

**KANDIYOHI COUNTY AND CITY OF WILLMAR ECONOMIC DEVELOPMENT COMMISSION (EDC)
BROADBAND AND ADVANCED TECHNOLOGY COMMITTEE MEETING
MINUTES**

August 1, 2016

Kandiyohi County Health & Human Services Building, Willmar

Present: Mark Boeschen, Travis Bonnema, Donna Boonstra, Dean Bouta, Bruce DeBlieck, Kathy Dillon, Scott Froemming, Larry Kleindl, Michelle Marotzke, Brian Mort, Les Nelson, David Sisser and Donn Winckler

Excused: Larry Handlin and Linda Kacher

Guest: Joe Buttweiler, Consolidated Telecommunications Company

EDC Staff: Connie Schmoll, Business Development Specialist

Secretarial: Nancy Birkeland, Legal & Administrative Assistants, Inc. (LAA)

Chairperson Dean Bouta called the meeting to order at approximately 12:04 p.m.

MINUTES—

IT WAS MOVED BY Larry Kleindl, SECONDED BY Mark Boeschen, to approve the minutes of the July 11, 2016 meeting as emailed. MOTION CARRIED.

REPORTS

Broadband provider partnership update. Chairperson Bouta informed the committee that the Kandiyohi County Board of Commissioners signed a letter of intent with Consolidated Telecommunications Company (CTC) for the state Border-to-Border Grant application. Schmoll noted there have been several meetings with CTC since the letter of intent was signed and once the letter of intent was signed, CNE (Communications Network Engineering, Inc.) customized the feasibility study report for CTC.

Feasibility Study Report. The committee reviewed the Draft Broadband Feasibility Study report (see attached). Larry Kleindl noted this report indicates why CNE divided the county into six areas. Joe Buttweiler discussed the following areas of the report:

- page 5—the references to BA4, etc., are construction units that are within the plans and specifications to provide to a contractor for a construction estimate. The number of units may change as final construction documents are prepared.
- page 6 starts to address the serving area.

The committee reviewed the report by Mpower Consulting, which is data from the actual surveys of county's residents (see attached).

- The middle of page 7 shows a 44% approval rating of broadband services provided by TDS. This information can be used in the grant application.
- Page 9, question 13, includes a wish list of items that can be used in the grant application. Dave Sisser commented on the number of people who feel they have broadband, but they possibly do not understand what is broadband.
- Page 11, question 16, shows 18% would work remotely for an employer if broadband was available.
- Page 13, question 20, gives the current monthly charges being paid by respondents with 25% indicating between \$75-\$100.
- Page 17, question 29, shows 82% support construction of a broadband network.
- Page 19 begins the responses to the Commercial Survey, which had 19 respondents.
- Page 21, question 14, shows 50% are very likely to switch from their current broadband provider to another company.
- Page 26, question 29, shows 73% of the businesses that responded are in support of construction of a broadband network by Kandiyohi County.

Michelle Marotzke noted it is important to refer to the percentage of respondents who want broadband when applying for the grant. Buttweiler indicated a typical charge for 250 MB through CTC is less than \$100 for residential and 1GB is approximately \$300 per month.

The draft Market Analysis Section (see attached) was reviewed. Chairperson Bouta noted the Market Analysis has very good narrative and information as to competitive nature and history. Donn Winkelmann noted at a meeting with Federated Telephone Cooperative (FTC), FTC was very confident about obtaining customers. Kleindl noted the county's current providers are shown starting on page 12 and the CAF Phase II funding each received and page 15 shows a summary of the price caps each will receive in the next six years. Kleindl stated the report reaffirms the information known by the committee. Kleindl believes the Market Analysis has the most interesting information for the County Board of Commissioners, but the Finance Section is what this committee will be addressing.

The committee reviewed the draft Finance Section (see attached). Connie Schmoll noted the Finance Section Summary shows the total cost of the project for the entire county to be in the range of \$60 million. Kleindl stated the draft Finance Section discusses the Minnesota Border-to-Border Broadband Grant program and the various funding options available, including bonding, loans, grants, USAC and FCC programs and public/private partnerships. Kleindl noted this committee has looked at public/private partnerships. Buttweiler explained funding options through school districts (USAC) and the FCC. The problem with programs for school districts is that school districts generally already have broadband.

The committee reviewed the cost estimates (see attached). Chairperson Bouta indicated the estimates with a total cost of nearly \$60 million is the projected cost if the entire county was done today and the other estimate of nearly \$67 million is the projected cost over the next five to eight years. Buttweiler discussed the cost estimates. The estimate to build 100% of the unserved areas of Kandiyohi County is \$59,095,099.30 covering 1,982.39 miles and 6,223 subscribers. Pages 1-6 of each estimate are the individual service areas that correlate to the maps in CNE's report. Four of the six areas are comparable in cost and the other two come in under \$7 million each. Buttweiler looked at the density of the sections and noted service area 4 is pretty rural with 3.7 people per

mile; and service area 3 is very remote with 1.9 people per mile. Buttweiler stated generally speaking one location will have one subscriber. Buttweiler believes the reference "OSP costs are inflated over # year period" in the Notes section of the current price estimates should be removed and only be in the report with the projected costs.

Kleindl stated the County Board of Commissioners will receive these reports at their meeting next week and will base their acceptance of the study on this committee's recommendation. The Feasibility Study will now be a working document for the state grant application. Buttweiler stated CTC staff will review the Market Analysis and Finance Section and estimates and discuss which service area they believe should be focused on. CTC has had discussions with FTC and agreed to leave service area 1 for now for FTC. Buttweiler reminded the committee the state grant application is due October 3, 2016 and requires applicants to notify all current providers of their intent to apply for the state grant six weeks prior to the grant deadline to allow the providers to respond to the application and state whether they plan to provide or upgrade service and meet the state requirements by June 2019. There is no requirement for the current providers to respond to the notification, however, if they do not respond, they cannot deny a project for the next two years. The state provides a template for the current providers to use. Buttweiler reported CTC notified Century Link, Charter, Frontier and TDS about its state grant application, which was more providers than they needed to give notice based upon the projected service area. Chairperson Bouta stated CTC and CNE will continue to discuss and finalize the report, but this committee needs to make a recommendation today for the County Board of Commissioners to consider. Buttweiler stated CTC and CNE will be discussing costs from prior projects that can be inserted into the report before it is finalized. Discussion was held on whether the entire committee should make a recommendation or if a small group should review the information and provide a recommendation. Kleindl stated FTC will also provide input as it paid for part of the feasibility study.

IT WAS MOVED BY Michelle Marotzke, SECONDED BY Larry Kleindl, to create a subcommittee consisting of Mark Boeschen, Dean Bouta and Michelle Marotzke to review the Broadband Feasibility Study and to communicate with Consolidated Telecommunications Company and Federated Telephone Cooperative. MOTION CARRIED.

The committee was asked to review all of the information by the afternoon of August 3, 2016 and provide any comments they have to Schmoll, who will forward it to the subcommittee.

NEW BUSINESS

Broadband Utilization Project for Border-to-Border grant. Schmoll stated a project is needed for the state broadband grant application and asked that a subcommittee work on that section. Chairperson Bouta stated the purpose of that section is public awareness and to educate the public on the broadband project and indicated it could be a seminar.

Schmoll stated a flyer is still being planned as a handout for the Kandiyohi County Fair. Schmoll recommended general letters of support be obtained now for the state grant application.

Kleindl stated he will be meeting with Ehlers on August 16th as to what the county needs to do to sell bonds and create a pro forma plan. Kandiyohi County will need to decide how to fund the project before the application is submitted. The county will need to bond for \$5 million and must have a match. CTC would make the bond payments. Buttweiler stated the state did not give 50/50 matches last year. Buttweiler stated funding has to be in place and a contract has to be negotiated with CTC by the time the application is submitted. Buttweiler believes CTC would have to construct outside the grant funds received.

September meeting date. Due to the Labor Day holiday, the September meeting date was changed to August 29, 2016 at a place to be determined. Schmoll noted special meetings may need to occur before the grant deadline.

NEXT MEETING—The next meeting is **12 noon, August 29, 2016**, at a place to be determined.

ADJOURNMENT—There being no further business, the meeting was adjourned at approximately 1:19 p.m.



**Communication Network
Engineering, Inc.**

New Name. New Logo. Same Pros!



Kandiyohi County

“Broadband Feasibility Study”

August 12, 2016





I Design

I.1 Scope

Kandiyohi County contracted with CNE and its partners to provide meaningful factual data, analysis and guidance on the feasibility of building an ultra-high speed broadband network in Kandiyohi County. It is the goal of the State of Minnesota for all state residents and businesses have access to high-speed broadband that provides minimum download speeds of 10 to 20 megabits per second and minimum upload speeds of 5 to 10 megabits per second. The state's modest goals will be exceeded over time with an FTTP broadband network established to all residents and businesses through a public/private partnership with area providers. Even though FTTP is the preferred technology, however other technologies may be considered.

According to informational maps from "Connect Minnesota," and the County's GIS system, there are 7,653 buildings (housing units and businesses) that are currently unserved or under served by the state's 2015 Border-to-Border definition of high-speed broadband. The design will only be for these areas, however the market study component shall include the entire county.

CNE was tasked with providing data sufficient to use the feasibility study as a tool to conduct financial analysis and return on investment scenarios that will fit into the plans of one or more broadband providers for the build out of Kandiyohi County. Ultimately, the County will not own the network and is only facilitating the implementation and potentially assisting with financing of the project.

I.2 Engineering Study Key Components

- Define the service area conceptual fiber routes.
- Collect and analyze current and potential subdivision growth.
- Provide preliminary fiber network designs showing deployed conduit. Provide maps that include locations of premises with an overlaid fiber route and possible alternative technologies.
- Provide capital costs of construction with materials.
- Determine the areas and stages of deployment most feasible to eventually cover all of Kandiyohi County.

I.3 Design Methodology

As determined through the RFP process and subsequent meetings, CNE was to complete a high-level FTTP network design for the under-served and un-served areas of the County as defined by Connect MN and the DEED Border to Border requirements. This high-level design is one in which we were able to get a project estimate, but not one in which a bill of material and contract for construction can be completed off of. Prior to building out any service area, further detailed engineering and field staking will be required to have the project ready for bid. This method has also been used for other counties in the area (Big Stone, Lac Qui Parle and Swift) with Federated Telephone Company and has been very beneficial.

1.4 Base Map and Completed FTTP Design Map

The key step to starting the project was to get a base map (entire county) created and homes/dwellings/business locations (for under-served and un-served) areas spotted on the map. This base map was created in AutoCAD in such a way that it will easily exported to a variety of other geographically referenced systems (GIS, ESRI, Google Maps, etc.) This method has been used for other counties in the area (Big Stone, Lac Qui Parle and Swift) with Federated Telephone Company and has been very beneficial.

The base map was created primarily from the various sources:

- Tiger Map Files – US Census Bureau
- Aerial Photography available through AutoCAD
- Kandiyohi GIS records
- Kandiyohi Electric GIS records

For the potential subscriber locations, we imported the data from the various organizations. We crossed checked the subscriber locations against each other and the aerial photography to ensure the highest level of accuracy without field verification.

The high level design was completed using a combination of AutoCAD and Innovative Systems Elation Mapping. The Elation product puts all mapping and design components into a database. This method will make it very easy for CTC or Federated to move forward with further engineering. In addition, most telecommunications engineering firms utilize this software. This will be beneficial in the case that another potential partner is identified.

1.5 Service Area Selection

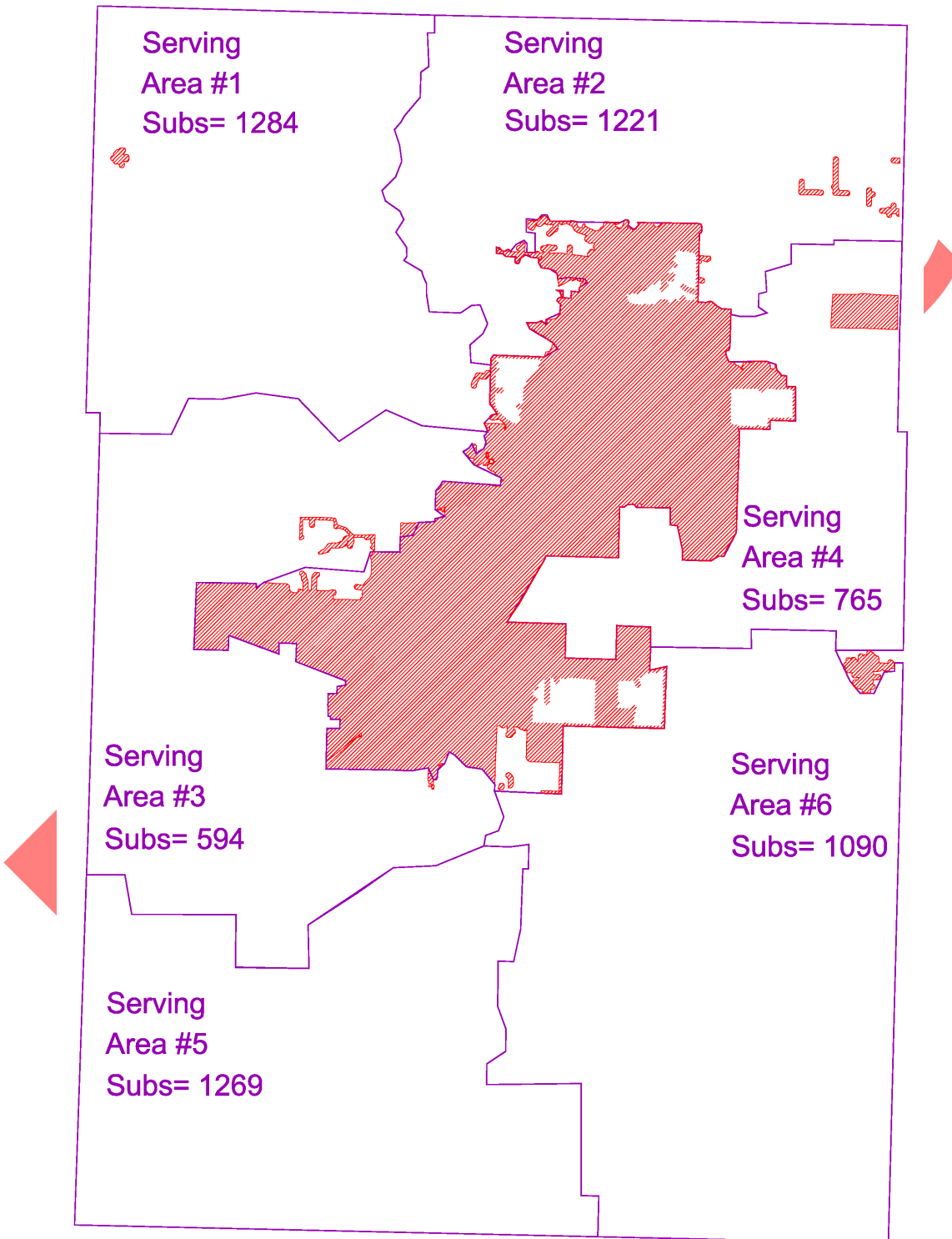
Due to the large potential service area and large quantity of potential subscribers, the high-level FTTP design incorporates multiple potential service areas. These areas will be laid out according to equipment capability, geography and potential areas for growth. In addition, it will be designed in such a way that all service areas will be connected via a ring topology for maximum performance. As Federated Telephone is a very interested party, we will provide redundant connections to their Swift County project. In anticipation of this potential project, we already have those redundant connection locations included in our design / contract for the Swift County project.

There are two main items to consider when laying out the Service Areas. One is the physical reach of the FTTP electronics and the other is the amount of subscribers/fibers being fed out of the electronics location/s. Typically, FTTP serving areas are designed to cover the most amount of subscribers while not exceeding 12.5 miles. The 12.5 mile is key as this is where the electronics to provide the service is the most economically feasible.

Kandiyohi County could have been designed with only four service areas. However, that would have provided for some extremely large fiber counts. For this reason, the design was broken into 6 service areas which allows for more manageable fiber/subscriber counts that the potential partners are more familiar with. In addition, it also allowed 2 of the service areas to be slightly smaller than the others



and allow to more easily edge into the defined served/under-served areas in the future. Below is a diagram of the proposed serving areas:





1.6 High Level Design

A high level design was created using the base map and service area definitions. This design was entered into elations so that the key components would be entered into the database. These key components are subscriber locations, pedestal/handhole location, and duct/cable size and placement. The mainline fiber and duct footage was estimated through the program. In addition, we have added in 120 feet at each pedestal/handhole location and an additional 10% to the total for each cable size. For drops, these were estimated by drawing them in on the map as accurately as possible with still allow for an easily readable map. We then added 20% to this estimate as it is hard to get very accurate with this method. This methodology has been used on other projects and is fairly accurate.

Other components of the outside plant (OSP) estimate are not as easily obtained without field engineering. In order to include them in the estimate, we used the following methodology (Update after review with CTC the week of August 1st):

- BA4 Stub Poles – 1 times the number of BDO 8000 and BHF (30x48x30)T
- BA22 Poles @ Trailer Houses – 0.25 times the number of BA4s
- BD2 Locate Peds – 1 times the number of BHF (30x48x30)T
- BDO 7 and 8000 Pedestals – As designed
- BFO Cable – As Designed. Add 120ft to each cable at pedestals and handholes. Add 10% to the overall footage.
- BFOV – As designed.
- BHF Handholes – As Designed
- BM2 Ground Rods – 1 times the total number of peds, handholes and subscriber locations.
- BM21 Building Entrances - .3 times the total number of subscriber locations. Used an average cost from existing projects.\
- BM25-I Misc. cable crossings - 0.006 times the total feet of BFO
- BM 60 (1x1.25) Bore w/duct – 200 ft per rural sub passed. **Note:** this item is very difficult to estimate on a high level design. This will need to be monitored and adjusted throughout the project.
- BM 60 (2x1.25) Bore w/duct – 10 ft per rural sub passed. **Note:** this item is very difficult to estimate on a high level design. This will need to be monitored and adjusted throughout the project.
- BM 60 (3x1.25) Bore w/duct – .003 times total feet of BFO. **Note:** this item is very difficult to estimate on a high level design. This will need to be monitored and adjusted throughout the project.

- BM 61 Bore w/o Duct – .003 times total feet of BFO. **Note:** this item is very difficult to estimate on a high level design. This will need to be monitored and adjusted throughout the project.
- BM 72 Cut/Replace Asphalt– 100 per service area
- BM 73 Cut/Replace Cement– 100 per service area
- BM 83 Warning Signs – 5 per mile of BFO
- HO-I Fusion Splices – 18 times the number of total subscribers
- HBFO(M) Splice Case - 0.65 times the number of handholes and pedestals
- HBFO(L) Splice Case - 0.35 times the number of handholes and pedestals
- SEBO 4 IL, PW, W – As designed. Added 20% to estimated map footages.
- SEBO 12 IL – 3ft per subscriber location
- SEBO 24 IL – 1ft per subscriber location
- SEBV (1x1) - 0.8 times SEBO 4IL

As discussed in some of the units above, it is very difficult to determine accurate quantities with a high level design. The way that the provided cost estimate is developed, it will allow for easily adjusting the pricing and multipliers throughout the buildout over the upcoming years.

1.7 Potential Phased Build Out Plan

When proposing a build out plan, numerous things should be taken into consideration. They are funds availability, potential broadband partner desires, potential residential/business input, ability to edge into the already served areas, existing provider speeds, access to existing fiber to provide transport, most “bang for the buck”, etc.

With these all taken into consideration, one recommended buildout plan would be:

- 1st. Serving Area # - To be completed. Coordinating with Bob and waiting on additional mapping available on the 2nd.
- 2nd. Serving Area #, #
- 3rd. Serving Area #
- 4th. Serving Area #
- 5th. Serving Area #

With this being said, this is a very subjective process and will be dependent on the company/s that the County partners with. Rarely does a telecom buildout plan stay the same as market conditions, etc. change as the project is implement. This will need to be continually monitored and adjusted throughout the implementation phases.



1.8 FTTP Project Cost Summary

Currently submitted as a separate attachment in a "Preliminary" format. CNE will be consulting with CTC the week of August 1st to discuss the methodology and pricing used. Once finalized, it will be inserted here into the document.

1.9 FTTP Project Costs by Service Area

Currently submitted as a separate attachment in a "Preliminary" format. CNE will be consulting with CTC the week of August 1st to discuss the methodology and pricing used. Once finalized, it will be inserted here into the document.

1.10 Additional Submittals

As many of the design components are hard to insert into this document while still being legible, the following items will be submitted in electronic format:

- Design Mapping – These will be provided in the following formats:
- Project Cost Estimate – This will be supplied in an Excel format. This will allow for adjusting the cost estimate as needed. In this file, you can modify the pricing, buildout period/annual increase, estimate drops constructed to and unit multipliers. Once modified, the project estimate pages are then updated.
- Supplemental Google Mapping – As much of the mapping is in AutoCAD and not the easiest to present in a potential grant application, we are supplying the following Google files
 - Kandiyohi Proposed Service Areas
 - Potential Subscribers
 - Survey Respondent Data (that were able to be accurately geocoded)
 - Existing service provider coverage areas
 - Existing service provider's speed and technology type

Draft



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Kandiyohi County
Broadband Internet
Feasibility Study
July 2016

Overview

The Kandiyohi County Broadband Internet Feasibility Survey was conducted over a period of three and a half weeks from mid-May to mid-June 2016 as part of a larger study of broadband services, providers, household costs, and network development feasibility within the county, headed by the Kandiyohi County & City of Willmar Economic Development Commission's Kandiyohi County Broadband Feasibility Committee.

The committee selected CNE Engineering to conduct the feasibility study, with the telephone and online surveys being conducted and administered by market research provider M•Power Consulting.

Survey Efforts & Methodology

Market Research Glossary

Instrument: The group of questions asked of survey participants

Respondent: A survey participant whose responses constitute a completed survey

Survey Operator: The telephone call center operator who administers the survey to the survey participant

The main residential survey was a telephone survey designed for statistical validity and conducted with randomized sampling, in order to provide the committee and the county with the most representative and actionable results. The confidence level of the county's survey was maintained at 95% confidence, with a confidence interval of +/- 5%. This variation allows for common surveying occurrences like non-responses and respondent declines, while still providing valid survey results for extrapolation and representation of the survey population's feelings on survey topics. Based on the populations surveyed, this led to a completed survey cohort of 379 surveys.

The surveys were targeted at residential populations living within specific census tracts in the County of Kandiyohi. The census tracts were specifically targeted for their outlying, rural nature – no city, town, or village areas were surveyed using the residential phone survey.

Lists were purchased specifically for the abovementioned areas, including both records for landlines and cell phones in order to capture the largest sample of respondents possible. The survey calling was conducted by a professional call center from Duluth, Minnesota, with survey calls carried out between the hours of 4PM and 9PM on week nights and Saturdays during the survey window.

Several survey questions offer respondents the opportunity to rate service providers on a 10-point scale, where respondents are given a scale with 10 data point answers in order to best quantify their feelings toward a particular response. This scale, called the Likert scale, is best for shorter surveys like the one conducted in Kandiyohi County, because it allows more variance than a smaller scale (like a 5- or 7-point scale) and thus a higher degree of measurement precision.

From an analyst's perspective, this difference is important, because it gives us the opportunity to detect subtle changes in sentiment and better differentiate multiple points of view. We ask specifically about satisfaction not because of our interest in a company's ability to provide good customer care to their constituents, but rather because metrics on satisfaction correlate highly to customer loyalty and, ultimately, their willingness to defect from the incumbent company's products.

What's more important, randomness or survey size?

The most important rule in surveying is not how many respondents, but instead how they are selected. Random sampling is the most reliable methodology available. Our survey utilized an auto-dialer for all outbound calls, with several recalls to eliminate sampling errors due respondents being away during the calling windows.

Survey sizes determined by statistical models based upon probability – similar to a coin toss experiment, but on a much larger scale. As the sample size increases, the deviation within the sample decreases, meaning a sample of a few hundred is valid, to within a few percentage points, of the feelings of a larger population.

Many of the respondents in the Kandiyohi County survey indicated a high level of indifference in their loyalties, which can be interpreted as an opportunity to convert customers from other service providers.

Figure 1: Metric Conversion Between Likert and Percentage Scales

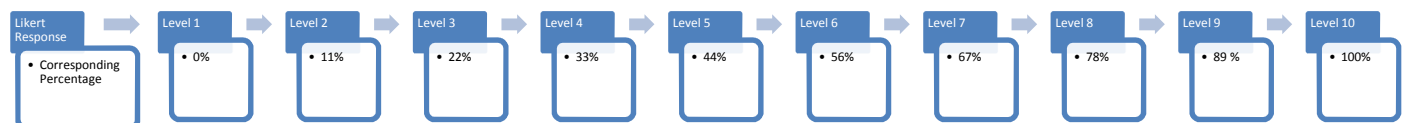


Figure 2: HBR Customer Satisfaction Graph and Correlating Percentage Scale



Instrument Development

The survey instrument was developed in tandem with representatives from the Kandiyohi County Broadband Feasibility Committee and M•Power Consulting, utilizing a vetted group of initial questions used by other municipal and private company broadband studies with whom M•Power Consulting has been involved. These initial questions were further refined using questions added by the Feasibility Committee, specifically investigating information they wanted to explore based on respondents' feedback. These questions, and the scripting used by the survey operators, were designed to build rapport with respondents throughout the survey interview, allowing us to gather insights without respondents feeling their privacy was being intruded upon. The survey instrument and the questions it contains were also carefully chosen to both provide insight for the current feasibility study as well as useful information for marketing and promotional campaigns when and if the broadband network happens.

The instrument was deployed not only to the residential respondents, but also to those respondents reached via commercial surveying and online surveying. The commercial surveying was also conducted via telephone, with the records coming from the local electric cooperative. The online survey was made available via the Economic Development Commission's website. These surveys are considered purely informational, as they were not completed at a high enough confidence level to be statistically valid, nor was their sampling pattern random enough to ensure valid data.

The survey instrument is contained in whole on the pages below. Survey results from the residential, and commercial surveys are individually tabulated and presented in-line, directly following the question as assessed to the individual respondents. Responses themselves and the associated analysis and insights are recorded in **bold font**. The online survey is a direct export document from the surveying software, and is contained in a separate document.

Residential Survey

1. Did we reach you today on a landline or mobile telephone?

Landline	58%
Mobile	42%

2. Who is your current landline telephone provider?
a. List provider name given

The majority of the respondents with landlines indicated TDS Telecom as their service provider. TDS boasts one of the lowest levels of subscriber satisfaction for landline in the survey, following only Frontier at the bottom of the group. The presence of mobile providers ATT and Verizon in this result indicates their provision of home phone services via their Wireless Home Phone and Wireless Home Phone Connect products (respectively), and should not be considered an error.

ATT	1%	9.0
CenturyLink	8%	7.6
Charter	14%	8.0
Frontier	19%	7.0
TDS	47%	7.1
Verizon	4%	8.0
Other/Unsure	7%	7.3

3. Who is your current mobile telephone provider?
a. List provider name given

Provider	Percent Responses	Average Satisfaction Per Provider
ATT	14%	8.0
Sprint	2%	7.3
Straight Talk	4%	9.2
Verizon	69%	8.3
Other/Unsure	11%	8.2

4. What is your level of satisfaction with your current provider?
a. Scale of 1 to 10; 1 being very unsatisfied, 10 being very satisfied

Overall satisfaction for all landline services was 7.3 on a 10-point scale and for all mobile services was 8.2 on a 10-point scale. Please see question 2 above for complete satisfaction breakdowns by provider for landlines, and question 3 above for complete satisfaction breakdowns by provider for mobile.

5. What is the current monthly charge for your landline/mobile phone?
- a. List amount provided

Charge Ranges	Percentage of Respondents
Less than \$50	51%
\$50-75	13%
\$75-100	13%
\$100-125	5%
\$125-150	4%
\$150-175	2%
More than \$175	12%

This response was unprompted, meaning respondents replied to the questions and provided information without being given choices by the survey operator. The ranges were constructed later to give an analysis framework to the answers provided by the respondents.

6. Do you know if broadband service is available at your place of residence?
- a. Yes, it's available
- b. No, it's not available
- c. Unsure

Yes, broadband is available	63%
No, it's not available	20%
Unsure	17%

7. Do you currently subscribe to broadband service in your home?
- a. Yes
- b. No

Of respondents who indicated broadband was available, 100% indicated they were subscribers. This shows a high level of correlation between broadband awareness and ultimate penetration (or subscriber take rate). Even when adding in the respondents who were unsure of the availability of broadband at their location (keeping in mind these respondents may or may not actually have broadband available to them at their location), the take rate remains high at 80%.

8. Do you currently use your broadband service for business purposes, either for an employer or as a business owner?
- a. Yes
- b. No

The strength of broadband as an economic development and business creation/growth mechanism is inherent within the answer to this question. Of the respondents currently subscribing to broadband services, 37% say they use the broadband for business purposes, either for an employer (like remote or telecommuting workers) or as a business owner. Business ownership in this response is fairly

loosely described, as it can mean everything from a sole proprietorship to a home-based business to a family farm.

As a portion of the total number of respondents surveyed, business users become 23% of the representative sample. The contributions broadband availability could make to the county's tax base are an interesting extrapolation of this response. If the 20% of the county where broadband was unavailable suddenly had access, could we see a similar 23% increase in business use, and the associated revenues? Data seems to suggest this type of relationship, and similar studies in other areas have closely tied broadband availability to business growth.

9. Who is your current broadband provider?
 - a. List actual provider name given

This question was only posed to respondents who had indicated they had broadband services available to them at their home location, or who said they currently subscribed to those services. This number accounted for roughly 2/3 of the total survey respondents.

The majority of respondents indicated they had TDS as a provider for broadband services, and that their satisfaction with the services as it was provided to them was low – just over 5 on the Likert scale, which translates to a 44% approval rating. Even Charter, the next most prevalent service provider, carried only a 67% converted approval rating. This means the brand or provider loyalty for these respondents is low, and they should be considered a potential audience for any new services provided in their areas.

Provider	Percent responses	Average satisfaction per provider
ATT	<1%	5.0
CenturyLink	3%	6.5
Charter	28%	7.1
DISH	<1%	7.7
Frontier	14%	4.1
Hughes/Excede	<1%	3.3
MVTV	5%	5.9
TDS	39%	5.2
Verizon	4%	6.0
WildBlue	<1%	4.5
Other/Unsure	3%	4.8

10. What is the speed of the broadband service you currently receive?
- a. List actual number given
 - b. Unsure

Only slightly more than 20% of respondents with broadband Internet services were able to name their speed of service; the vast majority of them were unsure, at 72%. The remaining 8% gave verbal speed references; “It’s high speed” or “not fast enough” or simply “slow” were the more frequently used examples of the verbal references.

While this is a common enough response for a survey of this type with residential users, it does speak to the larger issue of what is considered a “broadband” or “high speed” Internet connection. Given the number of changes made to the definitions of these terms at various levels of government and within the Federal Communications Commission itself over the past few years, it’s understandable for unsophisticated or nontechnical end users to have little understanding of what constitutes a true broadband connection.

The breakdown of named speeds are reported below. Those speeds over 30MG were identified as Charter-provided, meaning their delivery mechanism is via cable modem and subject to usage fluctuations during peak times. Satellite provider Exede was noted at a maximum of 15MG, but satellite has its own issues of latency (transmission delays) and usage capping. Similarly, terrestrial broadband provider MVTV was noted as delivering speeds of up to 5MG, but no mention was made of usage caps, if applicable. The maximum identified speed for a DSL-based provider (Frontier or TDS) was 15MG.

Reported Speed	Percentage of subscribers (of those respondents reporting a specific speed)
1Mg	6%
1.5Mg	11%
2.5Mg	6%
3Mg	6%
4Mg	6%
5Mg	12%
6Mg	4%
7Mg	2%
8Mg	4%
10Mg	6%
12Mg	4%
15Mg	12%
30Mg	4%
34Mg	2%
60Mg	15%

11. What is your level of satisfaction with your current provider?
a. Scale of 1 to 10; 1 being very unsatisfied, 10 being very satisfied

Overall satisfaction for all broadband services was 6.0 on a 10-point scale. Please see question 9 above for complete satisfaction breakdowns by provider.

12. What is the current monthly charge for your broadband service?
a. List actual amount provided

This response was unprompted, meaning respondents replied to the questions and provided information without being given choices by the survey operator. The ranges were constructed later to give an analysis framework to the answers provided by the respondents.

Scale	Percentage
\$19.99 to \$34	11%
\$35 to \$54	29%
\$55 to \$74	26%
\$75 to \$99	6%
\$100 to \$149	3%
More than \$150	4%
Unsure or bundled	30%

13. Are there any services related to broadband you wish were available to you?
a. List actual products/services

Wish List Item	Percentage of Respondents*
Higher Speeds	60%
Increased Reliability	14%
Land-based (nonwireless) service options	9%
Specifically fiber optic Internet provisioning	4%
Availability of more service provider option	7%
Better service**	5%
Lower prices	5%
Availability and support of TV and streaming	7%

***Percentages total greater than 100% due to respondents providing more than one wish list item**

****The "Better service" response is ambiguous – it could be interpreted as a wish for faster speeds, but it could also be interpreted as a desire for a better customer experience or interaction with customer service personnel.**

14. How likely would you be to switch from your current broadband provider to another company, if the other company offered the same or better services and competitive rates?

- a. Very likely
- b. Likely
- c. Somewhat likely
- d. Unlikely

Likelihood of Switching	Percentage	Yes/No Comparison	Percentage
Very Likely	36%	YES	56%
Likely	20%		
Somewhat Likely	28%	NO	44%
Unlikely	16%		

15. What are the reasons you don't currently subscribe to broadband at your location?

- a. Too expensive
- b. No equipment (computer)
- c. No use
- d. Speeds too slow
- e. Other – list actual

Reason	Percentage of Respondents
Too Expensive	20%
No Equipment	4%
No use	13%
Speeds too slow	15%
Not available	28%
Other	20%

This question was only asked of those respondents who indicated they were not currently subscribing to broadband service. The largest percentage of respondents were those who were interested in broadband service but found themselves unable to receive it at their locations.

“Other” responses include lack of options (respondents weren't satisfied with the providers and speeds available in their location), seasonal residence, personal preference, or lack of landline phone (for providers who don't provide standalone service).

16. If broadband services were available at your location, would you use them for any of the following business purposes:

- a. Building a new business
- b. Expanding an existing business
- c. Hiring additional employees
- d. Working remotely for an employer
- e. None of the above
- f. Other – list actual

Business Purpose	Percentage of Respondents*
Building a new business	5%
Expanding an existing business	9%
Hiring additional employees	3%
Working remotely for an employer	18%
None of the above	60%
Other**	21%

*Percentages total greater than 100% due to respondents providing more than one business purpose

**“Other” responses included online schooling and other personal uses.

Respondents who either didn’t have access to broadband services or who were unsure of the availability of broadband at their location were asked this question. Almost 1 out of 5 respondents indicated a desire to use broadband services to work remotely for an employer, identifying the possibility of a broadband network as a support mechanism for a telecommuting population.

17. Do you currently subscribe to any video entertainment or cable television services in your home?

- a. Yes
- b. No

Yes	75%
No	25%

The trend in non-subscription households is definitely growing. However, this can also be an indicator of a vacation-centric area, where families opt not to subscribe to video services of any kind because of their seasonal or transient residency.

18. Who is your current provider for video entertainment or cable television services?

a. List actual provider given

Provider*	Percentage	Average Satisfaction
Charter	16%	7.3
Charter & OTT	2%	7.1
DirecTV	18%	7.8
DirecTV & OTT	2%	6.8
DISH	40%	7.4
DISH & OTT	4%	7.3
Frontier	1%	4.5
Netflix or other OTT	12%	7.9
Slingbox	1%	5.7
TDS	2%	6
UHF	1%	7.7
Unsure/other	1%	5.7

* Left alignment is for traditional cable TV or satellite provision. Right alignment is for over-the-top or online services, either by themselves or in conjunction with another service.

TDS Telecom doesn't offer traditional land-based cable television in the areas covered by this survey. Responses for them include their reseller agreements with satellite providers, usually secured through DISH Network. In these situations, a TDS technician may be the one to install or service the satellite product, but it remains branded by the satellite provider. Depending on the nature of the agreement between the telecommunications provider and the satellite provider, end users might end up including their satellite payment with their telephone or Internet service, or might have to remit this payment separately to the satellite provider directly.

This reseller partnership also explains DISH's high penetration rate, and their outsized penetration lead against satellite competitor DirecTV within the survey area.

Regarding over-the-top providers, there is a negative correlation between satisfactions in respondents who had traditional cable or satellite TV packages, and those who had those packages in conjunction with an over-the-top subscription like Netflix or Amazon Prime. The respondents who had both services were slightly less satisfied overall. Compared to the highest satisfaction rating of standalone over-the-top subscribers, this could point to either price or quality of service (particularly on the satellite providers) being the source of dissatisfaction.

19. What is your level of satisfaction with your current provider?
a. Scale of 1-10; 1 being very unsatisfied, 10 being very satisfied

Overall satisfaction for all video and cable television services was 7.4 on a 10-point scale. Please see question 18 above for complete satisfaction breakdowns by provider.

20. What is the current monthly charge for your video entertainment or cable TV service?
a. List actual amount given

This response was unprompted, meaning respondents replied to the questions and provided information without being given choices by the survey operator. The ranges were constructed later to give an analysis framework to the answers provided by the respondents.

Charge Range	Percentage of Respondents
Less than \$25	12%
\$25-50	10%
\$50-75	20%
\$75-100	25%
\$100-125	14%
\$125-150	11%
More than \$150	8%

21. Are there any services related to video entertainment or cable TV you wish were available to you?
a. List products/services

Only 20% of video or cable service respondents provided insight into additional products or services that might be of interest to them. The percentages below are calculated based upon the number of respondents who put forth a wish list item.

Wish List Item	Percentage of Respondents
Better OTT service/Internet	30%
Other options for service providers	27%
A la carte channel selection capability	16%
No satellite/land-based service due to weather	14%
More sports channels	5%
Single bundle with one provider	5%
No fee for additional cable boxes	2%

22. How likely would you be to switch from your current video entertainment or cable TV provider to another company, if the other company offered the same or better services and competitive rates?

- a. Very likely
- b. Likely
- c. Somewhat likely
- d. Unlikely

Likelihood of Switching Percentage Yes/No Comparison Percentage

Very likely	24%		
Likely	18%	YES	42%
Somewhat likely	29%		
Unlikely	29%	NO	58%

Respondents showed less likelihood of switching providers in the video entertainment and cable services than in their Internet service. In other similar surveys, reasons for this hesitancy have included concerns about wiring and hardware, like cable boxes.

23. Are any of your current services provided to you in a service bundle?

- a. Yes
 - i. Which ones?
 - ii. What is the monthly charge for the service bundle?
- b. No

56% of respondents indicated they had a service bundle of some type, meaning 44% were subscribing to services a la carte from various providers. This arrangement presents an opportunity for attracting and retaining customers, as the telecommunications industry trend is for decreased churn and increased stickiness (the willingness of customers to switch between providers if alternatives are available) when all main services (phone, Internet and a television option) are provisioned by a single provider.

Bundle Type	Percentage
Landline, TV, Internet*	38%
Landline and Internet	29%
Television and Internet	10%
Landline, Internet and Satellite	8%
Landline and Television	4%
Landline and Satellite	2%
Internet and Satellite	2%
Cell and Hotspot	2%

*** The survey didn't script answers for respondents, so the category of landline, television and Internet could also include some respondents who had satellite services but didn't characterize them as such.**

24. What services would you be interested in seeing in a bundled service offering?
- List actual answer provided

The most popular responses to this question were a 3-way bundle of phone, cable television, and broadband, and an option for a television and broadband package without landline.

25. How much would you expect to pay on a monthly basis for a service bundle that offered a landline telephone, broadband service and video entertainment services?
- \$85-95
 - \$96-105
 - \$106-115
 - More than \$115
 - Other – list actual

Bundle Pricing	Percentage of Respondents
\$85-95	20%
\$96-105	18%
\$106-115	11%
More than \$115	25%
Other	27%

Many of the respondents (approximately 23%) who selected “Other” wanted smaller bundles at a rate of less than \$85 per month. The remainder were unsure of their ideal pricing.

26. How much would you expect to pay on a monthly basis for a service bundle that offered broadband service and video entertainment services?
- \$60-70
 - \$71-80
 - \$81-90
 - More than \$90
 - Other – list actual

Bundle Pricing	Percentage of Respondents
\$60-70	30%
\$71-80	11%
\$81-90	11%
More than \$90	20%
Other	28%

Many of the respondents (approximately 23%) who selected “Other” wanted smaller bundles at a rate of less than \$85 per month. The remainder were unsure of their ideal pricing.

27. If another provider for telecommunications services were available, what type of benefits would best motivate you to switch?

- a. Better speed
- b. Better price
- c. More services
- d. Opportunity to bundle
- e. Other – list actual response

Response Type	Percentage
Better Speed	37%
Better Price	39%
More Services	2%
Opportunity to Bundle	4%
Other	18%

34% of respondents who chose the “Other” category did so because they would want all of the above benefits. 9% chose indicated reliability to be a factor in their motivations to switch providers.

28. If another provider for telecommunications services were available, what type of offer would best motivate you to switch?

- a. Free installation
- b. Introductory rate
- c. Bonus services (calling features, premium channels, virus protection)
- d. Other – list actual responses given

Response Type	Percentage
Free Installation	25%
Introductory Rate	8%
Bonus Services	13%
Other/None	54%

A number of respondents reported no preference on motivational promotions or special offers, but it’s interesting to note that of the ones who did, the offer of free installation was the most appealing while the introductory rate was least appealing.

Introductory rate promotions are a popular marketing tool for larger telecommunications providers like Charter, and consumers, weary of the jumps in pricing that come with these offers, are responding less and less favorably to the tactic.

29. Do you support Kandiyohi County being involved in the construction of a broadband network to bring the opportunity for broadband services to all residents and businesses in Kandiyohi County?

- a. Definitely Yes
- b. Yes
- c. Maybe
- d. No
- e. Definitely No

Response	Percentage of Respondents
Definitely Yes	37%
Yes	45%
Maybe	11%
No	5%
Definitely No	2%

This question was asked of all survey respondents, using a modified Likert scale response that allowed for variance in attitudes about the proposed construction. An overwhelming majority of respondents, 82%, stated they supported or definitely supported the construction of broadband services to Kandiyohi County.

30. If Kandiyohi County were able to bring fiber-based broadband Internet services, with speeds significantly higher than any current cable, wireless or DSL providers, to all residents and businesses in the county, what would you expect to pay per month for unlimited use of those services?

- a. less than \$75
- b. \$75
- c. \$100
- d. \$125
- e. \$150
- f. more than \$150
- g. I wouldn't subscribe

Response	Percentage of Respondents
Less than \$75	36%
\$75	21%
\$100	15%
\$125	6%
\$150	2%
More than \$150	4%
I wouldn't subscribe to broadband	16%

The final survey data only recorded 145 responses to this questions, as it was added to the survey instrument midway through the surveying window. That means the numbers contained here are not statistically valid, but they can still serve an informational purpose, particularly when viewed in conjunction with other pricing sensitivity questions for individual services and bundles.

Demographic Information:

The survey also captured some basic demographic information about the respondents, in order to assist with demand forecasting and engineering modeling for other portions of the feasibility study. This information is self-reported and unscripted, meaning respondents answered the questions as posed to them without prompting from the survey operator.

Respondents were asked for their physical location, number of people in household and number of children under 25 physically residing in the household. This information was then used in determining demand in various census blocks throughout the county, and in understanding what the average household makeup looked like. 98% of respondents provided this information to the survey operators.

Household Size	Percentage of Respondents
No answer	1%
1	14%
2	57%
3	9%
4	11%
5	5%
6	1%
7 or more	2%

Number of Children in Household	Percentage of Respondents
No children	75%
1	7%
2	11%
3	4%
4	1%
5	1%
6 or more	1%

Commercial Survey

There were a total of 15 responses to the commercial survey. The contact information for the businesses targeted was supplied to the Broadband Feasibility Committee by the local electric cooperative. This response threshold is the equivalent to an 80% confidence level and a 15% confidence interval.

1. Did we reach you today on a landline or mobile telephone?
 - a. Landline
 - b. Mobile

Landline	60%
Mobile	40%

2. Who is your current landline telephone provider?
 - a. List provider name given

Provider	Percentage	Satisfaction
Centurylink	11%	6.0
Charter	22%	8.5
Frontier	33%	7.7
TDS	33%	8.3

3. Who is your current mobile telephone provider?
 - a. List provider name given

Provider	Percentage	Satisfaction
ATT	17%	7
Verizon	83%	6.4

4. What is your level of satisfaction with your current provider?
 - a. Scale of 1 to 10; 1 being very unsatisfied, 10 being very satisfied

Overall satisfaction for all landline services was 7.6 on a 10-point scale and for all mobile services was 6.7 on a 10-point scale. Please see question 2 above for complete satisfaction breakdowns by provider for landlines, and question 3 above for complete satisfaction breakdowns by provider for mobile.

5. What is the current monthly charge for your landline/mobile phone?
a. List amount provided

Charge Range	Percentage
\$40-80	40%
\$81-120	20%
More than \$120	13%
Unsure/varies	27%

6. Do you know if broadband service is available at your place of residence?
a. Yes, it's available
b. No, it's not available
c. Unsure

Response	Percentage
Yes, it's available	66%
No, it's not available	20%
Unsure	14%

7. Do you currently subscribe to broadband service in your business?
a. Yes
b. No

Yes	69%
No	31%

8. Do you currently use your broadband service for business purposes, either for an employer or as a business owner?
a. Yes
b. No

Yes	56%
No	44%

9. Who is your current broadband provider?
a. List actual provider name given

Provider	Percentage	Satisfaction
Centurylink	11%	6.0
Charter	22%	4.5
Frontier	11%	5.0
MVTV	11%	9.0
TDS	33%	5.3
Unsure	11%	3.0

10. What is the speed of the broadband service you currently receive?

- a. List actual number given
- b. Unsure

Speed	Percentage
16Mg	11%
Unsure	89%

11. What is your level of satisfaction with your current provider?

- a. Scale of 1 to 10; 1 being very unsatisfied, 10 being very satisfied

Overall satisfaction for all broadband services was 5.3 on a 10-point scale. Please see question 9 above for complete satisfaction breakdowns by provider.

12. What is the current monthly charge for your broadband service?

- a. List actual amount provided

Charge Range	Percentage
\$35-55	33%
\$56-75	22%
More than \$75	22%
Unsure	22%

13. Are there any services related to broadband you wish were available to you?

- a. List actual products/services

Respondents indicated they would live faster speeds or more bandwidth, specifically to make downloading and transferring of files easier.

14. How likely would you be to switch from your current broadband provider to another company, if the other company offered the same or better services and competitive rates? (Skip to Question 16)

- a. Very likely
- b. Likely
- c. Somewhat likely
- d. Unlikely

Response	Percentage
Very likely	50%
Likely	20%
Somewhat likely	0%
Unlikely	30%

15. What are the reasons you don't currently subscribe to broadband at your location? (Skip to Q17)

- a. Too expensive
- b. No equipment (computer)
- c. No use
- d. Speeds too slow
- e. Other – list actual

Response	Percentage
Too expensive	25%
No equipment	0%
No use	25%
Speeds too slow	0%
Other	50%

The "other" responses indicated the businesses were not able to receive broadband services at their location.

16. If broadband services were available at your location, would you use them for any of the following business purposes:

- a. Building a new business
- b. Expanding an existing business
- c. Hiring additional employees
- d. Working remotely for an employer
- e. None of the above
- f. Other – list actual

Response	Percentage
Building a new business	0%
Expanding an existing business	25%
Hiring additional employees	0%
Working remotely for an employer	0%
None of the above	75%
Other	0%

17. Do you currently subscribe to any video entertainment or cable television services at your business?

- a. Yes
- b. No

Yes	60%
No	40%

18. Who is your current provider for video entertainment or cable television services?

a. List actual provider given

Provider	Percentage	Satisfaction
Charter	22%	7.0
DISH	56%	9.0
Netflix/OTT	11%	8.0
Unsure	11%	5.0

19. What is your level of satisfaction with your current provider?

a. Scale of 1-10; 1 being very unsatisfied, 10 being very satisfied

Overall satisfaction for all video and cable television services was 8.0 on a 10-point scale. Please see question 18 above for complete satisfaction breakdowns by provider.

20. What is the current monthly charge for your video entertainment or cable TV service?

a. List actual amount given

Charge Ranges	Percentage
\$18-20*	11%
\$21-80	11%
Over \$80	33%
Unsure	45%

***This range was only for over-the-top services. Land-based and satellite video services prices started in the \$60 range.**

21. Are there any services related to video entertainment or cable TV you wish were available to you?

a. List products/services

The respondents who mentioned a wish list item listed better Internet services and the ability to watch streaming content like Netflix or Hulu more effectively.

22. How likely would you be to switch from your current video entertainment or cable TV provider to another company, if the other company offered the same or better services and competitive rates?

- a. Very likely
- b. Likely
- c. Somewhat likely
- d. Unlikely

Response	Percentage
Very likely	22%
Likely	11%
Somewhat likely	22%
Unlikely	44%

23. Are any of your current services provided to you in a service bundle?

- a. Yes
 - i. Which ones?
 - ii. What is the monthly charge for the service bundle?

75% of respondents indicated they had a service bundle of some type, meaning 25% were subscribing to services a la carte from various providers. Interestingly, only 10% of respondents had a 3-service bundle.

Bundle Type	Percentage
Landline, TV, Internet*	10%
Landline and Satellite	20%
Cell and Hotspot	10%
Landline and Internet	40%
Internet and Satellite	10%
Other	10%

*** The survey didn't script answers for respondents, so the category of landline, television and Internet could also include some respondents who had satellite services but didn't characterize them as such.**

Charges for the services were relatively flat, with 90% of respondents saying they had a bundle that was between \$120-200 per month.

24. What services would you be interested in seeing in a bundled service offering?

Respondents were once again interested in speed, with a third listing this as a priority. The availability of a 3-way service bundle was also of interest, with 67% targeting that provision as attractive.

25. How much would you expect to pay on a monthly basis for a service bundle that offered a landline telephone, broadband service and video entertainment services?

- a. \$85-95
- b. \$96-105
- c. \$106-115
- d. More than \$115
- e. Other – list actual

Charge Range	Percentage
\$85-95	20%
\$96-105	20%
\$106-115	13%
More then \$115	14%
Other*	33%

***Respondents indicated they were unsure of what they would pay for the bundle described.**

Those respondents who indicated they would pay more than \$115 said they would be willing to pay an average of \$150 for the bundle described.

26. How much would you expect to pay on a monthly basis for a service bundle that offered broadband service and video entertainment services?

- a. \$60-70
- b. \$71-80
- c. \$81-90
- d. More than \$90
- e. Other – list actual

Charge Range	Percentage
\$60-70	27%
\$71-80	7%
\$81-90	13%
More than \$90	20%
Other*	33%

*Respondents indicated they were unsure of what they would pay for the bundle described.

Those respondents who indicated they would pay more than \$90 said they would be willing to pay an average of \$100 for the bundle described.

27. If another provider for telecommunications services were available, what type of benefits would best motivate you to switch?

- a. Better speed
- b. Better price
- c. More services
- d. Opportunity to bundle
- e. Other – list actual response

Response	Percentage
Better speed	33%
Better price	20%
More services	13%
Opportunity to bundle	7%
Other	27%

Respondents who indicated other said they were unsure of what benefits would motivate their service change.

28. If another provider for telecommunications services were available, what type of offer would best motivate you to switch?

- a. Free installation
- b. Introductory rate
- c. Bonus services (calling features, premium channels, virus protection)
- d. Other – list actual responses given

Response	Percentage
Free installation	33%
Introductory rate	7%
Bonus services	7%
Other	53%

29. Do you support Kandiyohi County being involved in the construction of a broadband network to bring the opportunity for broadband services to all residents and businesses in Kandiyohi County?

- a. Definitely Yes
- b. Yes
- c. Maybe
- d. No
- e. Definitely No

Response	Percentage
Definitely Yes	40%
Yes	33%
Maybe	13%
No	7%
Definitely No	7%

30. If Kandiyohi County were able to bring fiber-based broadband Internet services, with speeds significantly higher than any current cable, wireless or DSL providers, to all residents and businesses in the county, what would you expect to pay per month for unlimited use of those services?
- a. less than \$75
 - b. \$75
 - c. \$100
 - d. \$125
 - e. \$150
 - f. more than \$150
 - g. I wouldn't subscribe

Response	Percentage of Respondents
Less than \$75	47%
\$75	26%
\$100	7%
\$125	7%
\$150	0%
More than \$150	0%
I wouldn't subscribe to broadband	13%

Demographic information was not collected for the commercial survey respondents.

Online Survey

The online survey results are compiled in a separate document.

Market Analysis Section – DRAFT

Section Summary

Outside of the County’s “served” areas, broadband faster than 5 Mbps is rare, unless video is present. This is borne out in FCC data described in this section and after removing urban subscriber from the survey data. By virtue of this alone, Consolidated should expect a favorable response, if the effective pricing of broadband is in the range of \$1.00 per downloaded Mbps, and as high as \$3-\$4 in areas that can only receive broadband from Wireless Internet Service Providers (WISPs) or satellite Internet providers today.

We found Charter to be the price leader, and limited to the Willmar 56201 zip code. They are arguably also the speed leader. At all prices, surveyed county Subscribers asked about broadband say their greatest wish is for speed and only one in six said they’d be unlikely to switch providers. From the survey:

Wish List Item	Pctg of Respondents*
Higher Speeds	60%
Increased Reliability	14%
Land-based (nonwireless) service options	9%
Specifically fiber optic Internet provisioning	4%
Availability of more service provider option	7%
Better service**	5%
Lower prices	5%
Availability and support of TV and streaming	7%

Source: Kandiyohi County MPower Telephone Survey, page 9, question 13

Likelihood of Switching	Percentage
Very Likely	36%
Likely	20%
Somewhat Likely	28%
Unlikely	16%

Source: Kandiyohi County MPower Telephone Survey, page 10, question 14

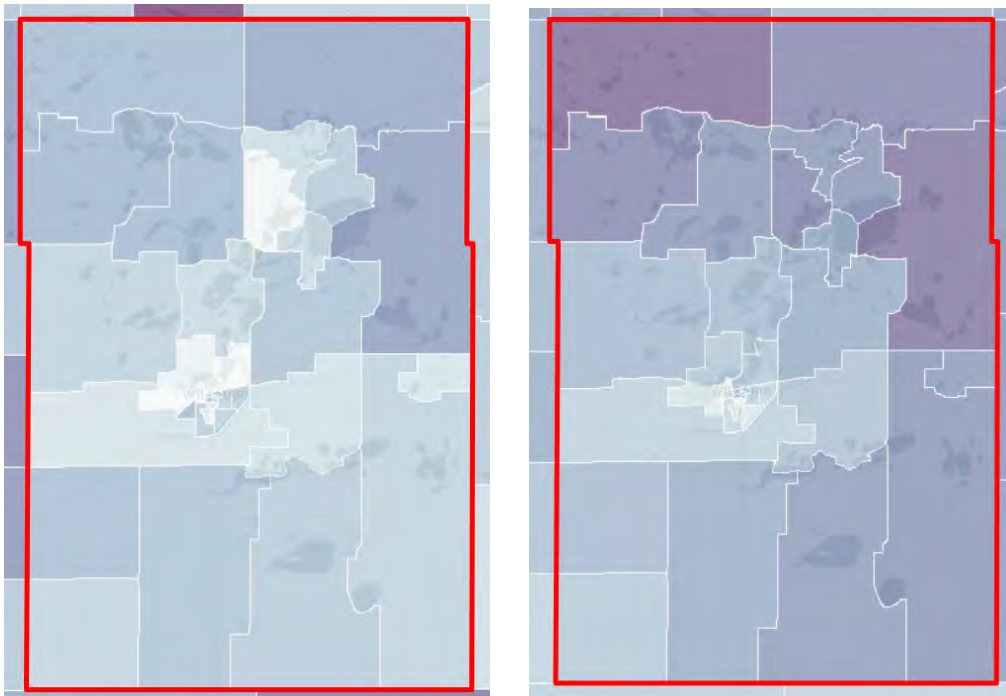
Bundles are important in Kandiyohi County. In County census block having broadband faster than 3-5 Mbps, we say video present. In 100% of those census blocks, we saw an incumbent voice provider with a stated strategy to bundle at least two of these services. 75% of those surveyed indicated they had a service bundle of some kind—usually with video present (*Kandiyohi County MPower Telephone Survey, page 11, question 17*). It would be prudent for a new competitor to also offer combinations of broadband with voice and/or video. Adding either or both is not a daunting task in the County:

- Outside of existing Charter and Mediacom footprints—that is, in the six designated serving areas—Consolidated or another partner of equal experience will have no difficulty setting up or expanding video content agreements and supplying adequate set top boxes with outputs for broadband modems.
- If telephone service is to be offered along with broadband in the six designated serving areas, there will be no show-stopping delays. All incumbent telephone providers already have

interconnected with competing voice providers, making it comparatively easy to achieve local interconnection agreements and fulfill all state and federal regulatory requirements to provide voice services by the time first fiber-based subscribers are connected in early 2017.

- Current TDS Mid-State and tds metrocom triple play subscribers will likely be under contract, and facing prices that are reasonable for services provided. They will be tougher to dislodge.

Work at home has become a popular theme in recent years, and should be seen as a notable opportunity for widely available fiber-based broadband services. The economy sees eased demands on urban energy and transportation, but this becomes possible only as high-speed broadband allows employees and employers to do effective work remotely. 18% of our broadband telephone survey respondents indicated a desire today to work at home over a broadband connection (*at page 9, question 16*). This is corroborated by recent census data showing as many as 13% of households have one member working at home.



1% - 13% current Work at Home range.

14-27 minute average commute to work range.

Source: http://www.city-data.com/county/Kandiyohi_County-MN.html Census Bureau data through 2013

So it should not be surprising that 70% of a self-selected group of respondents to the study's online survey indicated they use their broadband connection to work remotely at home, and that 100% would consider switching providers for the same or better services offered at competitive prices. (*Kandiyohi County MPower Online Survey, page 19, question 18*) This is all the more interesting because the average commute time to work for County residents has been a bit lower than the 29 minute average for the nation as a whole.

Frontier, Windstream-Lakedale, if opportunistically CenturyLink will not prove to be difficult to reach. Their broadband offering are poor, as is their credibility for improvements. In the County and throughout the midwest, their subscribers have been comparatively easy to take.

Subscribers currently using WISPs or Satellite broadband lucky enough to be passed by a fiber-based solution arising from this project will inclined to purchase the new, much faster broadband services.

Customer satisfaction for these providers is lower than average; speeds and data quality are uniformly lower. Providers realize the lack of choice sells the product, but to protect the cost of equipment and employee time in the field, and of course competition from satellite and other WISPs, more and more are selling only under multi-year contract.

The survey is also validated by these facts. An overwhelming 82% of respondents supported or definitely supported the construction of broadband services within Kandiyohi County.

Response	Pctg of Respondents
Definitely Yes	37%
Yes	45%
Maybe	11%
No	5%
Definitely No	2%

Source: Kandiyohi County MPower Telephone Survey, page 17, question 29

Given the current dearth of broadband available in the six serving areas under consideration, interest is strong, and could be expected to support both municipal bonding referendums and County efforts to spur broadband demand through smaller sector grants applications.

Market conditions, broadband availability and pricing, along with the behaviors of existing providers all point to opportunities for success in the County's project.

But what if extending broadband across all unserved and underserved areas of the County takes more than 3-4 years to accomplish? In this section we make the case that current subscribers of the Wireless ISPs and satellite Internet would quickly welcome fiber-based replacement services, and probably do so at or near the current high prices they pay. We also point out that WISPs' widespread coverage can offer both breathing space for the time it may take to deploy fiber across rural county areas, and an opportunity to leverage existing WISP availability with improved services. Point-to-Point WISP service can be improved beyond today's 5/1 Mbps speeds with new radios now becoming available –up to 40/10 Mbps and more for up to 100 simultaneous line of sight subscriber sessions. While replacing existing equipment is probably not a financial option for WISPs today, the newer technology may be a stopgap measure for a few years until population in some areas makes fiber deployment cost effective.

General Indicators of Broadband Demand

With all we know, it's surprising there is no definitive model of broadband demand. Market conditions and provider behavior described below, and the survey data collected, have not changed that fact. What we were able to learn from surveys collected from within the Willmar 56201 zip code regarded in this study as "served", and from census bureau demographic information available today, is that there does not seem to be a measureable difference between consumer (or business) broadband demand in served and underserved areas.

Tax roll data was not available for this study, but publicly-available census data by zip code paints a consistent story. Some selected demographic data is displayed below:

Zip Code: City Alias(es):	56201 Willmar	56209 Atwater	56216 Blomkest- Svea	56251 Kandiyohi	56253 Lake Lillian	56273 New London; Hawick	56279 Pennock	56281 Prinsburg	56282 Raymond	56288 Spicer	56289 Sunburg
2014 Population:	23,436	1,663	454	755	848	4,516	889	543	1,285	4,910	574
2010 Population:	23,173	2,339	670	987	1,015	4,797	1,271	619	1,510	4,696	634
Population Pct Change:	1.1%	-28.9%	-32.2%	-23.5%	-16.5%	-5.9%	-30.1%	-12.3%	-14.9%	4.6%	-9.5%
Households per ZIP Code:	9,031	975	264	398	431	1,902	458	251	585	1,973	279
Average House Value:	\$147,200	\$142,300	\$108,300	\$145,500	\$153,200	\$199,100	\$148,700	\$117,500	\$122,200	\$237,100	\$213,600
Avg. Income/Household:	\$46,132	\$53,618	\$61,375	\$51,964	\$53,393	\$61,131	\$55,156	\$64,531	\$50,938	\$64,655	\$56,786
Persons Per Household:	2.46	2.37	2.54	2.46	2.35	2.49	2.78	2.47	2.57	2.37	2.27
House Price/HH Income	3.2	2.7	1.8	2.8	2.9	3.3	2.7	1.8	2.4	3.7	3.8
\$/HHperson	\$18,753	\$22,624	\$24,163	\$21,124	\$22,720	\$24,551	\$19,840	\$26,126	\$19,820	\$27,281	\$25,016
Male Median Age:	33.00 years	42.10 years	43.70 years	41.10 years	46.90 years	42.60 years	37.70 years	39.70 years	38.50 years	46.10 years	49.10 years
Female Median Age:	38.00 years	46.00 years	45.00 years	40.40 years	46.70 years	45.20 years	37.50 years	41.90 years	39.90 years	48.10 years	49.10 years
Number of Businesses:	874	56	13	33	26	140	28	27	35	143	15
Annual Payroll:	\$491,671,000	\$10,281,000	\$2,937,000	\$3,791,000	\$4,155,000	\$32,202,000	\$3,936,000	\$25,542,000	\$4,217,000	\$33,323,000	\$873,000
# of Employees:	14,614	288	90	192	102	1,172	110	370	147	1,201	36
Pyr/Empl/mo.	\$2,804	\$2,975	\$2,719	\$1,645	\$3,395	\$2,290	\$2,982	\$5,753	\$2,391	\$2,312	\$2,021
Pyr/Empl/year	\$33,643.83	\$35,697.92	\$32,633.33	\$19,744.79	\$40,735.29	\$27,476.11	\$35,781.82	\$69,032.43	\$28,687.07	\$27,746.04	\$24,250.00

Source: Selected statistic, US Census Bureau, summarize at <http://www.zip-codes.com/county/MN-KANDIYOHI.asp> 2014.

The learnings that we feel are important:

1. Average household incomes and household income per person in those households, are higher outside of the Willmar zip code, which would argue in favor of equal or better demand in the underserved areas. With the exception of the Sunburg and Spicer areas, the price of housing is a noticeably lower percentage of household income, which argues in favor of higher disposable income than in Willmar. Sunburg and Spicer having significantly higher incomes and housing prices, argues in favor of other markers for broadband demand.

2. Median ages are higher in non-Willmar households. Normally this would signal a lack of interest in new technologies adoption. But at the same time, with average household sizes being almost identical, the presence of spouses and children, and higher household incomes, argue together in favor of the 75% bundled services seen in our survey data, meaning these households would have quite similar demand for video services.

3. The concentration of employment establishments and jobs in the Willmar area provides employment for many living suburban lives. Given moderate levels of household income across the county, the demand for work-at-home solutions would seem to be growing, again supporting growing broadband demand.

4. Despite recently slow growth in business establishments in the County, average wages have increased faster than the national average. Rising incomes tend to be positively associated with growing broadband demand.

Table 13. Kandiyohi County Industry Employment Statistics, 2010 to 2014									
Industry	Qtr. 3 2014 Data					Q3 2010 – Q3 2014 Data			
	Number of Firms	Number of Jobs	Percent of County Jobs	Total Industry Payroll	Avg. Annual Wages	Change in Firms	Numeric Change in Jobs	Percent Change in Jobs	Change in Wages
Total, All Industries	1,341	23,042	100.0%	\$201,289,210	\$34,892	-13	+673	+3.0%	+10.4%
<i>Total, All Government</i>	<i>87</i>	<i>3,648</i>	<i>15.8%</i>	<i>\$40,410,814</i>	<i>\$44,304</i>	<i>-16</i>	<i>+79</i>	<i>+2.2%</i>	<i>+6.5%</i>
<i>Total, Private Sector</i>	<i>1,254</i>	<i>19,394</i>	<i>84.2%</i>	<i>\$160,878,396</i>	<i>\$33,176</i>	<i>+3</i>	<i>+594</i>	<i>+3.2%</i>	<i>+11.5%</i>
Construction	181	1,449	6.3%	\$19,161,256	\$52,884	+8	+66	+4.8%	+7.2%
Manufacturing	70	3,375	14.6%	\$36,634,363	\$43,368	-1	+377	+12.6%	+9.4%
Utilities	5	113	0.5%	\$1,997,793	\$70,668	0	-7	-5.8%	+12.5%
Wholesale Trade	57	738	3.2%	\$9,718,374	\$52,624	-11	-92	-11.1%	+17.0%
Retail Trade	222	2,924	12.7%	\$17,716,583	\$24,232	0	-84	-2.8%	+11.8%
Transportation & Warehousing	79	563	2.4%	\$5,591,940	\$39,728	-6	+47	+9.1%	+15.4%
Information	25	391	1.7%	\$2,664,296	\$27,248	ND	ND	ND	ND
Finance & Insurance	64	549	2.4%	\$6,660,950	\$48,516	-5	-41	-6.9%	+16.8%
Real Estate, Rental & Leasing	42	142	0.6%	\$1,050,526	\$29,588	+3	-7	-4.7%	+21.6%
Professional & Technical Services	85	609	2.6%	\$6,422,905	\$42,172	+6	+102	+20.1%	+13.1%
Management of Companies	5	153	0.7%	\$1,524,213	\$39,832	ND	ND	ND	ND
Admin. Support & Waste Mgmt.	55	684	3.0%	\$4,165,581	\$24,336	ND	ND	ND	ND
Education & Health Services	152	6,907	30.0%	\$58,945,719	\$34,112	+10	+261	+3.9%	+7.5%
<i>Educational Services (gov't)</i>	<i>16</i>	<i>1,068</i>	<i>4.6%</i>	<i>\$11,153,871</i>	<i>\$41,756</i>	<i>-4</i>	<i>+81</i>	<i>+8.2%</i>	<i>+0.6%</i>
Arts, Entertainment, & Recreation	18	298	1.3%	\$961,236	\$12,896	0	-7	-2.3%	-6.1%
Accommodation & Food Services	75	1,449	6.3%	\$5,048,808	\$13,936	-8	-27	-1.8%	+18.1%
Other Services	115	771	3.3%	\$4,084,040	\$21,164	+6	+26	+3.5%	+8.0%
Public Administration	41	988	4.3%	\$10,733,439	\$43,420	-13	-21	-2.1%	+9.0%

Source: DEED Quarterly Census of Employment & Wages (QCEW) program

Source: [Kandiyohi Co. Demographic & Employment Provide -- DEED 2014](#), page 12

4. The single area of concern is the trend movement of population out of Kandiyohi County's smallest places. If County demographers expect this trend to continue, it will raise the cost of broadband deployment. But, there is growing evidence that the existing of high-speed broadband is an infrastructure benefit that raises the price of housing and according to DEED programs, leads to work at home opportunities that bring jobs within driving distance, and make suburban living possible for many new residents.

Table 1: Kandiyohi County Population, 2000-2013				
City Name	2013 Pop. Est.	2000 Population	2000-2013	
			Number	Percent
Willmar city	19,680	18,351	1,329	7.2%
New London township	2,955	3,057	-102	-3.3%
Dovre township	2,141	1,968	173	8.8%
Green Lake township	1,589	1,473	116	7.9%
New London city	1,285	1,066	219	20.5%
Spicer city	1,190	1,126	64	5.7%
Atwater city	1,126	1,079	47	4.4%
Lake Andrew township	988	1,051	-63	-6.0%
Irving township	911	787	124	15.8%
Raymond city	759	803	-44	-5.5%
Kandiyohi township	637	600	37	6.2%
Roseville township	619	570	49	8.6%
Harrison township	578	665	-87	-13.1%
Burbank township	567	510	57	11.2%
Colfax township	548	557	-9	-1.6%
Whitefield township	526	571	-45	-7.9%
Willmar township	514	661	-147	-22.2%
Pennock city	509	504	5	1.0%
Prinsburg city	491	458	33	7.2%
Kandiyohi city	486	555	-69	-12.4%
Genessee township	414	458	-44	-9.6%
St. John's township	409	386	23	6.0%
Mamre township	386	384	2	0.5%
Arctander township	382	401	-19	-4.7%
Roseland township	372	477	-105	-22.0%
Holland township	339	369	-30	-8.1%
Fahln township	336	412	-76	-18.4%
Norway Lake township	275	284	-9	-3.2%
Edwards township	243	304	-61	-20.1%
Lake Lillian city	237	257	-20	-7.8%
Lake Elizabeth twndsp.	233	277	-44	-15.9%
East Lake Lillian twndsp.	199	225	-26	-11.6%
Lake Lillian township	190	221	-31	-14.0%
Blomkest city	162	186	-24	-12.9%
Sunburg city	100	110	-10	-9.1%
Regal city	34	40	-6	-15.0%
Kandiyohi County	42,410	41,203	1,207	2.9%

Source: U.S. Census Bureau

Source: [Kandiyohi Co. Demographic & Employment Provide -- DEED 2014](#)

Review of Current Market Conditions

Population Density is the Single Largest Determinant of Private Broadband Deployment

We believe there are several ways to array the availability of broadband in an area. But its expansion is harder to describe. To be sure, broadband availability is greater where population density, business density, and income levels are greater. These and other indicators, such as a younger heads of households and the presence of more middle-school and older children, the presence of communications-intensive businesses, especially promoting work-at-home, are contributing factors matter, but these are most often proxies for population density and income. So, it's common sense more than study results that say rising population and business density, and rising area incomes must be associated with a faster spread of broadband.

But in the real world, it's a bit more complicated—especially in rural areas. Telecommunications and broadband provision are capital intensive businesses. Fiber and equipment technology costs are decline over time, but the cost of burying and maintaining the outside plant are truly distance sensitive. Distance between subscribers may be the largest deterrent to the spread of broadband. So expanding broadband in rural areas. Second, there is the chicken and egg of housing amenities (which more and more include reliable Internet connectivity) and household incomes in those homes. For business, it's much the same:

businesses like to locate where a broadband infrastructure is already in place. But the expansion of broadband tends to follow business and residential demand—not the other way around.

This is Kandiyohi County. Comparatively dense Willmar has reached a point necessary to allow the market to provide solutions to increased broadband demand. Except for limited pockets, much of the rest of the county needs a catalyst. To date, the catalyst has taken several forms. A large business seeking low-priced real estate and labor might locate on the outskirts of a community that already has infrastructure in place. Or, there can be an organizing role for government. We have benefitted over time from our postal system, rural electrification, the federal highway program, the telephone universal service program, and forward-looking border-to-board broadband grants here in Minnesota.

To better incent existing providers to economically expand broadband in the rural portions of Kandiyohi County, we profile them in the context of their histories. This is the history of telecommunications spawning broadband, and resulting competition leading to more options for both telephone and data services.

Willmar, named by George Becker for Leon Willmar, Flemish land agent for the St. Paul & Pacific Railroad, became a hub for the Great Northern Railway. A Great Northern steam locomotive and depot can be seen at the Kandiyohi County Historical Museum. In downtown Willmar, the A. Larson store, built in 1876, is on the National Register. The war Memorial Auditorium, 1933, holds the same honor.

Competition is the Single Largest Determinant of Broadband Speed

Willmar, without a doubt, has reached the critical level of subscriber density—both residential and business—to allow a competitive market to serve up 25 Mbps and faster broadband services. Incumbent CenturyLink, cable system operator Charter, CLECs like Windstream, tw telecom, Onvoy and others, and Wireless ISPs will all fill the growing demand for speed and specialized services. Willmar can clearly be marked as served for this reason.

Outside of Willmar, with some notable exceptions, the picture is quite different. With the exception of several small town clusters, broadband above 10 Mbps is pretty tough to find right now. Even these fall into two distinct camps. On the one hand, are some dense pockets of TDS Mid-State's New London, Pennock and Spicer exchanges in which Charter Cable's fiber-based 100/5 Mbps broadband is facing eventual response from the incumbent of 15/1 and 25/5 Mbps services. Little Atwater has a dense neighborhood in which Mediacom Cable's 150/20 Mbps offering is being countered in less than a handful of census blocks with 17/2 Mbps broadband from Frontier. The Town of Kandiyohi also features a small pocket of Charter 100/5 Mbps broadband, but incumbent Frontier recently featured only 2/1 Mbps service.

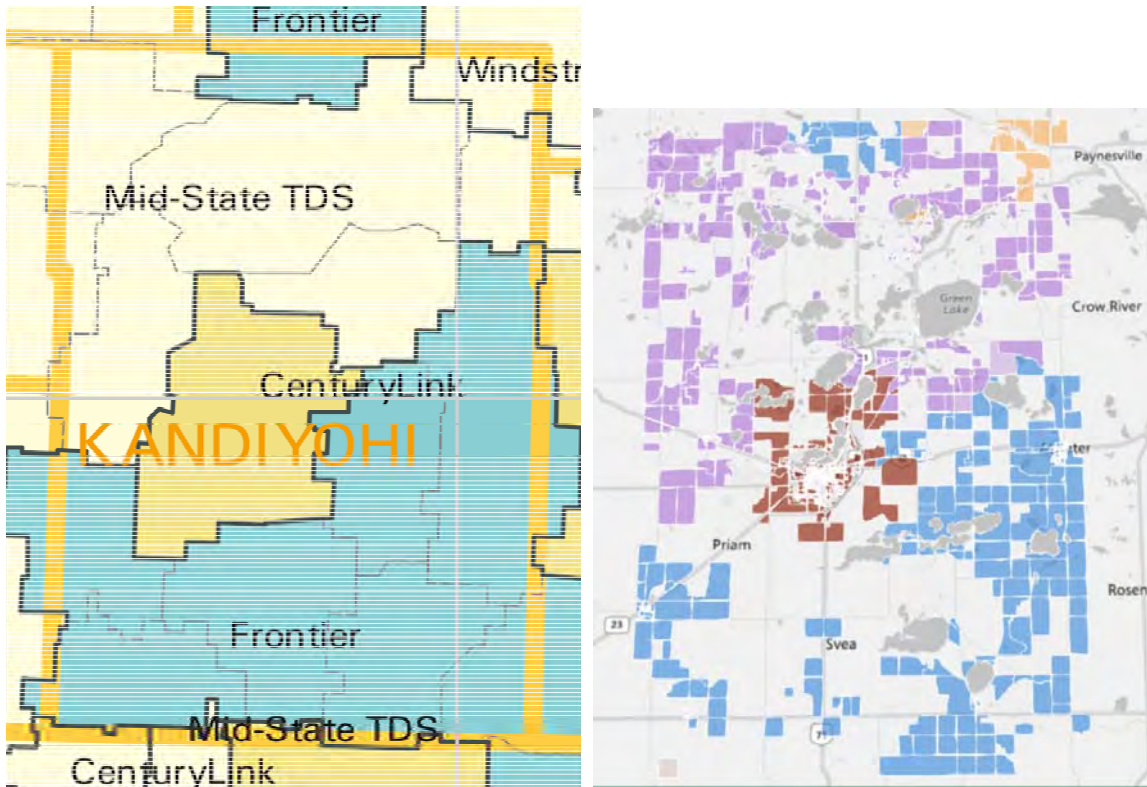
However, this isn't the complete range. Still lower population density shows competition besting the broadband provided by incumbents in the form of Wireless Internet Service Providers (WISPs). WISPs' 5/1 Mbps offerings, some of them subsidized by ARRA Stimulus grant/loan combinations, some possible only because no landline provider can profitably deploy a wireline network, remind us of the difficult work ahead to supply tomorrow's broadband ahead of subscriber density in many portions of the County.

Now we turn to a discussion of existing providers, which will both highlight the limits of current private and public support for expanding broadband into the most rural areas of the County.

Profiles of Existing Broadband Providers

Larger Landline Providers

The larger, traditional telephone service providers in the county have had to overlay broadband on their existing networks, and have made efforts in the past 15 years to evolve their network architecture to become fiber-based. The final stage—bringing fiber-based drops to end user locations—is the costliest part of this effort. It is This, combined with the slower development of broadband demand and lower subscriber density of rural areas, have resulted in these areas being broadband unserved and underserved.



Sources: [Minnesota Telephone Exchange Map - April 2012](#) and Kiesling Broadband mapping of FCC Form 477 Broadband to census blocks. On the right: TDS Mid-State in lavender; Frontier blue, Windstream Lakedale gold, and CenturyLink brown. Note white census block border lines obscure the presence of broadband within most populous (and therefore smallest) census blocks of CenturyLink in Wilmar and within some TDS Mid-State properties

CenturyLink/QWEST, Frontier and Windstream, the largest providers offering services within the County, introduced dial-up Internet access services in the 1980s. This, fixed local service rates and the prosperity of the times led to years of growth of copper telephone lines. The advent of Digital Subscriber Loop (DSL) service in the 1990s leveraged their copper loop plant to provide what we now know as broadband service. But regulated as public utilities at both the state and federal level, the largest telephone companies faced problems. Limits on rate of return limited their capital programs. Limits on retail pricing insured the availability of more and more copper land lines.

Developing digital and fiber technologies were slow to percolate into regulated industries as the AT&T breakup approached. Then, as the FCC's Telecommunications Act of 1996 opened the flood gates of competition on the industry, we saw large providers ill-prepared to act like unregulated businesses, and the imposition of price cap regulation on the largest providers. That is, QWEST, and ultimately

CenturyLink, Frontier and Windstream would essentially face capped rates. The incentive would be profit primarily via reductions in costs, in a capital-intensive industry.

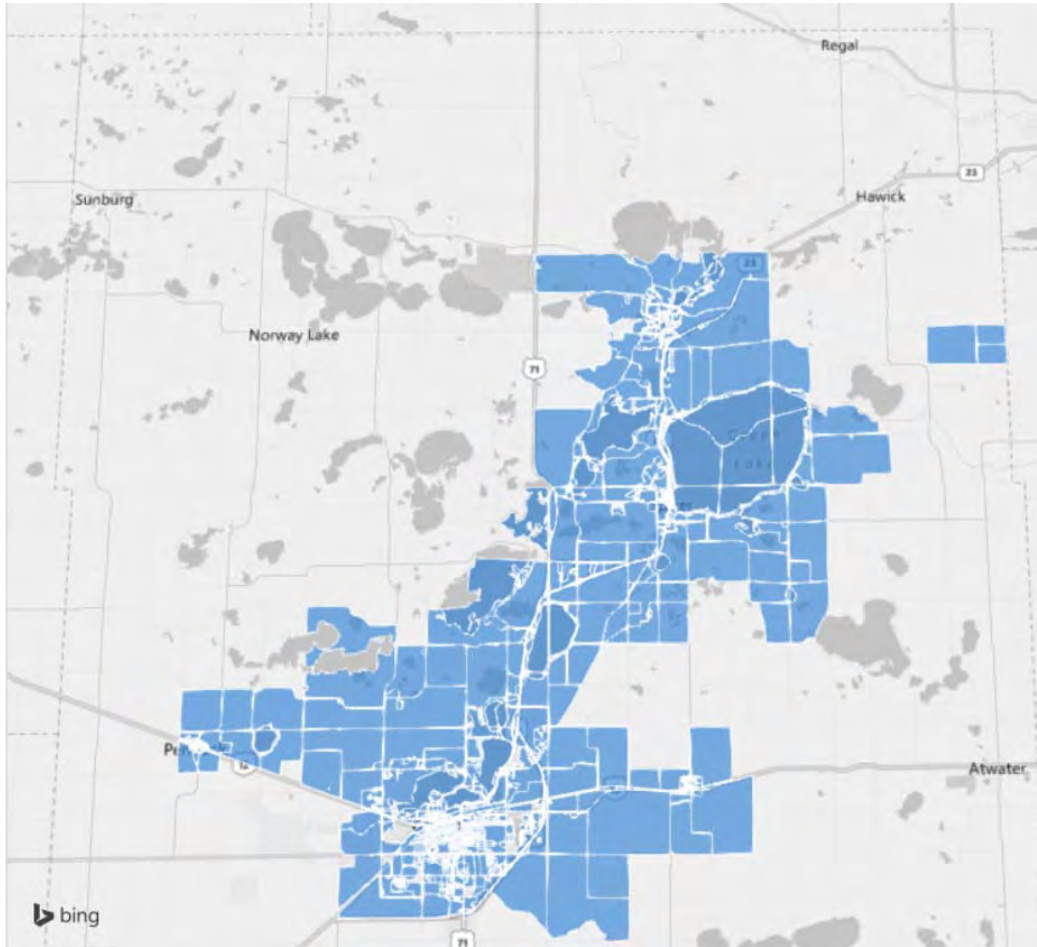
So it's not surprising that the largest providers have not been leaders in the placement of fiber optic plant and the fastest broadband services they can permit. Until recently, this has not been a big problem in urban areas, where customer density can often be equated with shorter copper loops, capable of faster broadband services.

But competitors with newer networks are not *replacing* older copper facilities; they are building their networks with more fiber-based elements, which are today's forward-looking least-cost approach.

Cable Providers. Notable in this way are the augmentation of cable system networks such as Charter and Mediacom in the County, and TDS's metrocom CLEC, for whom these dynamics permit both voice telephone and broadband competition, if newly-built networks are feasible. But, it's important to note that for these recent competitors, customer density is still of primary importance. Charter, Mediacom and metrocom appear only where there is higher customer density, or where that density is known to be growing in the presence of an incumbent provider with a copper-based network.

The presence of cable competition in the county comes about in several way—more and growing pockets of subscriber density, sale of failing cable properties to larger regional and national providers, and cable industry consolidation. In each of these cases, the provision of cable broadband in the more rural areas comes about when new or rebuilt systems are cross-subsidized by customers in more dense areas (in great part, from cities outside of the county).

As said before, with the exception of Willmar, and other small pockets, Kandiyohi County is mostly rural country. The largest national providers sought out urbanized areas long ago, leaving residents of the least dense areas to rely on a smaller class of rural privately held companies and cooperatives to organize telephone services in rural areas, where distances between subscribers are great and costs per passed customer have high capital costs.



Sources: Charter census block coverage of the Willmar area, based on FCC Form 477 data. Note White lines surrounding census blocks obscure the high amount of broadband in the smallest, most populous portions of Willmar.



Sources: Mediacom census block coverage of the Sunburg and Atwater areas, FCC Form 477 data.

TDS Telecom's Mid-State Telephone Company

Mid-State is the primary remaining example of this in the County.

The much higher cost of offering service in the most rural area came with slower technological development, until government worked with national provider AT&T to create a system of telephone settlements by which rising long distance revenues would be shared more equitably with the small rural companies. These smaller “rate of return” companies have been regulated to permit an adequate rate of return on capital that has brought newer technology to rural areas. It is not our intent to take political positions on how the externality aspect of settlements migrated to the FCC’s Universal Service goal or development of the Universal Service Fund. But it is well known that rural telephony, and more recently broadband cost subsidies have made broadband possible sooner and with newer technologies than would have been possible.

Today, federal regulatory support programs provide partial subsidies to large and small incumbent companies, alike, in rural areas including rural Kandiyohi County. CenturyLink, Frontier and Windstream have agreed to terms by which they will receive partial funding to extend 10/1 Mbps (or faster) broadband to all subscribers in their exchanges, with obligations to complete the work by the end of the year 2020. It’s important to note the federal program does not specifically require construction of any capability beyond the 10/1 Mbps speed level. There is much national debate about how to incent the deployment of faster broadband, and no legal requirement that it happen.

Mid-State will be required to make a decision later this year to either participate in a program similar to the larger carriers’—in which case it also will be required to construct and offer broadband at the 10/1 Mbps level over a ten-year period, or, to continue with an existing but possibly lower support stream that requires deployment of 10/1 Mbps. But in either case, they will be required to provide 25/3 Mbps broadband in selected areas in the state of Minnesota. Which customer locations in which of its exchanges has not yet been decided.

In both cases, these static buildout obligations do not meet Minnesota’s long-term rising speed goals, companies are not under requirements to exceed their federal construction milestones or speeds. They are not required to utilize fiber-based networks or to deliver fiber-to-the-premises (FTTP) that extend the service lives of products subscribers will ultimately want.

Finally, how and where the decisions are made to allocate additional corporate capital to broadband expansion present challenge to local and county governments. Final construction budget decisions for the County are not made within the County, or with the County’s interests place ahead of other areas.

So far, we have been talking about landline providers with fiber-based network elements, capable of delivering 25 Mbps broadband today over FTTP service drops today, and at Gigabit speeds in years to come. Kandiyohi County is also home to two other classes of broadband providers. Both have lower incremental costs of adding new subscribers than fiber-based network, but they also face significant additional challenges for achieving the state rising broadband speed and performance goals.

Satellite Internet providers are available everywhere in the County. They alone occupy a market niche in the most rural areas where no cable providers, or now, no broadband provider has established facilities. For the County, satellite has four notable limitations for the delivery of broadband services. First, capacity limitations. A limited number of subscribers may be served during any peak period unless or until another expensive satellite is placed in the proper orbit. Providers partially solve this problem by causing a second one—the trade-off with broadband speed, now popularly limited to about 10 Mbps downward and much less upward. The third problem, latency of the broadband signal, a function of the 22,500 mile distance

between satellite and receiver, can only be improved so much by new technologies. The forth problem, service reliability, is limited as signal quality is frequently impacted by weather such as during snow and rain storms. These limitations paired with the lack of competition in the most rural areas combine to cause higher prices per bit for satellite Internet services. They are not likely to be a workable solution for the County.

Fixed wireless Internet Service Providers (WISPs) are the final class of provider in the County. With a reach of just several miles over unlicensed spectrum, and speeds currently limited to about 10 Mbps in most cases (with one provider promising 20/10 Mbps, under ideal conditions) over line of sight pathways, when weather and foliage don't intrude, WISPs can be seen a solution of limited value. However, its low comparatively low cost of entry makes it an attractive proposition for small competitors to pursue. That's why Minnesota Valley Television Improvement Corp and others have set up WISP services to compete with limited copper-based DSL services of incumbents throughout Kandiyohi County. But rather than dismiss WISPs out of hand, radios now becoming available will soon double speeds, and with fiber backhaul will deliver 40+ Mbps Internet services to line of site geography beyond the reach of FTTP locations. Not to say this is a solution to last a generation, it may still play a role in the County's plans to capture the final five to ten percent of distant locations years before fiber arrives. As long as unlicensed spectrum is not a concern in the most rural areas, providers now profitably providing WISP services in the County are sufficiently experienced to play this role.

Kandiyohi County Broadband Service Providers

Frontier – Citizens Frontier (Study Area Code 361123)

A telecommunications-focused company providing wireline communications services in rural areas and small and medium-sized towns and cities. Formerly a GTE property, it became part of baby bell Verizon in August of 2000, and then sold off to Frontier. Citizens took the name of Frontier. *(Check this MN with BS.).*

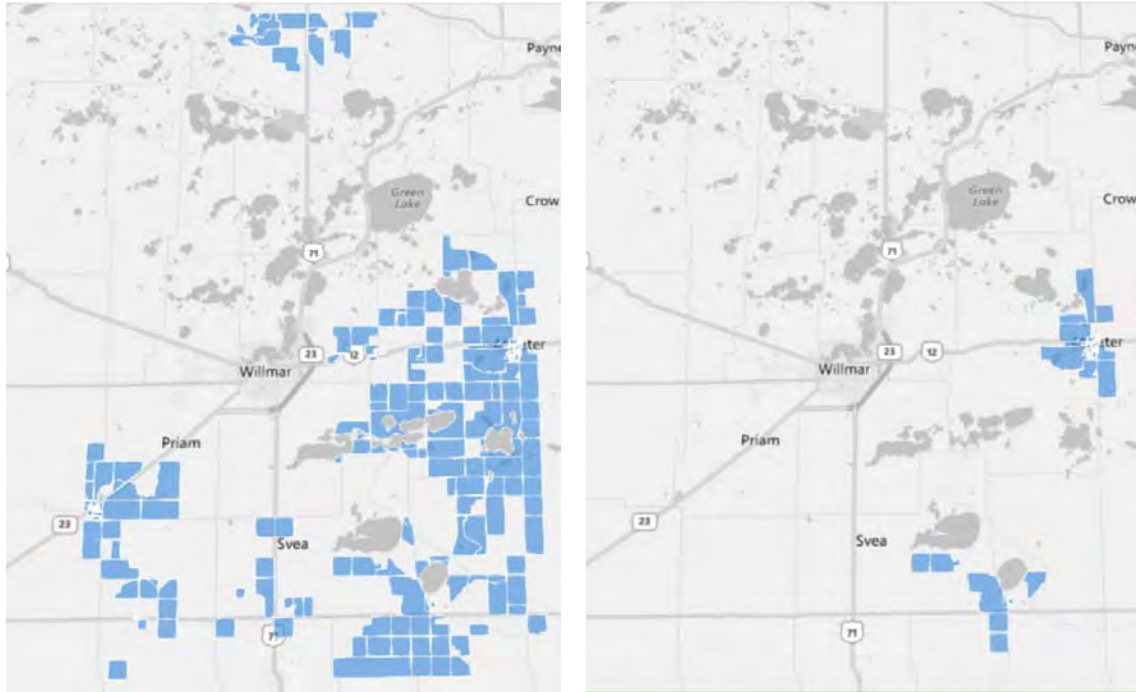
Citizens Telecommunications Company of Minnesota LLC was a privately held company in Mound, MN. Its name was established in 1999

Frontier's principle markets are rural with a comparatively low density residential subscriber base. That's exactly its geography in Kandiyohi County. Due partly to the high costs of modernizing plan in rural areas, and the incentive structure of price cap telephone regulation, Frontier has not delivered high speed broadband on the schedule most of us hope for. As the product of its background acquiring and being acquired, centralized capital planning does not make it easy for the County to negotiate locally to change course quickly.

Last year, Frontier agreed to accept FCC CAF Phase II funding for 1,610 supported households and business locations in Kandiyohi County. Its support will be \$1,114,635 per year, or about \$58/month per location, for six years. <https://www.fcc.gov/document/connect-america-fund-phase-ii-funding-carrier-state-and-county>

Unfortunately, for Frontier and all price cap regulated providers, the FCC's CAF Phase II support is keyed to the deployment of 10/1 Mbps broadband. And in the case of Frontier's current architecture, that will be delivered to homes and small businesses over existing copper facilities. This essentially rules out widespread achievement of the speeds promoted by the state of Minnesota.

Frontier's experience in the County has not been to replace copper network in response to competitive entry. A partial view of their response to competitive entry in other states suggests their responses will be stronger in the town centers and weaker in the more rural areas.



Total Frontier Communications Corp broadband by census block, contrasted with census blocks in which is offers broadband at download speeds in excess of 2Mbps. Source: FCC Form 477 data 6/30/15.

CenturyLink – QWEST Corp (Study Area Code 361142)

CenturyLink is the incumbent telephone provider in Willmar. Its heritage was as an AT&T exchange until the 1984 breakup created baby-bell Qwest Corporation. It was a local tandem hub for the company, in the St. Cloud LATA. Qwest merged with large national independent Century in 2010, and has taken the Century brand (<http://www.centurylinkqwestmerger.com/>). Century in Willmar offers the complete suite of residential and business services, and continues to have access to state of the art networking, engineering and operations techniques. At the same time, as a national company its construction budget is to a great extent determined on a national level. Its capital allocation decisions and priorities are at the very least, worked out at state level, and are based on multi-year network evolution objectives. To alter these plans in a single county, a plan of engagement and acceptance of following through the company's schedule for considering updates should not be seen as making change happen quickly.

CenturyLink also agreed to accept FCC CAF Phase II funding for 349 supported households and business locations in Kandiyohi County. Its support will be \$193,576 per year, or about \$46/month per location, for six years, which it says is significantly below costs it will incur. Again, this is for the deployment of 10/1 Mbps broadband.

Because much of the Willmar metropolitan area is regarded as served, the need to reach out to CenturyLink will be limited to incentives offered them, and to the many broadband competitors drawn to the high subscriber density 56201 zip code.

Windstream Lakedale, Inc. (Study Area Code 361414)

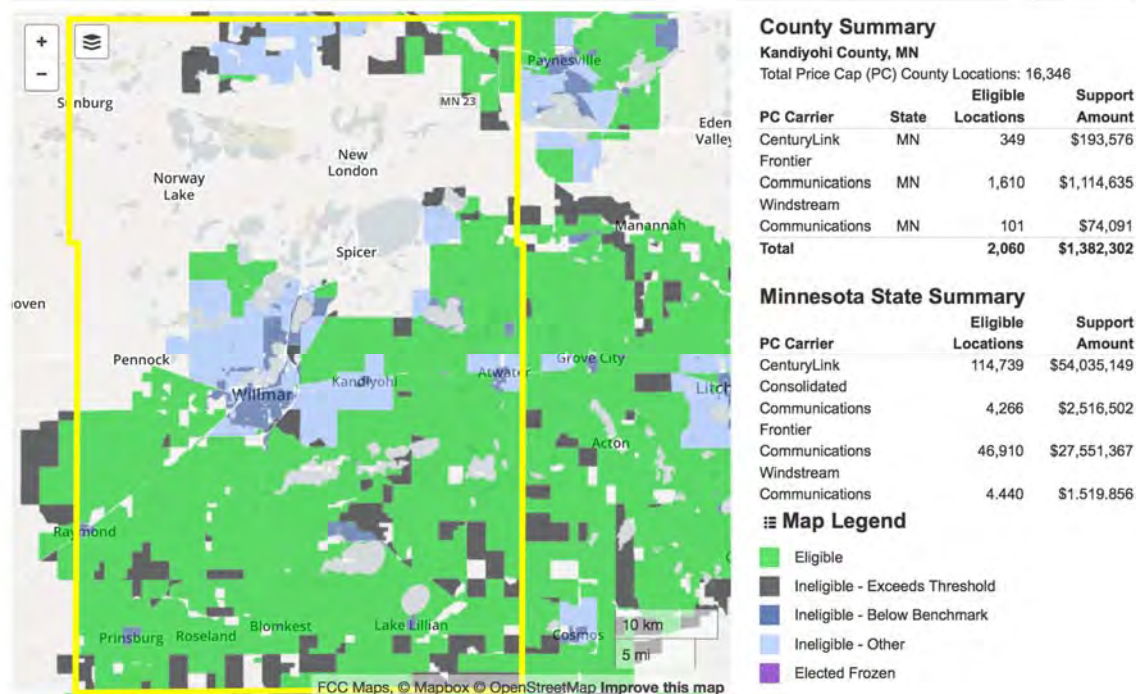
In 1995, GTE holding company acquired Contel of Minnesota, Inc. which included Contel study area jurisdiction Minnesota (COMN). In the same period GTE moved study area jurisdiction GTE/Minnesota (GTMN) from under the control of GTE Midwest, Inc. to Contel of Minnesota, Inc. d/b/a GTE Minnesota on 1/1/95.

In 2000, baby bell Bell Atlantic and GTE Corporation merged into one company, Verizon Communications. GTE Minnesota, Inc. was renamed under the new company GTE Minnesota, Inc. d/b/a Verizon Minnesota. In that same year, both of the Minnesota study areas (COMN & GTMN) were sold to Citizens Communications – CTC of Minnesota.

Created in 2006 with the merger of Alltel's landline division and Valor Telecommunications (itself created in 1999 with spun off GTE areas due to its merger with Verizon).

Throughout the entire state, Windstream has just 4,440 subscribers to bring up to 10/1 Mbps broadband under the federal CAF Phase II process by the end of the year 2020. Of those, 101 homes and businesses are in Kandiyohi County at or above a cost floor set by an FCC model, for which Windstream will receive \$74,091, or about \$61/month. (FCC Doc-335269A8.pdf).

Future Price Cap Support for Windstream, CenturyLink and Frontier in Kandiyohi County



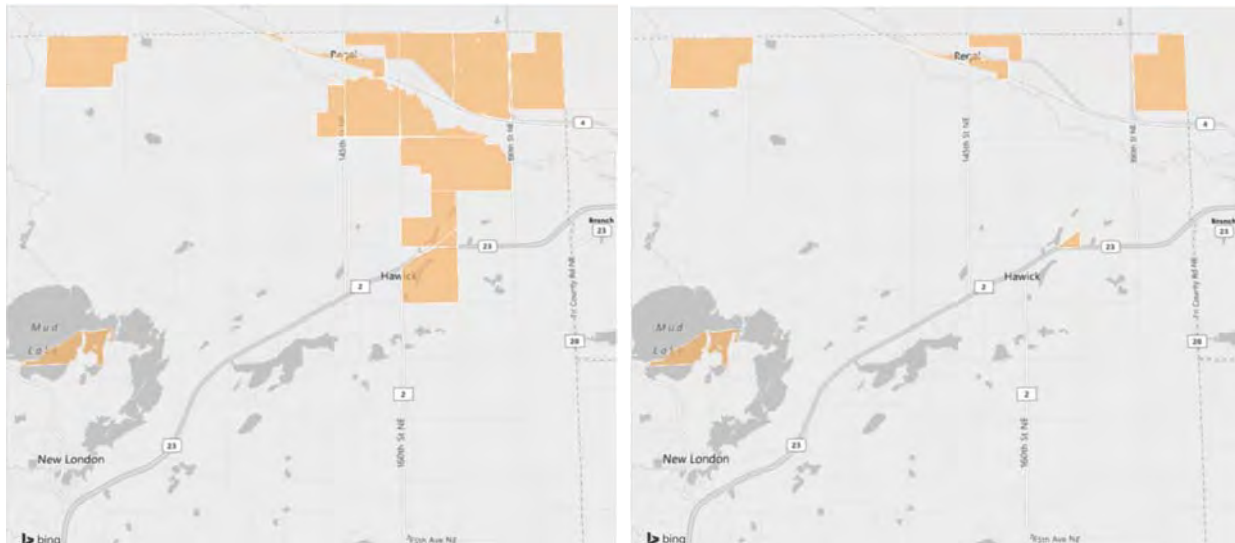
Source: Price Cap Carrier areas of model-based support under the FCC's CAF Phase II program, from 2017-2023 to deploy 10/1 Mbps broadband. Light blue areas are ineligible because either 10/1 broadband exists today (by carrier or competitor, or reserved for highest-cost CAF II program); TDS Mid-State areas are not included in this support regime. <https://www.fcc.gov/reports-research/maps/connect-america-phase-ii-final-eligible-areas-map>

This map identifies the areas that have been determined to be eligible for support for broadband and voice service from Phase II of the FCC's Connect America Fund. Specifically, the map identifies areas determined by a cost model as eligible for support and which are served by a class of larger carriers called price cap carriers. These areas are shown in bright green on the map. The map displays the outputs of the final version of the Connect America Cost Model (CAM) (version 4.3) adopted for purposes of making the offer Phase II support to price cap carriers. The model calculates costs per location in all price cap carrier census blocks for the entire country. Empty areas with no color are either located in areas served by another class of carriers, called rate-of-return carriers, which are not eligible for the offer of model-based support from the Connect America Fund, but may receive support from other universal service high-cost mechanisms, and/or are reported as uninhabited.

This is a summary of the support Kandiyohi County price cap carriers will receive in the coming six years.

	<u>Blocks</u>	<u>Total Locations</u>	<u>Served Locations</u>	<u>Unserved Locations</u>	<u>Total Support</u>	<u>Support/ Location/Yr</u>	<u>Support/ Location/Mo</u>
Kandiyohi Totals:	474	2060	1124	936			
Windstream	30	101	60	41	\$74,091	\$ 733.57	\$ 61.13
Century	91	349	71	278	\$193,576	\$ 554.66	\$ 46.22
Frontier	353	1610	993	617	\$1,114,635	\$ 692.32	\$ 57.69

Windstream Lakedale, centered in Paynesville outside the county, has rural geography only in the far northeast corner of the County. There, they are seeing broadband competition at faster speeds. With this in mind, it's not clear Windstream will spend to protect this territory, but may instead deploy improvements outside of the county, closer to its hub in Paynesville.



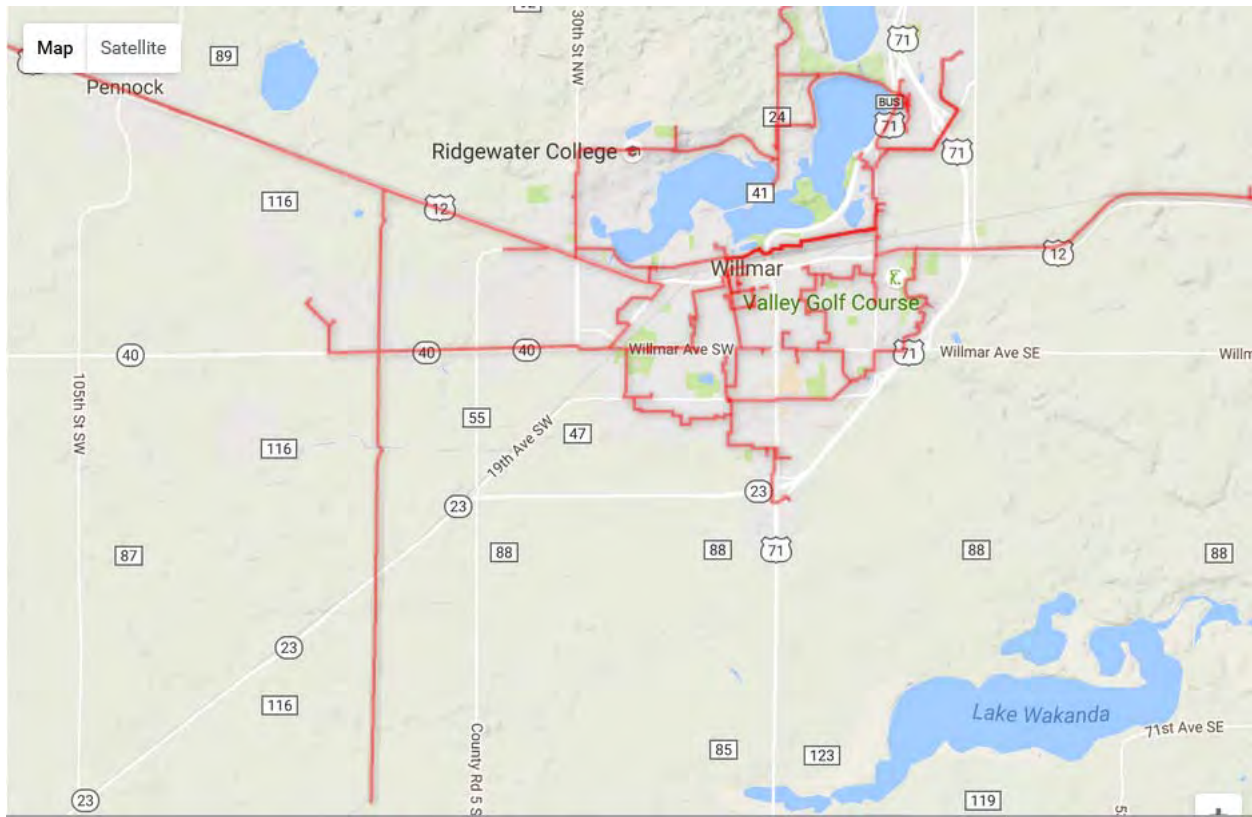
Total Windstream Lakedale broadband by census block, contrasted with census blocks in which is offers broadband at download speeds in excess of 3 Mbps. Source: FCC Form 477 data 6/30/15.

Windstrem En-Tel

EN-TEL Communications, LLC was established in 2009. It provides phone, video, and Internet services to residents and businesses in Willmar. It offers long distance calling plans and local telephone services;

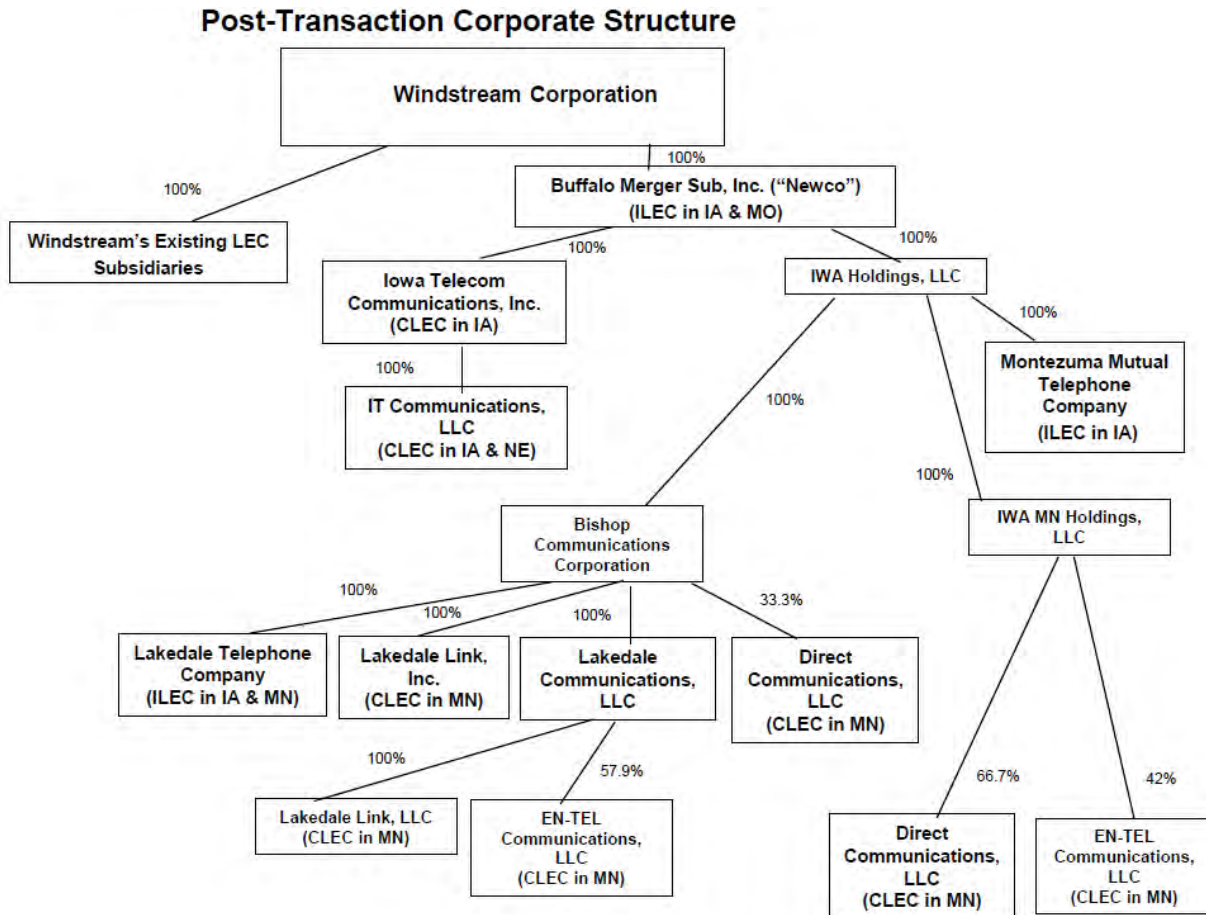
wireless and broadband phone services; digital and high-definition television services; and DSL, dial-up, Webmail, and hosting Internet services. The company is based in Willmar, Minnesota. EN-TEL Communications, LLC was a subsidiary of Iowa Telecommunications Services, Inc., but in 2012 has become a unit of Windstream.

Its CLEC mission continues in Willmar, within Kandiyohi County, where EN-TEL previously operated—but now selling Windstream’s brand and advanced large business product set. Windstream En-Tel also possesses a robust fiber network throughout central Willmar. But it also crosses the county from east to west, roughly along the US Highway 12 corridor. That asset should not be ruled out as points of connection for those who would build fiber-based broadband connectivity to the most rural portions of the County.



Source: <http://www.windstreambusiness.com/network-data-centers-map>

But working with Windstream En-Tel may be complicated by their current corporate parentage.



Source: [Windstream EN-TEL Corporate Structure](#), with EN-TEL shares shown at the bottom center and bottom right.

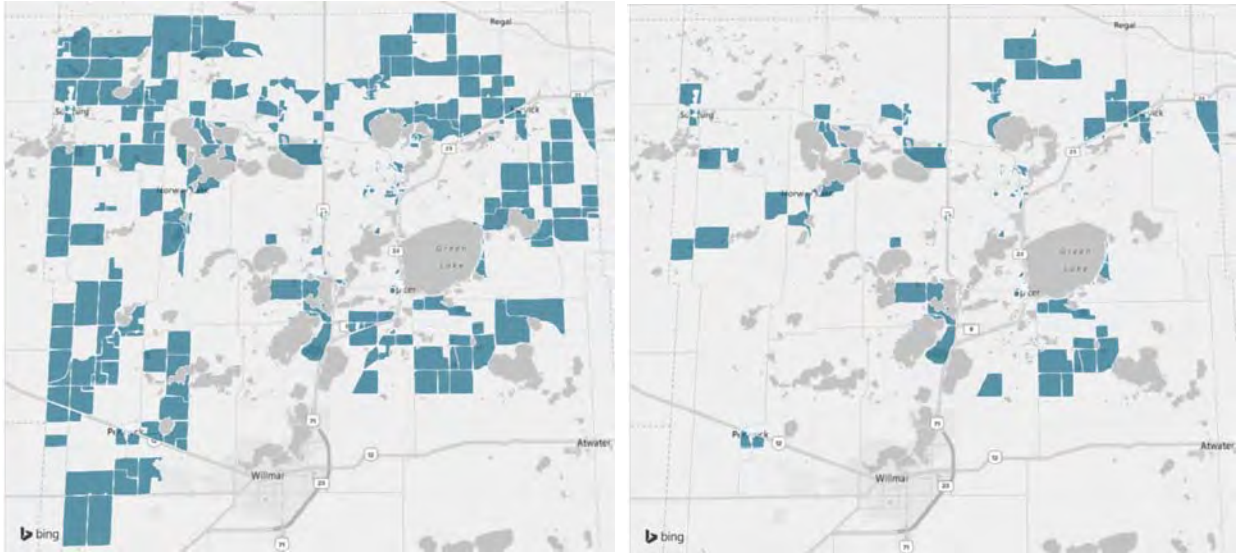
TDS-Mid-State

Mid-State is one of over one hundred local operating companies owned by TDS Telecom. TDS has a record of vigorously opposing municipal broadband in Minnesota, but also of responding to local competition in rural areas with its own video, and hence high speed broadband, deployments—often with the measured construction of fiber, as opposed to copper facilities.

TDS has made a significant national investment in small cable systems that it is using to selectively bring to properties across the midwest and west. In addition, its CLEC arm, tds metrocom selectively targets the business market in second tier markets as well as in the Cities. tds metrocom has been a tool in both Mid-State's exchanges and in Willmar. The marketing and sales organizations of both subsidiaries are well run and successful in their niches.

Mid-State is likely to accept FCC A-CAM model-based support at the end of 2016. If so, it will have ten years of predictable federal support to deploy 10/1 Mbps broadband to a majority of their geography. But unlike the price cap carriers, Mid-State and other rate of Return independents will be required to build 25/3 Mbps broadband to about a third of their areas. This does not mean they are required to follow those percentages within Kandiyohi County. So, one of the challenges the County and its provider partners will have is to advocate for, and possibly negotiate with TDS to put those 25/5 fiber drops in this County instead of others, or much better in addition to locations elsewhere in Minnesota. TDS decision-

making is highly data driven, so incentives that include demand side stimulation may be more persuasive than a plan that does not include them.



Total TDS Mid-State broadband by census block, contrasted with census blocks in which is offers broadband at download speeds up to 15 Mbps. Source: FCC Form 477 data 6/30/15.

Charter

Charter Communications offers cable services to over 25 million residential and business customers in 41 states. It is the second-largest cable operator in the United States by subscribers, just behind Comcast. For the last twelve years, the company has leveraged its cable assets to package voice and broadband services with video, and now does so under the Charter Spectrum brand. Providing services and by residential subscriber lines it is the tenth-largest telephone provider, alone. In May of this year, Charter acquired competitors Time Warner Cable and Bright House Networks at a combined cost of \$65.5 billion, making it the third-largest pay television company in the United States. Charter has lately been headquartered in St. Louis.

Charter operates in several TDS Mid-State territories as well as in Willmar. It is notable for in three ways. Across its network, Charter maintains a uniform product set. This gives them the opportunity for simple national messages and uniform pricing. Their national scale exceeds that of any other County provider. That and their investors' willingness to accept low earning allow the company to cross-subsidize its higher-cost properties with profits earned elsewhere. Charter has become a formidable competitor due to its deep pockets.

However, Charter's fiber network is also for hire, for the benefit of providers the County needing access to rural neighborhoods.

Mediacom

Mediacom Communications is the nation's eighth largest cable television company based on the number of basic video subscribers, and among the leading cable operators focused on serving the smaller cities and towns in the United States. Its service areas have a significant concentration in the Midwest and

Southern regions. They are currently the leading provider of broadband services in Iowa and the second largest in Illinois. In Minnesota and Wisconsin, they came more recently to broadband and voice competition than Charter. Their headquarters are located about 40 miles north of New York City.

Mediacom has a very small County footprint at this time.

Kandiyohi County Broadband Pricing

Broadband pricing information for this section is summarized, next. Except for off-price contract billing to large business and government accounts in Willmar, carriers offer the same rates throughout out their County serving areas, and through much of Minnesota.

General Comments

The real differences in effective rates paid by subscribers arise from other factors:

- Better prices are available to new customers. The maxim where competition exists is that subscribers stay for service quality, they switch for lower price. Almost every provider in the county facing a competitor today will offer a lower rate for the first one to three years of service. In many cases this requires a contract, and pricing quietly increases after the promotional period. This creates a culture of customers who stay through either satisfaction or inertia, and customers who repeatedly switch providers. This is the way it is in the industry.
- Broadband is almost always cheaper in bundled service offerings.
 - Bundles are “stickier” than individual services because the subscriber must do more work to disconnect and replace multiple services than to end a single account having multiple services.
 - Cable System Operators with coaxial or fiber-based networks face little additional costs from offering the second and third service over a single connection
 - Rural Rate-of-Return regulated telephone companies have received federal high cost support for the telephone services they offer. So the addition of more profitable broadband service over a single connection will often be discounted. TDS Mid-State and CenturyLink are the two remaining carriers in the county that still require simultaneous purchase of telephone service. This may end in 2017 with certain regulatory changes.
- New customer incentives usually mask the impact of added charges, some of which will continue after the promotional period pricing has ended.
 - Monthly modem charges, even in addition to television set top boxes are the most common. At this time, only Frontier appears to not have an additional charge for broadband modems. While well-informed buyers can purchase modems outright in any Walmart, Target or Best Buy, monthly rental rates are part of the effective rates subscribers pay.
 - One-time installation and set-up charges may sometimes be waived by the provider in order to lock-in a sale. The threat of another provider’s charges are sometimes noted as a

tool to dissuade subscribers from leaving a provider. Charter, for example, will add a one-time \$39.99 WiFi activation charge in addition to its monthly modem rental charge.

- Well-informed customers can often avoid installation charges if in-home installation is not required. This save new customers from scheduling an in-home appointment, and same the provider the high cost of rolling a truck.
- Most WISPs have significant installation and equipment costs. This is due to the nature of delivering a strong point-to-point signal for their services. WISPs are more frequently selling only under multi-year contract and not having a clear promotional pricing strategy. Since their market niche is primarily where no other broadband options exist, their higher rates are supports as long as the signal is dependable enough for subscribers.
- Monthly cumulative usage caps became popular in urban areas soon after the advent of cellular Internet services. This was due to the higher backhaul costs faced over a limited number of cell sites, and continues today, but has also spread to many landline providers. Landline carriers have developed a range of pricing options—often \$10/50 MB/month. 250 MB per month has become the de factor standard today. Faster broadband speeds simply mean you'll reach a cap sooner, at which point, a faster option with a higher price may come with a higher or no monthly usage cap. The smallest and most rural carriers have been late to introduce usage caps, but may do so to minimize increases in their middle-mile costs. WISPs, perhaps not intuitively, are less likely to have monthly usage caps, since it takes so long to get to caps when services is 5/1 Mbps. Satellite providers, not surveyed here, generally have lower monthly usage caps, due to the scarcity of spectrum they face.
- Taking install, modem and WiFi activation costs into account, the effective price per Mbps download speed for the first 250 GB per month over the first 24 months falls into three ranges:
 - National cable offerings, subsidized by costs elsewhere in their networks, currently price their County broadband between \$0.80 and \$1.40 per Mbps of download speed per month.
 - Incumbent telephone companies, that build their original networks for telephone service, currently offer effective rates between \$2 and \$3 per Mbps of download per month.
 - WISPs, due to much higher costs and much lower scale economies, offer services at effective rates between \$15 and \$20 per Mbps of download per month.

In summary, the County's broadband project would do well to note current incumbent provider's pricing structure, and by virtue of offering services over a fiber-based network, introduce significantly faster substitutes at similar, and declining, effective monthly rates.

Kandiyohi Co. Broadband Rates - Where Available - July 2016

Incumbent Providers	Res or Bus	Monthly Rate	Mbps Down	Mbps Up	Pricing Window	Rate, After	Yrs in Contract	Install/ Setup Charge	Modem Monthly Charge	WiFi Activation Charge	Usage CAP GB/Mo	Notes:
Frontier	Res	\$ 44.95	12	1	2yr promo			\$ -	\$ -			
Frontier	Res	\$ 54.95	24	1	2yr promo			\$ -	\$ -			
Frontier	Bus	\$ 69.99	15		3yr promo		2	\$ -	\$ -			
Frontier	Bus	\$ 129.99	50		3yr promo		2	\$ -	\$ -			
TDS	Res	\$ 34.95	15	0.768	2yr promo			\$ 14.95	\$ 4.95		250	8-15 Mbps down; requires telephone service
TDS	Res	\$ 49.95	25	5	2yr promo			\$ 14.95	\$ 4.95		250	18-25 down; 2-5 up.; requires telephone service
Cent	Res	\$ 24.95	20	0.875	3yr promo		3	\$ -	\$ 9.99		250	if tech install, \$59.99; requires autopay
Cent	Res	\$ 34.95	10		2yr promo		2	\$ -	\$ 9.99		250	if tech install, \$59.99; requires autopay
Cent	Res	\$ 44.95	25		2yr promo		2	\$ -	\$ 9.99		250	if tech install, \$59.99; requires autopay
Windstream En Tel	Bus	\$ 67.95	25					\$ -	\$ 6.99			\$0 setup if modem mailed; else charges
Windstream En Tel	Bus	\$ 57.95	6					\$ -	\$ 6.99			\$0 setup if modem mailed; else charges
Cable Providers												
Mediacom	Res	\$ 34.95	15	5	1yr promo	\$ 49.95	2	\$ 49.95	\$ 7.50		250	new customers only
Mediacom	Res	\$ 9.99	15	1	1yr promo	\$ 49.95	2	\$ 49.95	\$ 7.50		250	"Prime" plan, for current customers only
Mediacom	Res	\$ 59.95	50	5			2	\$ 49.95	\$ 7.50		350	"Prime Plus" plan
Mediacom	Res	\$ 79.95	100	10			2	\$ 49.95	\$ 7.50		999	"Ultra" plan
Charter	Res	\$ 39.99	60	4	1yr promo	\$ 59.99		\$ 34.99	\$ 5.00	\$ 39.99	9999	
Charter	Bus	\$ 59.99	60	4	1yr promo	\$ 79.99		\$ 99.00	\$ 4.99	\$ 39.99	9999	
Charter	Bus	\$ 99.99	100	7	1yr promo	\$ 169.99		\$ 99.00	\$ 4.99	\$ 39.99	9999	
Wireless ISPs												
MVTV	Res	\$ 69.95	5					\$ 114.95				
MVTV	Bus	\$ 122.95	7					\$ 164.95		\$ 80.16		\$80.16 to purch modem
Xtratyme		\$ 89.00	5					\$ 174.00				
Broadband		\$ 99.95	10	1			2	\$ 150.00			150	
Cloudnet	Bus	\$ 119.00	5	1.5				\$ 224.00				
Cloudnet	Res	\$ 89.00	5	1				\$ 174.00				
Notes:												
This sheet targets stand alone broadband services rather than bundled product pricing.												
All pricing should be assumed to be "where available". All speeds are best effort, and not necessarily available.												
Windstream En Tel is the CLEC subsidiary operating exclusively in Willmar at the time of this survey.												

Sources: provider websites

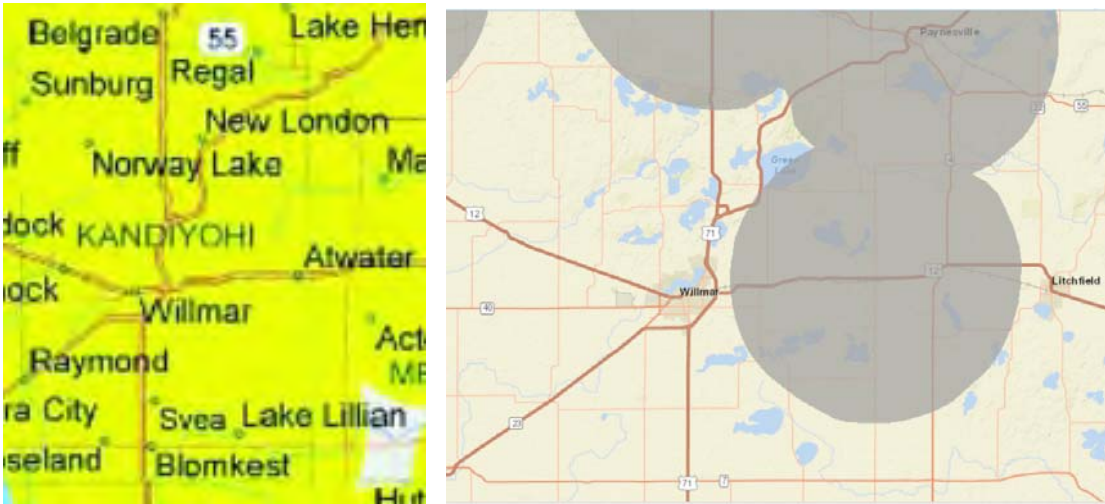
General comments about fixed wireless Internet provider carriers:

In general, they are more local in scope and less well capitalized. But with lower cap-ex per new customer, they are generally able to move quickly into areas with no usable broadband, choosing those pockets with growing demand. Their limitations from uneven geography, weather, and unlicensed spectrum are tolerated when no other providers are available.

However, today's 5/1 to 7/1 Mbps service is based on an earlier generation of radios. New equipment available today can provide 20-40 Mbps via line of sight with new end user equipment and fiber-fed towers. This improvement could pay for itself over a 5-6 year time horizon. Wireless ISPs may have a successful market niche at the fringe of areas where the costs of placing underground fiber infrastructure become unworkable. Or, to provide a short-term breather until local demand growth reaches a level necessary to justify expansive fiber expansions to the most rural neighborhoods.

Minnesota Valley Television Improvement Corporation DBA = MVTV Wireless offers 2/1 and 5/2 Mbps broadband to residential subscribers and may design faster services to businesses throughout much of the County. <http://www.mvtywiresless.com/our-products/wireless-internet/>. The company was the recipient of a \$1.3 million federal stimulus loan for the footprint shown below that gives them some protection from other providers seeking RUS loans covering the gray geography they had in place in the year 2014. MVTV offers

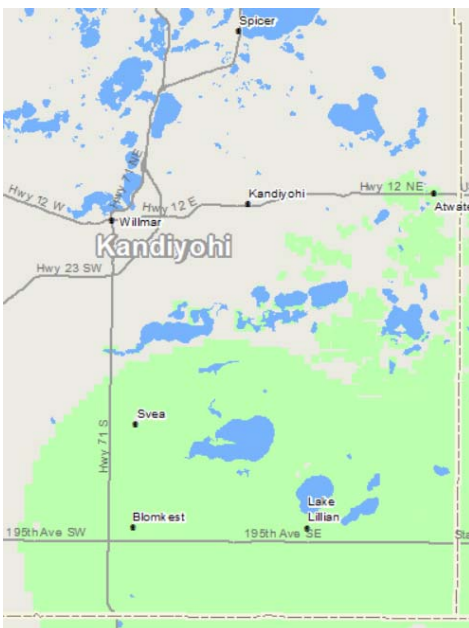
broadband plus video in counties to the south and west of Kandiyohi County, but only wireless Internet Service within the County.



Left: <http://www.mvtvwireless.com/our-products/wireless-internet/coverage-maps/> current coverage.

Right: USDA Borrower footprint for ARRA Stimulus loan/grant combo: MVTV's area within Kandiyohi County.

Broadband Corp. claims to offer fixed wireless broadband at 50/1 Mbps speed in the southeast quarter of the Count. This high-speed is highly unlikely for a WISP, although they have certified to the FCC as recently as last summer that they do. Their product is fixed wireless Internet access 10/1 for \$99/month, for 150 GB/mo cap on a two-year contract. Installation starts at \$150.



Source: http://broadband-mn.com/wp-content/uploads/2014/03/BroadbandCorp_Coverage03-2014.png

Gardonville Coop. Telephone Assoc.. It's Wisper product is fixed-antenna wireless provides 6 Mbps service along the norther edge of the county, served from their Belgrade area antenna in Stearns County. http://gctel.com/index.php?option=com_content&view=article&id=69&Itemid=97. They aren't committed to Kandiyohi

County at this time, but have sold satellite Internet service via their Exede franchise, <http://www.gctel.com/index.php/exede-packages>. Exede is capable of 12/3 Mbps broadband, primarily under multi-year agreements that include an installation charges, monthly equipment rental, and severe data caps. Finally, Excede, being a newer service with limited satellite capacity, frequently limits new signups for short periods of time.

Satellite – Hughes, Exede and dishNET services are usually provided through resellers who handle installs and customer service. Billing is handled centrally or locally, which allows several providers to sell the services from the same actual satellites. Speed, reliability and cumulative monthly data caps are inferior to fiber-based options. Depending on local foliage and weather, it's usually a toss-up with fixed wireless providers for speed. Satellite's market niche is in cable-like television and to a smaller extent Internet access where no other provider is active. This has been both a short-term tactic of landline providers (until their own facilities are available) and a godsend to the most remote of residential subscribers. One other particular comment to make about satellite is the frequent mis-match between supply and demand. Satellites are expensive to launch, and the provision of broadband vs. supply of available satellite capacity at any moment can make it difficult to meet expanding demand.

Broadband Availability by Market

Information for the following section was greatly improved by the Federal Communications Commission's release of census block level provider information. This is previously confidential FCC Form 477 submissions showing the advertised speeds and availability of residential and business broadband services at the census block level. While an entire construction season has been completed since this information was certified by providers, it provides some of the greatest trend-level descriptions of where existing providers are, the variety of speeds offered, and the engineering technology used. This information should be regarded as approximate, and will no doubt be reconfirmed as construction approaches.

Apart from the town areas, and the Served Areas in the Willmar metro area, broadband is slow and not always available beyond 2/1 to 3/1 Mbps speeds. Information from the FCC Form 477 data tool is summarized where meaningful, and made available as a file attachment to this report.

Serving Area #1, with 1284 Underserved Subscribers, and Served Sunburg

Sundburg anchored area in census tract 7802.

Sundburg, which is a served area, and Pennock to the south, are served by both its incumbent local exchange carrier TDS Mid-State, and its CLEC unit tds-metrocom. But Mid-State last summer offers limited broadband service to residential subscribers, while metrocom provided 25 Mbps symmetrical broadband service to businesses in town.

Minnesota Valley Television Improvement Corporation offers 5/2 Mbps wireless Internet services.

Serving Area #2, with 1221 Underserved Subscribers

Regal and townships in census tract 7801.

Regal, for its small size, is a desirable area. Incumbent Windstream Lakedale, Inc. has had a very limited ADSL offering that provided up to 6/.768 broadband.

tds metrocom offer a symmetric 25 Mbps broadband product to businesses in the area. Per the company's focus, they have not been taking on residential customers.

Outside of the town, wireless Internet is plentiful, reaching beyond the town. Gardonville Cooperative's Exede product has offered 6/6 Mbps wireless. Minnesota Valley Television Improvement Corporation has offered a slower 2/2 Mbps service aimed at unserved residential locations

There are a few served areas in the southern portion of Roseville Township that are another exception in the census tract, with some tds metrocom broadband available along a few specific roads.

Served Areas in Census Tracts 7803 and 7804, North of Willmar

New London in census tract 7803. (zip [56251](#))

Much of Incumbent TDS Mid-State last year offered a combination of ADSL (5/.512 Mbps), ADLS2 (15/.768 Mbps) and VDSL (25/5 Mbps) broadband services throughout most of the city, proper. Charter cable uses DOCSIS3 cable modems to deliver 100/5 Mbps broadband in many of the same census blocks as TDS.

Here too, wireless Internet providers offer services in most parts of the city. Gardonville Cooperative's Exede product has been offering 6/6 Mbps service, and Minnesota Valley Television Improvement Corporation offers a 5/2 Mbps service.

Spicer in census tract 7804.

Spicer look a lot like New London in terms of broadband providers. Incumbent TDS Mid-State offers a combination of ADLS2 (15/.768 Mbps) and VDSL (25/5 Mbps) broadband services throughout most of town.

Charter cable uses DOCSIS3 cable modems to deliver 100/5 Mbps broadband in many of the same census blocks as TDS.

Wireless Internet providers offer services in most parts of the city. Minnesota Valley Television Improvement Corporation offers a 5/2 Mbps service.

Served Areas in Census Tract 7806, West of Willmar

Pennock in census tract 7806. (zip 56251)

Pennock is served by both its incumbent local exchange carrier TDS Mid-State, and the company's CLEC unit, tds-metrocom. Mid-State offers a packaged voice/data/TV service, and has provided broadband over VDSL equipment at 25/5 Mbps, while metrocom has provided 25 Mbps symmetrical broadband service.

Charter's bundle utilizing DOCSIS3 cable modems delivers 100/5 Mbps in residential neighborhoods, and possibly soon to businesses, in most of the same census blocks as TDS.

Minnesota Valley Television Improvement Corporation offers the most 5/2 Mbps wireless Internet services.

Serving Area #4, with 765 Underserved Subscribers, and Town of Kandiyohi

Kandiyohi in census tract 7804. (zip [56251](#))

Incumbent Frontier has been able to provide 2/1 Mbps broadband to most of the town, but we expect its capability to be much higher since its service is said to be delivered via ADSL2 equipment.

Charter cable, Internet and phone service is widely available. Using DOCSIS 3.0 cable modems, it appears capable of delivering 100/5 Mbps broadband.

MVTV Wireless Internet has offered up to 5/2 Mbps broadband. Other fixed, Wireless ISPs are prevalent in the area around the town, given Frontier's lack of coverage.

Serving Area #5, with 1279 Underserved Subscribers

Raymond (zip [56282](#)) and Blomkest (zip [56216](#)) areas in census tract 7812.

Frontier is also the incumbent provider in this area where it has offered 2/.31 Mbps service over older ADSL connections.

Arvig's Redwood wireless Internet service had offered a 5/1 Mbps alternative in the Raymond area but appears to have ceased. But, Minnesota Valley Television Improvement Corporation has been offering 5/2 Mbps wireless with almost as wide a foot print.

The fastest claimed broadband service last year was Dish satellite, claiming a 10/1 Mbps capability.

Serving Area #6, with 1090 Underserved Subscribers, and Served Atwater

Atwater, and Lake Lilian areas in census tract 7811.

The town of Atwater is a tiny oasis at the northeastern tip of Serving Area #6. Frontier is the incumbent provider of telephone, and therefore broadband services. In the town, it has recently utilized ADSL technology to offer broadband locally at speeds limited to 3/.62 Mbps to most of the town. More modern ADSL2 has had a very limited presence, at 17/1.2 Mbps. We believe one or more civic locations are served by copper-based xDSL or Ethernet at speeds in excess of 20 Mbps. [The Atwater library is at 107 Pleasant Ave W, at the corner of 195th St NE and Hwy 12. The City Clerk's office is three blocks west, and one block south.]

Mediacom cable service is widely available with high speed broadband as the standard offering. Using DOCSIS 3.0 cable modems, it is able to provide 150/20 Mbps broadband to residential neighborhoods, and in excess of 100 Mbps broadband to some of the businesses in town. At this point, there is little overlap of Frontier high-speed and Mediacom-served census blocks.

South of town, Frontier is the sole landline provider of broadband service, which it combines with telephone service. The area is rural, and due to exceptionally low subscriber density, cellular, wireless and satellite broadband and the only options for faster service.

Broadband Corp claims to deliver 50/1 Mbps throughout town using a fixed wireless product, but we have not tested this claim. Beyond these, MVTW Wireless broadband is capable of providing 5 Mbps broadband. Satellite Internet services are available, as they are throughout the county.

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Finance Section - DRAFT

Financial [regular text is in 11 point Calibri Body]

The report will include a description and examination of available options for financing. Include

- Suitability of state broadband grants, USDA grant and loan opportunities for telecommunications providers.
- Review the wider menu of loan and grant programs available to rural communities, industry segments and specific infrastructure programs that are expected to be available at the time the County may consider an implementation phase.
- Examine opportunities for the use of general obligation bonds, revenue bonds and public/private partnerships may be forged to assist with funding.

Finance Section Summary

Kandiyohi County is considering and especially large and prolonged broadband project offering great benefits to the county over an entire generation. The total cost of in the range of \$60 million will not be available from a single source, and it is possible the total amount will not be available at a single point in time. That said, the County has access to several financing mechanisms to further fiber-based broadband deployment across the county. To put things in perspective and in order, this section lays out funding options in the order the County is likely to find money sooner, and at lower cost. The size of this project means the County will undertake a mix of funding and seek multiple sources over the coming three to five years. ^{It is} also important to understand that comments provided today refer to our understanding of opportunities and financial markets at a particular point in time. To the extent changes can be anticipated today, they will be mentioned.

will only be available in phases

A Minnesota Border-to-Border Broadband Grants is the first and arguably the key funding source for the County. Winning a grant in this program, with the inclusion of significant matching funds would serve as a base, upon which additional funding would be sought through to complete the project and fill gaps in the areas of the county facing highest costs and most slowly evolving demand.

This section will then cover additional sources the County and providers can use as follow-up funding mechanisms. The discussion of additional funding involves these steps, in this order:

- County access to municipal bond financing
- Potential application for USDA RUS loans and grants
- Assistance to provider partners for loans and loan guarantees
- Assistance to providers and county business including grant application assistance

Minnesota Border-to-Border Broadband Grant – 2016 Program

The Minnesota Office of Broadband Development will ^{award} ~~disperse~~ \$35 million in broadband grants in response to applications received by October 3rd of this year. Grants of up to \$5 million will be made to political units or providers for the purpose of acquiring or deploying middle- and last-mile broadband infrastructure for underserved areas in the state. These line up well with the six serving areas proposed in this study. That \$5 million may be used for project planning, engineering, facilities construction or

DRAFT

purchase, and for the installation and testing of equipment used to provide broadband services that are scalable up to the Minnesota goal of 100 Mbps symmetric services.

Within the \$5 million award cap, the County may earmark up to \$500,000 of its application to deploy broadband and spur adoption in low income areas of the county. Low Income households in this grant program are defined as being at or below 200% of the federal poverty guidelines. This part of the program is new in this application cycle, and ^{spell out} it's different in that the County may use award dollars specifically to discount recurring service costs and devices, and further digital literacy in this targeted group.

A successful application to the program must include at least a 50% matching commitment from the County and/or its partner Consolidated (CTC), and others who may have varying roles in county-wide broadband deployment with cash or in-kind contributions. Application scoring and chances of success improve as matching exceeds the 50% minimum.

Other Border-to-Border application scoring opportunities are found in the rules. They include::

- Addressing the greatest number of locations passed in this study's engineering model with fiber-based broadband, and the lowest percentage use of wireless ISP fill-in. This will be further informed by the engineering cost study and market dynamics.
- The effective use of Public-Private Partnerships demonstrating mutual trust to foster long term planning and deployment successes. There is a discussion below describing three prominent Partnership options, and some aspects that may be useful to guide the County and CTC over what is likely to be an extended period.
- Milestones to involve and improve public sector use of the new broadband infrastructure. This would involve the successful integration of educational, healthcare, digital government and job creation outcomes in the years leading up to and after the required 6/30/19 completion of work. USDA RUS loans and grants can do this, and as well contribute additional funding to the project. The County can also find itself in a coaching and administrative role assisting county groups and constituencies with grant and loan applications to spur broadband demand. The stimulation of broadband demand will raise take rates sooner for these services.
- Properly anticipating and diffusing potential challenges to the grant application by counter proposals of involvement by date certain in this project. The application interval includes some requirements in this area. But even after a successful application is made, the County and CTC should consider and pursue opportunities to have incumbent providers participate in the construction program, in areas they can manage at lower cost than the County's consortium can

The County is unlikely to ^{access} will a second Border-to-Border award since part of DEED's mandate is to distribute funding across the state. But nothing stops the County to apply for other ^{support} grants ^{investment} government, foundations or private business may offer. Experience says the County would do well to be vigilant to identify grant opportunities from other sources that may become available as its expensive project evolves.

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Municipal Bonding

Kandiyohi
The recommended second step for the County is the adjunct use of municipal bonds. This has been the fastest, and in the long term least expensive source of additional funds that will be necessary to complete County deployment. There are several workable options for the County to sell bonds on its own, or with the help of partial proceeds (or partial matching funds) of a successful Border-to-Border grant.

The County's plan to spur broadband deployment is probably best seen as comprised of several sequential steps. The Minnesota Border-to-Border Broadband Grant Program with appropriate matching funds can provide a rapid start to the County's plan, but in all likelihood will not fund the entire project as now envisioned.

There are two leading options for the issuance of municipal bonds that each have their advantages in different political situations. These include General Obligation bonds which are backed by the County's taxing power, or Revenue bonds back by specific and dedicated revenue streams.

Municipal Bonding Options

General Obligation Bond Financing

Kandiyohi
If through current events the County has *leveraged* *garnered* favorable citizen attitudes toward broadband expansion, General Obligation bonds can be a powerful and timely source of funding. Traditionally, general obligation bonds can be issued at a lower cost of money than revenue bonds or certificates of participation lease options. All other things being equal, higher public inclination can increase the size of the offering that requires a county referendum vote.

But the benefits the County would receive with general obligation bonds are well suited to a multi-year construction project such as would be the case for broadband deployment by one or more providers subject to the County's requirements.

- These bonds may finance the costs of construction, as well as planning and engineering expense. Financing may also include capitalized interest for debt payment during an extended buildout period, which would be especially important if a multi-stage buildout is necessary.
- Repayment of debt is not directly impacted by the schedule of cashflow generated by broadband providers. This provides the County with some important flexibility to sponsor faster buildout, and shifts some of the responsibility for a slower than planned take rate growth to providers, and not to the County. The County may still institute buildout, speed and take rate milestones for the extension of funding to providers, of course.
- The County would be able to recover debt through higher property tax rates as broadband deployment provides improved infrastructure that raises property values and county employment.
- Recently available demographic information suggests income and employment numbers are strong. In addition 82% of respondents to the MPower Telephone Survey said they were favorably inclined toward a County effort to deploy countywide broadband service. These are

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favorable trends, given the referendum vote necessary to permit the County to issue general obligation bonds for this purpose. However, the County must keep in mind that the great proportion of assessable property and referendum voters are within the served Willmar 56201 zip code area that will not be immediate beneficiaries of accelerated rural broadband deployment.

Minnesota's Swift County provides one current example of how this might be done, although not the only possible approach to this method. The Swift County project began with a \$4.9 million Border-to-Border grant, and was supplemented by that county's sale of \$7.8 million in general obligation bonds. The money was in turn loaned to the County's private partner, Federated Telephone Cooperative. Federated will repay the loan to Swift County over a 20 year period and agreed to establish a \$1 million escrow in the event a regular payment is missed.

Kandiyohi County has some different conditions, as reported earlier this year in the Tribune, <http://www.wctrib.com/news/local/4024564-swift-county-approves-bond-broadband-internet>, that are useful by comparison:

- Kandiyohi County's project will likely be 5-6 times as large as Swift's, so bonding may require several successive bonding rounds. This will require an ongoing communications effort and reporting to constituents on both the progress and unfolding benefits of the project.
- It initially appears that just 20-25% of County residents will be directly impacted by this broadband deployment, which will make the bonding referendum more of a challenge than a water or sewerage project.
- Interest rates are at historic lows this year and next. If done sooner over sooner, the County may be able to proceed with lower interest rates by relying more heavily on a current sale than then spreading the indebtedness out over longer periods. Interest rates in the 3% range may be available during 2016.

Revenue Bond Financing

This is an alternative bond financing option that may be appropriate in a very particular funding situation. Revenue Bond Financing requires the recurring revenue of an asset, utility or recurring assessment that is dependable enough to be the basis of a bond offering. In some counties it would be the recurring cashflow from an electric or water utility, possibly from a new revenue sources such as cable television franchise fees, or another mature revenue stream that would not put local tax payers or mandated budget expense in jeopardy.

Compared with
If thought of against the earlier example set by Swift County, Revenue Bonds might find a use as a follow-along step, once additional broadband service subscriptions could generate a dependable recurring revenue stream. But more likely, any increase in the effective local cost of broadband services would work against any advantage these bonds would have.

Revenue bond interest rates are traditionally somewhat higher than those of general obligation bonds of the same sized offering. And due to the slightly higher repayment risk associated with a municipal revenue stream over a business cycle, offerings can be somewhat more difficult to place.

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The clear benefit, however, is that revenue bond financing can be accomplished without a county-wide referendum.

Like general obligation bond financing, this method can finance the full amount of a system it would authorize a provider to construct, and capitalized interest for the debt payment during the system's buildout years. The major concern, however, is the reliability of schedule both construction and the continuing availability of the revenue stream.

As said above, this tool is best fitted to a scenario that already has a dependable revenue stream available to the county for debt service. Unless the County has an asset to back this financing and does not favor a bonding referendum, it would appear to just be an unnecessary complication to general obligation bond financing.

USDA Rural Utility Service Loans, Loan Guarantees, and Grants

There are several reasons to consider sources of funds beyond state broadband grants and adjunct municipal bond funding. First, county-wide broadband deployment could be a multiyear project of a size, and complexity not possible to complete in a single effort. And second, the ability to spur broadband demand, as well as supply, can help improve the outcome of the project.

The federal government through the USDA's Rural Utilities Service (RUS) offers several loan, loan guarantee, and grant programs that can help fill-in the capital needs of the broadband project. These are some general pros and cons to keep in mind when considering the addition of RUS programs:

Pros of RUS Programs	Cons of RUS Programs
Lower cost of funds in the short run, compared to municipal bonds. Some programs offer what amounts to a line of credit allowing borrowers to draw funds as they are needed.	Loan interest rates are not fixed, but instead tied to government cost of money. These rates are low, but could increase for draws made at a later date.
Some grant opportunities beyond those available from the state.	Grant programs are competitive, and do not always have money available.
The County and Consolidated would each be able to assist County providers and local sectors of the economy with some grant and loan applications that expand demand for broadband services, in addition to its efforts to increase the supply of broadband.	Some traditional RUS loan programs (infrastructure and Farm Bill) have lengthy application intervals, and require the assistance of industry consultants who specialize in this work. Applications for the 4 RUS programs discussed below have closed their 2016 finding cycle, but are expected to re-open for Fiscal 2017.

The USDA Rural Utilities Service (RUS) has had a central role in creating national infrastructure for electricity and telecommunications. Just as has been the case with the last century's Rural Electrification and national highway efforts, RUS is a catalyst for access to broadband, which has become essential for the social and economic benefits it provides to American residents, businesses, governments and communities. Broadband is crucial for increased health, educational and economic opportunities, as well

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Grant funds be used for the construction, acquisition, or leasing of facilities, spectrum, land or buildings used to deploy broadband service for residential, business and governmental locations in eligible areas. There are two particular uses of funds that are permitted in under this program, and have included by the highest scoring applicants:

- Funds may used to defray the cost of providing broadband service free of charge to critical community facilities for 2 years.
- Less than 10% of the grant amount (up to \$150,000) may be used for the improvement, expansion, construction or acquisition of a community center that provides online access to the public.

Owing to the different purpose of this grant program, these additional requirements are in place, at this time:

- Matching funds of at least 15% from non-federal sources must be detailed in the application. Matching can be used for construction, or for operating costs, and have usually exceeded the 15% requirement.
- Buildings constructed with grant funds must be located on property owned by the awardee
- Leasing expenses will only be covered through the advance of funds period included in the award documents
- Grantees must have legal authority to provide, construct, operate and maintain the proposed facilities or services
- Partnerships with other federal, state, local, private and non-profit entities are encouraged, and contribute to grant scoring.

As mentioned above, this is a complete grant program that currently has very low funding, which allows a limited number of winners each year. The application process is moderately complex, and the highest scoring applicant have been those with the least access to broadband, and the most local community involvement toward establishing teaching programs for would-be first time broadband subscribers. Having a dedicated space for interim internet access or education enhancing an applicant's score, as does low employment in the proposed funding area.

Here are the most recent Minnesota awardees under the Community Connect Grant program. Both were Fiscal year 2015 awardees:

Northeast Service Cooperative
Community: Fond du Lac Reservation
Grant Amount: \$3,000,000
Contact: Lyle McVey, Chief Technology Officer, 218-748-7623
County: Carlton, MINNESOTA
Congressional District: MN-08 (project); MN-08 (awardee)

The Northeast Service Cooperative (NESC) proposes a Fiber-to-the-Home (FTTH) or last mile project on the Fond du Lac Reservation in order to address the lack of broadband availability to the rural population, critical public services and businesses. NESC will partner with the Fond du Lac Band of Superior Chippewa and provide broadband on portions of the Fond du Lac Reservation.

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Northeast Service Cooperative

Community: Fond du Lac Reservation

Grant Amount: \$3,000,000

Contact: Lyle McVey, Chief Technology Officer, 218-748-7623

County: St. Louis, MINNESOTA

Congressional District: MN-08 (project); MN-08 (awardee)

The Northeast Service Cooperative (NESC) proposes a Fiber-to-the-Home (FTTH) or last mile project on the Fond du Lac Reservation in order to address the lack of broadband availability to the rural population, critical public services and businesses. NESC will partner with the Fond du Lac Band of Superior Chippewa and provide broadband on portions of the Fond du Lac Reservation.

Farm Bill Broadband Loans & Loan Guarantees

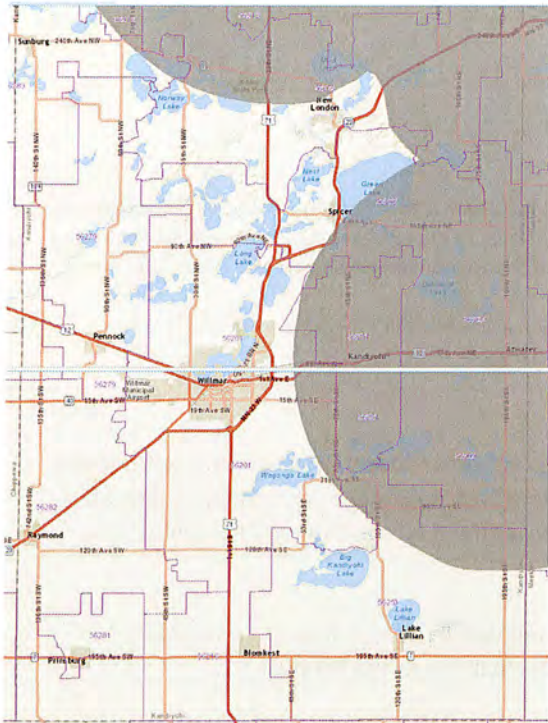
The Rural Broadband Access Loan and Loan Guarantee Program (Broadband Program) furnishes loans and loan guarantees to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide service at the broadband lending speed in eligible rural areas.

Proposed funded service areas must be completely contained within a rural area or composed of multiple rural areas, as defined in 7 CFR 1738. Generally, this will mean the following:

- At least 15 percent of the households in the proposed funded service area are unserved,
- No part of the proposed funded service area has three or more “incumbent service providers.”
- No part of the proposed funded service area overlaps with the service area of current RUS borrowers or the service areas of grantees that were funded by RUS.
- Communities where USDA Rural Utilities Service has previously provided funding for construction of broadband infrastructure may not be eligible.

For Kandioyhi County this would eliminate areas this report regards as “served”, but subject to confirmation from RUS, could also rule out the areas on the eastern side of the County served by MVTv. That Wireless ISP receive a \$1.3 million grant from RUS in 2011 under the American Recovery and Reinvestment Act stimulus program. An RUS representative said the different nature of fixed wireless broadband the County is considering may help work around this limitation, but that a clear answer might be delayed until a formal funding application is made.

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USDA Current Borrower footprint for ARRA Stimulus loan/grant combo: MVTV's area within Kandiyohi County *are shown in the lighter area.*

Eligible applicants for Farm Bill broadband loans are not limited to existing incumbent telephone service providers such as Frontier in the southern portion of the County. Applicants could be non-profit or for-profit organization/corporation/LLC/cooperative/governmental or tribal governmental unit. Individuals and business partnerships, however, are not eligible.

Broadband loans provide funding on a technology-neutral basis for financing:

- The construction, improvement, and acquisition of facilities required to provide service at the broadband lending speed including facilities required for providing other services through the same facilities
- The cost of leasing facilities required to provide service at the broadband Lending speed if such lease qualifies as a capital lease under Generally Accepted Accounting Principles (GAAP)

Direct loans are fixed rate Cost-of-money loans are offered at current U.S. Treasury rates depending on loan maturity at time of each advance. Loan Guarantees are at fixed rate, primarily from the Federal Financing Bank (FFB). Interest rates (Treasury rate plus 1/8%) vary depending on call options and the interim maturity rate selected at each advance, which may be as short as 90 days, with auto-rollover. Current rates available online, scroll down to "Treasury Constant Maturities" add 0.125% for FFB rate.

Direct "Cost of Money" Loans. Loan Terms are limited to the expected composite economic life of the assets to be financed plus 3 years. In the case of a fiber network build, this can expected to be between 15 and 20 years.

Kandiyohi County, another governmental entity created for this purpose, or any incumbent of broadband service provider would be eligible to apply for Farm Bill Broadband loans in the next funding

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cycle. The \$40 million allocated for the current year has all be committed, and possibly over-subscribed according to one RUS representative.

It would be prudent to begin any applications under this program over the winter, and to expect the FY2017 application window to open in April, and close at the end of June, 2017.

Telecommunications Infrastructure Loans & Loan Guarantees

Kandiyohi

The County would have the least chance of success pursuing broadband construction with a Telecommunications Infrastructure loan. This funding has historically been reserved for incumbent telephone providers, and there are none in the county that appear to have any current inclination to apply under this program. The County could theoretically apply and then re-loan proceeds to Consolidated as its provider, but just as with the Farm Bill broadband loans already described, the eligible areas in the county would be severely limited.

This RUS program provides financing for the construction, maintenance, improvement and expansion of broadband and telephone services in rural areas. Successful applicants have most frequently been existing rural telecommunications providers, but may also be governmental entities such as the Kandiyohi County, federally recognized tribal entities, or even for-profit businesses.

Funds may be used to finance broadband construction, expansion and improvements in accordance with [7 CFR 1735](#) . For Fiscal Year 2016, approximately \$790 million was budgeted for this loan program.

Several types of funding area are available. These include direct loans from USDA Rural Utilities Service referred to as Cost-of-Money Loans since they are tied to rates charged on federal debt instruments, Loan Guarantees of up to 80% to allow private lenders, including the Federal Financing Bank (FFB), to extend credit to qualified borrowers in rural areas.

Direct loans are fixed rate Cost-of-money loans are offered at current U.S. Treasury rates depending on loan maturity at time of each advance. Loan Guarantees are at fixed rate, primarily from the Federal Financing Bank (FFB). Interest rates (Treasury rate plus 1/8%) vary depending on call options and the interim maturity rate selected at each advance, which may be as short as 90 days, with auto-rollover. Current rates available online, scroll down to "Treasury Constant Maturities" add 0.125% for FFB rate.

Eligible areas are includes towns with a population of 5,000 or less and surrounding areas without telecommunications facilities or areas where the applicant is the recognized telecommunications provider offers services.

Generally, RUS will not make a loan to another entity to provide the same telecommunications service in an area served by an incumbent RUS telecommunications borrower providing such service. RUS may, however, consider an application for a loan to provide the same type of service being provided by an incumbent RUS borrower if the Administrator determines that the incumbent borrower is unable to meet its obligations to the government, including the obligation to provide service set forth in its loan documents and to repay its loans.

Kandiyohi County would be eligible to apply an RUS infrastructure loan in Fiscal Year 2017, and appoint one or more providers to build broadband networks at its request through a Public-Private Partnership.

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Such a loan or loan guarantee would be limited to county geography that is most rural, having town/village populations below the 5,000 mark. In addition, USDA under federal rules is likely to protect the 2011 investment made through the ARRA Stimulus broadband loan/grant combination awarded to MVTN. According to RUS field staff, a new loan applicant could make a request to provide a fiber network covering some of the same geography MVTN was awarded for Wireless ISP service deployment. There is no way to say at this time if the request would ultimately be granted.

The many steps in RUS loan applications have historically taken as long as a year to complete. While RUS has goals to bring this interval down to five months' time, it would be prudent to begin any applications as soon as possible to qualify for the coming fiscal year.

Alternatively, any partner of the County that is a current borrower under this program, may request additional funding from RUS to complete work in the same rural areas. Such a request would of course be a management decision of the partner, and could not cause the provider to exceed their allowable draw under the program, or cause certain financial ratios it agreed to in its loan covenants to fall short of committed levels.

USAC and FCC Programs

Schools and Libraries Division Programs

Minnesota already has programs that extend broadband service discounts to its schools and libraries. But there is nothing to prevent ~~the~~ County or its provider partners from offering additional incentives to local school districts or libraries under the USAC Schools and Library program. This can be in the form of county assistance with the preparation of forms, or specification preparation. Recent improvements in the program allow providers to bid to lease lit and dark fiber between schools, construct certain types of wireless network systems in and around schools. The same may be done for local libraries.

Again, providers are usually already participating in this program, so the County's role could be to insure all possible county opportunities have been explored and implemented. The justification and result being advancements in educational technology and outcomes, job growth and security in a smaller county.

Rural Healthcare Program

Similarly, USAC manages a Rural Healthcare Program that extends similar discounts to the healthcare sector. The processes are intentionally similar, which benefits providers. ~~The~~ County could find a role in caring for and incenting missed opportunities for access to technological solutions. Since it is difficult for smaller counties to attract and retain adequate healthcare facilities and citizen access to care, involvement by the County would benefit local citizens, making the County a better place to live, ultimately maintaining or increasing property values and tax base.

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The Importance of Public-Private Partnerships to Expand Broadband Supply

Public-Private Partnerships

Regardless of the financing instruments ^{Kandiyoti} the County takes, on the establishment of a Public-Private Partnership with its provider partners can be a valuable source of trust for citizenry and its government, by virtue of building the right network the first time, at lowest cost.

This is essentially the path the ^{and experienced} County embarks upon by applying for a Border-to-Boarder Broadband Grant with an already chosen partner carrier. What becomes quickly important to all involved is a having a relationship built on trust, that is supported by a well-researched plan and legal framework that work together to protect County taxpayers.

The Benton Foundation in conjunction with The Coalition for Local Internet Choice (CLIC) have created a powerful tool that is recommended to the County. "The Emerging World of Broadband Public-Private Partnerships: A Business Strategy and Legal Guide". ^a [Footnote: "Hovis, Joanne; Schulhof, Marc; Baller, Jim; and Stelfox, Ashley, "The Emerging World of Broadband Public-Private Partnerships: A Business Strategy and Legal Guide." Evanston, IL: Benton Foundation, February 2016 benton.org/broadband-private-partnerships-report]

The report outlines three relationship alternatives to equitably share the interwoven issues of risk, benefit and control of those risks for large broadband deployments involving municipal resources and funding.

The first approach, described as Private Investment, Public Facilitation, resembles the Google Fiber experience, in which a private company constructs a broadband network with non-controlling support from the municipality that might include Right-of-Way concessions, TIF or other tax reductions, etc. The private provider's buildout plan has the potential for great benefit to citizens, the municipality incurs no substantial risk associated with the buildout, but it has no significant control over outcomes or shaping the long term infrastructure (broadband speed and take rate) or customer experience. Municipalities choosing this model have generally found they've spend significant amounts of staff time to understand and exert oversight over the private provider's deployment—most of which does not result in changed outcomes. At this point, this does not appear to be the path the County has taken.

The second approach, described as Private Execution, Public Funding, is one in which a service provide is under contract with the municipality to build broadband network infrastructure. This model carries with it more and more varied risks for the municipality, which now take on added roles of project management, some marketing and pricing, as well as understanding a business it does not normally run. The municipality takes on more costs in exchange for more control of infrastructure deployment. This also significantly adds to the municipality's risk of missing details providers would normally see to, that lead to missed due dates. The authors of this study describe the benefits of this scenario as high, but recent municipal experience shows high variability in the long term profitability of broadband networks deployed.

At this point, the County appears to be en route to the Goldilocks "just right" third scenario by which partners share both investment and risk. The County is expending significant resources in early stages through its feasibility study and Border-to-Border grant application to secure initial funding from both the state and provider matching funds. Through this approach, the provider has enough "skin in the game" to be highly incented to operate and market a successful system that leads to comparatively rapid

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customer sign-ups. The municipality is able to engage one or more partners according to their capabilities to cover key portions of the county on a schedule, and provide incremental financing assistance if the provider(s) meet agreed-upon milestones. Under the right conditions of trust and legal framework, the partners should be able to achieve a high level of benefit to each, while keeping control shared and risks of unforeseen outcomes lower than might otherwise be seen.

This option can be better than a zero-sum outcome, since the goals of public and private sectors should be more intertwined. Faster deployment of fiber combined with joint responsibility to building subscriber demand tend to make benefit the local economy, which in turn protects and grows long term services demands.

The Benton Foundation report offers several case studies of this middle partnership scenario that illustrate potential issues and then offers a long and insightful section on legal issues municipalities and providers, alike, can use to guide toward a more effective relationship.

[illegible][illegible][illegible][illegible][illegible][illegible]

[illegible]

FTTP Estimate - Serving Area 2

354.26 Miles

1221.00 Subscribers

100.00%

Item Description	Quantity	Unit Cost	Total Cost
Network and Access Equipment			
Switching	0	\$0.00	\$0.00
Routing	1	\$75,000.00	\$75,000.00
Transport	1	\$75,000.00	\$75,000.00
Access	1,221	\$1,000.00	\$1,221,000.00
Fiber Termination	1,221	\$185.00	\$225,885.00
CO Prep	1	\$10,000.00	\$10,000.00
Subtotal			\$1,606,885.00
Outside Plant			
Per OSP Detail	1	\$7,713,802.02	\$7,713,802.02
Subtotal			\$7,713,802.02
Buildings and Land			
Land Purchase	1	\$20,000.00	\$20,000.00
Prefab building	1	\$120,000.00	\$120,000.00
Subtotal			\$140,000.00
Customer Premise			
ONTs	included in Access	\$0.00	\$0.00
Routers	included in Access	\$0.00	\$0.00
Inside Wire and Turnup	1,221	\$600.00	\$732,600.00
Subtotal			\$732,600.00
Professional Services			
Engineering		14.00%	\$1,427,060.18
Environmental	1	\$15,000.00	\$15,000.00
Subtotal			\$1,442,060.18
Notes			
-Does not include any IP or RF TV components			
-OSP costs are inflated over # year period			
-All other costs held constant			
			\$11,635,347.21

[illegible]

[illegible]

FTTP Estimate - Serving Area 4

205.69 Miles

765.00 Subscribers

100.00%

[illegible]

[illegible]

FTTP Estimate - Serving Area 5

366.82 Miles

1269.00 Subscribers

100.00%

[illegible]

[illegible]

[illegible]

Kandiyohi County Broadband Feasibility Study

FTTP Estimate - Serving Area 1

350.31 Miles

1284.00 Subscribers

100.00%

[illegible]

[illegible]

[illegible]

[illegible]

FTTP Estimate - Serving Area 4

205.69 Miles

765.00 Subscribers

100.00%

[illegible]

[illegible]

[illegible]

FTTP Estimate - Serving Area 6

395.60 Miles

1090.00 Subscribers

100.00%

[illegible]

Kandiyohi County Broadband Feasibility Study

FTTP Estimate - TOTAL

1982.39 Miles

6223.00 Subscribers

100.00%

[illegible]