees teleworking if sufficient, quality internet connectivity was available to them – one in five said they would.
- Of the 27 respondents who telework, there is an estimated annual savings of \$19,000 in fuel costs per teleworker – or a total of \$513,912 in fuel costs and 7 Metric tons in reduced CO2 gas emissions annually.

Opportunities through broadband and digital transformation

- a. Adding new tele-work opportunities through inward migration
- b. New telework opportunities for unemployed and underemployed already living in Custer County

C) Home Businesses

The majority of businesses in Custer County, in terms of number of businesses, can be considered home based. There are 135 employer establishments¹¹ in Custer County with a total employment of 569, compared to 683 non-employer establishments. Home-based businesses are an important category of current economic activity in Custer County and expected to remain so for the future.

SNG Research profile:

- 36% of household respondents had a home-based business
- 56% of business respondents operate as a home-based business
- 78% of respondents said their broadband connection was essential for their business
- 11% of respondents said broadband increased their income by over \$50,000 per year

Opportunities through broadband and digital transformation

- a. Marketing online.
- b. Underemployed / unemployed.

D) Increased income and new income opportunities to address poverty, opportunities for young people, and workforce readiness

17.9% of the population for whom poverty status is determined in Custer County, (772 out of 4,304 people) live below the poverty line, a number that is higher than the 14% national average. Furthermore, 40% of households in Custer County earn less than \$30,000 per year. The largest demographic group living in poverty is Male 55-64, followed by Female 45-54 and then Female 65-74. Source:

<https://datausa.io/profile/geo/custer-county-co/>

SNG Research profile:

- 11% of participating households reported less than \$20,000 in annual household income.
- 25.6% of respondents are in the 55-64 age group, which is the largest demographic in Custer County living in poverty
- 57.7% of residents are retired, of which 11% reported household annual incomes below \$30K

Opportunities through broadband and digital transformation

There are new income opportunities through telework and home-based businesses that can have a significant impact on Custer County residents who are unemployed or under-employed. Reliable broadband is a necessity for them if they are to take advantage of such opportunities to work remotely, to access new customers online, etc. Broadband also enables low income households to augment income, through side-businesses or additional work opportunities, which can make a significant difference to monthly income of households.

¹¹ US Census Bureau Quickfacts 2016

It is important to note that although broadband is necessary, it is not a sufficient condition for creating new income or business opportunities. Those who are unemployed, or underemployed need training and support to:

- Become aware of new opportunities – and that if their neighbors down the road are doing it, why can't they as well?
- Have affordable access and the skills to use telework and online business applications
- Become workforce ready, with the necessary training and support based on their needs

There are numerous existing programs and support options available to Custer County residents to help them through this process, which includes:

- A group of successful teleworkers and home based businesses that are local role models who can share their experiences. They are potential coaches who if asked, may be interested in sharing with others what they have learned.
- An outstanding community library in Westcliffe that already is a resource in supporting teleworkers and home based business people.
- State and federal programs and support for workforce readiness.

“Creating new opportunities for work and economic growth” is the number two (2) priority for businesses and number three (3) priority for households in terms of Custer County community goals (see Section 2.3). A local economic development strategy needs to incorporate an action plan to include how Custer County residents can realize these new opportunities for telework and home based businesses. These represent significant and sustainable opportunities to create new jobs, address local poverty, and grow the local economy.

E) Tourism

Tourism is a current and future economic driver for Custer County. The tourism industry has transformed online. Operators who cannot be found online risk becoming irrelevant, i.e. not found by the increasing number of people who search online. As 80% of businesses are small (less than five employees), they need awareness and technical support so they can understand what they need to do to stay relevant by implementing the necessary infrastructure and online tools.

Broadband access for tourists is also important for those who want to find out about local activities, services and stores – and want to stay connected. Expanding the broadband footprint through fixed wireless and the Main Street Wi-Fi System will enable tourists to find out more about what is available, to stay longer, and to spend more in Custer County.

SNG Research profile:

- Tourism related businesses represent 42% of employment (105 of the 205 jobs in Custer County from businesses that responded to SNG's [eSolutions Benchmarking](#) survey)
- 80% of respondent businesses have less than 5 employees
- Retail trade is the number one home-based business in Custer County, representing 18%. Art and entertainment is number four, representing 10%.

- 59% of business respondents are underutilizing online applications (i.e. they have a DEi score under 7). SNG's significant data and research shows that financial impacts to businesses are realized by businesses with DEi scores greater than 7.

Opportunities through broadband and digital transformation

- a. Provide guidance and technical support to increase the effective use of online business tools, especially by small businesses, to help them reach new markets, expand and deepen their customer base, etc.
- b. Online marketing of the amenities of Colorado, but without the traffic nor higher costs since Custer County is off the 'beaten path'. For example, designation as a Dark Skies community is a tourism draw to Custer County from around the globe.
- c. New job opportunities for under-employed / unemployed from growing tourism business

F) Agriculture / Ranching / Farming

Agriculture has been a traditional economic base for Custer County with livestock and crop sales. Technology-enabled tools and agricultural practices not only enable ranch and farm operators to remain viable, but also to expand and diversify their service offerings. Some examples include:

- Raising cattle on grass feed is a premium product that can be marketed directly to customers, eliminating middle-men, and command prices that are multiple times what historically ranchers have received.
- "A Painted View Ranch" and "Music Meadows Ranch" are good examples of this where professional and user-friendly websites with accompanying online marketing have expanded a horse and a cattle ranch into tourism destinations.

6.2 Next Steps

Going forward, based on the research and findings for this report, below are key next steps that SNG recommends for Custer County:

1. The data collected in April and May 2018 in Custer County and presented in this report provides elements of a baseline from which broadband speeds and demand were assessed. Although a response rate of 8-10% is good, greater participation in the survey would provide more baseline data with which to assess and benchmark broadband speeds and demand. Re-launching the [eSolutions Benchmarking](#) survey anytime between now and when the new broadband service is offered, would augment the baseline data with which to benchmark incremental impacts in terms of new jobs, economic growth, and community benefits.
2. Following up with businesses, organizations, and households that have completed the survey can be started 1 to 2 years after the baseline data collection to track incremental growth from broadband in terms of new revenues, cost savings, new jobs, etc.
3. 59% of businesses in Custer County are underutilizing their internet connection. To help local businesses, organizations, and households realize the full potential benefits from broadband in Custer County, there is EDA funding available for outreach and engagement campaigns that raise awareness and provide technical assistance in order to drive effective use of broadband and online applications. Such campaigns can accelerate economic and community benefits for Custer County.

Appendix A - Economic Impact Estimate for Custer County

The following is SNG's Economic Impact Estimate for Custer County which uses SNG's normative database on broadband connectivity, use, and impacts to estimate new jobs, increased GDP, and tax base impact. For further details, please see: <http://sngroup.com/impacts/> or SNG's white paper on [Economic Impacts through Broadband](#).

Broadband Utilization Economic Impact Model

Estimate of economic impacts from business adoption of eSolutions for selected geographies and industry profiles.



Select a State
(Leave blank for entire state; Select Multiple for more than one county)
Select a County

Scenario Parameters	Inputs and outputs
Target Profile ⁽²⁾	100% Rural
State	Colorado
County	Custer
Total Households ⁽⁹⁾	1,925
Total Businesses (all industries/sizes) ^(4,4)	791
Selected Industries (Max. of 10)	Information Other services (exc. public admin) Professional & Technical Services Real Estate Retail Trade
Selected Employment Range	Less than 50
Total Businesses (selected industries/sizes)	713
% of Selected Industries	100.0%
% of ALL businesses	90.1%
Total Employment of Selected Industries ⁽¹⁾	1,276
Selected Industries % of Total Employment	94.2%
Adoption Scenario - Selected eSolutions (Max. of 5)	Deliver services and content Customer service and support
Number of Selected eSolutions	5
% Increase in adoption	5.0%
Estimates of Direct Impacts from Adoption ⁽⁵⁾	
Total number of businesses adopting eSolutions	32
% of Total businesses participating in selected industries	4.3%
Total number of new eSolutions adoptions	83
Average new eSolutions per business adopting	2.6
Total incremental Revenue from new eSolutions	\$1,580,000
Total incremental Cost Savings from new eSolutions	\$91,100
Total incremental Direct Impact	\$1,671,100
Direct Impact Metrics	
Total annual revenues for adopting businesses	\$13,200,000
Total annual operating expenses for adopting businesses	\$8,300,000
Operating expenses as percentage of revenues	62.9%
Aggregate percent increase in revenues	12.0%
Aggregate percent cost savings	-1.1%
Average incremental revenue per business adopting	\$49,200
Average cost saving per business adopting	\$2,850
Economic Impact Assessment ⁽⁶⁾	
Total Direct Output - Selected industries	\$1,670,000
Total Indirect Output - All Industries	\$740,000
Total Induced Output - All Industries	\$841,000
Total Incremental Output	\$3,251,000
Total Direct Jobs	14
Total Indirect Jobs	5
Total Induced Jobs	7
Total Incremental Job Creation ⁽⁶⁾	26
Total Incremental GDP ⁽⁷⁾	\$1,920,000
Total Incremental Household Earnings	\$916,000
Total Incremental State and Local Taxes	\$68,900
Total Incremental Federal Taxes	\$95,500
Economic Impact Metrics	
Average total incremental output per adopting business	\$101,000
Average direct jobs per adopting business	0.5
Average indirect and induced jobs per adopting business	0.4
Average incremental total taxes per adopting business	\$5,140
Average incremental GDP per adopting business	\$60,000
Average incremental Household Earnings per new job	\$35,600

© Strategic Networks Group, Inc. 2016

For more information about the Broadband Economic Impact Calculator, visit: <http://www.sngroup.com/impacts/>

Dashboard Metrics

Measure	Impact	Increase
Businesses Adopting	32	4.3%
New Revenues / Business	\$49,200	11.9%
Annual GDP	\$ 1.9 M	
Annual Tax Revenues	\$ 0.07 M	
Total New Jobs	26	2.0%

Scenario Parameter Selections

Adopting	Select up to 10 Industries ^(3,4)	All Businesses ⁽¹⁾	Rank
3	<input checked="" type="checkbox"/> Accommodation & Food Services	93	3
	<input type="checkbox"/> Administrative & Support Services	9	15
	<input type="checkbox"/> Agriculture / Forestry / Fishing	15	13
1	<input checked="" type="checkbox"/> Arts, Entertainment & Recreation	21	10
7	<input checked="" type="checkbox"/> Construction	137	1
	<input type="checkbox"/> Educational Services	0	16
2	<input checked="" type="checkbox"/> Finance & Insurance	50	6
2	<input checked="" type="checkbox"/> Health Care & Social Services	22	9
2	<input checked="" type="checkbox"/> Information	29	8
	<input type="checkbox"/> Manufacturing / Processing	19	12
5	<input checked="" type="checkbox"/> Other services (exc. public admin)	105	3
4	<input checked="" type="checkbox"/> Professional & Technical Services	106	2
2	<input checked="" type="checkbox"/> Real Estate	50	6
4	<input checked="" type="checkbox"/> Retail Trade	100	4
	<input type="checkbox"/> Transportation & Warehousing	14	14
	<input type="checkbox"/> Wholesale Trade	21	10
32		791	

Adopting	Select Employment Ranges	All Industries ⁽¹⁾	% of Bus.
26	<input checked="" type="checkbox"/> 1 - 4	756	95.6%
2	<input checked="" type="checkbox"/> 5 - 9	21	2.7%
2	<input checked="" type="checkbox"/> 10 - 19	8	1.0%
2	<input checked="" type="checkbox"/> 20 - 49	6	0.8%
	<input type="checkbox"/> 50 - 99	0	0.0%
	<input type="checkbox"/> 100 - 249	0	0.0%
32		791	

AND	Select Number of eSolutions	
	<input type="text" value="5"/>	
	% Increase in adoption ⁽¹⁰⁾	
	<input type="text" value="5%"/>	

OR Select up to 5 eSolutions and % increase in adoption

Adopting eSolutions	% Increase ⁽¹⁰⁾	Not Using
19 <input type="checkbox"/> Selling goods or services		46.0%
<input type="checkbox"/> Purchasing goods or services		18.2%
10 <input type="checkbox"/> Web site for organization		11.1%
15 <input type="checkbox"/> Advertising and promotion		26.5%
25 <input type="checkbox"/> Deliver services and content		30.7%
14 <input type="checkbox"/> Customer service and support		28.0%
<input type="checkbox"/> Banking and financial		27.3%
<input type="checkbox"/> Research by staff		10.0%
<input type="checkbox"/> Electronic document transfer		11.2%
<input type="checkbox"/> Supplier communication and coordination		18.3%
<input type="checkbox"/> Access government information		14.2%
<input type="checkbox"/> Government transactions		29.5%
<input type="checkbox"/> Staff training and skills development		24.4%
<input type="checkbox"/> Teleworking		45.3%
<input type="checkbox"/> Accessing collaborative tools		28.3%
<input type="checkbox"/> Social networking		25.1%
<input type="checkbox"/> Multimedia content or service creation		46.7%

Selected Counties (Multiple Selection)	All Businesses ⁽¹⁾
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

0

Appendix B - Survey Respondent Comments

The following comments from survey respondents are unedited and presented for further insights into context and community concerns.

Household comments in response to – “In what ways do you think that broadband can be used to further benefit your household and your community?”

Age	Home Business	Telework	Comments
65 years and over	No	No	Having a higher speed at my home would be ideal. Not being able to stream video well due to low performance is an issue. But since the trend is for increasing use of the internet for all areas of our lives and lack of availability in the rural areas should be seen as a depressive effect on our community
65 years and over	No	No	Household use is sufficient but reliable broadband is essential for improving our community. We need to recruit families and younger residents in order to grow our community. In order for these folks to want to live here, they need reliable internet capabilities for nearly every activity - e.g. communicating with family as well as ability to work from home or have a home-based business.
55 to 64 years	No	No	WiFi cellphone coverage, additionally if the Internet service in the area had been faster I would have continued working by teaching online technical classes rather than retiring.
35 to 54 years	No	Yes	Broadband is essential for the work that multiple members of this household perform. Currently one ends up in town frequently using local wifi so the other (who is not as mobile due to work constraints) has enough bandwidth to continue his work.
55 to 64 years	No	No	No access to broadband. Centurylink landline is too expensive; not sure we can even get DSL at our place in Custer County. Barely phone service at our place. We use a spotty hotspot with verizon that is terrible and not reliable and only available with doors to the garage open. This is a second place for us and we are waiting to build and move to Custer County permanently once they get better phone service, DSL and internet. One question asked about broadband I had to answer something before I could move forward so I answered but we don't have broadband in Custer County. We live full time in El Paso County so very spoiled with broadband internet. Usually avoid internet while in Custer County and just use it when we are back home to the Springs.

Age	Home Business	Telework	Comments
55 to 64 years	No	Yes	Reliable and affordable broadband at reasonable speeds (ie 20mbps and up) would ensure that I would not lose my job or have to relocate due to a lack of the aforementioned service. I have deadlines as well as important tasks to complete for my job that have on occasion been impacted by an outage or reduced speed. Such situations have brought my remote location to the attention of upper-level management - never a good thing. On at least one occasion, my job was explicitly threatened by one such manager due to an extended period of low speeds that did not allow me to connect to vpn in order to get my work done. In that particular case, the manager spared my job but transferred me out of his department (against my will!) so that I could be "someone else's problem".
35 to 54 years	No	No	Too many to mention. I moved from a large city where the benefits were endless and now can't get a fraction of what I had.
65 years and over	No	No	We do not currently reside in Custer County but plan to become permanent residents before the end of 2018. Coming from an area where the internet plays a very important role in employment and business, we would like to see the benefit made available to Custer County residents. Lack of satisfactory internet access renders Custer County's residents to a competitive disadvantage.
65 years and over	No	No	The disadvantage of living in Custer county is the distances involved in most or all activities. Broadband lessens or eliminates the distance/isolation problems. The internet brings practical problem solutions to hand (eg: how to attach a plow to a 75 year old tractor to clear snow from the driveway...)
55 to 64 years	Yes	Yes	Fast RELIABLE and affordable rural broadband will make it possible for more young people to live in our community - because they can work, study and live more effectively here than they can now. It will make our community more vibrant and stable
35 to 54 years	Yes	No	I think broadband will make it possible for young families to have a livelihood in this community. Even at the height of agriculture here, very few households could fully support themselves from the land; they had to have supplemental work. To keep this community rural and supporting agriculture, online work is essential.
65 years and over	Yes	No	It's the 21st century. To take advantage of all that modern technology and the modern way of life have to offer, fast, affordable, reliable broadband is an absolute necessity. Excellent broadband service could encourage light industry to come here and young families to stay here. The internet connects us with the world and enhances our rural lifestyle. It can enable us to live rurally but not be backward.
65 years and over	No	No	We do not need 6 towers with all the eco damage and their pending obsolescence due to the progress and increase use of satalites

Age	Home Business	Telework	Comments
35 to 54 years	No	No	If it's not century link, who take terrible care of their equipment and care even less about their service users, and we could get reliable high speed internet (especially if we can lease the towers intelligently to service provider and put money back into the community) this could be a very good thing. Our internet is not reliable enough now, business lose money when card readers won't work because the internet is down (frequent and common) and as a household we don't have the speed we need to use Skype effectively (constant problems for telehealth and peer support meetings) or to supplement our kids education with live school meet ups/instruction, or to enjoy much recreation with television viewing, educational videos must also be purchased online rather than streamed to prevent endless wait times for slow streaming.
65 years and over	No	No	Not at all. One of the selling points of my small house in Rosita was that it had DSL. Of course, "service" has gone downhill since centurytel was folded into centurylink, but that's another story. Moving to a remote area in the mountains is a choice, and a trade-off of sorts. One cannot expect all sorts of urban amenities, given the natural setting; goods and services generally are higher, wages lower. But that is offset by the beauty and serenity of the WMV which largely is due to the fact that ranching remains the primary industry. one cannot have it "both ways."
65 years and over	No	No	It won't it is not practical, cost effective for this area and only wanted by a few who do not care about using other's \$\$ to fulfill their wants. The technology will outgrow the need for line of sight and this is a boondoggle
55 to 64 years	Yes	No	Without broadband I think the economy here is doomed. The population is old. Without young people the county will evaporate and there will be no young people without a fast, reliable internet.
55 to 64 years	No	Yes	Current work environments and technology support opportunities to work from home and/or a location (like Westcliffe) that would otherwise not be an option. Implementation of broadband in the area would allow such opportunities, thus improving the local economy.
35 to 54 years	Yes	Yes	I currently telecommute but struggle with Internet speeds and mobile data and satellite data usage caps. We moved here from a city where cable TV and broadband Internet capable of streaming Netflix/Amazon content was available but now have limited streaming capability. Broadband Internet would allow me to continue to telecommute and stay in this area; I think it would also make living here more appealing for families that like to stream TV and movie content.
55 to 64 years	No	Yes	More employment opportunities, more options to access goods and services offered online, more opportunities to research options, better quality of communications for home and work. Living in a rural community, sometimes the internet is the ONLY WAY to stay connected to

Age	Home Business	Telework	Comments
			news, employment opportunities, medical availability and community happenings.
65 years and over	No	No	It is essential in today's world. I worry most about the children who don't have broadband access. They will be left behind. It is also hard to conduct business...I have seen vendors unable to swipe credit cards via mobile devices. Finally, the intermittent, poor service we currently have at our home is a nuisance when trying to perform critical functions like booking airline flights etc. Reliable service, at reasonable speeds is essential for homes and businesses. I am not certain, but I think that MOST people in Custer County have unreliable, slow internet access.
35 to 54 years	Yes	Yes	It allows me to run my business and provide an income all while living in a rural area where quality of life is much better.
65 years and over	No	No	I sell real estate. I do not have any connections with phone or internet in 40% or more of the county. This makes my job difficult to say the least. Most ALL BUYERS want good internet / broadband.

Business comments in response to – “What would you expect to be able to do through using broadband access that your organization is not doing now with the internet?”

Industry	Employees	Sector	Home Business	Comments
Real Estate	1 - 4	Business	Yes	Receive and send all types of information to persons interested in purchasing real estate in this area at a much faster means. That would make you at least as fast as the competition. The possibilities are limitless.
Educational Services	20 - 49	Nonprofit		More powerful video conferencing (with live video from multiple sources, instead of only voice for teleconferencing)
Accommodation & Food Services	5 - 9	Business	No	Use of POS system, better ability to use social media as an advertising and marketing format, online ordering and payment, payroll.
Information	5 - 9	Government entity		We're now using broadband access for everything we would use it for, but we would have increased productivity with better speeds and reliability.

Industry	Employees	Sector	Home Business	Comments
Professional & Technical Services	1 - 4	Business	Yes	I have really been thinking of putting out marketing videos but our internet is too undependable. Although the speed at times is good, it fluctuates.
Real Estate	1 - 4	Business	No	Have consistent internet at my office throughout our county no matter where we are. If there was an emergency in certain parts of our county there is a STRONG possibility that we could not get a call out to anyone!
Real Estate	1 - 4	Business	No	My concern is not just for our office location, it is for the whole Valley. We have people to want to mover here but choose not to because they cannot get the internet service they need.
Retail Trade	1 - 4	Business	Yes	Compete! My Secom service causes dropped transactions, missed calls (my phone service is VOIP) and many times just unable to run my business due to down service.
Accommodation & Food Services	1 - 4	Business	Yes	We would be able to offer Wi-Fi to our vacation rental guests, thus increasing rental bookings.
Accommodation & Food Services	1 - 4	Business	Yes	Dramatically enhance ability to do ALL online activities without interruption of buffering. Just being able to make reliable calls over internet, stream high resolution videos, and video conference are a few of the he more important aspects. Same as increased ability to conduct research online.

Appendix C - Custer County Broadband Infrastructure Expansion Plan

The following slides are from Custer County's Broadband Infrastructure Expansion plan.



Custer County Broadband Infrastructure Expansion



Custer County Board of County Commissioners

Tom Flower – Chairman/Commissioner
Bill Canda – Vice Chairman/Commissioner
Jay Printz - Commissioner

Custer County Economic Development Corporation
Charles Bogle - President

March 13, 2018



A Plan For Success



Fiber To The Home/Fiber to the Business– Westcliffe/Silver Cliff
(2021-2023)

Tri-County Fiber Optic Middle Mile System – Walsenburg to Canon City
(2019-2023)

Broadband Internet Connectivity to 80% of County Addresses
(2016-2019)

Opt Out of SB 05-152 Public Funding Restrictions
(Nov 15 (County),
Apr 2016 (Westcliffe and Silver Cliff)

Wi-Fi Connectivity: Public Complimentary Access
(2015 June/2016/2017 July)

Five Year Regional Broadband Strategic Plan
(2013 – 2015 Mar)

Hickenlooper's Bottom Up Planning Starts
(2011 – Present)

March 13, 2018

Appendix D - US Census Bureau Data for Custer County, CO

ALL TOPICS	Q Colorado	Q Custer County, Colorado	UNITED STATES
Population estimates, July 1, 2017, (V2017)	5,607,154	4,874	325,719,178
PEOPLE			
Population			
Population estimates, July 1, 2017, (V2017)	5,607,154	4,874	325,719,178
Population estimates base, April 1, 2010, (V2017)	5,029,325	4,255	308,758,105
Population, percent change - April 1, 2010 (estimates base) to July 1, 2017, (V2017)	11.5%	14.5%	5.5%
Population, Census, April 1, 2010	5,029,196	4,255	308,745,538
Age and Sex			
Persons under 5 years, percent	△ 6.0%	△ 3.0%	△ 6.1%
Persons under 18 years, percent	△ 22.5%	△ 14.1%	△ 22.6%
Persons 65 years and over, percent	△ 13.8%	△ 31.0%	△ 15.6%
Female persons, percent	△ 49.7%	△ 48.5%	△ 50.8%
Race and Hispanic Origin			
White alone, percent (a)	△ 87.3%	△ 95.0%	△ 76.6%
Black or African American alone, percent (a)	△ 4.5%	△ 1.5%	△ 13.4%
American Indian and Alaska Native alone, percent (a)	△ 1.6%	△ 1.0%	△ 1.3%
Asian alone, percent (a)	△ 3.4%	△ 0.6%	△ 5.8%
Native Hawaiian and Other Pacific Islander alone, percent (a)	△ 0.2%	△ Z	△ 0.2%
Two or More Races, percent	△ 3.0%	△ 1.9%	△ 2.7%
Hispanic or Latino, percent (b)	△ 21.5%	△ 5.6%	△ 18.1%
White alone, not Hispanic or Latino, percent	△ 68.3%	△ 90.2%	△ 60.7%
Population Characteristics			
Veterans, 2012-2016	383,699	719	19,535,341
Foreign born persons, percent, 2012-2016	9.8%	2.3%	13.2%
Housing			
Housing units, July 1, 2017, (V2017)	2,385,359	4,353	137,403,460
Owner-occupied housing unit rate, 2012-2016	64.4%	80.5%	63.6%
Median value of owner-occupied housing units, 2012-2016	\$264,600	\$230,700	\$184,700
Median selected monthly owner costs -with a mortgage, 2012-2016	\$1,585	\$1,325	\$1,491
Median selected monthly owner costs -without a mortgage, 2012-2016	\$427	\$315	\$462
Median gross rent, 2012-2016	\$1,057	\$725	\$949
Building permits, 2017	40,673	74	1,281,977

ALL TOPICS ▾	Q Colorado ☑	Q Custer County, Colorado ☑	UNITED STATES ☑
Population estimates, July 1, 2017, (V2017)	5,607,154	4,874	325,719,178
PEOPLE			
Families & Living Arrangements			
Households, 2012-2016	2,051,616	1,950	117,716,237
Persons per household, 2012-2016	2.56	2.24	2.64
Living in same house 1 year ago, percent of persons age 1 year+, 2012-2016	81.1%	87.0%	85.2%
Language other than English spoken at home, percent of persons age 5 years+, 2012-2016	17.0%	8.2%	21.1%
Education			
High school graduate or higher, percent of persons age 25 years+, 2012-2016	91.0%	91.7%	87.0%
Bachelor's degree or higher, percent of persons age 25 years+, 2012-2016	38.7%	29.4%	30.3%
Health			
With a disability, under age 65 years, percent, 2012-2016	7.2%	10.1%	8.6%
Persons without health insurance, under age 65 years, percent	△ 8.6%	△ 12.1%	△ 10.1%
Economy			
In civilian labor force, total, percent of population age 16 years+, 2012-2016	67.5%	40.7%	63.1%
In civilian labor force, female, percent of population age 16 years+, 2012-2016	62.5%	27.1%	58.3%
Total accommodation and food services sales, 2012 (\$1,000) (c)	13,617,654	3,179	708,138,598
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	29,488,161	D	2,040,441,203
Total manufacturers shipments, 2012 (\$1,000) (c)	50,447,098	D	5,696,729,632
Total merchant wholesaler sales, 2012 (\$1,000) (c)	77,034,971	403	5,208,023,478
Total retail sales, 2012 (\$1,000) (c)	67,815,200	48,594	4,219,821,871
Total retail sales per capita, 2012 (c)	\$13,073	\$11,437	\$13,443
Transportation			
Mean travel time to work (minutes), workers age 16 years+, 2012-2016	24.9	30.1	26.1
Income & Poverty			
Median household income (in 2016 dollars), 2012-2016	\$62,520	\$38,605	\$55,322
Per capita income in past 12 months (in 2016 dollars), 2012-2016	\$33,230	\$22,333	\$29,829
Persons in poverty, percent	△ 11.0%	△ 13.6%	△ 12.7%

ALL TOPICS	Q Colorado	Q Custer County, Colorado	UNITED STATES
Population estimates, July 1, 2017, (V2017)	5,607,154	4,874	325,719,178
BUSINESSES			
Businesses			
Total employer establishments, 2016	165,264 ¹	135	7,757,807
Total employment, 2016	2,318,190 ¹	569	126,752,238
Total annual payroll, 2016 (\$1,000)	120,398,734 ¹	18,210	6,435,142,055
Total employment, percent change, 2015-2016	2.9% ¹	3.1%	2.1%
Total nonemployer establishments, 2016	497,109	683	24,813,048
All firms, 2012	547,352	633	27,626,360
Men-owned firms, 2012	284,554	282	14,844,597
Women-owned firms, 2012	194,508	142	9,878,397
Minority-owned firms, 2012	85,849	F	7,952,386
Nonminority-owned firms, 2012	442,365	614	18,987,918
Veteran-owned firms, 2012	51,722	48	2,521,682
Nonveteran-owned firms, 2012	469,524	485	24,070,685
GEOGRAPHY			
Geography			
Population per square mile, 2010	48.5	5.8	87.4
Land area in square miles, 2010	103,641.89	738.63	3,531,905.43
FIPS Code	08	08027	00



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