623 EXCHANGE FIBER BROADBAND STUDY

Phase 1 Final Report

Abstract

Red Oak Area Market Study

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Contents

Executive Summary

SmartSource Consulting and collaborator Kielkopf Advisory Services conducted this fiber broadband study to help leaders in Montgomery County and the city of Red Oak to identify possible deficiencies in broadband services in the study are and the impacts those deficiencies are having in the broader community.

Given that a significant amount of fiber infrastructure is already in place, leaders have also stated the need for a roadmap to how Montgomery County could become the first known county in Iowa with 100% fiber broadband coverage within its borders. There have been informal discussions about the costs for that to occur, and this study helps define the market opportunity for potential paths to align a viable solution and potential retail customers.

The study shows that consumers in the study area do not feel well served by current providers. Rural areas are without real broadband internet service as commonly defined. City customers have just one provider that can meet the criteria for broadband service. Community leaders are rightfully concerned that the lack of adequate broadband service will continue to be a drag on housing, workforce, community, and economic development efforts underway. And a strong market opportunity does exist for a new provider, such as Farmers Mutual Telephone Company (FMTC), to build fiber throughout the exchange.
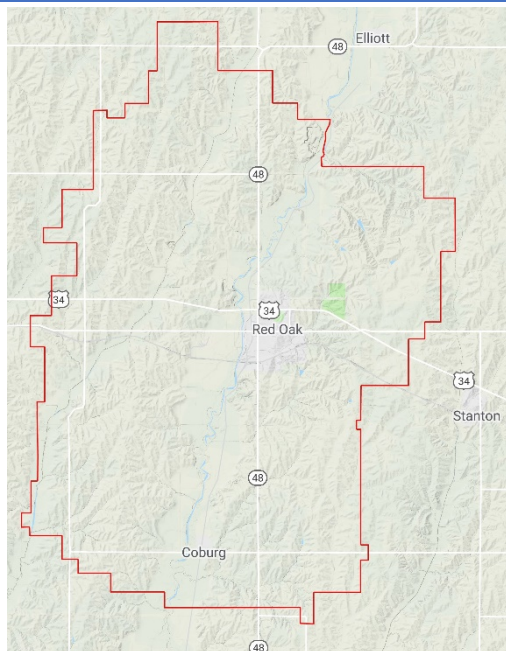
Background

Figure 1: Fiber broadband study area (623 telephone exchange)

Montgomery County, Iowa is served by several telecommunications companies. Much of the county is served by fiber-to-the-premise (FTTP) networks operated by independent telecommunications companies (ITC's) with deep and historical roots in the areas they serve. However, in the 623 exchange in and around the city of Red Oak, only copper-based networks are available.

Leaders in Montgomery County identified that extending FTTP to all citizens, including those in the 623 exchange, is a high priority for economic development, quality of life, education, and health care. If all locations in Montgomery County had access to FTTP, it would be the first county in Iowa to be able to make that claim.

Farmers Mutual Telephone Cooperative (FMTC) of Stanton has proposed to build FTTP in rural portions of the exchange utilizing grants and loans from the United States Department of Agriculture (USDA) under its ReConnect Program. If their proposal for funding is accepted it would make a project feasible to extend into these rural areas. This funding is not available inside the city limits of Red Oak, however, as it meets the federal definition of having broadband service.

The Montgomery County Development Corporation (MCDC) has previously held discussions with FMTC on how to incentivize extending their network to serve both the rural areas of the 623 exchange and the City of Red Oak itself. FMTC has estimated that FTTP in the rural areas would cost $6.4 million – funding for which they are hoping to obtain though the USDA. FMTC also estimates that FTTP in the city limits of Red Oak will cost approximately $10.5 million. Without access to federal grants or loans, the Red Oak city portion of the project would only be feasible to FMTC if a public, private, or partnership funding mechanism can be identified.

Current Provider Landscape

Although pay TV products and landline telephone service are also delivered over telecommunications networks, the focus of this study is the service that has been elevated to a necessity in today's connected world – broadband internet. From a community leader's perspective, excellent broadband internet (and the ISP's that deliver it) should meet several criteria.

1. The service should deliver fast download and upload speeds. Although download speeds have traditionally been the main measure of an ISP's quality, more and more consumers rely on fast upload speeds for daily internet use. In addition to fast speeds, consumers are best served with speeds are consistent regardless of time of day.
2. The service should be highly reliable with few service slowdowns and interruptions. The network should be redundant and avoid single points of failure. When interruptions do occur, service should be resorted rapidly.
3. The service should be affordable so that most citizens can have access to at least adequate service.
4. The service should be available everywhere in the community. "Digital deserts" where acceptable service is not available can limit a community's ability to attract and retain residents, employers, and economic opportunities.
5. The service should provide excellent customer support.

We will use these metrics as a guidepost in evaluating the level of service provided in the study area. Since there are different providers available in the Red Oak city limits than in the rural areas, we will discuss the provider landscape in each portion separately.

In determining service availability, we utilized data collected by BroadbandNow.com for the 51566 zip code.[1]

Within Red Oak City Limits

There are three facilities-based broadband providers in Red Oak.

Mediacom, the legacy cable company, is one of the nation's largest internet providers with customers in 22 states. It is Iowa's largest internet and cable TV provider. Based in Blooming Grove, New York, Mediacom is privately owned. Mediacom's network is hybrid fiber-coaxial (HFC) with a fiber optic backbone. While most customers are served via coaxial cable, some businesses are likely connected directly via fiber optics.

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[1] https://broadbandnow.com/Iowa/Red-Oak?zip=51566#

CenturyLink, the legacy telephone company, has operated under several different names since the breakup of the Bell system in the 1980's[2]. Today's CenturyLink is one of the nation's largest provider of internet service. Headquartered in Monroe, Louisiana CenturyLink is investor-owned and publicly traded on the New York Stock Exchange. While CenturyLink does offer FTTP in limited areas, mostly in urban areas, their Red Oak area network is based on digital subscriber line (DSL) technology which uses a fiber optic backbone but delivers service to the end user via twisted pair copper lines. Because of the nature of the technology, the farther a customer is from the nearest fiber connection point, the slower their speed.
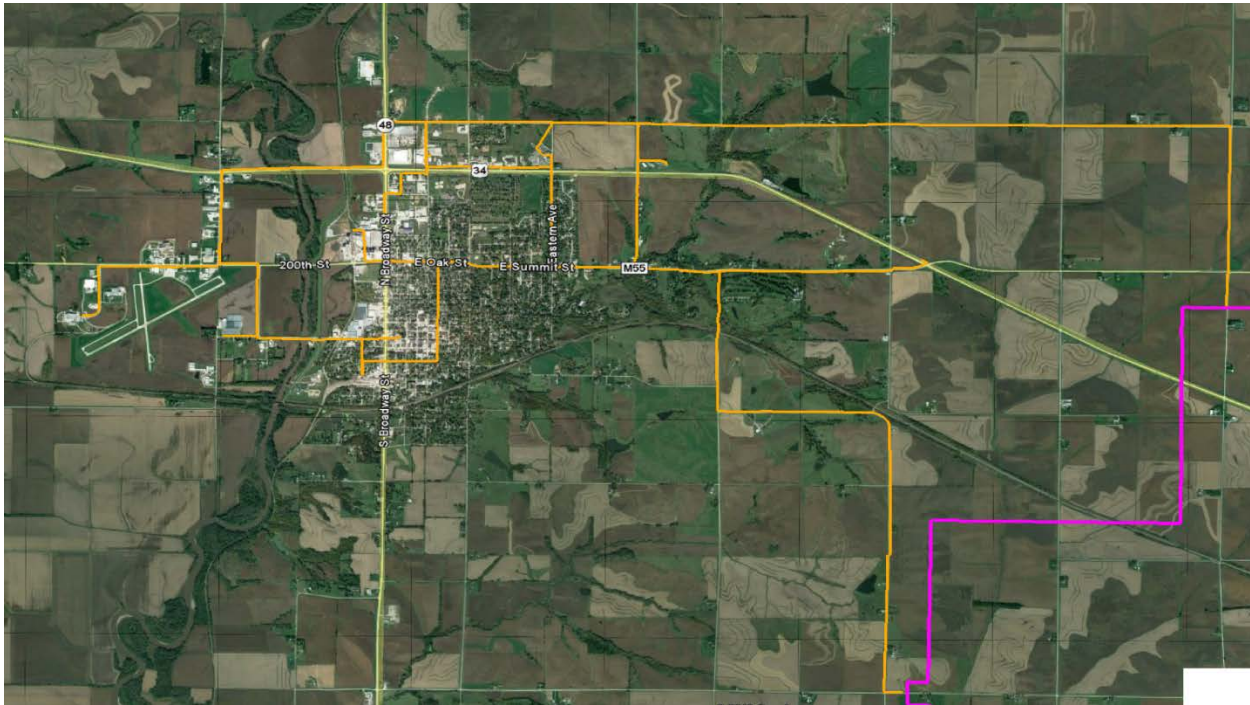

Figure 2: FMTC fiber routes in the Red Oak area

FMTC offers FTTP service in limited areas of Red Oak, primarily to businesses along the path of their fiber through the community. As mentioned above, FMTC has expressed interest in extending their fiber routes to cover more of the Red Oak community if a viable financing path could be identified. The map above shows their current fiber assets (yellow lines) in and around Red Oak.

In addition to these facilities-based providers, Red Oak residents also have access to two satellite-based internet providers (ViaSat/Excede and HughesNet) and, depending on the line of sight, fixed wireless service. The vast majority of internet customers in the Red Oak City limits are connected to either Mediacom or CenturyLink.

Mediacom

Mediacom offers high-speed internet access, digital pay TV service, and landline telephone service utilizing Voice over Internet Protocol (VoIP). Several years ago, Mediacom upgraded its core network to take advantage of DOCSIS 3.1 technology that allows it to provide speeds of one gigabit per second

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[2] https://en.wikipedia.org/wiki/Breakup_of_the_Bell_System

(Gbps) across its entire HFC network. It was one of the first large cable operators to make the transition to DOCSIS 3.1.

> *"Mediacom's speed and service is unreliable. They have frequent outages, inconsistent download speeds, their upload speed is VERY poor, and I own all my own equipment because theirs is of poor quality and very unreliable." – Comment on Residential Broadband Survey*

The next generation of DOCSIS, labeled 10G by the industry, is designed to provide even higher download and upload speeds than today's platform while still using an HFC network instead of FTTP. Although Mediacom has mentioned that it plans to be an early adopter of the new 10G cable internet protocol, a definitive timetable for deployment of this next generation of service has not been determined.[3] Overall, download speeds advertised by Mediacom – up to 1 Gbps – are considered more than adequate for most consumer usage today.

Although Mediacom has made investments in internet speed, it continues to be challenged by consumer complaints related to reliability and customer service delivery. It is unclear over the long term if the Mediacom network in Red Oak and other small communities will receive the kind of investment and upgrades needed to improve reliability and therefore consumer satisfaction.

CenturyLink

CenturyLink's copper telephone network does not have the same internet delivery capabilities as Mediacom's. According to BroadbandNow[4], the highest internet download speeds available on CenturyLink's Red Oak network is 20 Mbps. However, as with any xDSL network, not all speeds are available in all areas of the community. Among persons who participated in the performance testing via CrowdFiber, the highest download speed by a CenturyLink customer was 13 Mbps. While published information on CenturyLink's upload speed is not available, the highest upload recorded during performance testing was 2 Mbps, with most upload speeds less than 1 Mbps.

To significantly improve delivered internet speeds to end users, CenturyLink would need to extend existing fiber routes closer to the end user so higher DSL speeds could be utilized. To date, the company has not announced any significant technology upgrades that will enable it to do so in Red Oak. Without an upgrade to their network allowing more people to delivery true broadband service, CenturyLink is unlikely to be able to effectively compete. And they will continue to face the same consumer backlash as Mediacom if reliability and customer care are not improved.

One of the challenges of examining the current provider landscape is the same challenge that is

> *"Century Link doesn't spend capital to upgrade system and thus poor performance results." – Comment on Residential Broadband Survey*

frustrating to consumers: determining the real price of services. Most providers offer so many combinations of pay TV, internet, and landline telephone services with varying discounts and surcharges that it becomes difficult to compare

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[3] https://10g.mediacomcable.com/
[44] https://broadbandnow.com/Iowa/Red-Oak?zip=51566#

apples to apples. On top of this, providers often create special offers to attract new customers that are not made available to existing customers. Some offers are not necessarily published and widely distributed and require a customer to be proactive to obtain a better deal. This lack of transparency makes shopping for the best deal within or among providers a difficult task.

Rural Red Oak

Mediacom is the only provider that meets the FCC criteria for broadband internet in Red Oak. They do not have significant coverage outside of the city limits, however, and as a result rural addresses in the 623 exchange are underserved. CenturyLink likely offers some limited DSL capabilities in the area immediately outside of the Red Oak city limits, but due to DSL distance limitation these speeds are likely to be quite low.

As reported by survey takers, fixed wireless and satellite-based providers are the only choices in the rural Red Oak area. Heartland.net, a fixed wireless provider, appears to be used by most people in the rural exchange, with smaller numbers utilizing either ViaSat/Excede or HughesNet satellite. There were a few CenturyLink DSL customers also reported in the rural area.

Project Goals and Methodology

The goals of the broadband study were as follows:

1. Take steps to educate citizens about the importance of broadband and leaders' steps to understand and measure deficiencies.
2. Engage with individuals, anchor entities, and leadership groups to discover broadband gaps.
3. Conduct and report on a comprehensive survey to measure attitudes about incumbent providers and gauge interest in a new provider to close those service gaps.
4. Utilizing an online platform – CrowdFiber – to allow consumers to conduct internet performance testing and provide feedback on reliability.

Various tools and resources were used to achieve these goals. For education, we relied on a web page[5] and Facebook page[6]. Engagement took place during several stakeholder meetings on August 15th and 16th. The online survey and broadband assessment allowed citizens to test performance of their internet connection, state opinions, and provide feedback.

Engagement and Education

To provide citizens with information about broadband in general and the Red Oak area broadband study in particular, a Red Oak-specific web page was established at http://www.ourbroadbandfuture.com/red-oak.html. This page and other pages on the website were developed to serve as an information hub for communities that are conducting broadband studies. Other pages include a glossary of broadband terms, success stories from other community broadband networks, and information about the importance of excellent broadband service.

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[5] http://www.ourbroadbandfuture.com/red-oak.html
[6] https://www.facebook.com/redoakareafiber/

To provide educational information and attempts to engage in a dialogue with area residents, we also established a Facebook page. Between its launch in early July and the date of this report there were several thousand page-views.

While the efforts listed above were focused on the population at large, we also took pains to engage in conversations with community stakeholder groups to learn more about their perceptions of current broadband options in the area and identify any gaps that exist. The following stakeholder meetings were held on August 15 and 16, 2019.

Health Care

Representatives of the Montgomery County Memorial Hospital and local mental health agencies attended the health care stakeholder meeting. Much of the meeting was centered on discussion of the proactive role that the hospital has taken to make sure their own needs are being met. The hospital has partnered with FMTC to bring redundant fiber optic routes to the hospital and to facilitate a data center colocation between the two entities. The partnership with FMTC has enabled an exceptional telemedicine program by Montgomery County Memorial Hospital that has received national recognition. FMTC has also provided a connection to the Montgomery County Jail that has allowed the delivery of telemedicine to inmates. Hospital officials feel that they have a positive working history with FMTC and would be supportive of efforts to bring their services to the community at large.

Regarding mental health, there is an increasing need for reliable and fast internet connections to facilitate remote access due to the shrinking number of mental health professionals available in rural areas.

The group also discussed a previous effort in Red Oak to bring locally-owned telecommunications to Red Oak. That effort, which was led by local investors, was seeking to leverage federal loan guarantees to finance a broadband network. It was stated that the effort was unsuccessful due to a lack of local support for the concept. There was concern that current efforts will also fall flat for similar reasons.

Public Sector

Representative of local governmental entities and the school district gathered to share their views about broadband in the Red Oak area. In general, most agreed that that their own institutional needs were being adequately met. This is not unusual, as public entities generally have the resources needed to secure better connectivity through providers than small businesses and individual consumers. The school district, while satisfied with their own connectivity, expressed concern about adequate access by students, especially rural students with lower speed internet connections. As education relies more and more on technology and online delivery, this issue will only deepen unless internet connections are improved. Southwest Community College indicated that a redundant connection would be desirable.

Agriculture

The agricultural community in the study area is particularly and acutely affected by inadequate access to broadband. Modern farming operations are highly reliant on internet connectivity, and choices in rural Red Oak are limited and not sufficient, particularly for boutique or small producers that rely on connectivity for finding markets and customers. Ag sector representatives expressed strong support for a solution that could not only bring better broadband, particularly fiber, to their farms but also to the community of Red Oak itself.

Commercial and Small Business

A small group of local business owners and decision makers participated in a "Fiber Friday" Business After Hours event on August 16, 2019 at the Firehouse Restaurant. Most of these businesses were inside the Red Oak city limits. Participants shared their particular issues with broadband connectivity and expressed support for efforts to bring fiber to the community. In addition to helping solve for their own needs, they seemed acutely aware that the future growth and success of Red Oak is tied to having adequate broadband infrastructure. Some of the participants have taken advantage of FMTC's existing fiber to improve their services. More indicated they would be more likely to switch if upfront installation costs were more affordable.

Figure 3: Approximately 40 people attended the public broadband meeting on 8/15/19

General Public

On the evening of August 15, 2019, a public meeting for interested residents of the study area was held at the Wilson Performing Arts Center. Attendance was strong, with about 40 people participating in the discussion. The presentation and follow-up questions were also shared online via Facebook Live, a recording of which was made available on the Red Oak Area Fiber Facebook page.[7] Not surprisingly, the live telecast was negatively affected by slow upload speeds available on the WiFi connection at the venue. Overall, the audience seemed very engaged in the discussion and expressed general frustration with choices and quality of service provided by existing providers

Community Broadband Survey

To gather feedback from residents and businesses in the study area, two surveys were launched in mid-July and responses were collected until the end of August. The residential survey received a total of 402 responses from persons within the 623 study area. The business survey received 29 total responses. 24 respondents said their business was in Red Oak and 5 said they were in the rural portion of the exchange.

Because broadband internet access was the primary focus of the City's decision to engage this Pre-Feasibility study, we will focus on those survey results for this report. The survey also gathered feedback from citizens on pay TV and landline telephone services. The results of those questions as well as the entire residential survey are included in Exhibit 1.

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[7] https://www.facebook.com/redoakareafiber/videos/385370585694285/

Sample Size and Margin of Error

Residential Survey

To determine the number of possible survey respondents (the population), we utilized USPS address data as provided from CrowdFiber for both the Red Oak city limits and the rural area. Not including 201 addresses listed as vacant in the USPS database, the total residential addresses for the entire exchange was 2,910.

We attempted to limit responses to one per household through instructions and by limiting responses to one per IP address. If the 402 responses (the sample) represent 402 households out of 2,910 total occupied households in the exchange (2,399 Red Oak, 522 rural), the margin of error on the residential survey would be 4.5%[8]. While this margin of error is considered good, the potential for self-selection bias must be considered. In an ideal market survey of this type, a random sample of respondents would be selected from the community and only those persons would answer the survey. Logistically that was not possible in this case, so anyone in the community could respond. While we consider the survey results to be a reasonable representation of attitudes in the Red Oak area, leaders will need to take this potential self-selection bias into account when considering next steps.

Business Survey

USPS data showed a total of 226 commercial addresses in the exchange (196 Red Oak, 30 rural). Because the business survey was based on a much smaller population, the margin of error based on 29 responses is much higher (approximately 17%) than the residential survey. While those survey results may provide helpful feedback, they should be not be considered a representative sample of the business community. Business survey results are included in Exhibit 2.

Demographic Information

We also captured demographic information from survey respondents (age, gender, income level, and education level) to compare the sample group of respondents to the population at large. Comparing these responses with data from the 2018 American Community Survey[9], the survey respondents tended to be more middle-aged, with higher household incomes and a greater level of education than the population in general. More females responded to the survey (60.9%) than males (39.1%) even though census data shows a closer balance with more men than women (51.3% to 48.7%).

To evaluate whether these demographic variances had an impact on the validity of the data, we compared the responses of demographic groups to key questions to all answers. That review found little difference in the responses of different demographic groups to those questions versus the survey population in general. As a result, statistical weighting of results was not conducted.

Summary of Residential Survey Findings

To measure opinions on several characteristics of services, we used a standard Likert Scale[10], then assigned a score to those responses as follows:

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[8] MOE calculated using the American Research Group, Inc. online calculator.
http://americanresearchgroup.com/moe.html

[9] https://factfinder.census.gov
[10] https://www.surveygizmo.com/resources/blog/likert-scale-what-is-it-how-to-analyze-it-and-when-to-use-it/

- 5 – Very Satisfied
- 4 – Somewhat Satisfied
- 3 – It's OK
- 2 – Somewhat Dissatisfied
- 1 – Very Dissatisfied

While input was gathered on pay TV and landline telephone service, those results will not be summarized for purposes of this report. Information on these topics is available in Exhibit 1.

Overall Internet Usage

94% of survey respondents reported subscribing to internet service at home. Mediacom had the highest penetration rate at 49.3%, followed by CenturyLink with 28.9%.

The survey also asked respondents to share information about how they use the internet. Email was the most popular choice, with social media and online shopping all above 90%. The biggest strain on overall internet bandwidth - streaming video – was also very popular (73.7%) along with online banking (88.0%) and general web surfing (75.2%). 51.9% of respondents say they use the internet for education, including adult education. 23.9% reported that they work from home part-time and another 7.2% said they work from home part-time. This is consistent with national trends showing and increasing number of Americans that rely on internet connectivity for some or all their livelihood.

Overall ISP Satisfaction

Overall, 46.8% of respondents were very or somewhat dissatisfied with their ISP. The trait with the highest level of dissatisfaction was price, with 62.5% of respondents saying they were very or somewhat dissatisfied. It was closely followed by speed (59.9%) and reliability (58.3%).
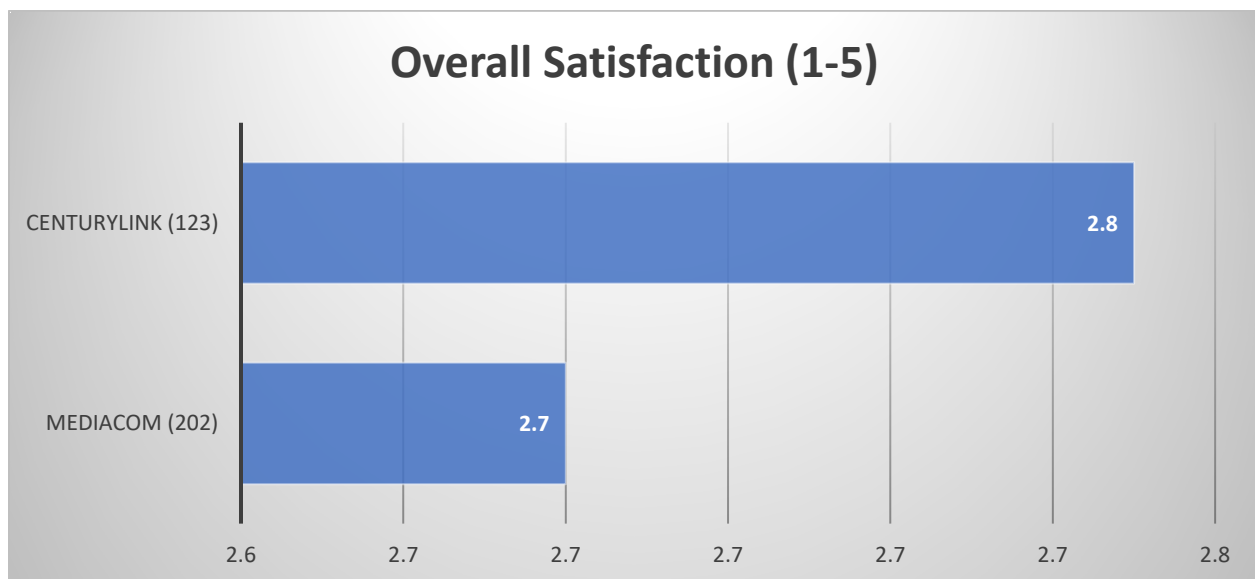

Satisfaction by Service Characteristics

Different people use different criteria when evaluating their satisfaction with any product, including internet access. So, respondents were asked to rate their level of satisfaction on several ISP service criteria.

The two largest providers in the study area were rated below average by consumers when it comes to customer service, price, reliability, and speed of internet service. Both were rated average for the final criteria – data allowance.

Net Promoter Scores

A common tool used to measure consumer attitudes about companies is called the Net Promoter Score, or NPS. The NPS asks a simple question: "On a scale of 0-10, how likely is it that you recommend (company or service) to a friend or colleague?" The graphic below is a visual representation of how those answers indicate if a consumer is a PROMOTER of that product/service, a PASSIVE, or a DETRACTOR.
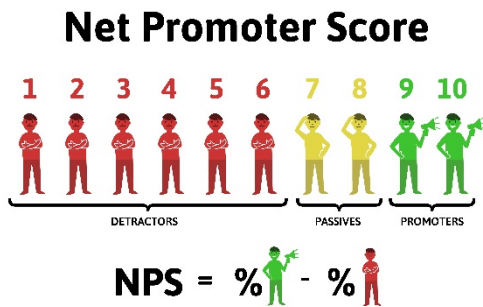
Respondents are grouped as follows:

- Promoters (score 9-10) are loyal enthusiasts who will keep buying and refer others, fueling growth.
- Passives (score 7-8) are satisfied but unenthusiastic customers who are vulnerable to competitive offerings.
- Detractors (score 0-6) are unhappy customers who can damage your brand and impede growth through negative word-of-mouth.
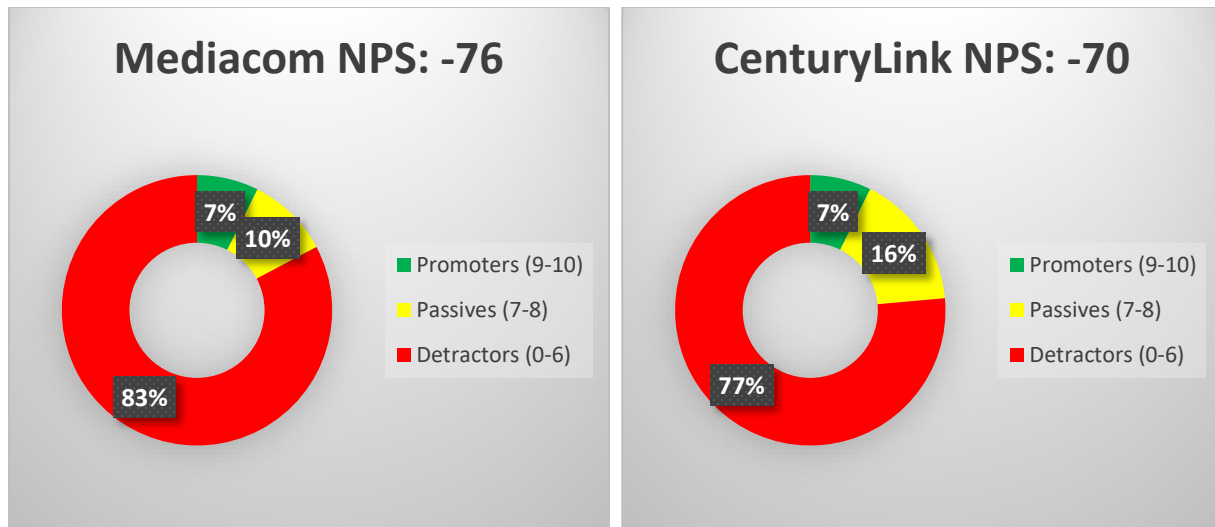
Net Promoter Scores are different across different industries. Internet service providers are consistently ranked among the lowest in terms of NPS scores. NICE Satmetrix, the co-developer of the Net Promoter Score, reported that average NPS for internet service providers in 2018 was -1.[11]

For purposes of the Red Oak Area Community Survey, we asked the following question:

"How likely is it that you would recommend your ISP to a friend or colleague?"

Respondents to the Red Oak residential survey were even more unforgiving when it came to their ISP's than national industry averages.

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[11] http://info.nice.com/rs/338-EJP-431/images/NICE-Satmetrix-infographic-2018-b2c-nps-benchmarks-050418.pdf

In terms of the average score assigned by respondents on the 0-10 scale, Mediacom's average was 4.2 and CenturyLink's was 4.9. Of the other responses for the ISP's with fewer customers, Heartland and FMTC had higher average scores while ViaSat/Excede and HughesNet were lower.

Interest in A New Provider

One of the most important questions in the residential broadband survey was Question 23:

> **"If a new provider made broadband available at your home with superior service for a competitive price, how likely would you be to switch from your current provider(s)?"**

The purpose of this question is to identify whether current broadband market conditions would be favorable to a new market entrant. If interest in a new provider were low it would tend to indicate that, despite complaints from customers, current providers are covering the market well and would likely retain high market share. If interest in a new provider is high, it indicates that consumers are open to a new option and shows that a new market entrant would have the opportunity to capture a significant market share.

The presence of a new provider is not enough, however. That's why we use the terms "superior service" and "competitive price". A new provider whose standards of customer service, delivered speed, and reliability are the same as current providers would offer consumers no real benefit. And a new provider would be forced by the market to offer services at a reasonable and competitive price in order to attract business.

For this question we used the same 0-10 scale as the Net Promoter Score, where higher number indicate a higher likelihood to switch. This question revealed that 79% of respondents had a strong likelihood (8,9, or 10) of switching to a new provider.

Likelihood to switch to new provider (0-10)

Score	Percentage
10	53%
9	11%
8	15%
7	8%
6	1%
5	5%
4	3%
3	1%
2	0%
1	0%
0	2%
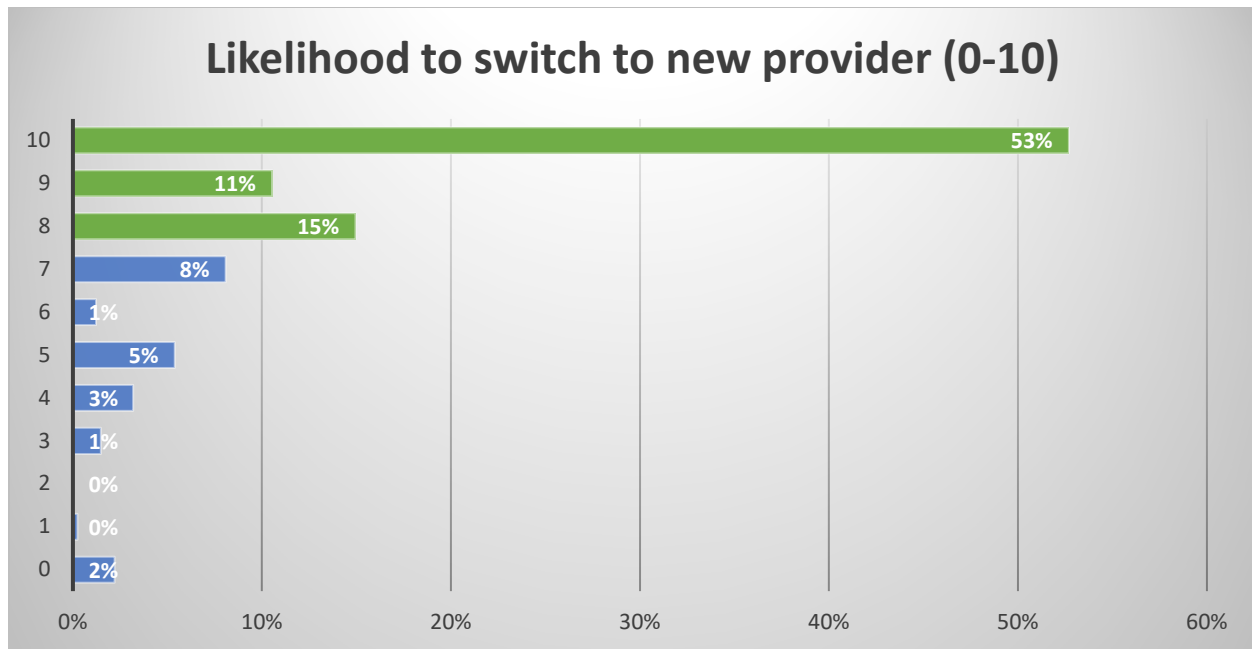
For sake of comparison, we asked a similar question as part of a market surveys in Pella and Fort Dodge, Iowa with similar results. Clearly many people in Iowa's small to medium sized communities are yearning for other internet connectivity options.

"This needs to happen in our community! It will prove to be a great incentive for people to locate here, open businesses here, and improve the daily operations of current residents." – Comment on Residential Broadband Survey

A new provider in the Red Oak exchange could not expect to capture 53-79% of the market by simply launching services. Existing providers will market heavily to consumers to retain as much market share as possible. They could also choose to address the issues that consumers have identified to keep churn to a minimum and/or reduce prices or offer additional services as competitive tools. A new provider would need to employ significant marketing resources to attract and retain customers and offer the superior service and competitive pricing that was part of the survey question. However, the responses to this question clearly shows a strong market potential for a new provider in the study area.

Anecdotal Feedback

In addition to answering questions with a choice of several set responses, survey participants were given several opportunities to provide additional feedback about their experiences and opinions. A complete listing of each individual comment from the residential survey is provided in Exhibit 4, with business survey comments included in Exhibit 5. These comments were not edited for spelling, punctuation, or language.

Broadband Assessments

Input on internet characteristics and reliability was gathered through an online broadband assessment tool. Using the CrowdFiber[12] application, Red Oak area residents could identify their address and conduct a network performance test at their location, as well as provide feedback on their online experiences. The performance test measured download speed, upload speed, latency, and jitter.

During the time that the broadband assessment site was active, responses were recorded from 185 locations across the study area. The map in Exhibit 4 shows the physical location of participants, with each dot indicating a completed broadband assessment.

Performance Testing

A key purpose of the broadband assessment tool was to capture internet performance information. Participants were asked to conduct a performance test from their wired internet connection whenever possible.

"We must have broadband internet speed in order for our area of the world to compete and thrive, or Red Oak will continue to die." – Comment on Broadband Assessment

The performance test measured four characteristics: download speed, upload speed, latency, and jitter. Download and upload speeds were measured in megabits per second (Mbps) and their meaning is self-explanatory. Latency and jitter are two measures of network performance expressed in terms of milliseconds. Generally, the lower the latency and jitter, the better the condition of the network. 145 successful performance tests were recorded from the 185 responses (78%). Keep in mind that performance tests such as the one used in the broadband assessment are simply a snapshot in time. Two speed tests conducted a few minutes apart could deliver very different results.

We evaluated the performance tests to measure differences between those taken in the Red Oak city limits versus those from rural areas of the exchange. We also measured the results between internet service providers used to conduct the testing.

Location	Download Speed (Mbps)	Upload Speed (Mbps)	Latency (milliseconds)	Jitter (milliseconds)
Red Oak city	33.2	10.1	63	23
Rural Red Oak	6.7	3.0	211	30

Figure 4: Performance tests by location

Not surprisingly, overall performance was better within the city limits of Red Oak than in the rural areas. The primary reason is that Mediacom's network, with a few exceptions, does not extend outside the city limits.

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[12] https://crowdfiber.com/

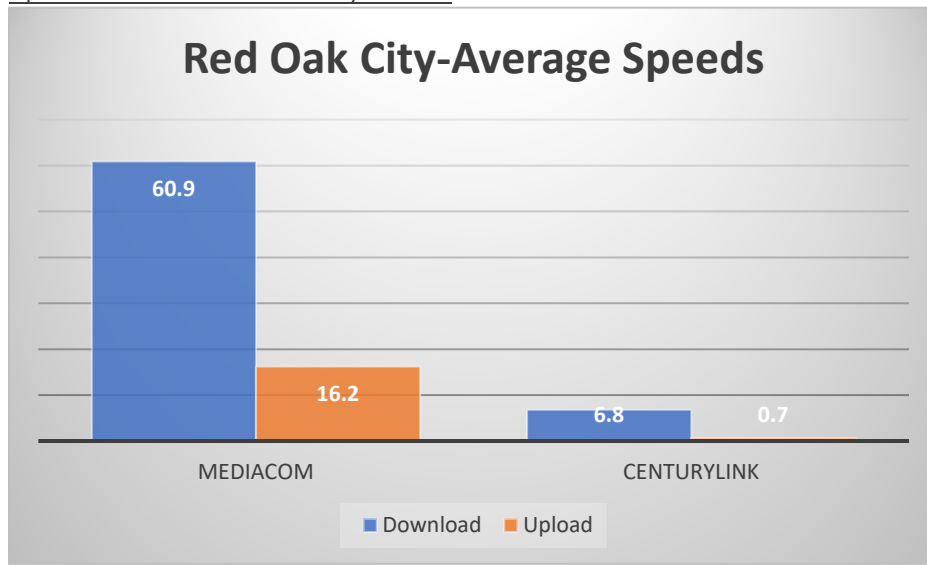Speed Tests-Red Oak City Limits

Figure 5: Red Oak City Average Speeds

Mediacom's average recorded download speed in Red Oak was roughly nine times greater than CenturyLink's. A similar disparity was seen in terms of upload speed. As mentioned earlier, this is primarily a result of the differences in technology that each provider uses. Mediacom's HFC network is capable of better performance.
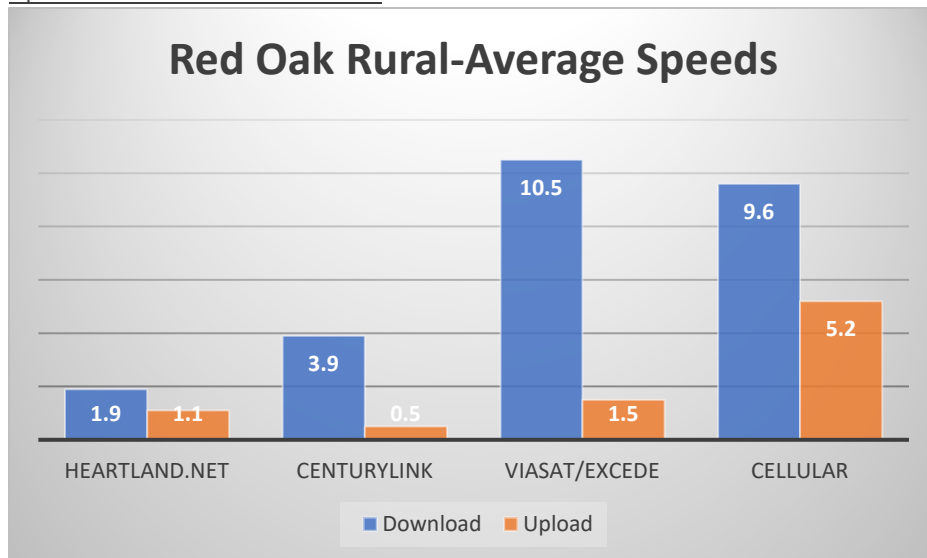
Speed Tests-Rural Red Oak

Figure 6: Red Oak Rural Average Speeds

Speed test performance in rural areas was much poorer than inside the city of Red Oak, although both ViaSat/Excede and cellular carriers outperformed CenturyLink's in Red Oak. The largest number of tests were recorded by customers of Heartland.net, which uses fixed wireless technology. However, it does not appear to have the ability to deliver the performance that many users would like to have nor does not meet the FCC's definition of broadband internet.

ViaSat/Excede's speed performance was stronger than the other rural options, but satellite providers have two big drawbacks to the average consumer. Due to bandwidth restrictions for satellite internet,

these ISP's have low data limits that make it difficult for consumers to use for activities such as streaming video. High latency is a big issue for applications such as VoIP and gaming.

Performance Feedback

The performance test measured network conditions. The broadband assessment also asked respondents to provide additional feedback on their internet experience using three questions. For questions one and two, participants were asked to select one of the following answers to the question: once a day, once or more a week, once or more a month, once or more a year, or never. The chart below shows the responses broken down by area, comparing responses within Red Oak to rural responses.

Question One
"Approximately how often do you suffer significant slowdowns of internet speeds at your home or business?"
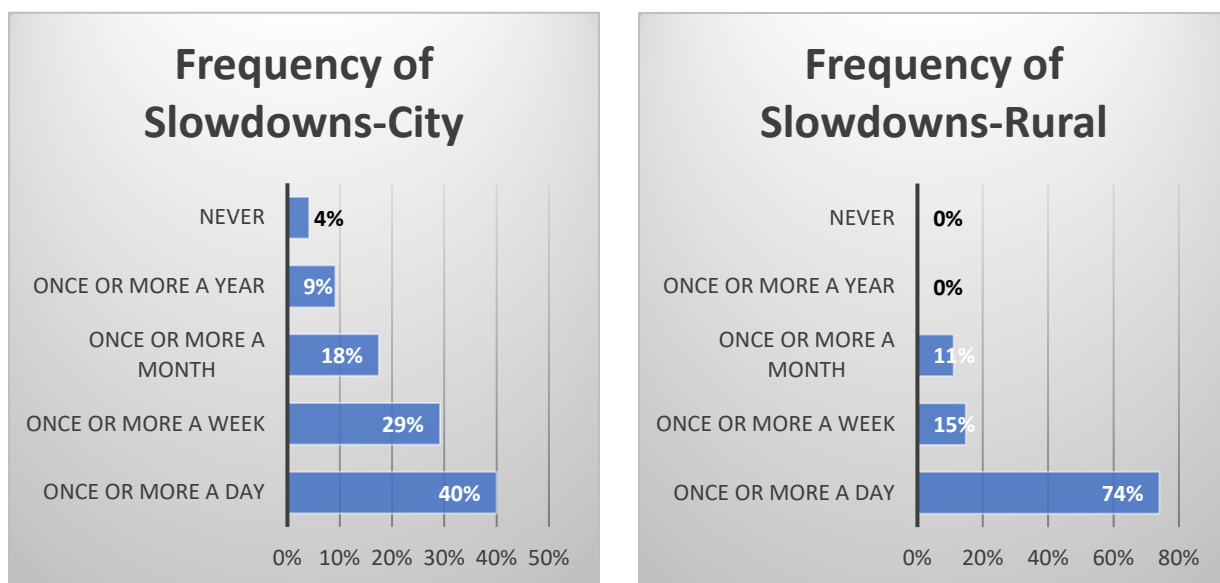

Internet slowdowns in rural areas are a daily occurrence for most rural customers. A majority of both rural and city customers report that their service slows down daily or weekly. Internet slowdowns can be a result of many factors, including conditions on the ISP's network, within the home network (especially if WiFi is the primary way that users connect to their ISP), and in some cases weather.

Among the two largest ISP's in the study area, CenturyLink customers tended to report more frequent slowdowns than Mediacom customers. 68.9% of CenturyLink customers in the service area said service slowdowns were at least a weekly occurrence. 58.9% of Mediacom customers reported the same frequency of slowdowns.

Question Two

"Approximately how often is your internet service interrupted entirely at your home or business?"
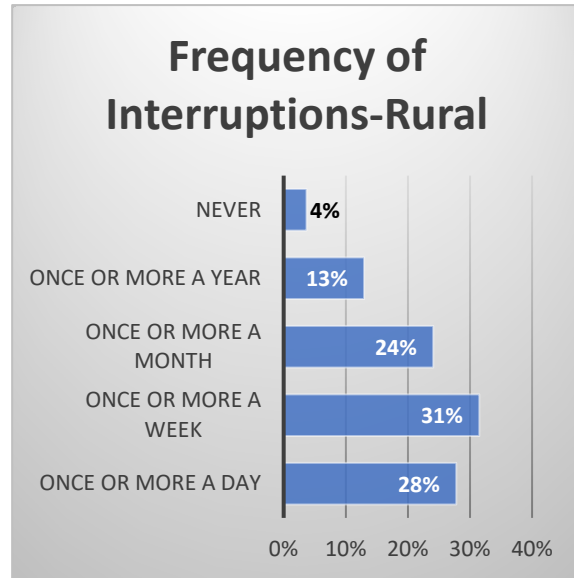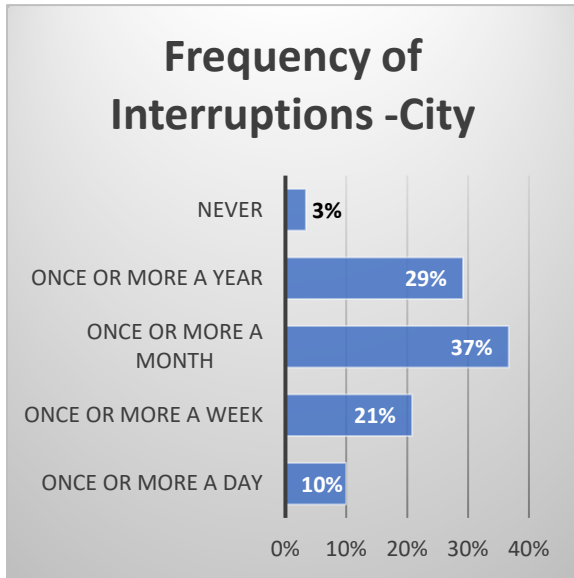

Respondents reported internet service interruptions less frequently than slowdown in internet speeds. However, a significant of percentage of rural internet customers reported that they lost internet connectivity at least once a week or more frequently (59%).

Mediacom customer reported service interruptions at least weekly at a greater rate (30.4%) than CenturyLink customers (22.2%).

Question Three

"Does your current internet service meet your needs?"

Meeting Needs - By ISP
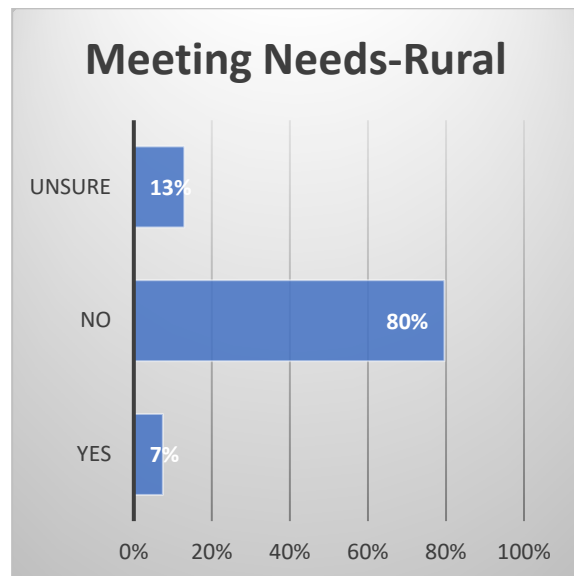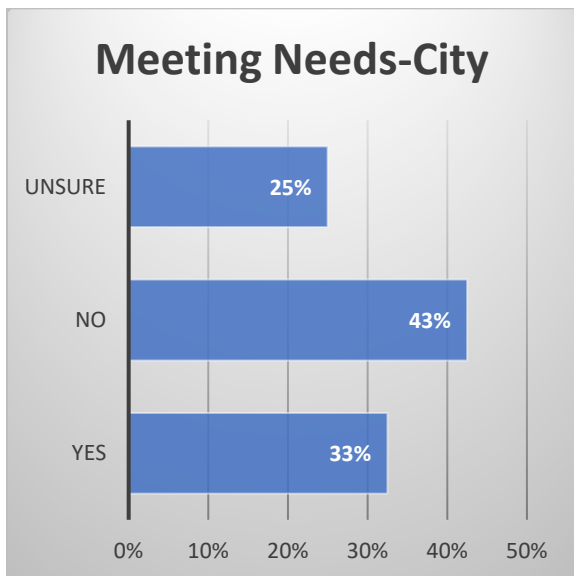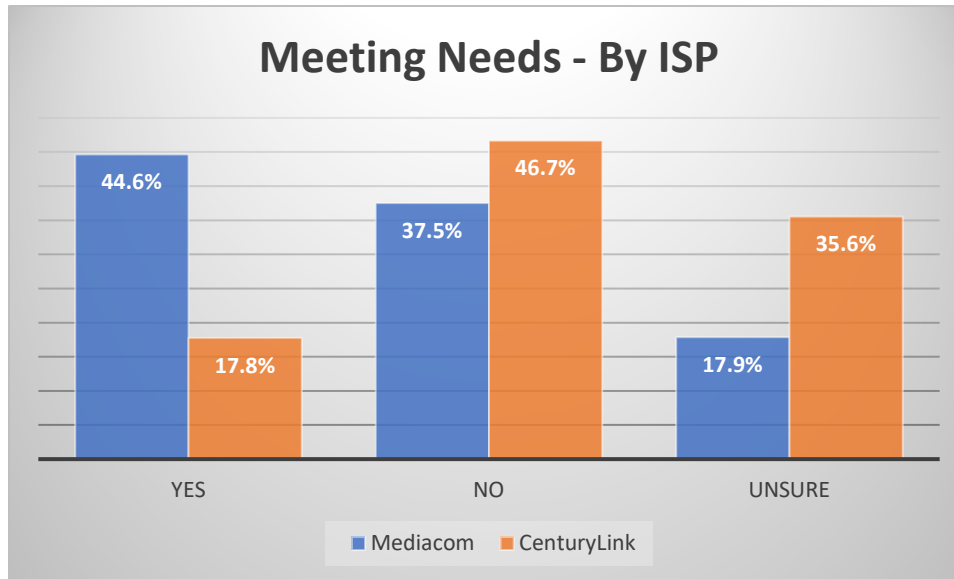
Clearly, rural residents in the study area feel that their internet service is not meeting their needs. While opinions among city internet customers are more even, a plurality still feels that their needs are not being met.

When comparing the two largest providers in the study area, more people feel that Mediacom's internet service is meeting their needs than CenturyLink.

Broadband Assessment Comments

As was done on the survey, assessment participants were offered an opportunity to make comments on their internet experience. A complete listing of these comments is included in Exhibit 6.

FMTC USDA Grant/Loan Application

In the summer of 2019, Farmers Mutual Telephone Company of Stanton applied for funding under the USDA's ReConnect Program for a FTTP network in the rural Red Oak exchange. The application is for a grant of $3.2 million and a loan of $3.2 million to 477 households that do not have access to broadband today. The project would also include the completion of a central office building in Red Oak. The application is still under review by the USDA, but a decision is expected to be announced before the end of 2019.

If the USDA approves FMTC's application, rural residents of the Red Oak exchange will finally be able to receive fast, affordable, and reliable internet service (as well as pay TV and telephone) from a local provider with a strong reputation for excellence. However, it will also further isolate the city limits of Red Oak as an island of copper-based service delivery in a sea of fiber to the home.

FMTC has expressed interest and willingness to build out fiber within the city of Red Oak, building on its existing fiber assets to reach every home and business. They have developed a plan to build out the network at an estimated cost of $10.5 million. However, access to funding for the project will prove to be a challenge. Because the city is considered served under the FCC definition, there are currently no funding programs available – state or federal. Although political leaders in Washington and Des Moines have spoken at length about the need for broadband expansion, most of those efforts have been focused on unserved rural areas (such as the rural 623 exchange). Communities that have at least one provider meeting the minimum definition continue to struggle to find ways to bring fiber infrastructure to their citizens without creative solutions and partnerships.

In some small to mid-sized cities in Iowa, the solution has been a publicly owned and financed network. Such a network is currently under construction in Vinton and are planned for 2020 in Pella, New Hampton, and Charles City. In each of these cases the city will operate the network as a utility and be the service provider. Adair, Iowa is taking a modified approach. The city will finance and own a fiber network that passes every address in the city limits. But rather than become a provider on its own, Adair is planning to partner with Casey Mutual Telephone Company to provide the services over the city's network. This allows the city to accomplish the goal of a city-wide fiber network without having to acquire the personnel and expertise needed to be a provider itself.

It is possible that such a public-private partnership between the City of Red Oak and FMTC would be one possible pathway to building out fiber in the community. Other approaches could be community, outside investor and county economic development assistance in helping FMTC secure the financing needed to tackle the project, reduce risk, or offset connection fees in the Red Oak portion of the network.

Conclusions

The combined and consistent feedback gathered through the survey, broadband assessment tool, and meetings with stakeholders and the general public provides statistical and anecdotal evidence to support the following conclusions:

1. A highly significant number of people living in the study area do not feel adequately served by existing telephone and cable TV companies to meet their quality of life needs. Rural residents do not have access to a single provider that meets FCC minimums for broadband.
2. Reliability, price, and overall customer service experience are issues for consumers that cause negative perceptions about the value of service they are being provided.
3. Because choices for broadband internet service are very limited or even non-existent for some consumers – especially in the rural areas - there is strong desire for an alternative provider to serve the community.
4. There appears to be adequate potential market share for a competing alternative provider to compel additional investigation as to the financial viability of their entering the Red Oak area.
5. The community appreciates that Farmers Mutual Telephone Company of Stanton has already established fiber assets in the study area, has applied for federal funding to build fiber to the rural areas of the exchange, and is able to help identify the costs for an alternative provider.
6. Potential customer density, consistent levels of dissatisfaction in the community, and scaled construction costs improve the financial viability for an alternative provider to be able to financially compete with existing providers.

Next Steps

This broadband study has gathered valuable information that local leaders can use to take action to improve broadband connectivity for Montgomery County residents. The following are additional steps that MCDC and its study committee should examine to continue these efforts:

1. Closely monitor FMTC's efforts to receive USDA funding to build the rural areas of the 623 exchange with fiber; maintain open communication through MCDC and its committee to avoid duplicative conversations and planning.
2. If funding is approved for the rural exchange, work with FMTC to identify any potential barriers to building FTTP in the Red Oak city limits. This would include facilitating discussions on financial arrangements that MCDC, the city, or the county could leverage to help FMTC make a business case for building in Red Oak.
3. Validate FMTC's cost estimates for the Red Oak FTTP project (est. $10.5 million) by hiring an independent telecommunications firm such as HR Green to review those estimates at a high-level to ensure that they are reasonably accurate. This third-party verification is important if any public resources are to be brought to bear to assist FMTC and if there is a phasing or incentive plan reliant on customer revenue.

Exhibits List

Exhibit 1 – Residential Survey Report

Exhibit 2 – Business Survey Report

Exhibit 3 – Broadband Assessments Map

Exhibit 4 – Residential Survey Comments

Exhibit 5 – Business Survey Comments

Exbibit 6 – Broadband Assessment Comments