PHASE 2 – COMMUNITY BROADBAND STUDY

Final Report

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SmartSource CONSULTING

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Contents

Executive Summary

SmartSource Consulting and its collaborators, BigGig Iowa and Kielkopf Advisory Services, are pleased to present our final report for the second phase of the City of Tipton's broadband exploration, this Community Broadband Study.

The information contained in this report provides community leaders with valuable data about citizens attitudes and experiences with existing broadband service providers. And the framework and options for improving service throughout the community. This allows community leaders to:

- Engage with citizens and businesses on broadband availability and service issues based on a larger data set than what only anecdotal evidence can provide,
- Understand the revenue, capital, debt service and operating metrics required to attract a new provider to address perceived deficiencies,
- Evaluate technology and business model options relative to each's competitiveness, regardless of if a public or private alternative provider is to enter the Tipton market, and
- Prioritize the next steps forward in a more wholistic approach, based on having this common market analysis.

This report, including its appendices, consists of (a) the residential and business survey results that measures current levels of satisfaction, (b) a summary of findings from the broadband assessment that measures both general satisfaction and actual broadband service quality, (c) high level cost estimates for both a fiber-to-the-home or premise network and a hybrid fiber-wireless network, (d) high level business models for several scenarios that describes each network/business model's relative potential viability, ability to be financed, and operational sustainability, and (e) a set of conclusions based on our team's perspectives.

Key findings from each of the sections include:

a) There was difficulty getting sufficient engagement from citizens in our broadband survey and assessment. Statistically weighting results by age and income levels, though, shows modest levels of dissatisfaction across the normalized Tipton population.
b) Speed and reliability performance appear to meet the general expectations of most, but not all, Tipton customers based on how they use or rely on broadband today.
c) Constructing either a fiber-to-the-home or a hybrid fiber-wireless network relies on the ability and willingness of a new market entrant to finance and construct a core network outside fiber plant, costing $1.5 - $3.0 million, regardless of how services reach premises and how many customers connect; phasing options exist that can spread expenditures over time to limit risk.
d) There are a range of business models for a new market entrant to consider; each have financial metrics such as debt service coverage and operating cost synergies to attain to be price-competitive given likely continued long-run market fragmentation.
e) Evaluating municipal utility formation options requires leaders to have confidence that spending additional funds on a Feasibility Study, by a qualified engineering firm, would result in a feasible business model; a lower-cost option for the next step is to seek out a potential market entrant through a Request for Information process designed for them to provide insights on the level of public involvement needed for them to invest in Tipton's telecommunications infrastructure to offset their business risks.

Background

In 2019, the Tipton City Council engaged SmartSource Consulting and a team of advisors to begin gathering data about the state of broadband services in the community.

Phase 1, Provider Research, was conducted during the late summer and early fall of 2019. Led by David LaMarche of BigGig Iowa, this phase identified what facilities and services were currently available in Tipton. It also showed that in addition to the two incumbent providers serving Tipton, at least two other companies with a presence in the region – Clarence Telephone/Cedar Communications, and Liberty Communications – have varying levels of interest in also serving the market.

Upon receipt of the Phase 1 Report, the Tipton City Council asked SmartSource Consulting to move forward with Phase 2, this Community Broadband Study, as the next step in the City's efforts. The study includes four key components:

1. Community Broadband Survey. The survey measures consumer attitudes about existing providers and gauged the interest in an alternate provider of services. Discussions with community and business leaders provide anecdotal viewpoints on the impacts of service gaps.
2. Broadband Assessment. The assessment gathers experiential data from internet users, including both network performance tests and self-reported experiences with providers.
3. High-Level Cost Estimate. The cost model identifies likely costs for two types of broadband networks in Tipton: a fiber-to-the-home (FTTH) network and a hybrid fiber-wireless (HFW) network.
4. High-Level Business Model and Analysis. Cost estimates and take-rate scenarios extrapolated from the survey demonstrate financial metrics a new provider (public or private) would evaluate for both risks and return on investment.

Community Broadband Survey

Before starting a new business or extending an existing business into a new market, it is prudent to identify the market conditions that exist in that new area from the perspective of potential customers. Phase 1 identified the existing telecommunications providers in Tipton. The Community Broadband Survey seeks to identify the strengths and weaknesses of those providers to gauge how well a new service provider may compete for market share.

Methodology

The best measurement of a community's attitudes and opinions is to have 100% of the population answer a survey. While some surveys have a higher response rate than others, a 100% response rate is unrealistic. The alternative is to seek out responses from a statistically valid sample of the population, then use that data to draw reasonable conclusions about the general population.

An early goal was to reach a representative sample of Tipton citizens through an online survey. However, survey responses were not meeting goals, so a paper survey was mailed to each household in Tipton to increase the overall sample size.

Two surveys were conducted: one focused on business broadband users and the other on residential users.

Business Survey

The challenge with conducting a survey within a small population, such as businesses in a town the size of Tipton, is getting a sample that leads to a reasonable margin of error. As with other communities SmartSource has surveyed, the margin of error for the Tipton business survey was high.

While these survey results do provide helpful feedback, they should be not be considered a representative sample of the entire business community. The Business Survey report is included as Exhibit 2.

Residential Survey

A total of 295 residential survey responses were received. Of those, 268 were from persons who responded that they live in the Tipton city limits. Since the goal of this study is to measure attitudes and experiences among Tipton citizens, these are the responses used in the residential market analysis.

Of these 268 Tipton citizen responses, 166 were conducted online and 102 were received from the paper surveys.

Sample Size and Margin of Error

According to the 2017 American Community Survey conducted by the US Census, there are 1,343 households in Tipton[1], which was the survey population target.

Since the paper surveys were individually mailed to each Tipton residential electric customer, those responses are highly likely to each represent a single household. For the online survey, we attempted to limit responses to one per household by limiting responses to one per IP address on the online survey.

Presuming the 268 responses represent 268 different Tipton households (the sample) out of 1,343 households (the population), the survey rate of response was 20%. More importantly, this results in a survey margin of error of 5.36%.[2]

On its surface this margin of error is considered acceptable. However, the potential for self-selection bias must be considered. In an ideal market survey of this type, a random sample of respondents would be selected from the community and those persons would answer the survey. Logistically that was not possible in this case, so anyone in the community could respond. Another factor that must be considered is demographical differences between the survey respondents and the general population. Tipton survey respondents were older than the population as a whole[3] and had higher household incomes. SmartSource used statistical weighting to try to offset those demographical biases, but it is not clear that the overall results are as representative as if the response rate were significantly higher.

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1 https://data.census.gov/cedsci/table?q=Tipton%20city,%20Iowa%20households&g=1600000US1978285&tid=ACSDP5Y2017.DP02

2 American Research Group margin of error calculator, https://americanresearchgroup.com/moe.html

3 Using data from the 2017 American Community Survey

Summary of Residential Survey Findings

To measure opinions on several characteristics of services, the survey used a standard Likert Scale[4], then assigned a score to those responses as follows:

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

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

Overall Internet Usage

90.2% of survey respondents reported subscribing to internet service at home. There was some variation on internet usage by age and income range as shown in the table below showing the percentages and raw numbers for each subcategory.

Annual Household Income	Age			
	20-34	35-54	55-64	65+
Less than $25, 000	100% (1)	100% (13)	28.6% (2)	71% (22)
$25,000 to $49,999	70.0% (7)	95.7% (22)	90.0% (9)	93.9% (31)
$50,000 to $99,999	100% (11)	97.2% (35)	90.9% (10)	96.0% (24)
$100,000 or greater	100% (7)	100% (29)	93.8% (15)	100% (6)

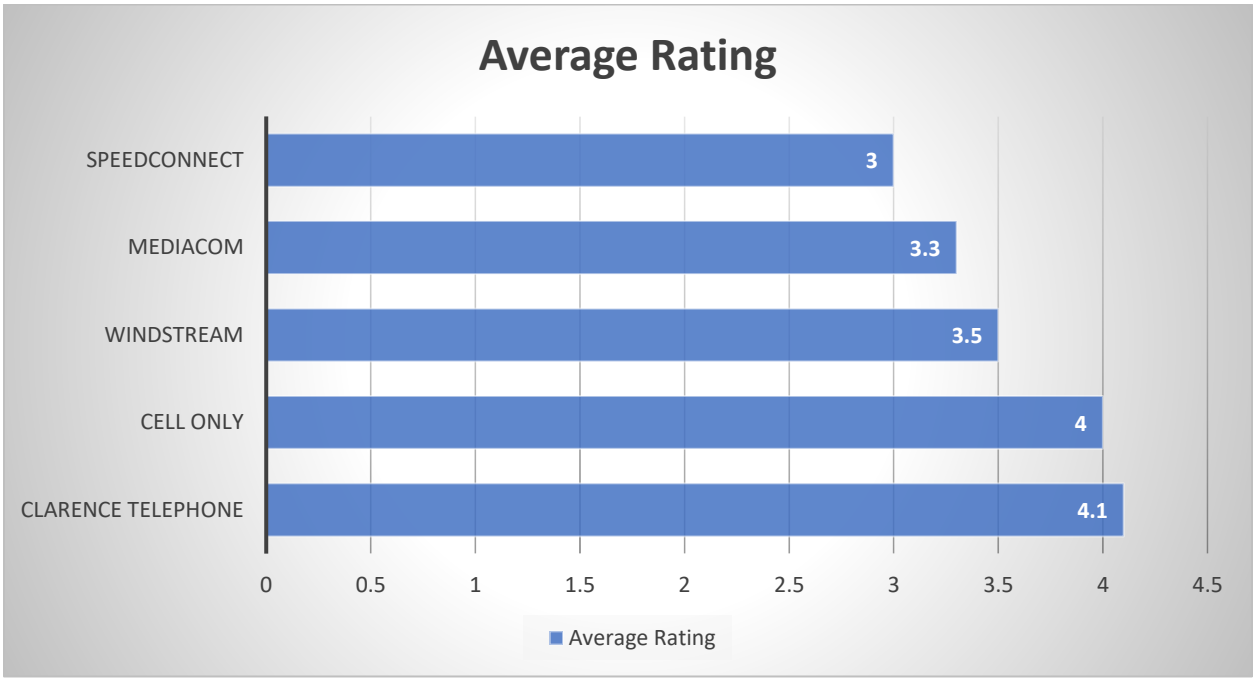
54.6% of respondents subscribe to Mediacom with 36.6% reporting Windstream as their internet service provider (ISP). Clarence Telephone/Cedar Communications had 6.5% of the share with cell-only internet customers and SpeedConnect at around 1% or less each.

The survey also asked respondents to share information about how they use the internet. The top five reported uses were email, online shopping, social media, online banking, and web surfing. 41.6% of respondents say they use the internet for education, including adult education. 24.2% reported that they work from home full-time and another 9.5% said they work from home part-time. This is consistent with national trends showing an increasing number of Americans that rely on internet connectivity for some or all their livelihood. It should be noted that the internet use question was only available with the online survey due to time restrictions on the paper survey.

[4] https://www.surveygizmo.com/resources/blog/likert-scale-what-is-it-how-to-analyze-it-and-when-to-use-it/

Overall ISP Satisfaction

The survey asked respondents to rate their overall satisfaction using a Likert Scale. As a score of 3 would be considered average satisfaction, each of the providers identified on the survey had an overall satisfaction at or above average.

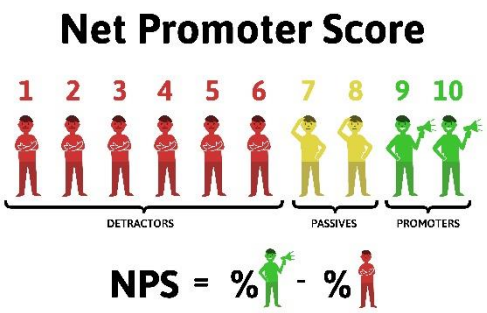


Satisfaction by Service Characteristics

Different people use different criteria when evaluating their satisfaction with any product, including internet access. So, respondents were asked to rate their level of satisfaction on several ISP service criteria. These responses again showed average or above average satisfaction with customer service experience, data allowance, reliability, and speed. Only price was rated below average.

Net Promoter Scores

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



Respondents are grouped as follows:

- Promoters (score 9-10) are loyal enthusiasts who will keep buying and refer others, fueling growth.
- Passives (score 7-8) are satisfied but unenthusiastic customers who are vulnerable to competitive offerings.
- Detractors (score 0-6) are unhappy customers who can damage your brand and impede growth through negative word-of-mouth.

The Net Promoter Score is then determined by subtracting the percentage of detractors (0-6) from the percentage of promoters (9 and 10). Positive NPS scores are considered above average; negative NPS scores are considered below average.

Net Promoter Scores are different across different industries. Internet service providers are consistently ranked among the lowest in terms of NPS scores. NICE Satmetrix, the co-developer of the Net Promoter Score, reported that average NPS for internet service providers in 2018 was -1.0.[5]

For purposes of the Tipton Community Survey, we asked the following question:

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

Among all respondents, the Net Promoter Score for internet providers was a -32.4. Mediacom's NPS was -36.2. Windstream had an NPS of -35.8. On the other hand, although limited in number, Clarence Telephone's customers had a net positive NPS of +31.3.

While the Net Promoter Scores for the two largest providers were negative overall, they were still higher than the results that have been seen in other community surveys. Again, these metrics indicate that Tipton customers are more satisfied with what they have than the other communities that we have surveyed.

Interest in A New Provider

One of the most important questions in the residential broadband survey was Question 21:

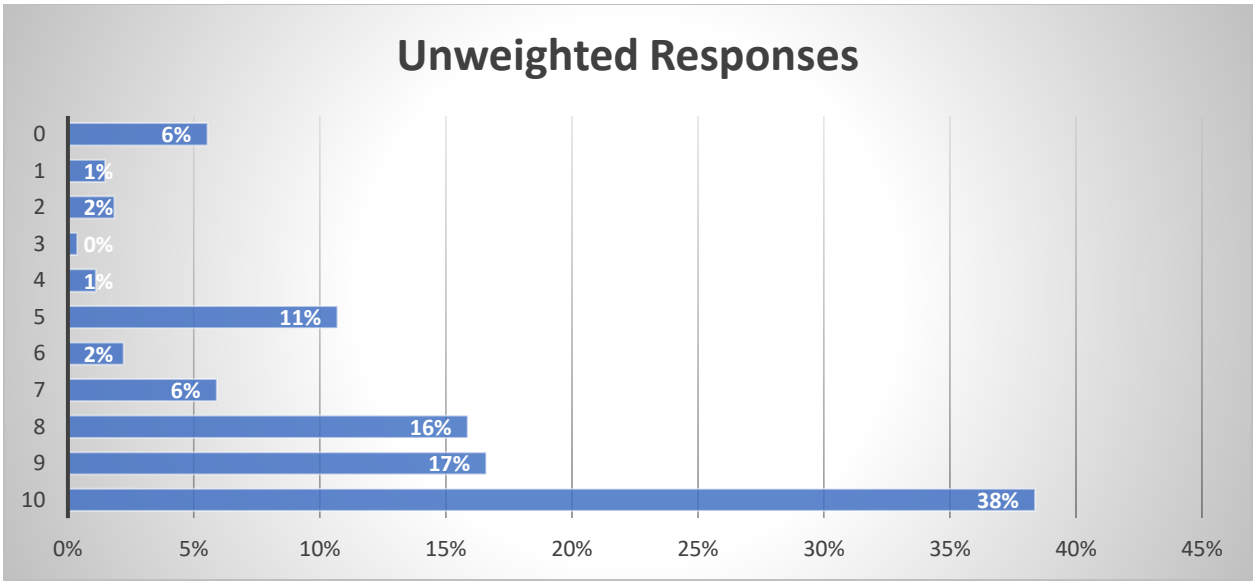
> **"If a new provider (public or private) built a broadband network in Tipton offering superior service for a competitive price, how likely would you be to switch from your current provider(s)?"**

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

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

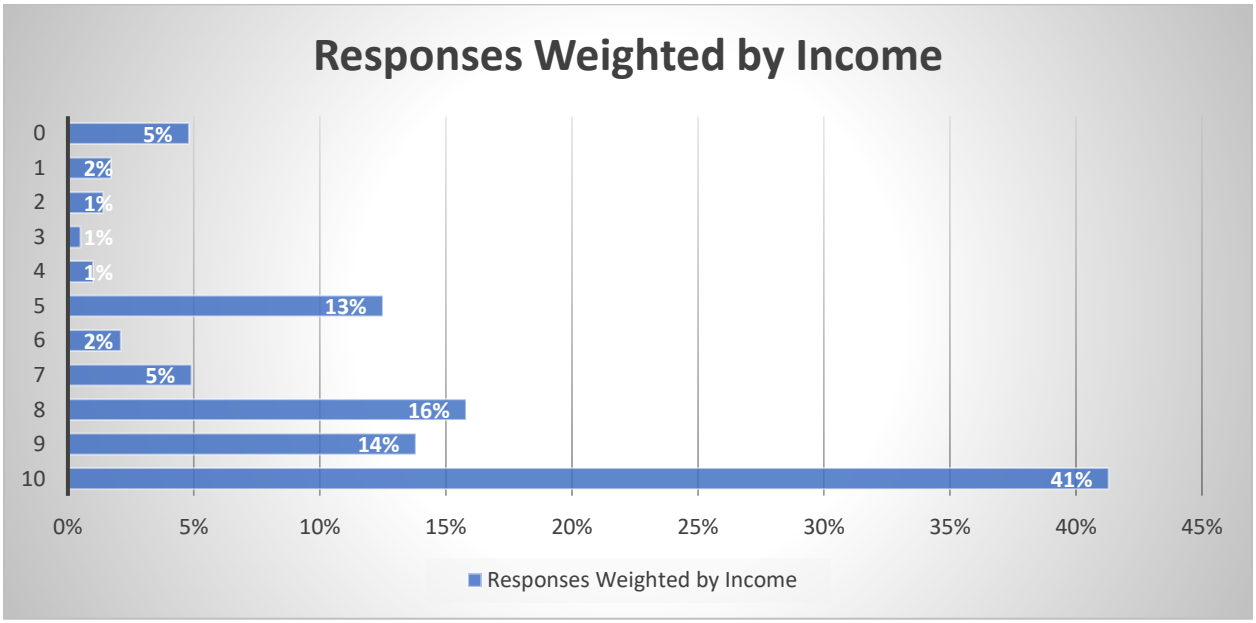
For this question we used the same 0-10 scale as the Net Promoter Score, where higher number indicate a higher likelihood to switch. The first graph shows the unweighted responses on the likelihood to switch to a new provider question.

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

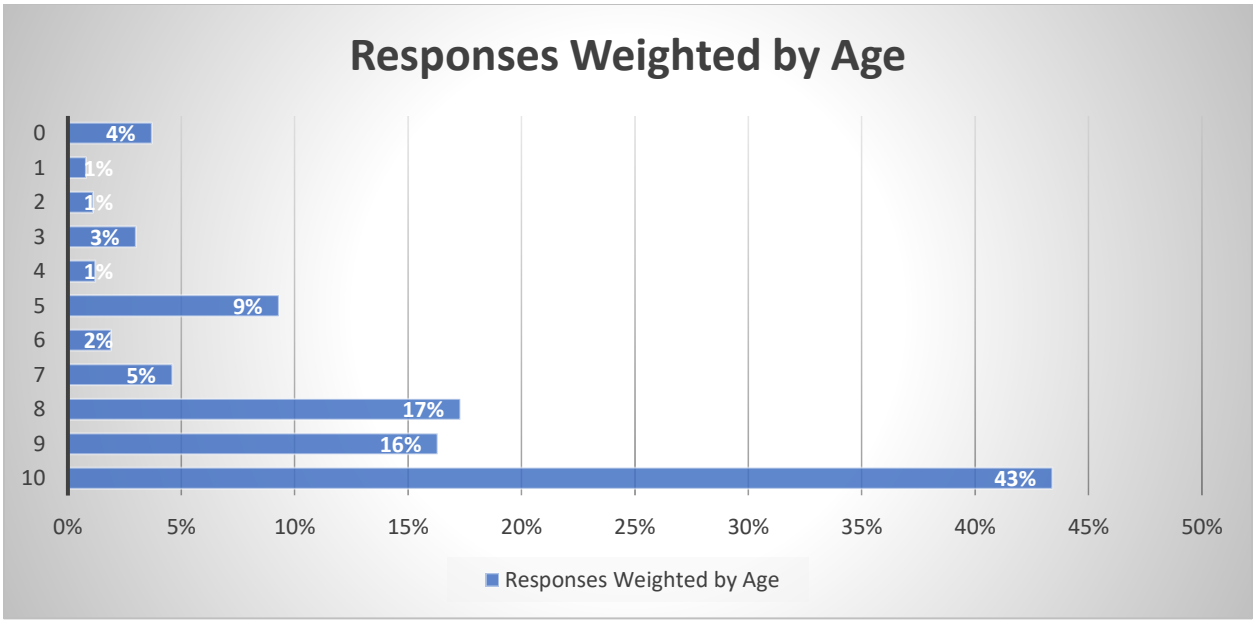


Earlier we mentioned that respondents to the survey tended to be older than the Census population and having higher household income levels. Since this question is a vital to determining whether there is space in the market for a new provider, we used statistical weighting to provide a more accurate view of community opinions.

The chart below shows responses weighted by income so that each income category's weighted sample is a match to Census data. Persons indicating a high likelihood to switch to a new provider (a score of 9 or 10) added up to 55%.



When statistically weighted by age (see below), a total of 55% of respondents indicated a strong willingness to switch (9 or 10) to a new provider.



On the surface these numbers indicate that there is a significant interest in a new broadband provider in Tipton. However, by comparison, similar surveys in other Iowa cities conducted by SmartSource, and where new utilities are being launched, showed around 66% potentially willing to change providers; and those on-line results did not need statistically weighting due to having high levels of engagement by citizens.

> *"I'm satisfied with the current internet provider with everything but the price. For the service we receive, it is way overpriced." – Comment on Residential Broadband Survey*

A new provider in Tipton could not expect to attain 55-59% market share by simply launching services. Existing providers will market heavily to consumers to retain as much market share as possible. They could also choose to address the issues that consumers have identified to keep their churn to a minimum and/or reduce prices or offer additional services as competitive tools.

A new provider, public or private, would need to employ significant marketing resources to attract and retain customers, provide superior customer service, and enhanced offerings that are competitively priced.

Anecdotal Feedback

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

"I VOTE NO! The city does not have any business getting into this business!!!" – Comment on Residential Broadband Survey

This feedback, and supplemental social media comments, show the existence of a small but vocal group of Tipton residents who are against the concept of a new provider, especially if the City of Tipton were to be involved in the operation of such a network. It is difficult to gauge whether these skeptics represent a significant share of the population, but they made their voices heard loudly and clearly at every step of the process. Since one of the goals of a Community Broadband Study is to identify barriers to success for a project, this negative undercurrent should be considered when deciding what, if any, additional steps the City wants to take to address the issues identified in this report.

Broadband Assessments

Data on internet service characteristics and reliability was gathered through an online broadband assessment tool. Using the CrowdFiber[6] application as an optional assessment, Tipton citizens could self-identify their address and conduct a network performance test at their location and provide feedback on their online experiences. The performance test measured download speed, upload speed, latency, and jitter.

A Tipton city limits map was overlaid with the maps for each of the city's wards so that information could be compared between different areas of the city. Persons outside of the city limits could take the broadband assessment as well, but those results were ignored for purposes of this report.

A total of 123 responses were recorded from locations within the city limits. The maps in Exhibit 3 show the physical location of participants (residential and business), with each dot indicating a completed broadband assessment.

Performance Testing

A key purpose of the broadband assessment is to capture internet performance information.

"Internet service is 85% reliable, which is not a high enough standard for business." – Comment on Business Broadband Assessment

Participants were asked to conduct a performance test from their wired internet connection whenever possible.

The performance test measured four characteristics: download speed, upload speed, latency, and jitter. Download and upload speeds were measured in megabits per second (Mbps) and their meaning is generally understood. Latency and jitter are two measures of network performance expressed in terms of milliseconds. Generally, the lower the latency and jitter, the better the condition of the network. 95 successful performance tests were recorded from the 123 responses (79.7%). The 28 responses that did

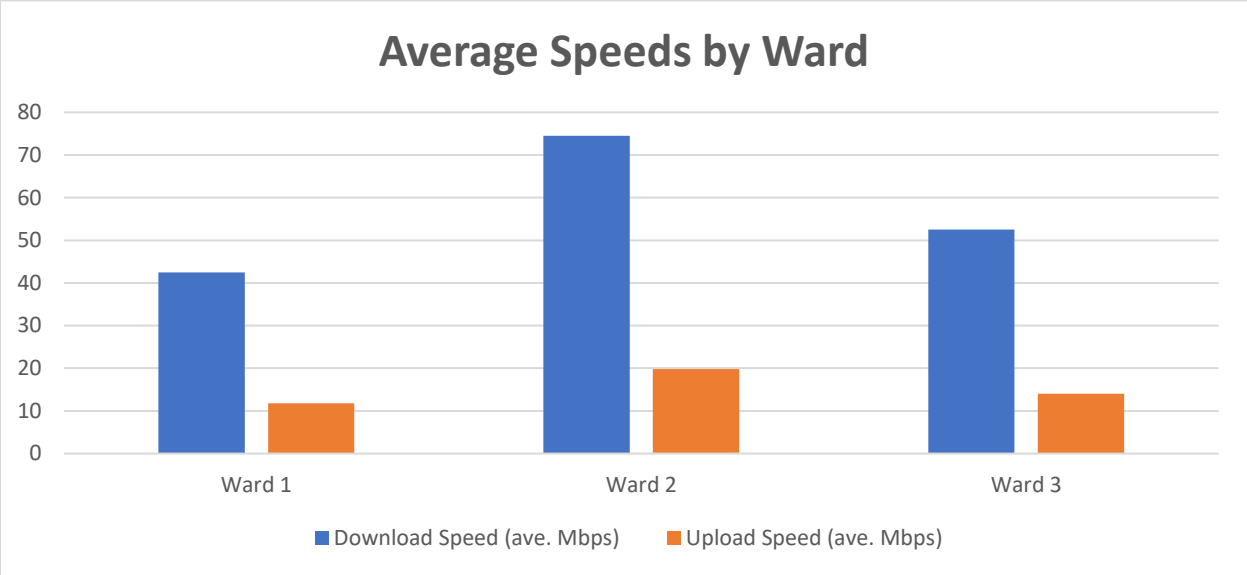
[6] https://crowdfiber.com/

not result in a performance test did record their experiences with service slowdowns, service interruptions, and whether their current internet provider is meeting their needs.

Also, it is important to keep in mind that performance tests such as the one used in the broadband assessment are simply a snapshot in time. Two speed tests conducted a few minutes apart can deliver very different results. However, when averaged together, trends can be identified.

Results by Ward

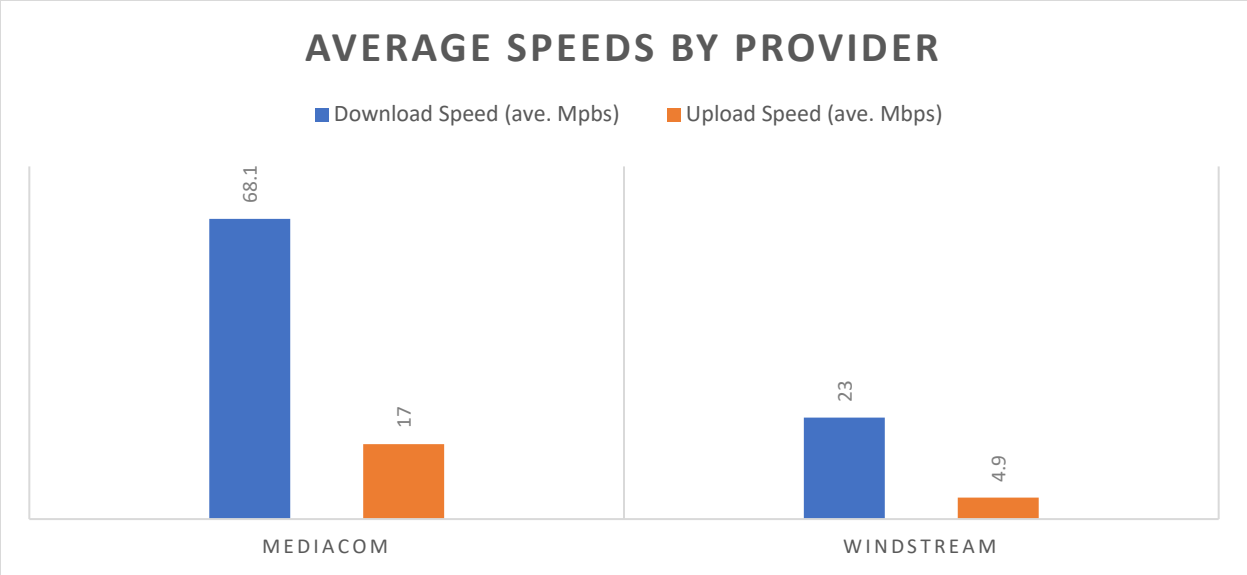
SmartSource evaluated the performance tests to measure differences between geographical areas of the community (as defined by wards) and between internet service providers used to conduct the testing.



The chart above shows average download and upload speeds among all providers across the city's three wards. Test results tended to show best results in Ward 2, but this could simply be a matter of chance and not necessarily indicative of any particular network performance issue.

Results by Provider

We also analyzed the average speed test result by provider across Tipton. The chart below shows the average speeds recorded by customers of the two predominant providers, Mediacom and Windstream.



As mentioned earlier, some people used their mobile carrier's network to conduct their speed test. Those are listed although the primary focus of this study is the landline providers.

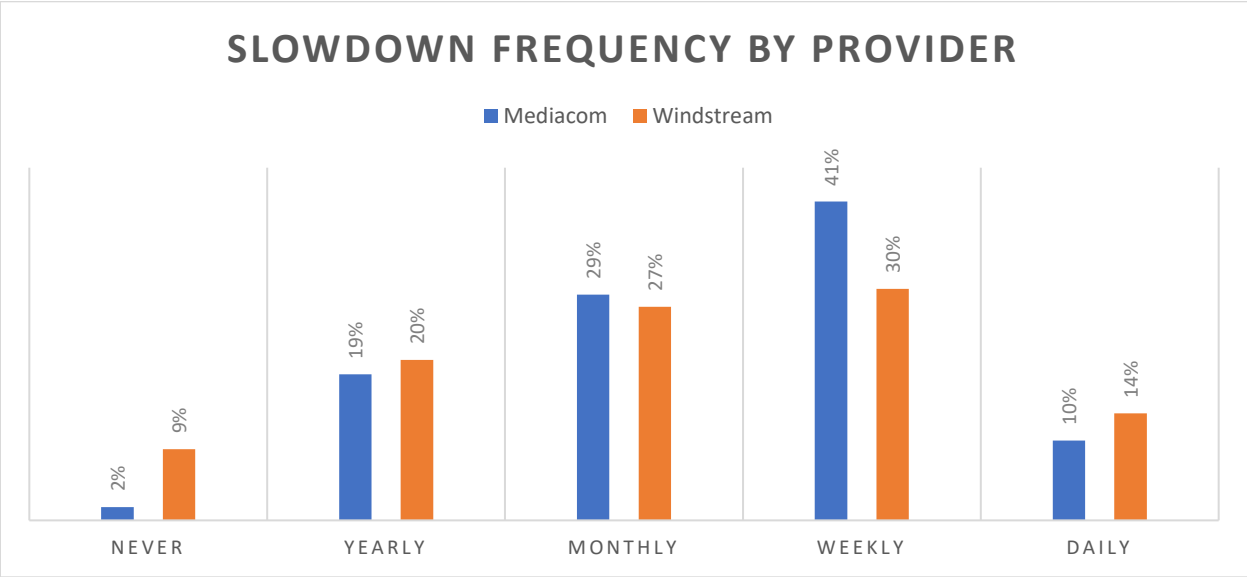
Performance Feedback

The performance test measured network conditions. The broadband assessment also asked respondents to provide additional feedback on their internet experience using three questions.

Question One

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

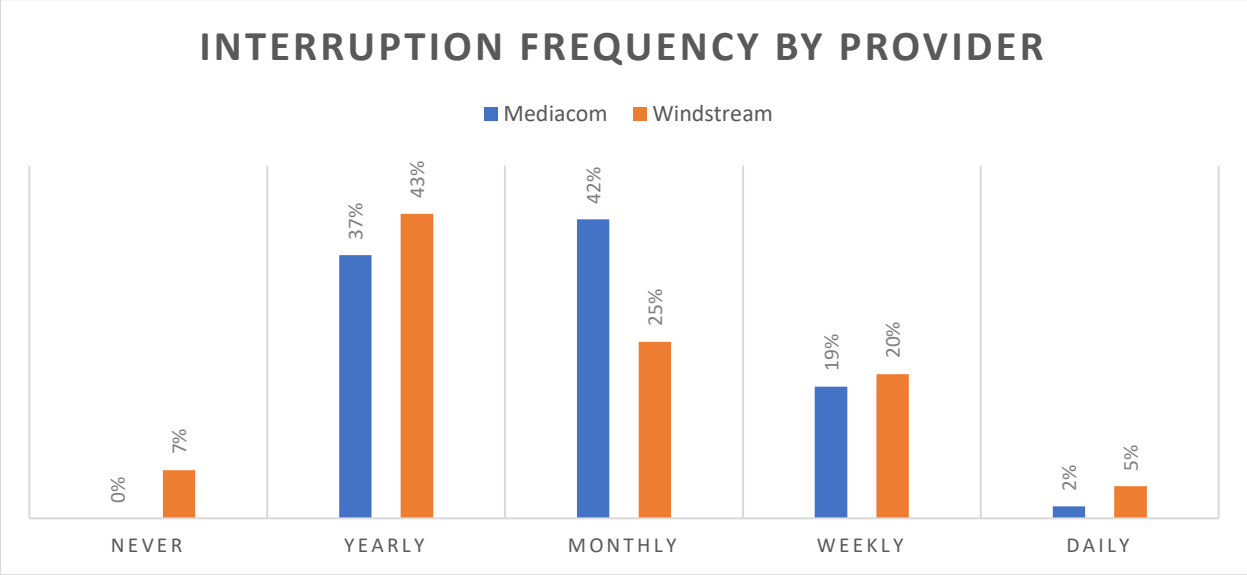
Participants were asked to select one of the following answers to the question: once a day, once or more a week, once or more a month, once or more a year, or never. The chart below shows the responses broken down by ISP.



Question Two

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

Again, participants were asked to select one of the following answers to the question: once a day, once or more a week, once or more a month, once or more a year, or never. The chart below shows the responses by ISP.

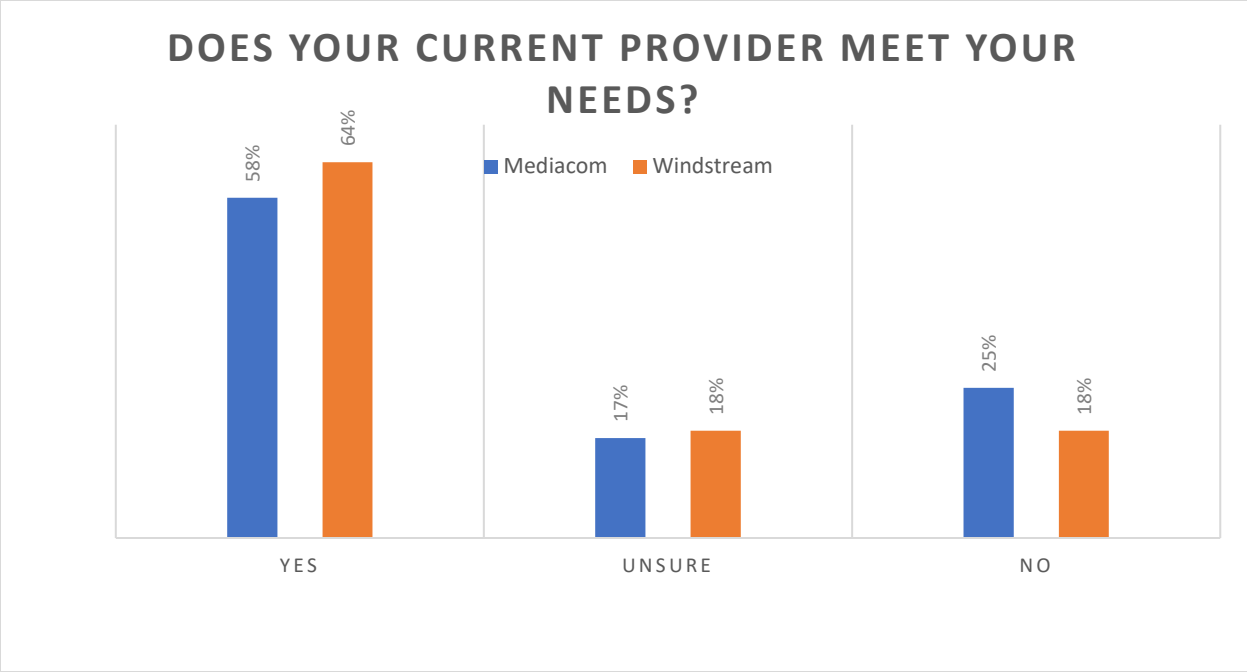


It appears that Tipton consumers are experiencing relatively more-reliable service in terms of slowdowns and interruptions than what was measured in broadband assessments conducted in other communities during the past two years.

Question Three

"Does your current internet service meet your needs?"

The broadband survey asked several questions designed to measure customer satisfaction with consumer's internet service. The broadband assessment asked a satisfaction-based question a different way to learn if the service quality customers have today met their needs. However, even if a customer is unhappy with various aspects of their provider, they may still agree that it's doing the job good enough for them at the price they pay. That is exactly what Question Three results showed.



A clear majority of both major providers' customers said their service is meeting their needs today. These results are significantly higher than what was measured in most other SmartSource surveys conducted in Iowa communities.

Broadband Assessment Comments

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

High-Level Cost Estimates

An ISP network build-out has two main components, the core network (including backhaul) and the access network. The core network would mainly reside in a central location in Tipton. For this study, the assumption was made that rack space could be leased at 506 Meridian Street. The core network outside plant footage built, and thus cost, is largely the same for a fiber-to-the-home (FTTH) or hybrid fiber-wireless (HFW) access network is built. The access network is the method of connecting from the core network to the end customer. FTTH and HFW models were considered.

Costs were then broken down by "per home passed" and "per drop". The "per home passed" costs are what it costs to build-out the core network and access to that network to serve all customers, but without the cost of actually installing equipment at customer locations or connecting the customers. The 'per drop' cost is the cost of the equipment needed at each customer location, the labor to install it and the cost to turn-up each customer. For FTTP, the drop includes bringing buried fiber from a splitter by the street into the home. A 'success based' model would allow the drop costs to be incurred incrementally over time as customers subscribe.

The complete BigGig Iowa cost estimate is attached as Exhibit 7.

Fiber-To-The-Home or Premise (FTTP)

For FTTP, the estimated cost "per home passed" ranges from $1,313 to $2,500, while the estimated cost "per drop" ranges from $550 to $800. The total estimated cost to build-out the network and connect all customers ranges from $2.99 to $5.19M.

Hybrid Fiber-Wireless (HFW)

For HFW, the estimated cost 'per home passed' is $1.34M, while the estimated cost 'per drop' is $0.59M. The total estimated cost to build-out the network and connect all customers is $2.07M.

High-Level Business Model

SmartSource Consulting was also contracted to develop a high-level business model for the Tipton market pertaining to the following:

- The construction and operation of a municipal fiber network; and
- The construction and operation of a hybrid fiber and fixed wireless network

Its goal is to help determine the likelihood that a Feasibility Study, by a firm qualified to conduct one, would result in their study's pricing parameters being favorable for Tipton to provide superior customer service at a competitive price with ubiquitous coverage. That level of study compiles detailed data on all aspects of construction and operations, while factors analyzed in this analysis include property density, rates of adoption, fixed costs for both construction and equipment, interest, and operating costs based on industry averages.

For the stand-alone municipal telecommunications utility model, one of this report's key findings is that for a Feasibility Study to result in favorable pricing parameters, its proposed business model will need to address and mitigate risks in terms of (1) financially viable in terms of the ability to provide services and personnel; (2) financeable in terms of the ability for net operating revenue to be collateralized through Revenue Bonds with minimal other security and reserves; and (3) sustainable in terms of maintaining revenue debt service coverage and reserve balances over time.

These may be offset by taking next steps of:

1. Reducing perceived take rate and customer acquisition ramping risk through a more-demonstrative champions committee or board; and
2. Making plans and obtaining commitments to offset a lack of operation synergies; and
3. Improve debt service coverage ratios through subordinate debt issues by the city, utility, or outside financing.

High level business modeling does support that there are more-favorable economic parameters for an alternative provider of fiber-to-the-premise broadband services, who may be able to attain capital and operating cost synergies by extending into the Tipton market, to be successful in a partnership with Tipton in some manner. *Identifying potential new market participants' levels of interest and financial requirements prior to either party expending funds on feasibility is a viable next step.*

In addition, there are favorable parameters for an existing alternative fixed wireless provider extending into the Tipton market in a partnership with Tipton in some manner.

A more detailed discussion of the high-level financial summary is included in Exbibit 8.

Conclusions

1. Overall satisfaction with Tipton's current broadband providers was at or slightly above average across most criteria compared to other communities who have conducted similar surveys.
2. Network performance was generally acceptable to customers, both in terms of actual speed tests and in self-reported issues with service interruptions and slowdowns. Most participants in the broadband assessment said their internet service is meeting their needs today.
3. Despite generally acceptable levels of satisfaction, customer loyalty to current providers is not strong as indicated by mostly negative Net Promoter Scores. That lack of loyalty was further indicated in the numbers of survey respondents that would strongly consider switching to a new provider if one were available.
4. An apparently small but vocal group of Tipton citizens have a negative opinion about existing City services and as a result are opposed to the city playing a significant role in bringing a new provider to the community.
5. Building a new fiber-to-the-home network in Tipton would likely cost $2.5 - $3.0 million in outside plant bonding, which would need backed by revenues received for providing service regardless who owns it. A hybrid fiber-wireless network would cost less, at $1.5 - 2.0 million for a fiber backbone network plus fixed wireless end user connections. Additional revenue-backed bonding for each is needed for working capital, facilities, customer premise connections, and equipment. Ending capital and operating costs will be dependent upon synergies able to be achieved with either existing provider's operations or other utility services.
6. Using projected network costs and likely take rates extrapolated from the customer survey, it appears that successful stand-alone municipal broadband network operating model relies on reducing several business risks. Achieving more favorable and early community support through citizen engagement while leveraging organizational synergies and financing avenues to reduce operational costs improves prospects for a successful business plan and launch.
7. A partnership between the City of Tipton and another provider that shares outside plant investment risk could be beneficial to the community by filling market gaps identified in this report.

Exhibits List

Exhibit 1 – Final Residential Survey Report

Exhibit 2 – Final Business Survey Report

Exhibit 3 – Broadband Assessments Maps

Exhibit 4 – Residential Survey Comments

Exbibit 5 – Business Survey Comments

Exhibit 6 – Broadband Assessment Comments

Exhibit 7 – BigGig Iowa High-Level Cost Estimates

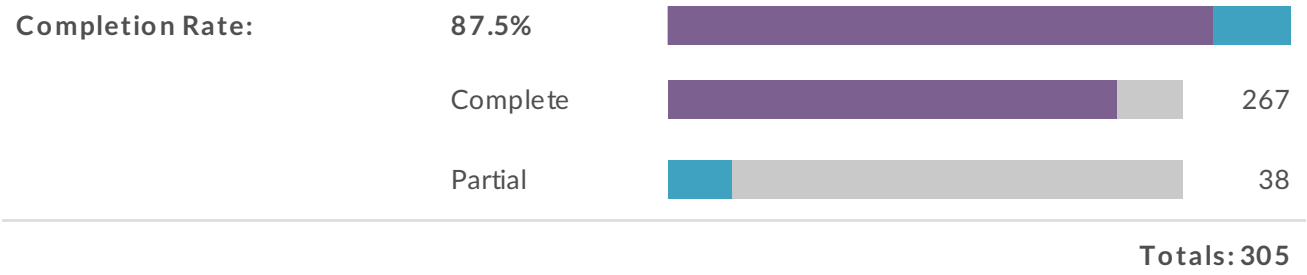
Exhibit 8 – High-Level Business Model

Exhibit 1 - Final Residential Survey Report

This report is filtered
Only show: #1 Question "Do you live in the Tipton city limits?" is one of the following answers ("Yes") and #24 Question "Age" is not one of the following answers ("19 or younger")

Tipton Residential Survey-FINAL

Response Counts



Totals: 305

1. Do you live in the Tipton city limits?

Value	Percent	Responses
Yes	100.0%	305

Totals: 305

2. What telecommunications services do you currently subscribe to at home? (Check all that apply)

Value	Percent	Responses
Internet	90.2%	275
Cable TV or Satellite television	59.7%	182
Streaming video service (Netflix, Hulu, SlingTV, etc.)	54.8%	167
Landline telephone	44.9%	137
Cellular telephone	87.2%	266
None of the above	0.3%	1

3. Who is your Internet service provider?

Value	Percent	Responses
Cedar Communications/Clarence Telephone	6.5%	17
Cellular data plan only	0.8%	2
Mediacom (cable modem)	54.6%	143
SpeedConnect (fixed wireless)	1.1%	3
Windstream	36.6%	96
Other - Write In	0.4%	1

Totals: 262

4. Please rate your overall level of satisfaction with your current Internet service provider.

Value	Percent	Responses
Very dissatisfied	6.9%	18
Somewhat dissatisfied	15.7%	41
It's OK	26.4%	69
Somewhat satisfied	28.0%	73
Very satisfied	23.0%	60

Totals: 261

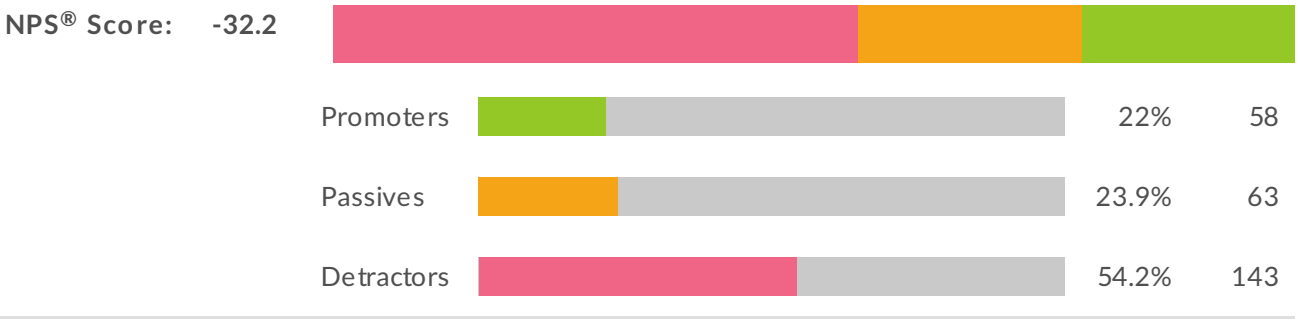
5. Please rate your satisfaction with your Internet service provider on each of the following characteristics.

	Very dissatisfied	Somewhat dissatisfied	It's OK	Somewhat satisfied	Very satisfied	Responses
Customer service experience Count Row %	23 8.8%	36 13.7%	83 31.7%	44 16.8%	76 29.0%	262
Data allowance Count Row %	14 5.4%	30 11.7%	70 27.2%	56 21.8%	87 33.9%	257
Price Count Row %	54 20.4%	79 29.8%	70 26.4%	29 10.9%	33 12.5%	265
Reliability (frequency and length of service interruptions or slowdowns) Count Row %	31 11.7%	57 21.6%	63 23.9%	57 21.6%	56 21.2%	264
Speed Count Row %	22 8.4%	39 14.8%	75 28.5%	62 23.6%	65 24.7%	263
Totals Total Responses						265

6. How do you use Internet service in your home? (check all that apply)

Value	Percent	Responses
Education - Primary/Secondary (K-12)	24.2%	46
Education - Adult (Degree or certificate)	17.4%	33
Email	94.2%	179
Finance/Investing	38.4%	73
Gaming	48.4%	92
Health Care	34.7%	66
Online Applications & Storage (Google Apps, Dropbox, etc.)	52.6%	100
Online Banking	85.3%	162
Online Shopping	88.4%	168
Smart home & Security applications	21.6%	41
Social Media (Facebook, Twitter, etc.)	87.4%	166
Streaming music (Pandora, Spotify, etc.)	64.2%	122
Streaming Video (Netflix, Amazon Prime, Hulu, YouTube, etc.)	73.7%	140
Work From Home-Part Time	24.2%	46
Work From Home-Full Time	9.5%	18
Video Chat (FaceTime, Skype, etc.)	45.3%	86
Web surfing	75.8%	144
Other - Write In	2.1%	4

7. How likely is it that you would recommend your Internet service provider to a friend or colleague?



Totals: 264

8. Do you have any other comments, questions, or concerns about your current Internet service?

9. Who is your current television service provider(s)? Check all that apply if you have more than one.

Value	Percent	Responses
Cedar Communications/Clarence Telephone	0.4%	1
DirecTV	14.9%	37
Dish Network	20.6%	51
Mediacom	33.9%	84
Streaming Video (Netflix, Amazon Prime, Hulu, Playstation Vue, DIRECTV Now, Sling TV, etc.)	33.1%	82
None or antenna only	8.1%	20
Other - Write In	4.0%	10

10. What is your overall level of satisfaction with your television service provider(s)?

Value	Percent	Responses
Very dissatisfied	6.6%	16
Somewhat dissatisfied	9.8%	24
It's OK	27.9%	68
Somewhat satisfied	29.1%	71
Very satisfied	26.6%	65

Totals: 244

11. How likely is it that you would recommend your television service provider(s) to a friend or colleague?

NPS® Score: -23.2

Promoters	23.7%	58
Passives	29.4%	72
Detractors	46.9%	115

Totals: 245

12. Do you have any other comments, questions, or concerns about your television service?

13. Who is your landline telephone service provider?

Value	Percent	Responses
Cedar Communications/Clarence Telephone	2.3%	3
Mediacom	39.5%	51
Windstream	57.4%	74
Other - Write In	0.8%	1

Totals: 129

14. What is your overall level of satisfaction with your landline telephone service provider?

Value	Percent	Responses
Very dissatisfied	4.0%	5
Somewhat dissatisfied	9.6%	12
It's OK	40.8%	51
Somewhat satisfied	12.8%	16
Very satisfied	32.8%	41

Totals: 125

15. How likely is it that you would recommend your landline telephone provider to a friend or colleague?

NPS® Score: -25.8

Promoters	24.2%	31
Passives	25.8%	33
Detractors	50%	64

Totals: 128

16. Do you have any other comments, questions, or concerns about your landline telephone service?

17. What is the total monthly cost (rounded to the nearest dollar) of the Internet, television, and landline telephone services that you receive at home?If you have more than one provider, please add those monthly bills together.Do not include the cost of your cellular plan.

Statistics	
Min	0
Max	500
Sum	35,060.4
Average	145.5
Total Responses	241

Notice: Enable a chart or summary table to see your data.

18. If you have a cellular phone plan, what is the total cost per month (including data)?

19. In your opinion, how important are fast, affordable, reliable, and universally-available telecommunications services to Tipton in helping to improve the following community attributes?

	Not important	Somewhat important	Very important	Responses
Quality of life (making Tipton a good place to live) Count Row %	12 4.4%	51 18.8%	208 76.8%	271
Education (for kids and adults) Count Row %	10 3.7%	42 15.4%	220 80.9%	272
Economic development and jobs (including work-at-home and side income opportunities) Count Row %	12 4.4%	45 16.5%	215 79.0%	272
Health care (remote health care, virtual doctor visits) Count Row %	20 7.4%	78 28.8%	173 63.8%	271
Totals Total Responses				272

20. When considering a provider for Internet, television, or telephone service, how important are the following characteristics of that company?

	Not important	Somewhat important	Very important	Responses
Is locally owned or managed Count Row %	71 26.0%	123 45.1%	79 28.9%	273
Provides excellent customer service Count Row %	2 0.7%	17 6.2%	254 93.0%	273
Is involved in the community Count Row %	41 15.0%	119 43.6%	113 41.4%	273
Uses the best available technology Count Row %	5 1.8%	46 16.8%	222 81.3%	273
Makes service available to all homes and businesses in the community Count Row %	9 3.3%	35 12.8%	229 83.9%	273
Offers multiple services (internet, TV, and telephone) so I can bundle all my telecommunications services from one provider Count Row %	37 13.6%	87 31.9%	149 54.6%	273
Totals Total Responses				273

21. If a new provider (public or private) built a broadband network in Tipton offering superior service for a competitive price, how likely would you be to switch from your current provider(s)?

Totals: 271

22. Additional comments, questions, or concerns

23. Gender

Value	Percent	Responses
Male	45.1%	119
Female	54.9%	145
	Totals: 264	

24. Age

Value	Percent	Responses
20-24	1.1%	3
25-34	9.4%	25
35-44	16.1%	43
45-54	18.4%	49
55-59	6.0%	16
60-64	10.1%	27
65 or older	39.0%	104
	Totals: 267	

25. What is your annual household income?

Value	Percent	Responses
Less than $15,000	5.7%	15
$15,000-$24,999	7.9%	21
$25,000-$34,999	7.5%	20
$35,000-$49,999	12.8%	34
$50,000-$74,999	15.8%	42
$75,000-$99,999	15.8%	42
$100,000-$149,999	17.7%	47
$150,000 or more	4.9%	13
I prefer not to answer	11.7%	31

Totals: 265

26. What is the highest level of education you have completed?

Value	Percent	Responses
Did not graduate from high school	1.1%	3
High school graduate or GED	17.3%	47
Some college, no degree	28.0%	76
2 year degree/Associates Degree	14.4%	39
Bachelors degree	26.2%	71
Graduate degree or higher	12.9%	35

Totals: 271

Exhibit 2 - Final Business Survey Report

This report is filtered
Only show: #1 Question "Where is your business located?" is one of the following answers ("In the Tipton city limits")

Tipton Business Survey-FINAL

Response Counts

Completion Rate:	**86.8%**	
Complete		33
Partial		5

Totals: 38

1. Where is your business located?

Value	Percent	Responses
In the Tipton city limits	100.0%	38

Totals: 38

2. Is your business based in a commercial property or your home?

Value	Percent	Responses
In a commercial property or storefront	92.1%	35
In my home	7.9%	3

Totals: 38

3. What is the primary industry sector of your business?

Value	Percent	Responses
Agricultural	5.3%	2
Banking/Financial services	13.2%	5
Bar/Restaurant	5.3%	2
Construction	5.3%	2
Education	2.6%	1
Government/Public service/Non-Profit	15.8%	6
Health Care	5.3%	2
Manufacturing	7.9%	3
Professional services (including legal and insurance)	2.6%	1
Retail sales	13.2%	5
Other - Write In	23.7%	9

Totals: 38

4. How many full or part-time employees does your business have?

Value	Percent	Responses
5 or fewer	57.9%	22
6-10	21.1%	8
11-20	7.9%	3
21-50	10.5%	4
51 or more	2.6%	1

Totals: 38

5. What telecommunications services do you use at your business? (Check all that apply)

Value	Percent	Responses
Internet	100.0%	38
Cable TV or Satellite television	26.3%	10
Streaming video service (Netflix, Hulu, SlingTV, etc.)	10.5%	4
Landline telephone	71.1%	27
Cellular telephone	60.5%	23

6. Who is your Internet service provider?

Value	Percent	Responses
Mediacom	33.3%	11
Windstream	63.6%	21
Other - Write In	3.0%	1

Totals: 33

7. Is your business served via a fiber optic connection?

Value	Percent	Responses
Yes	11.8%	4
No	47.1%	16
Unsure	41.2%	14

Totals: 34

8. How many devices are connected to the Internet at your business? Include PC's, tablets, smart phones, or any other devices that use the Internet connection.

Value	Percent	Responses
5 or less	38.2%	13
6-10	32.4%	11
11-20	17.6%	6
21-30	5.9%	2
31+	5.9%	2

Totals: 34

9. What specialized data service(s), if any, do you currently receive from your internet provider? (check all that apply)

Value	Percent	Responses
Dedicated bandwidth or circuit	23.5%	4
MPLS	5.9%	1
SD-WAN	11.8%	2
Static IP addresses	64.7%	11
Other - Write In	11.8%	2

10. How do you use Internet at your business? (check all that apply)

Value	Percent	Responses
Company website	73.5%	25
Credit card processing	58.8%	20
Data management, back-up or data storage	64.7%	22
Education & professional development (including webinars)	64.7%	22
Electronic health records	17.6%	6
Email	94.1%	32
File or Data sharing (outside of your internal network)	61.8%	21
Hosting your own server	29.4%	10
Online banking	70.6%	24
Online purchasing or inventory	73.5%	25
Online sales	35.3%	12
Operations in the Cloud (Accounting, Sales, Project management, etc.)	47.1%	16
Social media (Facebook, Twitter, etc.)	58.8%	20
Streaming music (Pandora, Spotify, etc.)	55.9%	19
Streaming video (Netflix, Amazon Prime, Hulu, YouTube, etc.)	20.6%	7
Video conferencing	35.3%	12
Web surfing	67.6%	23
Other - Write In	5.9%	2

11. Please rate your overall level of satisfaction with your current Internet provider.

Value	Percent	Responses
Somewhat dissatisfied	23.5%	8
It's OK	38.2%	13
Somewhat satisfied	20.6%	7
Very satisfied	17.6%	6

Totals: 34

12. Please rate your satisfaction with your current Internet provider on each of the following characteristics.

	Very dissatisfied	Somewhat dissatisfied	It's OK	Somewhat satisfied	Very satisfied	Responses
Customer service experience Count Row %	2 6.1%	3 9.1%	15 45.5%	5 15.2%	8 24.2%	33
Data allowance (data cap) Count Row %	0 0.0%	2 6.3%	12 37.5%	6 18.8%	12 37.5%	32
Price Count Row %	5 15.2%	8 24.2%	12 36.4%	5 15.2%	3 9.1%	33
Reliability (frequency and length of service interruptions) Count Row %	0 0.0%	12 36.4%	11 33.3%	6 18.2%	4 12.1%	33
Speed Count Row %	2 6.1%	7 21.2%	9 27.3%	10 30.3%	5 15.2%	33
Totals Total Responses						33

13. How important is improved internet service (in terms of the criteria listed in Question 12) to your business today?

Value	Percent	Responses
Not important, current service meets our needs	21.2%	7
Somewhat important, we don't have everything we want but can make do	51.5%	17
Very important, current internet does not meet our needs	18.2%	6
Not sure, would like to learn more	9.1%	3

Totals: 33

14. How important do you think improved internet service (in terms of the criteria listed in Question 12) will be to your business in the next few years?

Value	Percent	Responses
Not important	11.8%	4
Somewhat important	35.3%	12
Very important	52.9%	18

Totals: 34

15. Over the past few years, have internet speeds kept up with your business needs?

Value	Percent	Responses
Yes	58.8%	20
No	41.2%	14

Totals: 34

16. How likely is it that you would recommend your Internet provider to a friend or colleague?

Promoters		14.7%	5
Passives		23.5%	8
Detractors		61.8%	21

Totals: 34

17. Do you have any other comments, questions, or concerns about your current or future Internet service?

18. Who is your current television service provider?

Value		Percent	Responses
Dish Network		30.0%	3
Mediacom		50.0%	5
Streaming Video Only (Netflix, Amazon Prime, Hulu, etc.)		10.0%	1
None or antenna only		10.0%	1

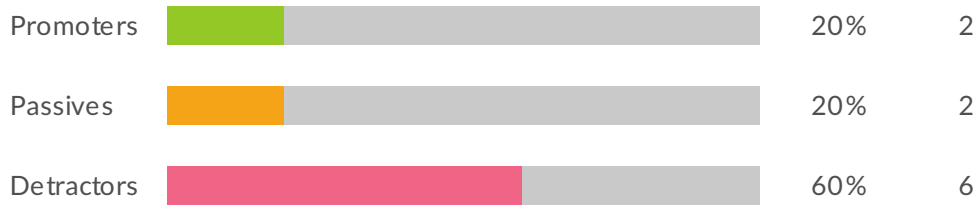
Totals: 10

19. What is your overall level of satisfaction with your television service provider(s)?

Value		Percent	Responses
Very dissatisfied		10.0%	1
It's OK		50.0%	5
Somewhat satisfied		10.0%	1
Very satisfied		30.0%	3

Totals: 10

20. How likely is it that you would recommend your television service provider(s) to a friend or colleague?



Totals: 10

21. Do you have any other comments, questions, or concerns about your television service?

22. Who is your landline telephone service provider?

Value	Percent	Responses
Mediacom	21.7%	5
Windstream	69.6%	16
Other - Write In	8.7%	2

Totals: 23

23. What types of telephone service does your business use (check all that apply):

Value	Percent	Responses
Traditional phone lines	87.0%	20
Hosted VoIP	17.4%	4
Other - Write In	4.3%	1

24. How many telephone lines does your business have? Include voice lines, fax lines, security system lines, etc.

25. What is your overall level of satisfaction with your landline telephone service provider?

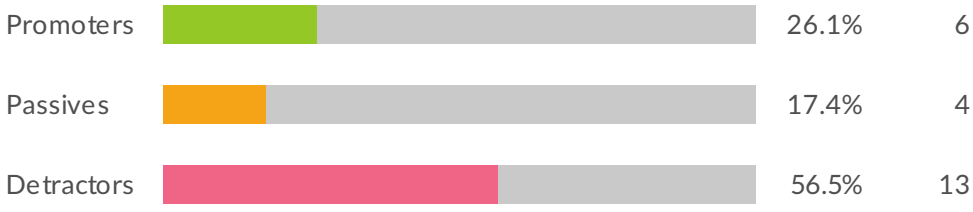
Value	Percent	Responses
Very dissatisfied	4.3%	1
Somewhat dissatisfied	4.3%	1
It's OK	52.2%	12
Somewhat satisfied	17.4%	4
Very satisfied	21.7%	5

Totals: 23

26. What is your level of satisfaction with your landline telephone service provider based on the following characteristics?

	Very dissatisfied	Somewhat dissatisfied	It's OK	Somewhat satisfied	Very satisfied	Responses
Call completion (dropped calls, incompleted calls, etc.) Count Row %	0 0.0%	1 4.3%	9 39.1%	4 17.4%	9 39.1%	23
Customer service experience Count Row %	2 8.7%	1 4.3%	9 39.1%	6 26.1%	5 21.7%	23
Price Count Row %	1 4.3%	6 26.1%	9 39.1%	5 21.7%	2 8.7%	23
Reliability (frequency and length of service interruptions) Count Row %	0 0.0%	4 17.4%	9 39.1%	3 13.0%	7 30.4%	23
Voice quality Count Row %	1 4.3%	2 8.7%	9 39.1%	4 17.4%	7 30.4%	23
Totals Total Responses						23

27. How likely is it that you would recommend your landline telephone provider to a friend or colleague?



Totals: 23

28. Do you have any other comments, questions, or concerns about your landline telephone service?

29. What is the total monthly cost (rounded to the nearest dollar) of the internet, television, and landline telephone services that you receive at your business?If you have more than one provider, please add those monthly bills together.Do not include the cost of your cellular plan.

Notice: Enable a chart or summary table to see your data.

30. If your business has a cellular phone plan, what is the total monthly cost (including data)?

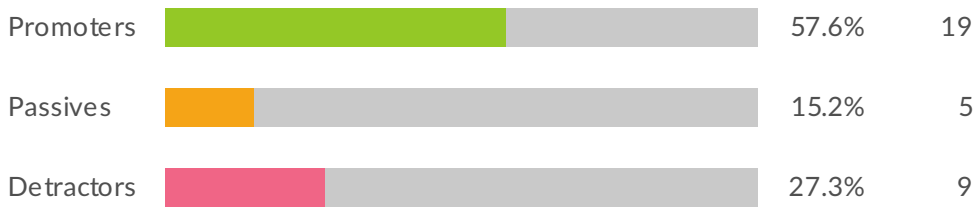
31. In your opinion, how important are fast, affordable, reliable, and universally-available telecommunications services to Tipton in helping to improve the following community attributes?

	Not important	Somewhat important	Very important	Responses
Quality of life (making our area a good place to live) Count Row %	0 0.0%	8 24.2%	25 75.8%	33
Education (for kids and adults) Count Row %	0 0.0%	5 15.2%	28 84.8%	33
Economic development and jobs (including work-at-home opportunities) Count Row %	0 0.0%	3 9.1%	30 90.9%	33
Health care (remote health care, virtual doctor visits) Count Row %	1 3.0%	7 21.2%	25 75.8%	33
Agriculture (field equipment & monitoring) Count Row %	0 0.0%	9 27.3%	24 72.7%	33
Public works (traffic control, infrastructure management) Count Row %	1 3.0%	9 27.3%	23 69.7%	33
Totals Total Responses				33

32. When choosing a provider for internet, television, or telephone service, how important are the following characteristics of that company?

	Not important	Somewhat important	Very important	Responses
Is locally owned or managed Count Row %	12 36.4%	12 36.4%	9 27.3%	33
Provides excellent customer service Count Row %	1 3.0%	0 0.0%	32 97.0%	33
Is involved in the community Count Row %	6 18.2%	13 39.4%	14 42.4%	33
Uses the best available technology Count Row %	1 3.0%	0 0.0%	32 97.0%	33
Makes service available to all homes and businesses in the community Count Row %	1 3.0%	3 9.1%	29 87.9%	33
Offers multiple services (internet, TV, and telephone) so I can bundle all my telecommunications services from one provider Count Row %	4 12.5%	9 28.1%	19 59.4%	32
Totals Total Responses				33

33. If a new provider (public or private) built a broadband network in Tipton offering superior service for a competitive price, how likely would you be to switch from your current provider(s)?

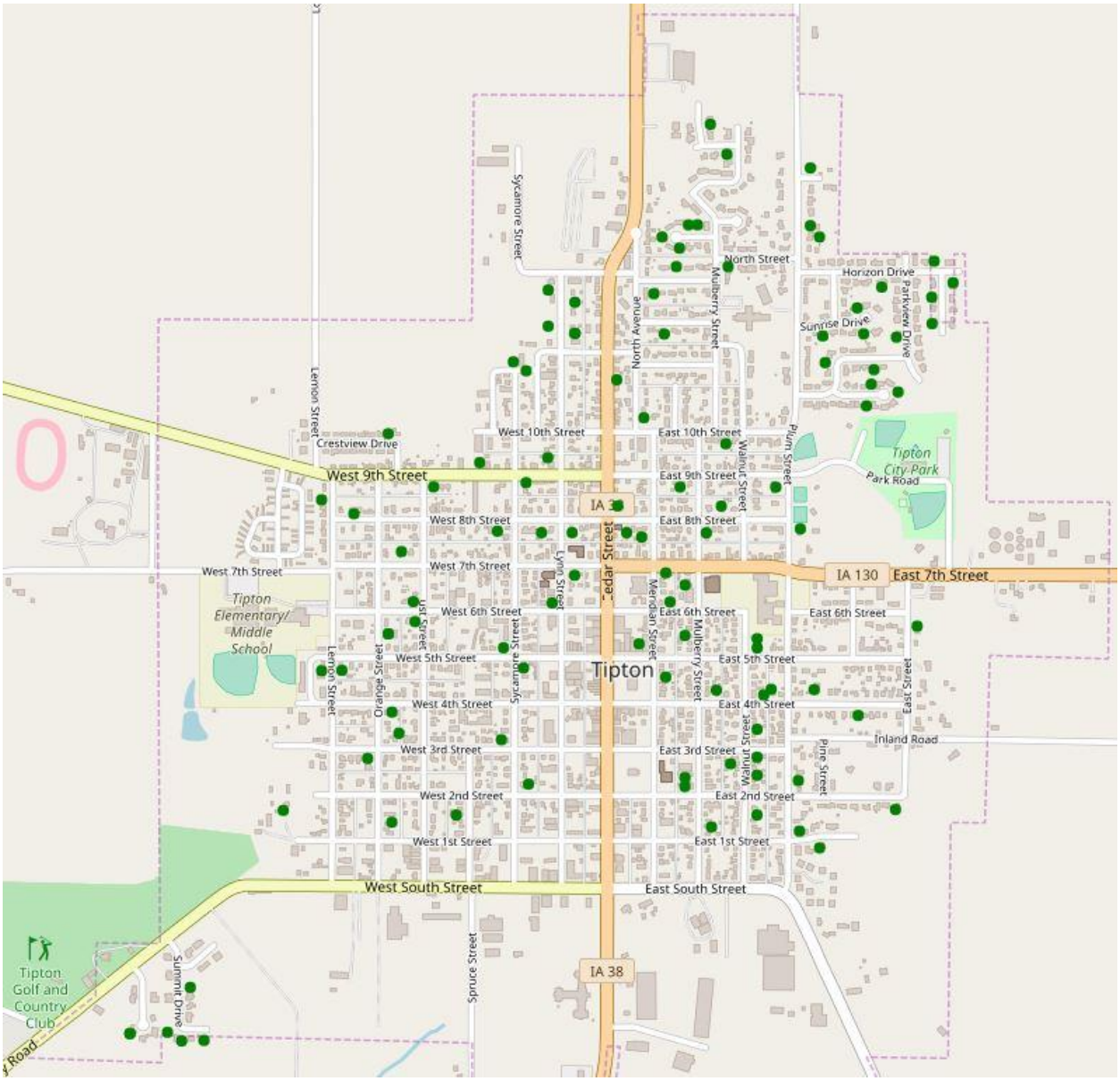


Totals: 33

34. Additional comments, questions, or concerns

Exhibit 3 – Broadband Assessments Map

Residential Assessments



Business Assessments

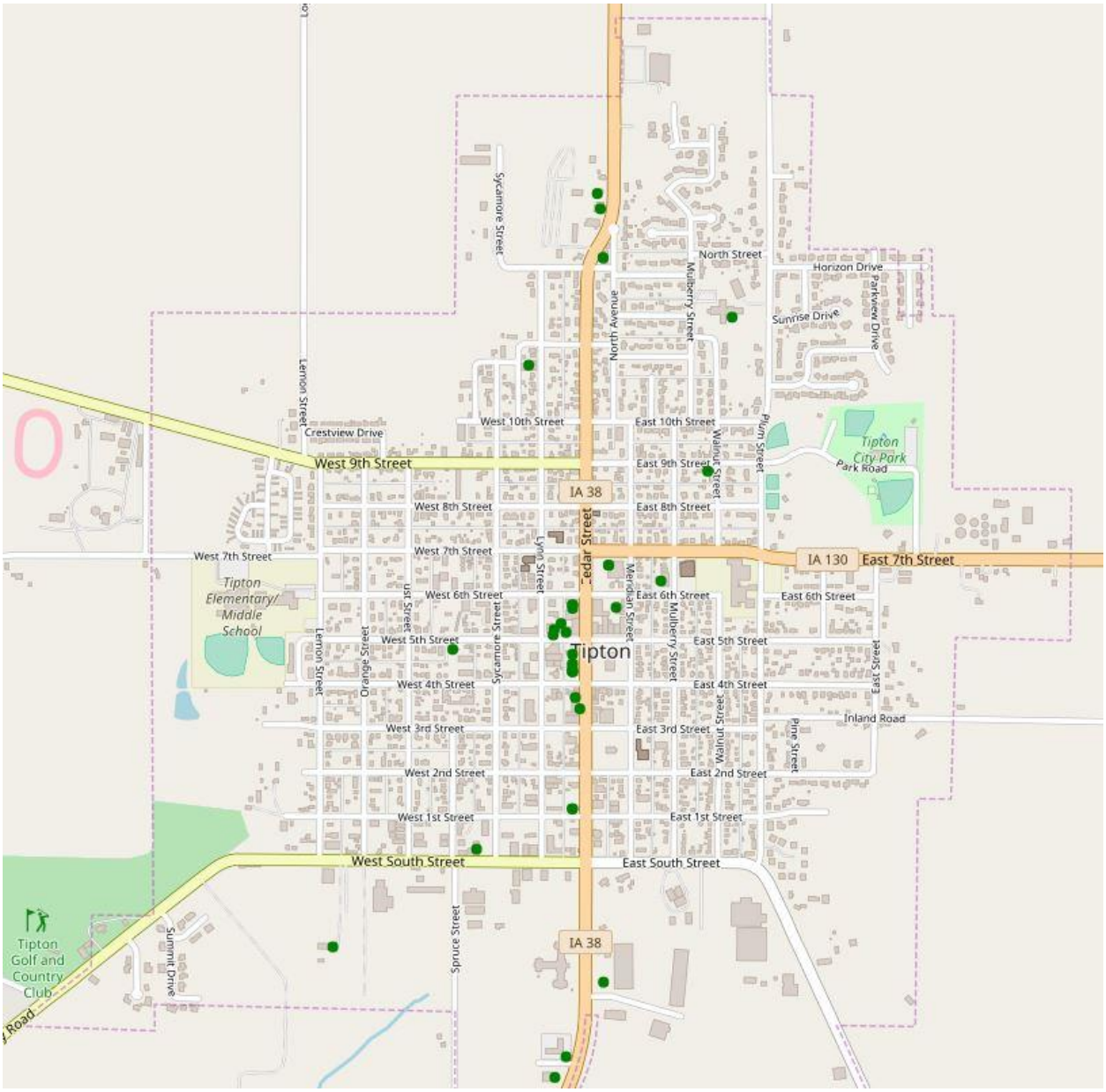


Exhibit 4 – Residential Survey Comments

Internet Comments

1 gig service doesn't seem to be much (if at all) faster than Windstream-also kinda glitchy
Cable from cable box to house (coax) isn't buried very deeply and is not optimally routed through our yard.
can only go up to 12 mbits
Don't feel that I am getting the value for what I am paying for the services from Mediacom!
Don't use the internet much anymore.
Every service has some issues, mediacom has been better for us since we switched from windstream
Expensive
Have no problem with them
I am pleased with the service, not pleased with the price and the speed.
I don't recommend internet services to others-everyone has their own expectations.
I feel like it could be a little less expensive and more easily accessible
I have had terrible customer service from day one, took 4 weeks for them to install and they cancelled the initial appointment and never called to tell me. Internet goes out once a week. I use internet for my full time work from home job and require reliable high speed internet as part of my contract to work from home. I would be very interested in switching to a more reliable and better customer service based company.
I have no information with which to compare the value of Mediacom to other options. I would like more information in that regard.
I like our internet service and cable tv, however, the cost for basic service seems to be higher than what friends of mine in other communities are paying.
I live in Tipton, but in the country. I have one option for internet service (SpeedConnect). They have no tech support from Friday evening through Monday morning. Internet always has issues over the weekend when no one is available to remedy the problem. I am hoping for a new and better option for home internet.
I need to call them about my connection not being what it should be, but would rather not sit on the phone with them since it's "good enough" for what I'm doing right now. We also tend to run out of data over the winter if there are a lot of snow days and the kids are home streaming video.
I think the price is somewhat high for what we receive.
If there are other providers with that type of speed please let me know
I'm loosing them wish they were in Tipton
I'm satisfied with the current internet provider with everything but the price. For the service we receive, it is way overpriced.
Inconsistent. Slow to fix. Only use mediacom because they are the not the worst
It comes and goes. Can't really watch Netflix internet is that bad. Soooo slow
It is very spotting and goes out a lot
It seems like the speed I actually receive is far less than what I am supposed to receive. This also causing interrupted/pixelated/slowed streaming (often at night). Also, I pay almost $100 for the internet which seems like a lot considering it's almost a basic necessity.
It's a little pricey looking for something cheaper that possibly includes television packages
It's a older system

it's just ok. I would look elsewhere if better options were available.
I've thought for a long time that the citizens of Tipton were being ripped off by Windstream (specifically) as they do not provide the services and product that the people of Tipton are paying for - with little other choice. They try to tell you that it's your hardware or wireless, etc...but it JUST ISN'T. It's their lack of ability to provide what they charge for. Access to reliable, fast internet is necessary in today's world - I'm willing to pay for it but I need to get what I'm paying for. I can't imagine trying to run a business (POS, etc...) off of this - it has to be maddening.
Just wish if could be faster. It's maxed out at 12 meg
Just wish it was faster
Local servicemen are excellent. Getting questions answered at the national (home office) level could be improved
Media com is expensive for what we get.poor service that is always down
Mediacom ALWAYS SHUTS DOWN
Mediacom has for the most part been reliable and fast. If I could change anything about the service it would be the cost and the data restrictions. We currently pay $83/month for our internet service. I cannot recall what speed it is but it has never been an issue even while streaming on 2-3 devices at the same time.
Mediacom is garbage but we don't have any better options without going satellite, or paying even more
Mediacom requires a very specific modem that is old and outdated--only they can provide it.
Mediacom speed and reliability has come a long way since fiber went in.
Medidacom has been reliable unless a cable gets cut; my usage is not high;I pay more for a package of internet and landline than I would like.
My current provider has a habit of giving you a certain internet speed and in a few months it decreases. You call and complain and for some unknown reason it speeds up again.
My main complaint is the efficiency of Media Com and the customer service and urgency to attend to the multiple interruptions. Too much downtime and interruptions. Currently MediaCom changed the TiVo service so it does not work like it is supposed to. I don't understand why they did this and the Customer Service department does not take suggestions or input.
My main trouble with my isp is extended outages at times. Otherwise, I love all that they have to provide!
My only complaint is the INTERUPTIONS to service. Unnerving and don't run a business.
need fiber optics
No Questions regarding my current services. I'm only taking the survey because I think it's a crock of crap that Tipton is trying to get into the broadband communication business. They can't handle the utilities they have now, And charging us ridiculous rates for services that could be provided in a much cheaper fashion. It seems that Tipton has misspent the money for years and years and years and thinks this is a great way to try and make some money for the town. This is a stupid idea.
No additional comment other than thank you for this forward thinking. Moving into the future fast, reliable, affordable modern communications will only become more crucial to Tipton proving itself to be a progressive community and attractive to residents and business alike.
No. Happy with ours except for the price....$89ish/month
Other than pricey, no other concerns are this time
Our household would very much appreciate to have fiber optic lines run to our home for internet service. We do a lot of school related work on our internet and also telework part-time. An increased speed and performance would be very beneficial in our home.
Over priced and they play games with rate increases.
Paying for 100 Mbps, speed test has never shown it. Usually around 50. Bad Mediacom
Prarie Hills is O.K. now-before no connection-lots of trouble

pretty costly
Price
price
price is too high
price keeps going up
Price starts low and then increases every couple months
seems like it goes "out" a lot
Seems to lose service frequently during bad weather
service better the past two years
Service has been more reliable the past year.
Since Freddy came to Tipton, service and help have been GREAT and problems resolved. I could pay a little more for faster, more channels, but this gives us what we need and want.
Slows down significantly at night and is overpriced
terrible liars, cant get the same answer answer from them twice regarding internet speeds
The cost Is too high and there are no other options
The only offer "deals" to new customers rather than rewarding long time customers. Customer Service is horrible. The automated attendant is too frustrating for words.
The price keeps going up every year - I get no more for my money
The price we pay is to expensive
There really isn't much to pick from. None of them are great around the Tipton area.
Very slow and inconsistent - I don't feel i'm getting what I am paying for.
We live outside of the Tipton city limit and a wireless option would be nice like we had in Alaska.
We need a new provider Mediacom is not a good option they have one tech for our area and we wait days for services to be fixed
We need more options, and for the price to go down.
Wind steam is good service with minimal issues but the price is kinda pricey.
Windstream is better than mediacom, but I'm still not 100% satisfied.
Wish it was a lot cheaper.
Wish there were another option. Not at all like in the city.
Work from home full time, refrence, fun
Works for me.
would consider getting landline telephone.
Would like a better option. Would use Clarence Telephone if available.
would like to have a Faster speeds and no data limits
Would love something cheaper than $90 a month.
Would love to get more internet options out in our area, especially higher speed. Unsatisfied with the fact our current provider slows our internet down during peak times to a rate that cannot load Netflix or my class lectures.
Would love to have something cheaper.

Cable TV Comments

Access to high speed internet for streaming will only become more and more important to people.
Again, I have no basis upon which to have an informed opinion as to value of this service.

Again, price keeps going up
Again, the price is outrageous for what we get. Just a normal package and the only time we get any deal is if we quit the service for 90 days and then get back on.
Again, this is an asinine idea. Tipton already has more than it can handle, in the job it's doing is sub par. The amount The amount of money that this town spends On what it thinks are quick get rich schemes is ludicrous
As an option to high priced cable or satellite I like to stream TV through the internet and occasionally have issues. Maybe higher and more reliable speed or better modem would make the difference but not sure.
As far as streaming goes, again the speed and performance of fiber optic cable would be a huge benefit for that service.
Between Durect/dish/mediacom they all have the same M/O-reasonable to start with good channels. Give it a year and everything changes.
Cost is too high
Customer service isn't very good
Customer service not knowledgable of their job. Called 4 times w/in 2 weeks. Asked same question all 4 times and 4 different answers. Please consider another provider.
Did have Mediacom-now dish-both the same "BAD"
Did like Mediacom better but became too costly streaming costs about 1/2
Direct tv cuts stations but not price, just went up again as soon as contract ran out. Will look for something else
Dish has broadcast issues...we are sorry we switched from DirecTV.
Doesn't have a lot of movies available
Everything is to expensive!
expensive
Expensive
Good service but too expensive
Have no problem
Hulu has tech issues too often. Netflix content has declined in interest and too expensive for the content available. Amazon prime charges for shows on top of membership.
Hulu wastes a ton of data with their excessive ads; dislike having to pay for multiple services because none are great on their own.
I can't always understand people on the phone when I call - and the workers that come to my home are inconsistent - some good, some...not so much.
I do not have cable or satellite due the cost! I'm happy with Netflix and Hulu.
I don't have use for internet services
I don't recommend television services to others due to their own expectations
I hate that I've been a loyal customer for over 10 years and my bill always goes up and or when we need to update it costs us an arm and leg. Being a loyal customer to me means that we should get some type of discount
I only have it because I want my local channels--I could get an antenna I know but DirecTV has dropped the price so much to keep me that I have just kept it.
I think the prices are high for what we get and dealing with almost as many commercials as the programming. When we have storms the signal gets knocked out and we loose tv in this important time.
I use YouTube TV, Netflix, and Amazon Prime and they are all awesome despite the frequent-ish reliability of the internet connection.
If Clarence had their broadband in North Tipton I would buy in a second
If there is a storm it goes out It goes out all the time They say their reajusting

It goes out in heavy rainstorms-paying for channels we never watch
It is way too costly. Service is not that great.
It's all about the price of tv for me.
It's not the system for future changes because of cost
It's very expensive. Looking for other options due to cost
Mediacom ALWAYS DOWN
My only complaint about Dishis losing signal during storms and the cost.
need fiber optics
Prefer cable but it got WAY too expensive.
pretty costly
Price continually goes up. Even when the make arrangements that it won't. Constant calling them every other month. Awful
Price is way too high for what you get.
Price lock
Price to high
price-expensive, better channels and better packages
Question the value that I am receiving for what I am paying for the service.
Same as before. Cost is too high.
Same as previous
Same comments as provided with the Internet service and Media Com in general is horrible customer service. Way too long on the phone waiting and no resolutions or not timely service for restoring interruptions and customer feedback/issues.
Satisfied with streaming services, not satisfied with internet service used to access streaming services
Tell you ANYTHING to get your business.
The cost is way too high for the different packages. I have basic and the cost, for what you get, is very high. However their service is good.
The Price has gotten out of hand. It goes in streaks where it seems to go out a lot then it is good for awhile.
the price is expensive.
the price is terrible cost way too much for cable
The price per year should go down (not up) if I am going to keep any provider
They are getting Pricey
This question seems to be a repeat of question 6. If you are referring to my TV streaming it's about 8
Too costly for rerun shows
too expensive
Too expensive
TV guide is poorly done.
TV service is good when it is working; I am paying too much for the few channels I watch; I pay more to get one channel that is in a package that contains channels that I do not want or watch.
Very expensive, I'm lucky my wife lets me keep it.
Way too expense
We don't do extras, such as Netflix, etc., do to price
we have an antenna for basic channels and then we stream everything else. We have amazon prime video, Hulu, Netflix and Disney plus. By sharing with a family member we are able to keep our costs reasonable.

We have an antenna for local stations. Streaming services include: Sling, Disney+, Amazon Prime
We need a new provider in the area Mediacom isn't reliable, only provides one tech for repair calls and he's only in the area a few days a week.
We need another option like Clarence Telepone Co.
We only stream don't use/have tv
We pay a high price for local channels, we dont watch alot of the chanles we pay for.
We recently began streaming live tv from YouTube tv and enjoy it but might consider switching back to cable tv if we had another option besides mediacom
We stream more than anything but we need internet to be able to provide the broadband
We switch between dishnetwork and directv every couple years and get the newest dish deal. they are nearly the same
wish they were less expensive
would like to be able to select channels available but are not on their packages
you receive a deal as a new customer with a two year commitment. After two years the price increases. There doesn't seem to be any deals for loyal customers...
YouTube TV is great

Telephone Comments

3 times in the last year I had no service - and they still wanted full payment
Don't use it it came in with the mediacom package
don't use the land line. have it for backup only
goes out when power goes off
Have no issues with the landline
I do not use the land line very often and would consider dropping it.
I never use it
I no longer need a landline and will be dropping the service to save money
I would like to get rid of my landline but we have to bundle with Mediacom or pay even higher prices
If there is a lot of rain, the landline service is terrible. Other than that it is okay.
If you have both TV and landline phone & they have a problem you they are both out of service that's why we have windstream so at least we have a phone.
It goes out when we have too much rain
It's not really landline it's through the air
No internet
No internet
No issue
Nope. It's always great and only cost like $5. Good deal and great backup when a couple times in last.... 5 years or so when cellphone service was down.
Not sure why I keep it given cellular service.
Nothing to add
Outages seem longwhen it happens. HaS NOT HAPPENED IN QUITE AWHILE AS OF LATE.
Phone & Internet outages are less frequent than in the past, but within the past year I had a very lengthy outage (approx 8 days) because an outage had damaged my modem and Mediacom only comes 1 day a week to service the Tipton area. The repairman said it was because they only had one technician for

Tipton area. I told him they needed to hire more techs because they needed to treat their customers better
Phone service and internet are together from same provider, again i think the price is high
pretty costly
price
Same comments as on previous page
scratchy lines interrupt conversation, even on NEW phones. Great service over phone!
so far we have had good service
This is our households source of internet. Again, we would benefit greatly from fiber optic cable for internet instead.
Too expensive
Too expensive
Used for emergencies only. Receive a lot of spam calls despite never giving out the number.
Will probably drop the landline soon as the vast majority of incoming calls are SPAM.

General Comments

Affordability and hidden fees are huge!
All dependent on cost & service.
Anything would be better Than Mediacom and or Windstream
Bring Tipton up to date and allow access to high speed broadband for all homes!
cellar service is very costly
Current technology would be needed.
currently satisfied
depending on tv channels offered
depends
Depends on cost-beginning? Increases over what period of time, etc?
Depends on price and don't want all the services
depends on the offer
DEPENDS ON THE PRICE
Depends on who owns the utility the cost and the business ethics.
especially if it's cable tv and we would get a better price
excellent customer service by phone & person fair price for individual service-not necessary to bundle to get fair prices
Finally a choice.
Find me another option!!!
For our family to switch, any new service would have to be very reliable and fast, cost competitive and Ideally there would be no data restrictions.
Have to see it to believe it
Have tried Mediacom and Dish direct Im sure would be the same :bad"
having multiple years on contract to keep same price
Hope they come out to the country
Hopefully it happens!

I absolutely would not switch providers no matter how much I hated my current provider Because anything the city of Tipton gets its hands on is destined to fail. Let's look at the poor management that caused the fiasco with the aquatic center, and the lies that were told to run gas to a residential subdivision in the county. Pick a project finish it and quit bobbing from project to project
I came to Tipton from West Liberty 3 years ago. I would highly recommend Liberty Communications if Tipton changes broadband. They have excellent service. I bought my computer in 2009 in order to go to graduate school online. L Comm had rural high speed internet then
I don't have a computer
I have learned that when I call Mediacom and ask them to reduce the cost of my plan, they will! They charge what they can get and most people don't realize they could be paying less if they only asked. Also, Mediacom will give you credit for days your service is down, but you have to call them and ask for it.
I have wanted another option for years. I hope this finally happens!
I have what I feel is the best current option. If something better were available I would switch
I live 5 miles south of town and have no internet. I would help them trench it and pay for it if they let me
I live outside tipton but still Tipton. Would have to reach rural areas also
I may not be the first to switch--I like to see how well things are working for others and wait for "bugs" to be worked out before I jump on board with new tech--but I've already been shopping around because I would like something better.
I notice in the next area, there is no place for skilled trade certification. This is certainly a national problem with our educational system. That doesn't even acknowledge that this as important and beneficial as other secondary educational programs.
I VOTE NO! The city does not have any business getting into this business!!!
I want to be able to buy my own equipment, modem, router, cable box, etc. Renting that is more costly. Also, there's no option to get better equipment
I will reserve my answer until I see the prices, what is available and how the service is handled
I would support all competitive service providers to compete with MediaCom and help provide the best service and pricing that can be offered.
I would switch without a thought as long as I could continue to stream using YouTube TV, Netflix, etc.
I would wait to see what others thought of the broadband.
If broadband were installed will there be a monthly fee whether a resident prescribes or not, as other city services are..
If this is now a significant concern for some, then Tiptons city manager should make it a priority to go speak directly with Freddy of mediacom (who lives in town) and GO TO Clarence telephone co. And speak directly with them about options for expansion, improving what's here, future services, etc... That should be AND should've been done before using our taxes to pay an absorbent amount to hire a group for $20,000 to create this survey, put a form in the mail, ad in the paper, and fb posts. He should also meet directly with Swick Cable, a LOCAL company that does upgrading, digging, and laying cable for a living.
if we have our own services it would bring in revenue and maybe cut down on the costof living in Tipton. It is high cost to live here.
Including rural area would be great. Tired of the answer being our service stops at city limit.1.8 miles from me to city limit so it is frustrating
Internet, cable and telephone should ALWAYS be bundled. It's 2020, so I'd stay competitive by offering and installing each service for no extra charge. It's mathematics, stats, futures and research. The logistics are pretty well streamlined these days. Figure it out, we have outer space to explore.
It all depends on price and quality of service, both customer service and download speeds.
It depends on the competitive price. If it's about the same price as what I currently have, I doubt I'd switch.
It needs to be offered to cedar county as a whole not just in the city limits

It will need to be done sooner or later. We already have the billing system and that is a big piece of the puzzle.
It would depend on the cost-cable is $90 a month
It would have to be superior service and would love a lower price.
LIKE ALL BUSINESSESS, All come in with hook gimmicks, then in 6 months to 1 years discount is over then over the hill prices.....
Lived in Independence Iowa, before I moved to Tipton. Independence had a municipal light and power company,. Their Tele communication System was outstanding I hated to leave it up to Tipton can come up with something similar to theirs it would be great
maybe - not sure city can provide service
need definition of "superior service" and "competetive Price". Hard to answer w/o details- do understand details are scarce in discovery
need fiber optic. broad band is old technology and slow
not necessary
only if cheaper than what I have now. I haven't had a raise in 20 years and the price on everything keeps rising
only if it not expensive for the elderly
Please bring broadband internet service to the community. It would greatly improve many lives in the town and rural homes as well.
Please stop wasting money and fix existing issues like when raw sewage backs up in our homes
Price, reliability and service are very important
Question 17 depends on price to me. If the price is the same, then I'm happy with what I have, however if it is significantly lower priced, there is no doubt I would switch in a second.
taxes cant pay for this if the city cant afford it. Save money like everyone else. Citizens cant be forced to pay for it if they dont want to.
The prices of current providers is the biggest concern for me. I do not need a better service. I desire something that is more affordable. Clarence and Mediacom are too pricey. I am unsure of the costs associated with the other providers but their products are inferior so I would never even co sider them. Same quality as Mediacom at a better price. Would prefer more ala carte.
The TV squares out to often - the price should go down - not up-for loyal customers at least not go up evver time it thinks they can get away with it
This is a great idea and I'm excited to see the outcome from your survey. I'm sure many other residents will be excited to have other options available and move on from Mediacom.
This is a great idea but to keep customers happy you have to have very fast internet in todays environment when whole entire homes run on it. Try to match mediacom speeds.
Tipton does not need to own or be involved in the management of the management of the broadband network! Government makes a poor business partner!!
value per dollar top priority
Want something better than Mediacom
We have more important things then this to deal with. ðŸ¤·ðŸ¼â€â™€ï¸
We need more info-the service-price
We need something better than what we have
We would much rather pay a local service provider for these services rather than a company based out of state.
We would prefer to pay a local provider for these services rather than a company out of state.
Where we live (5miles west of town) we have NO internet options outside of satellite. Most of the time leaving us to rely on our cellphone data. What year is this, again?

Would need to be RELIABLE and well priced
Would need to check out prices and learn more about them & their services.

Exhibit 5 – Business Survey Comments

Internet Comments

As far as future internet, I think the city of Tipton has far more things to worry about getting fixed then worrying about internet service
Currently in the process of switching to fiber, so many of these answers may change at that time.
Have not had any service outages in the past year, but frequently had outages in prior years. Local service tech in Tipton has provided excellent customer service and response times. Calling the company service number outside of Tipton has not had good response time or customer service.
I would like information on value of this provider vs other choices.
Mediacom has sucked in the past but I don't believe the problems they were having was theirs and instead Tipton Utilities not being up to per to allow Mediacoms equipment reach their full potential.
No
Service interruption cannot happen
Would like to have high speed fiber for sure

Cable TV Comments

I cut the cord 5 years ago and just use it during production as background noise during work.

Telephone Comments

Business landline through Windstream is very expensive. Will likely port the number to cellular in the near future.
These are the last two years I will prefer to answer my landline over my cell phone due to the fake Google people... When I answer my landline at least I know it is a proper sales person and not a scammer.

General Comments

Crossing my fingers
I move locations 3 years ago. I was going to switch from Mediacom to Windstream due to the issues I was having at my old location. I made it very impossible for me to switch service providers or at least to my knowledge as they said that I wasn't guaranteed to hold the same phone number for my business that I had the previous five years.
I would prefer the city not be the provider, but rather it would reduce the burden of a private company with installing a better service.
Once again, I feel that the city of Tipton has far more important things to fix/address then internet services. Fix our roads and sewers first! Tipton wastes too much money on things we don't need, like expensive dump trucks, building a pool that we couldn't afford that no one uses, a rec facility that no one uses, a backup electric generator that rarely works

Exhibit 6 – Broadband Assessments Comments

Cost and reliability are an issue. I use different ISP for home and business so that I have backup access when one is down.
Frequent and inconvenient outages are very frustrating both for personal and work use.
I am interested in learning about the new service Clarence phone company is providing as it is in my neighborhood. Just never received any info on how to switch, how to bundle, how much and what I would get.
I feel it should be cheaper and more consistent.
I know my connection speed is under performing for what I'm paying, but since I am not using it for anything major lately it hasn't been a concern at the moment.
I'm getting alot slower speed than I'm paying for.
Internet service is 80% reliable which is not a high enough standard for business.
It meets our needs, but could be improved. We make do with what we have.
Mediacom
Meets my needs but cost seems high for quality. Also not sure how it will adapt to future needs.
Once again, the city of Tipton has far more things to worry about than this!
Our internet service provider is mediacom and their customer service is not good at all. The only reason I continue to use their service is my choices of providers are very limited. We definitely need another option.
Please remove Mediacom from our area.
Question the value that I am receiving for the cost that I am paying for the services. Get aggravated at Mediacom making offers to get new customers at a discounted rate because as a loyal customers for over ten years I receive no incentives to remain a customer!!
Right now we are paying the promotional price and are not excited about when the price jumps after 2 years.
Running slow is more frequent than complete outages. Better speed would be good.
Terrible customer service from Mediacom and they are only in Tipton certain days during the week. They canceled my initial setup appointment without calling me and I had to wait 2 more weeks to get setup which is unacceptable for a full time work from home person.
The router I rent from Mediacom needs to be restarted almost every day to work properly
The speed test was blocked. My usual download speakeasy test is 3.4 and upload is 0.4. I definitely want wireless only.
too costly.
Too expensive
Too expensive
Too expensive. Too slow
We are currently investigating fiber through Windstream right now and Clarence phone company has interduct in place to connect us, they are just waiting for more customers before they put the fiber in.
We don't have cable but do stream TV on multiple devices that get interrupted all the time and we have Windstream
Would love a cheaper option or internet offered through the city as utilities.
would much rather have a locally owned and operated internet option

Exhibit 7 - High-level Design and Costs

ISP Network Overview

Components and considerations relating to building-out an Internet Service Provider (ISP) include:

- Internet Connectivity:
  - Contract with Internet Transit provider
    - Providers with fiber in Tipton today that provide Internet Transit
      - Windstream
      - Liberty Communications
      - Unite Private Networks (UPN)
  - IP (Internet Protocol) addressing – IP addresses purchased or leased
- Core Network
  - Connects Internet Transit to Access Network
  - Central Office building(s) and/or Data Center space
    - Lease, building costs
    - On-going operation
  - Electronics
    - Purchase, installation, operation, on-going support, software licensing
    - Core Router, Firewall, DHCP server, etc.
- Access Network:
  - Electronics mainly located in same location as the Core Network
  - Electronics
    - Purchase, installation, operations, ongoing support, software licensing
    - Switches, distribution electronics (e.g. Calix), Access Points (e.g. Mimosa)
  - Fiber plant
  - Power for powered field components
  - Locations for Access Points to be mounted on (e.g. light poles, subscriber buildings, new poles) – Fixed-wireless only
- Customer premise equipment
  - Optical Network Terminal (ONT) (FTTP)
  - Network Interface Device (NID)
  - Antenna and converter (Fixed-wireless)
  - External and internal wiring
  - Customer router
- Additional considerations:
  - Billing, customer management, maintenance, trouble ticketing

This study considers two Access Network architectures and estimated costs:

1. Fiber to the Premise (FTTP)
   - Fiber to every premise - business and residential
   - GPON, NGPON2, XGS-PON or other technology
   - Speeds exceeding 10Gpbs
   - Highest initial cost, lowest on-going operational cost
2. Fixed-wireless & Fiber Hybrid
   - Fiber to Fixed-wireless Access Points

- Typically, 100Mbps+ speeds (dependent on line-of-site between access point and receiver)
- Able to be expanded and converted to FTTP later
- Lower initial cost, higher ongoing operational cost

All costs are estimates. Based on endpoint count of 135 business and 1,394 residential units.

Core Network and Backhaul

The Internet Backhaul and Core Network Infrastructure are essentially the same regardless of whether FTTP or fixed-wireless/fiber hybrid are deployed.

Costs

Initial One-time Costs					Recurring Costs			
Network Component	**One-Time Cost Item - Description**	**Qty**	**Unit Cost**	**One-Time Cost Total**	**Recurring Cost Item - Description**	**Recurring Costs**	**Frequency**	**Annual Cost**
IP Addresses	Block of 1,024 Public IP Addresses	1	$22,000	$22,000	ARIN Dues	$1,000	Annually	$1,000
5Gbps Internet Transit	Setup	1	$600	$600	5Gbps Internet Transit	$2,000	Monthly	$24,000
Core Infrastructure	Cisco ASR 1001-X (or similar)	1	$15,000	$15,000	Core Router Support	$3,000	Annually	$3,000
Core Infrastructure	Transport Equipment (L2 transport - Calix / Cisco / etc)	1	$20,000	$20,000	Transport Equipment Support	$4,000	Annually	$4,000
Core Infrastructure	DDI Appliance (Infoblox/etc.)	2	$6,000	$12,000	DDI Appliance Support	$2,000	Annually	$2,000
Core Infrastructure	Optics	1	$5,000	$5,000				
Core Infrastructure	Server Cluster (Dell/HP)	2	$5,000	$10,000	Server Support	$1,000	Annually	$1,000
Core Infrastructure	Storage (SAN)	1	$5,000	$5,000	Storage Support	$500	Annually	$500
Core Infrastructure	Backup System (NAS)	1	$1,500	$1,500				
Core Infrastructure	Firewall (OSS/Virtual)	2	$2,500	$5,000				
Core Infrastructure	Switch - Layer 3 (Cisco/etc.)	1	$12,000	$12,000				
Core Infrastructure	Switch - Access (Cisco/etc.)	2	$1,000	$2,000				
Core Infrastructure	Management Console (TrippLite/etc.)	1	$500	$500				
Core Infrastructure	Racks (leased)	2	$750	$1,500	Racks (leased)	$1,500	Annually	$18,000
Core Infrastructure	Datacenter Cross-connect	1			Datacenter Cross-connect	$100	Annually	$1,200
Services	Network Architecture, Staff Hiring, Purchase Coordination	60	$175	$10,500				

Services	Technical Deployment, Peering Coordination, Documentation	100	$175	$17,500				
Core Infrastructure					2k Subs - Sonar - management, trouble and billing software	$1,912	Monthly	$22,944

Total Core Network One-time Setup Costs - $140,100
Annual Recurring Core Network Costs - $77,644

Access Network

Fiber to the Premise

Fiber to the Premise networks provide a fiber connection from the Core Network to each customer termination. The devices in the Core Network and at the customer termination are powered, but everything in-between is passive (non-powered). This results in very low maintenance and reliable connection with very long life. Additionally, upgrading the technology is a simple matter of replacing electronics on the endpoints; the fibers are viable for any foreseeable technology advances.

In residential areas, like Tipton, typically fiber will be placed underground via boring. The cost of boring fiber varies based on unforeseeable underground factors, such as ground composition, obstructions, restrictions, etc. Additionally, drops to homes and business must navigate considerations unique to each property, from underground complications to customer requirements. Due to these factors, the cost estimates for a full FTTP build are created around industry cost averages based upon households passed and drops (connection from the passing fiber to the customer termination point), rather than a detailed cost breakout. These cost ranges consider everything for a FTTP access network build-out aside from the Core Network and Backhaul.

Fiber to the Premise Costs:

- $1,313-2,500 per home passed
    - This covers all access network design, engineering, install and turn-up, building costs and fiber installation.
    - The result is fiber passing each home and business, providing the option to create a ‘drop’ to connect a customer and provide service. This does not include the cost of the drop.
- $550-800 per drop
    - This covers the cost of the fiber connection from the street to the house, installation of a ground point, Optical Network Termination (ONT), wireless router and installation

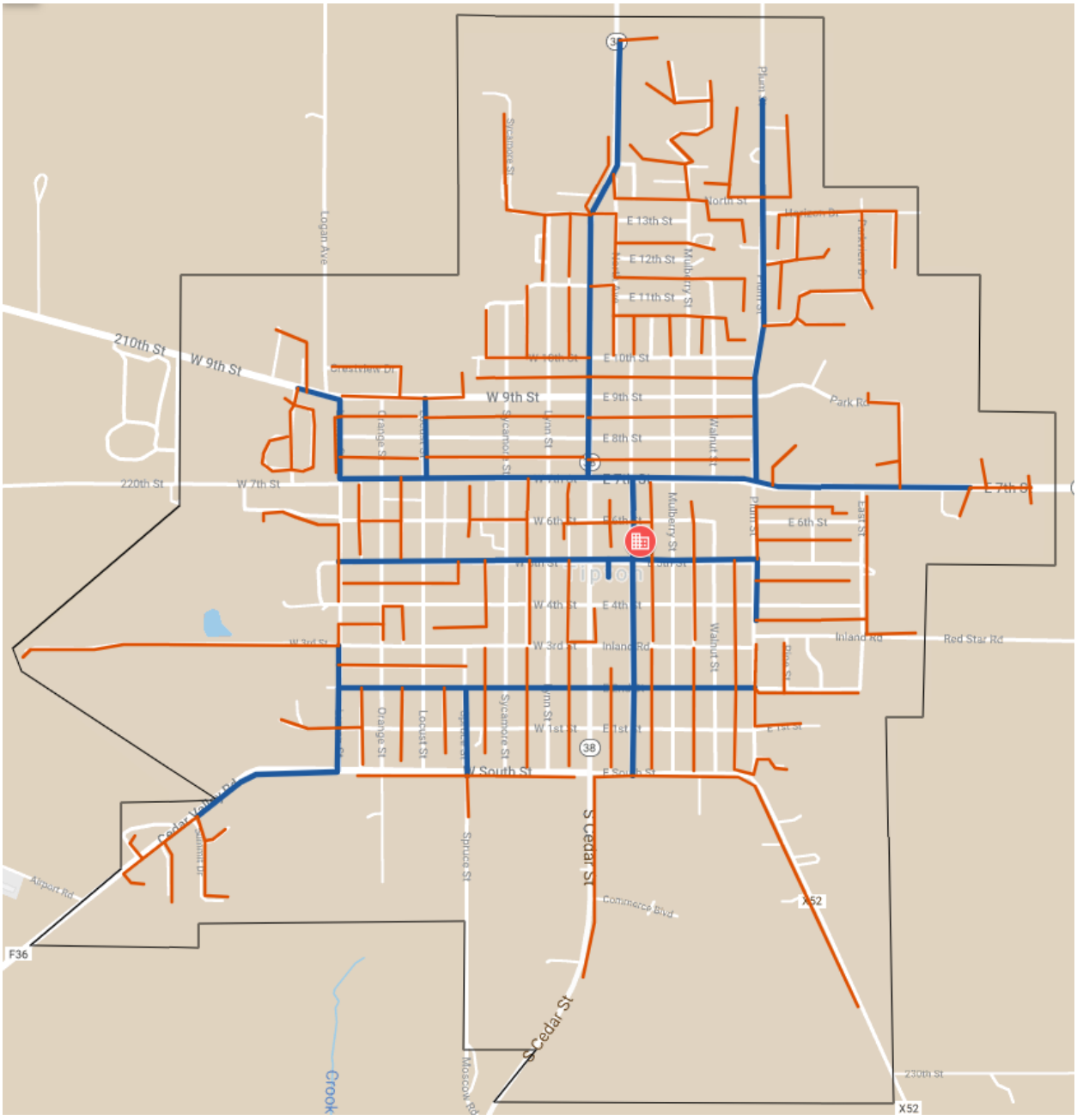
A deployment model can include burying all drops initially (e.g. Cedar Falls Utilities), which is a higher upfront cost, or burying them as subscribers request service (Waverly Utilities model), which saves upfront cost but complicates subscriber turn-ups (e.g. in winter drops cannot be buried, so must be laid above ground until the ground thaws).

Costs for a 100% build-out (1,529 endpoints):

- Network passing every home and business
    - Low: $2.01M

    - High: $3.82M
- Drops to every home and business and turn-up
    - Low: $0.84M
    - High: $1.22M
- Totals, including network passing each home and business, drops, Core Network and Backhaul
    - Low: $2.99M
    - High: $5.19M

Fiber to the Premise High-level Design



The design assumes the Core Network is installed at 506 Meridian Street, which is represented by the red circle, in leased rack space. The blue fiber paths are distribution fiber paths that connect to passive optical splitters. The orange fibers represent fiber paths connecting from the passive splitters to the home or business termination points. This drawing shows the fiber passing all homes and businesses but does not show the individual drops to the customer endpoints.

This is a high-level design. There are many ways to layout a FTTP build, which would be determined by the engineering firm tasked with producing a detailed design and buildable plan.

Fixed-wireless & Fiber Hybrid

A fixed-wireless and fiber hybrid network connects to customers via a wireless line-of-site connection from the subscriber premise (typically a receiver on a roof or wall) to an Access Point (AP) located on a pole or other tall structure. The AP is connected back to the Core Network via fiber optic cable and serves many customers (25+, depending on equipment type). This type of infrastructure eliminates the need for burying fiber all the way to the customer endpoint yet provides 100+ Mbps connectivity (with 1Gbps possible with certain equipment types in proper deployment circumstances). This model allows deployment of one device (AP) which then provides the ability to serve many customers (20-50) and allows later conversion to FTTP if desired. Therefore, it makes for a cost effective and flexible deployment model. However, due to line-of-sight requirements and electronic wireless APs in the field, tree trimming, wireless frequency management and equipment replacement costs are factors that must be considered. When built correctly, this model can provide a competitive network at a lower cost point that can be deployed more quickly than a FTTP network.

In residential areas, like Tipton, typically fiber will be placed underground via boring. The cost of boring fiber varies based on unforeseeable underground factors, such as ground composition, obstructions, restrictions, etc. However, since the quantity of fiber required for a fixed-wireless/fiber hybrid model is a fraction of a FTTP model, these costs and risks are significantly reduced. Additionally, drops to homes and business are accomplished via wireless connections, so boring/trenching is not necessary to connect to the home or business. Instead, a receiver is installed on the customer's building with a line-of-site to an Access Point, which establishes an Internet connection wirelessly.

Fixed-wireless Access Points have been modeled within 1,000 ft of all endpoints, providing an estimated Access Point count (51) and fiber footages required. This data has been combined with cost and count estimates for poles, vaults, customer premise equipment, engineering and distribution electronics.

Fixed-wireless & Fiber Hybrid Costs

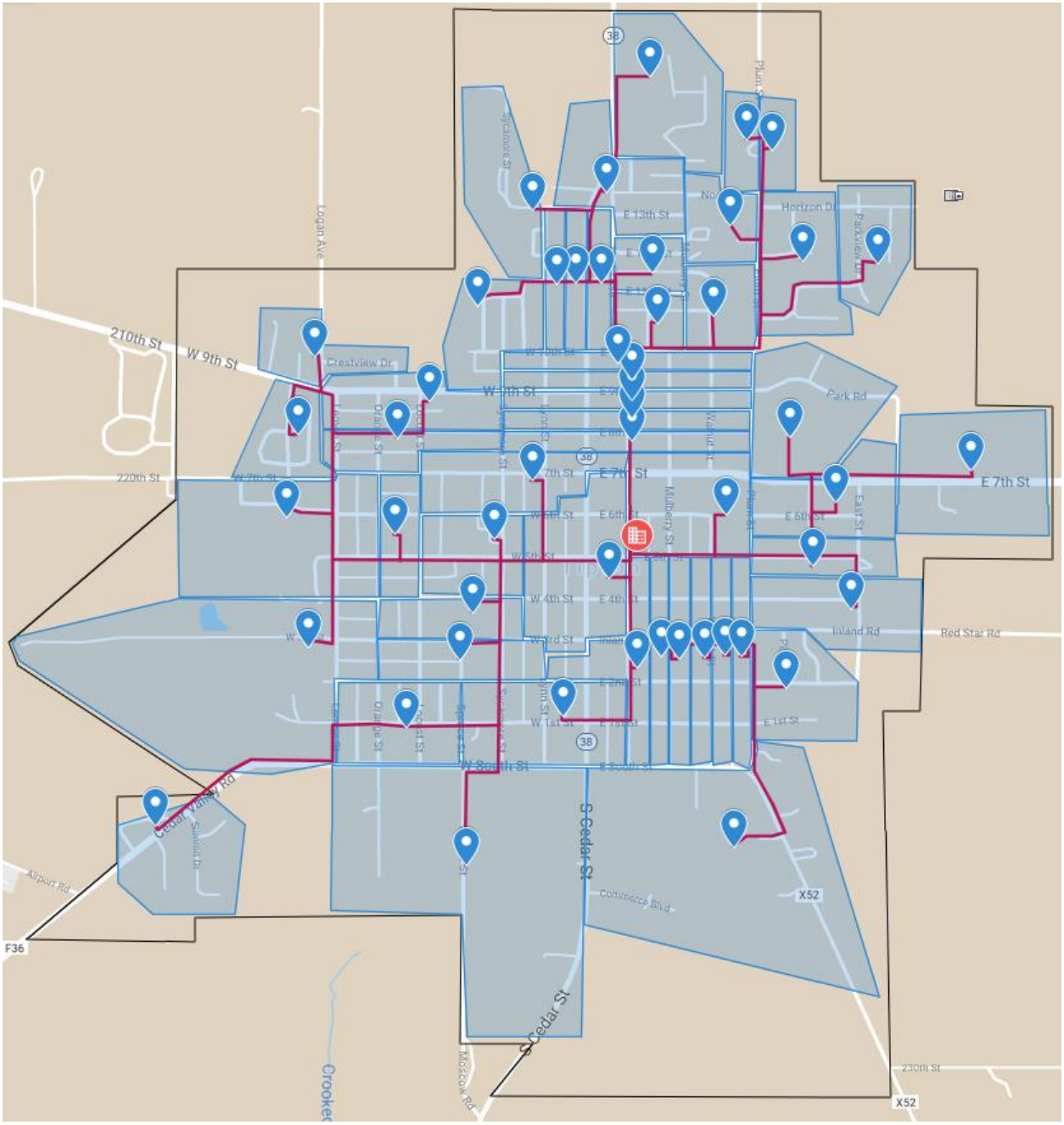
Network Component	Description	Cost
Fiber Distribution	Construction & Splicing Labor	$641,233
Fiber Distribution	Materials	$107,424
Wireless Access	APs & Poles – Materials and Labor	$404,000
Wireless Access	Tree trimming/removal	$100,000
Design, Project Management, Permitting and As-built Mapping		$85,680
Customer Premise	Receiver, CPE, Labor	$588,665

Cost estimate for a 100% build-out (1,529 endpoints):

- Network passing every home and business
  - $1.34M
- Drops to every home and business and turn-up
  - $0.59M
- Totals, including network passing each home and business, drops, Core Network and Backhaul
  - $2.07M

While the cost modeling has been built around 100% customer adoption, the drop cost would only be incurred on a per subscriber basis when a new customer signs-up for service. Additionally, it would be possible to only put the fiber in and wait to install a pole, power to the pole and an Access Point until a subscriber signs-up off that Access Point. This would allow a portion of the investment to wait until there is revenue (success based).

Fixed-wireless & Fiber Hybrid High-level Design



The design assumes the Core Network is installed at 506 Meridian Street, which is represented by the red circle, in leased rack space. The blue teardrops represent the approximate location of the Fixed-wireless Access Points (APs). The coverage area of each AP is represented by a blue outline surrounding it. The dark red lines represent fiber paths connecting the Fixed-wireless Access Points to the Core Network. This design places Access Points within 1,000 ft of every existing home and business.

This is a high-level design. There are many ways to layout a Fixed-wireless and Fiber Hybrid network, which would be determined by the engineering firm tasked with producing a detailed

design and buildable plan. One important consideration of a fixed-wireless build is ensuring line-of-site between customer receivers and wireless Access Points. This will require the removal of some trees and repositioning some wireless Access Points to obtain the best orientation to customer endpoints.

Exhibit 8 – High Level Business Models

Introduction

High-level cost estimates were developed to develop financial metric ranges for each business model's potential viability, ability to be financed, and operational sustainability. The 3 models evaluated are:

A. Stand-Alone Fiber to the Premise (FTTP) Municipal Telecommunications Utility

   Description: Tipton forms a municipal telecommunications utility that achieves few synergies with city administration, utility operations, or other providers. Take rates are an average of actual data and modified data, and are conservative given all risk is assumed by the local utility. A typical model receives most of its net revenue from internet customers, with some additional from phone service and minimal from offering IPTV service due to programming costs. Virtual video and phone services are typically provided by contract by 3rd parties vs. building a local head-end.

B. Partnership Fiber to the Premise (FTTP) Models with Modified Take Rates (3 scenarios)

   Description: Tipton forms a municipal telecommunications utility, and then finds a private partner through a Request for Information (RFI) process that achieves financing and operating risk synergies with existing utility operations and another provider. Take rates are an average of actual data and modified data, and are a wider range given shared investment and branding risks. A typical model receives most of its net revenue from internet customers, with some additional from phone service and minimal from offering IPTV service due to programming costs. Virtual video and phone services are typically provided by contract by 3rd parties vs. building a local head-end.

E. Partnership Hybrid Fiber-Wireless (HFW) Model with Modified Take Rate

   Description: Tipton forms a municipal telecommunications utility, and then finds a private wireless partner through a Request for Information (RFI) process that achieves financing and operating risk synergies with existing utility operations and another provider. Take rates are an average of actual data and modified data, and are a wider range given shared investment and branding risks. A typical model receives most of its net revenue from internet customers, with some additional from phone service and none assumed from offering IPTV service.

Modeling and Analysis

The 4 FTTP business model scenarios (A – D) are based on similar assumptions based on industry cost estimates and those contained elsewhere in this report.

Premises = 1,530
Outside fiber plant = $1,750 per premise passed
Cost per drop to customer premise = $970 (assumes contracted labor)
Phased drop installations as customers sign up; start with 40% constructed
Cost per customer equipment at premise = $300
Construction contingency = 5%

Per-customer bandwidth usage growing by factor of 5x over next 5 years
Per-Gb capacity and usage cost falling by a factor of 66% over next 5 years
Billing cost of $2.50 per customer per month

Model inputs are then customized based on potential impacts of ownership, brand awareness and support, potential cost synergies, and other factors. Modifications include:

- Maximum take rates vary based on brand awareness; new(er) entities have slower ramp-up expectations than existing providers unless they have overwhelming community support.
- Capital cost synergies may include the need for additional facilities, equipment, and personnel to serve just the Tipton market; a stand-alone utility does not have those inherent cost advantages.
- Having synergies, and lower outside plant costs in the case of using wireless technologies, reduces operating losses during ramping years thereby reducing the amount of working capital a provider needs to enter the Tipton market.
- Lower borrowing levels and a more-established credit partner both bring the potential for slightly lower interest rates.
- Borrowing is primarily based on collateralizing the market's revenues; lenders require debt service coverage and restricted reserves to protect their ability to be repaid under varying market conditions so demonstrating higher levels of coverage is advantageous.

While no model is perfect due to the number of variables involved in these types of complex projects, they are useful in being able to provide insights on the variety of risk factors described above. Assumptions and insights for each scenario are provided on the following pages.

Scenario A: Stand-Alone FTTP Municipal Telecommunications Utility

Revenues:

Max take rate = 60% by end of Year 5 with progressive ramping in prior years

Net revenue of $92 per customer per month from retail broadband + phone services
5% retail pricing increase in Year 6

Capital Costs:

Outside plant = (premises x per premise) + (drops + CPE) x # of customers based on take rate

Network equipment, shelter, administrative space, equipment and organizational costs
= $850,000 - $1.0M

Working capital = $1.5M - $1.8M for losses during ramping years

Projected debt issue = $6.3M - $6.5M
20-year debt service @ 6%; principal deferred first 5 years then added to remaining 15 years

Debt service in Year 6 = $56 - $59 per customer per month

Operating Costs:

Bandwidth and Transport

Customer service and technician staffing begins at relatively higher rates per 1,000 customers and falls as new signups and installation work slows; contingency percentage of costs start high and fall as operations gain efficiencies

Operational costs in Year 6 = $42 - $47 per customer per month

Analysis:

- Debt service coverage is below 1.0x; financing requires 1.1x – 1.2x so reliance on partially issuing subordinate debt from an undetermined source to obtain project financing
- Little or no assumed administrative and facility synergies to offset operational costs
- Modest take rate risk given pre-feasibility study data

Scenarios B-D: Partnership FTTP Model w/Modified Take Rates

Revenues:

Max take rate = ranging from 52% -68% by end of Year 5 with progressive ramping in prior years

Net revenue of $92 per customer per month from retail broadband + phone services
5% retail pricing increase in Year 6

Capital Costs:

Outside plant = (premises x per premise) + (drops + CPE) x # of customers based on take rate

Network equipment, shelter, administrative space, equipment and organizational costs
= $400,000 - $500,000 due to synergies

Working capital = $750,000 for losses during ramping years

Projected debt issue = $5.0M - $5.3M
20-year debt service @ 5.75% - 6.25% depending on projected take rate; principal deferred first 5 years then added to remaining 15 years

Debt service in Year 6 = $42 - $52 per customer per month

Operating Costs:

Bandwidth and Transport

Customer service and technician staffing begins at relatively higher rates per 1,000 customers and falls as new signups and installation work slows; contingency percentage of costs start high and fall as operations gain efficiencies

Operational costs in Year 6 = $40 - $42 per customer per month

Analysis:

- Debt service coverage is between 1.0x - 1.3x; likely financeable by both parties, especially if partner has funds to contribute as subordinate debt
- Much administrative and facility synergies for operational costs
- Shifts brand and customer retention risk to private partner of unknown quality

Scenario E: Partnership HFW Model w/Modified Take Rates

Revenues:

Max take rate = ranging from 52% -60% by end of Year 5 with progressive ramping in prior years

Net revenue of $82 per customer per month from retail broadband + phone services
5% retail pricing increase in Year 6

Capital Costs:

Outside fiber plant = $553 per premise passed
Fiber access points = $330 per premise passed
Customer equipment at premise = $425 x # of customers based on take rate

Network equipment, shelter, administrative space, equipment and organizational costs
= $850,000 without synergies

Working capital = $750,000 for losses during ramping years; could be offset by phasing construction based on neighborhood demand

Projected debt issue = $3.3M - $3.5M
20-year debt service @ 6.5%; principal deferred first 5 years then added to remaining 15 years

Debt service in Year 6 = $32 - $37 per customer per month

Operating Costs:

Bandwidth and Transport

Customer service and technician staffing begins at relatively higher rates per 1,000 customers and falls as new signups and installation work slows; contingency percentage of costs start high and fall as operations gain efficiencies

Operational costs in Year 6 = $40 - $42 per customer per month

Analysis:

- Debt service coverage is between 1.2x - 1.4x; likely financeable by both parties, especially if partner has funds to contribute as subordinate debt and phasing based on customer demand occurs
- Modest administrative and facility synergies for operational costs
- Shifts brand and customer risk to private partner and wireless technology