BROADBAND UTILITY BUSINESS PLAN

Loveland
Water and Power

October 12, 2018 – Version 2

This document is intended to offer a high-level business plan for initiating and operating a broadband utility within the City of Loveland. It is intended to be a living document that will be updated as needed to reflect changes in the project and market.

This business plan has been written with information gathered though the Assessment and Feasibility Analysis conducted by Magellan Advisors, market research study conducted by Jill Mosteller from Insights2Use, various advisors and contractors throughout the entirety of the project, and research performed by City staff.

Cover photo was taken by Dick Knapp from Dick's Photography.

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Executive Summary

This Broadband Utility Business Plan provides a background of the City of Loveland's broadband initiative, survey conclusions, community-focused network design, and an analysis and evaluation of proposed business and financial models, including mitigating potential risks.

To date, the City has invested $2.75 million, and over four years of staff, advisory, and contractor's time studying the potential business and added value opportunities, risks, and costs of providing municipal broadband. This effort has allowed staff to identify potential business models and to determine the most viable path forward. This plan charts a course for how the City of Loveland could most effectively provide fiber-to-the-premise (FTTP) service throughout our community.

When you consider current internet service provider (ISP) options in Loveland for high-speed internet, the majority of Loveland residents and businesses have limited choice, with only one or two options typically available. The City is in a position to increase marketplace competition, drive economic development, and leverage the benefits of community ownership with our broadband service offering. Marketplace competition has proven to be a vital motivation for lowered pricing, innovation, and increased performance. Whether a consumer subscribes to the City's broadband service or not, they stand to gain from this increased competition through lower prices and enhanced services from incumbent providers striving to remain competitive.[1] Increased competition typically comes from consumers having more choice and businesses innovating to attract new customers. Over 81% of residential survey respondents stated that having a choice in an ISP was moderately to extremely important. For residents and economic development in Loveland, having access to multiple high-speed internet providers in our community is a driving factor behind this response.

According to the Federal Communications Commission (FCC), "High-speed Internet access, or broadband, is critical to economic opportunity, job creation, education, and civic engagement."[2] The benefits of a community owned utility have been proven by Loveland's electric utility. Loveland's electric utility is consistently within the lower third of electric rates and has been awarded the highest level in reliability, safety, workforce development, and system improvement by the American Public Power Association.[3] A top priority for a municipally-owned broadband utility is quality of service for the community. Money is reinvested within the community and decisions are made locally, allowing for the highest positive impact to customers. Jobs ranging from executive to engineering, operations, technicians, and customer support will be needed to run a viable and effective broadband utility. Other ISPs will likely need to add to their current staff to compete, creating local job creation and resource investment within the community.

In May 2015, the Loveland City Council provided primary objectives that City offered broadband service must meet. These are: city-wide accessibility, fast, reliable and affordable service, and customer service excellence. These objectives have served to guide the project and have been considered through every critical decision point. Taking into account these objectives as well as the analysis throughout the two and a half year assessment and feasibility study, the business option that offers the City the least amount of risk with the most control and flexibility is a retail model that incorporates regional collaboration.

An enterprise utility would operate under a unique brand to offer tiered high-speed internet and voice services designed to meet the individual needs of potential residential and business customers. The current plans include monthly residential internet pricing starting at $19.95 and business internet pricing starting at $49.95. This utility would be located within Loveland Water and Power (LWP), allowing the broadband and electric utilities to utilize and maximize potential economies of scale by sharing

[1] www.analysisgroup.com/uploadedfiles/content/insights/publishing/broadband_competition_report_november_2016.pdf
[2] www.fcc.gov/about-fcc/fcc-initiatives
[3] www.publicpower.org/rp3-designated-utilities

established resources of the other three utilities: water, wastewater, and electric. Efforts would focus on collaborating with regional partners such as Fort Collins, Longmont, Estes Park, and Platte River Power Authority (Platte River) to share experiences, cost, and operational matters to further take advantage of economies of scale at a regional level.

The network installed to provide these services in Loveland will be a complete fiber-optic network, one that connects fiber-optic cable to every subscriber. Fiber-optic networks have been demonstrated to be the most reliable, robust, and future proof technology currently available. Loveland's broadband utility will utilize a network architecture that can handle download and upload speeds of 1 Gigabit per second (Gbps) or 1000 Megabits per second (Mbps) and is positioned to handle speeds of 10 Gbps or greater in the future.

The broadband utility will be financed by the issuance of 20-year revenue bonds with three years of capitalized interest, backed by electric utility revenues. A combined total of $93 million of taxable, tax-exempt, and small-denomination bonds will offer the most variation and opportunities to all potential investors for local, small and large retail, and institutional buyers. The bonds will be paid back by the customers that subscribe to the broadband services – no increase in taxes or electric and water rate increases will be used to service the bonds.

A governing structure, provided from City Council and Loveland Communications Advisory Board (LCAB) that allows a municipally-owned broadband utility to nimbly adapt to changing and competitive market conditions by remaining confidential and proprietary is vital for success. Many municipally-owned utilities have successfully managed this by establishing a governance model that allows for non-policy decisions to be made at the utility and City Manager level.

Extensive research has been performed to understand successful municipal broadband utilities throughout the country, as well as evaluate lessons learned from utilities who have not been as successful. The City has performed risk management planning for the broadband utility and identified mitigation plans to reduce adverse effects.

This Broadband Utility Business Plan is a comprehensive and thorough assessment on how the City of Loveland can best provide broadband services to the Loveland community.

Background and Purpose

Project Background

The City of Loveland began investigating community broadband after the January 2015 City Council Workshop. At this workshop, City Council directed staff to bring back more information on the topic. In November 2015 Loveland voters approved a ballot initiative as allowed by Senate Bill 152 (SB 152), which authorizes local governments to provide broadband service upon approval of a majority of the voters. SB 152, which was passed in 2005, prohibits municipal organizations from engaging in telecommunications services either directly or with a private sector partner, unless the people of the community vote to exempt the City from the restrictions.[4] On November 3, 2015, of those who participated in the election, 82% voted to exempt the City of Loveland and the electric service territory from the restrictions imposed by SB 152.

In April 2016, City Council approved a supplemental budget appropriation of $250 thousand to fund the assessment and feasibility study. The feasibility study was conducted through December 2017 and the findings were presented to City Council. The results highlighted several potential and feasible business models for the City, consisting of retail, public-public, and public-private, including how the projected organization could work.

During the feasibility study, two surveys were given to both residents and businesses, one given in the fall of 2016 and the other in the fall of 2017. The first survey was designed to understand many aspects of our community including how people are using the internet, their current provider, and their opinions on current service and reliability experiences while the second used a methodology called conjoint-analysis to determine what are Loveland's community values – both to determine the wants and needs of the community and how many people would subscribe to the service if it was offered to them.

A broadband community task force was created as an informal body to help understand community input, provide advice for the broadband team, and assist and consult during the feasibility study. In December 2017, the task force along with City staff provided their findings and recommendations to City Council. Following a review of the survey results and collected data, the task force recommended that the city pursue a retail or public-public business model. It further stated that future activities should not preclude a public-private venture should such a feasible option arise. The task force also recommended that the city should further develop a detailed business plan, issue a request for proposal (RFP) for a build-ready network design, evaluate financing options, implement an aggressive community outreach and education campaign, and transition the task force to a formal city board or commission. City Council adopted this recommendation in February 2018. The product of that meeting established the Loveland Communications Advisory Board (LCAB), appropriate $2.5 million from the Electric Enterprise Unrestricted Fund to pay for the build-ready network design and professional services, establish the Loveland Electric and Communications Enterprise, and launch an aggressive community education and outreach campaign.

In July 2018 nine members were appointed to LCAB by City Council. Through a lengthy RFP and interview process the City selected Nokia partnered with Bear Communications for the build-ready network design. From this build-ready network design, Nokia along with the City, has determined a more accurate cost for the network buildout of $52.4 million. In August 2018, the City announced J.P. Morgan as the broadband underwriter and senior manager to help craft and issue the bond series. The community education and outreach efforts have reached thousands of residents and businesses through a variety of speaking engagements, community events and online efforts. Common themes collected from community

[4] www.leg.state.co.us/clics2005a/csl.nsf/billcontainers/FA216226F45192FE87256F41007B483C/$FILE/152_enr.pdf

feedback strongly continued to support the need for competition within the current market and the benefits of a community owned and operated broadband utility.

Why Fiber-to-the-Premise?

As the world continues to become more connected, access to the internet is becoming an essential service. Hundreds of communities across the U.S. have chosen to offer this service to their community, each with a different and unique business model to fit the needs of the community.

FTTP is often regarded as the best option among communication connections. It is far more reliable, and easier to maintain. The network is flexible and robust to handle future technology changes than any other current network. Key drivers for broadband utility success are making a positive impact in economic and community development, to increase competition in the marketplace, and to have the fiber-optic network and business structure be community owned and benefited. Each business decision was constructed to offer the highest potential for these key drivers.

Economic Development

A dynamic community supports the needs of the public today and into the future. For the City of Loveland, this includes a vision to be a well-planned community with integrated networks that provide equal access to all – fostering a stable and diverse economic foundation. Today, the rapid exchange of digital information is as essential to our community members as other infrastructures such as roads, water, and electricity for a competitive economy and thriving community.

With quality infrastructure as a requirement for stability and growth. This serves as the basis for economic growth. The ability to connect and share information is vital to support ongoing economic opportunity and productivity. The internet has lead the economy with many of the world's most successful companies leveraging the ability to share information and connect with customers and clients.

All community offerings, including City-provided utilities, are used to evaluate a communities potential for economic, political, and social well-being. Residents want to know their needs will be supported today and in the future. This includes community, schools, retail, recreation, potential work, and many more. As residents draw businesses to the local community, so too do businesses draw residents. Each requires the other to be successful, this being no different than a thriving ecosystem. Business location decision-making reflects this new technological reality as well. Twenty years ago, internet service was not a factor in business site selection – today, fast, reliable internet service is paramount. Businesses need quality, speed, reliability, and demand robust connectivity.

Investments in broadband provide communities with a strong competitive advantage.

Competition

When more than one or two providers are available in a marketplace, there is a substantial positive impact to consumers regarding cost and quality of services provided. According to years of research done by the FCC, the root of slow and costly internet is directly related to a lack of competition in the marketplace.[5] Competition spurs innovation as companies try to provide new and innovative options and solutions to their customers. Incumbent providers try to maximize the use of their existing infrastructure and as this infrastructure nears the end of its useful life, costs to maintain their system or upgrade will be significant. This is true for many communities across the U.S. and is not unique to Loveland.

Competition doesn't just benefit the customers who choose to subscribe to the service, but rather everyone in the community. In order to compete, incumbents often lower their prices. Even in Loveland, in

[5] www.fcc.gov/wireline-competition

response to the City merely considering the possibility of municipal broadband, the dominant incumbents have lowered their prices, encouraging customers to sign multi-year contracts. But this model only works if there is constant pressure in the market. If there is no competition the market will return to the previous service and pricing plans.

A great example of a successful municipally-owned broadband network and subsequently altered competitive market is Longmont, Colorado. They began construction of a fiber-to-the-premise network in 2014, with substantial completion in early 2018. The Longmont community has seen significant price reductions of more than 20% from the incumbents. Not only is Longmont's NextLight™ offering internet at more competitive rate, but the entire community is experiencing cost savings from other providers as well.

Community Owned – Community Benefited

There are significant benefits of a community owned broadband network. A City owned broadband utility would be a not-for-profit entity, with a goal of reinvesting in our community and network. In other words, the money paid by residents and businesses to buy services stays within the Loveland community.

A City-owned broadband utility provides significant employment opportunities in our community. The City of Loveland already employs over 770 people, making the City one of the area's largest area employers. Many additional utility staff members would be locally hired and live within the community they serve. Therefore, response time to customer service calls or outage events is quick, and reliable service is offered to customers.

Local control allows for local decisions to be made that provide the highest positive impact to customers. These local decisions can include clearer pricing plans, privacy and security policies, and tailored programs to benefit and better serve customers.

Community ownership allows the utility to continually work to identify and maximize the most effective collaboration areas to achieve economies of scale, efficient operational practices, and maintain a community focus. A City-owned, regionally collaborative, broadband utility could create similar benefits to those experienced by the electric utility through its co-ownership of Platte River. LWP has consistently leveraged its relationships and operational expertise to keep electric rates low. According to the most recent Colorado Association of Municipal Utilities (CAMU) rate survey, Loveland is in the lower third or better among electric utility rates throughout the state compared to other municipally-owned, cooperative, or investor owned utilities. The same economies of scale could be applied to all northern Colorado municipally-owned broadband efforts.

City Council Objectives

In May 2015, City Council provided staff with their primary objectives and vision statements regarding this project. These are the guidelines that have been used to guide the feasibility analysis and narrow down the business model options.

Vision Statements	
City-wide Accessibility	Service must be available to all homes, businesses, schools, non-profit groups, health service providers, and other users within Loveland.
Fast	Any broadband system must deliver symmetrical service at the rate of 1 Gbps (1000 Mbps). Consider future proofing for higher speeds when new technologies become available.
Reliable	The service must accommodate diverse uses, from home entertainment, to business, education and health care, with high reliability.

Affordable	Our efforts have the goal of delivering broadband service to all at a reasonable cost, regardless of how broadband service is used.
Customer Service Excellence	Provide consistent and reliable customer service.

Market Profile and Analysis

Global, National, and Local Market

The internet used to be considered a nonessential service. Access was limited to special use cases, in developed and wealthy countries, with governments, universities, and private parties as the main users. Twenty-five years ago, only a few people and countries had access. Now over 3.2 billion people in over 214 individual countries and territories have access to the internet.

The U.S. ranks 10th globally for average connection speeds and 16th for average peak connection speeds. Countries such as South Korea, Norway, Sweden, Hong Kong, Switzerland, and Singapore lead the way. With the average download connection of the U.S. at 18.7 Mbps, most communities are not even meeting the FCC's broadband threshold of 25 Mbps. Delaware and the District of Columbia, were the only places ranked above the FCC threshold at 25.2 Mbps and 28.1 Mbps respectively.[6]

Colorado has a diverse market, with few ISPs in larger, more urban areas and even fewer in rural areas. Connection speed differs in each city and county. Some of Loveland's neighboring communities such as Longmont, Fort Collins, Estes Park, Boulder, Windsor, Greeley, and Weld County are either offering broadband service, completing feasibility studies, or within the business planning phase. Two, Longmont and Fort Collins, will be or are currently offering, the fastest speeds within their community, presently at 1 Gbps (1000 Mbps).

Loveland Market

The City of Loveland lies along the Northern Front Range of Colorado. The City has an estimated population of 76,701 and, as part of the metropolitan area of Loveland-Fort Collins, is considered one of the faster growing communities in the country.

Loveland is at the center of the tri-city area of Fort Collins, Loveland, and Greeley. This tri-city region boasts two universities and two community colleges, creating a highly educated workforce. Northern Colorado also has a high number of technology-based companies that draw on knowledge-based employees. In most recent estimates, 34% of the adult population over the age of 25 has a bachelor's degree or higher and over 94% are high school graduates.[7] However, Loveland's employment population is diverse with jobs ranging from arts, retail, and construction, to engineering, healthcare, and finance.

There are currently 32,097 residential premises and 4,600 business premises. A compounded annual population growth rate of 1.81% could make the city exceed 100,000 in population by 2034.[7] The City of Loveland can be segmented into three main categories for the purposes of understanding market needs and behavior: residential customers, small and medium businesses, and large business and key accounts.

[6] www.akamai.com/us/en/multimedia/documents/state-of-the-internet/q1-2017-state-of-the-internet-connectivity-report.pdf
[7] www.cityofloveland.org/home/showdocument?id=44674

Profile and Survey Results

Two market demand surveys were conducted, one through Magellan Advisors, performed in the fourth quarter of 2016,[8] and another through Jill Mosteller Ph.D. with Insights2Use, performed during the third and fourth quarter of 2017.[9]

Magellan Advisors conducted a traditional survey that asked respondents a series of questions about speed, pricing, and other information about their current service. This survey received responses from 1,028 residential households and 288 businesses. Both the residential and business surveys yielded statistically valid responses rates with a 95% confidence level with ±5% margin of error for residential and 95% confidence level with ±6% margin of error for businesses. In addition to the survey, Magellan Advisors conducted in-depth qualitative interviews with Loveland's large businesses and key accounts. Respondents specified a need for competition, redundancy, and connections for students, employees, and customers.

Jill Mosteller Ph.D. with Insights2Use, conducted a second survey using conjoint-analysis to determine take rates of internet offers by varying the provider, download speed, and price. The survey received responses from 4,527 residential households and 273 businesses. Both the residential and business survey yielded statistically valid responses rates with a 95% confidence level with ±1% margin of error for residential and 95% confidence level with ±6% margin of error for businesses.

Residential

As in most communities the majority of Loveland internet subscribers are residential. Though each user is unique, increased connectivity needs are not limited to just entertainment. Home offices, education, medicine, news, and access to services and products are some of the many ways residents are using the internet – with more emerging uses every day. Both residential surveys found that, over 97% of household's subscribe to internet services and over 90% consider the internet to be an essential service.

Loveland has a high percentage of people who operate a business from their home. In the most recent survey conducted, about 19% of respondents said they operate a business from their home, much higher than the national average of 12.6% of U.S. households.[10] Additionally 44% of respondents in the same survey said they work from home at least some of the time. With more companies becoming flexible and conscious of their employees schedule and lifestyle, it is becoming increasingly popular and attractive to families, to have the ability to work from home.

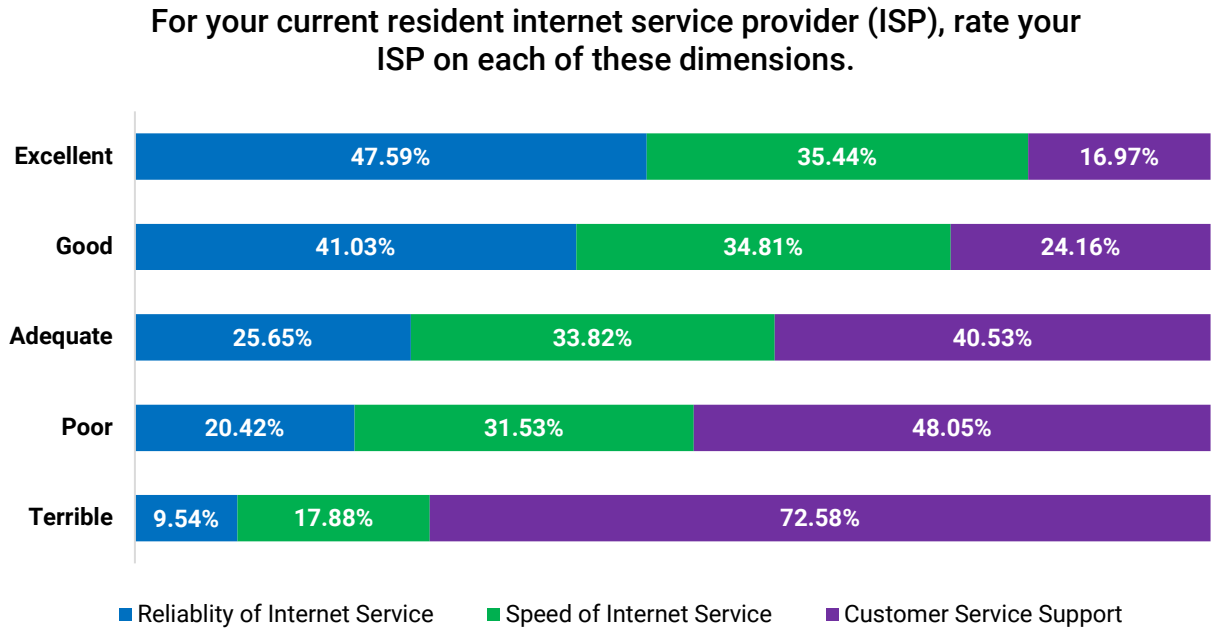
Do you run a business from your home?

Do you telecommute to work from your home?

The private industry generally agrees that speeds between 75 Mbps and 100 Mbps will handle the requirements of a vast majority of internet users in the current market. Demand will grow with more devices in the household sharing bandwidth, as well as more bandwidth being consumed per device. More consumer applications are being offered as an online service, with increasingly more diversity and potential. With the growing use of cloud-based services, the ability to access data from any device is becoming more important to individuals.

[8] www.letstalkloveland.org/1880/documents/1891
[9] www.letstalkloveland.org/1880/documents/1886
[10] www.sba.gov/sites/default/files/advocacy/SB-FAQ-2017-WEB.pdf

The chart below is a normalized representation of residents' ratings of their current providers on reliability, speed, and customer service. Residential customers responded that their current ISP provider's strongest attribute was reliable service, compared to their weakest attribute being customer service. Speed of service was well distributed between all ratings. This indicates that although customers are generally satisfied with reliability, there is room for competition in the areas of speed and particularly improved customer service offerings.



There are considerably more devices being connected to the internet every day. As devices become more diverse, more and more consumers will look to solve problems with technology and the internet. Devices that can currently be internet connected include smart TVs, smart appliances, lighting controls, thermostats, doorbells and locks, monitoring/security systems, smoke/carbon monoxide detectors, irrigation controllers, electric vehicles, solar and electric storage, etc. The Institute of Electronics and Electrical Engineers (IEEE) estimates that over 30 billion Internet of Things (IoT) devices will be connected by 2020.[11] All of these current and future devices will have to operate on existing internet infrastructure. IEEE along with IHS's current 2018 estimates of 17.6 billion connected devices including computers, smartphones, tablets, etc., must share bandwidth with all future IoT devices. The needs for high-speed, high-bandwidth, robust, and flexible networks are becoming the new expected norm.

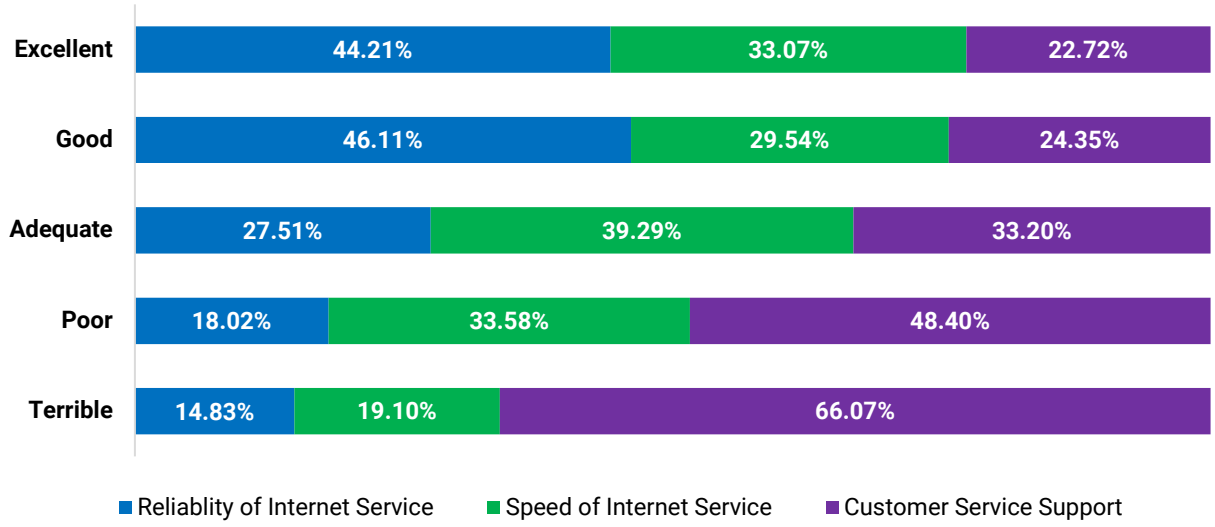
Small and Medium Business

Loveland's business community is diverse and, although major employers such as hospitals and large retail/distribution operations are the largest employers by count, the vast majority of 4,000+ businesses in Loveland have 10 or fewer employees. Loveland is also home to many high tech, engineering, and technical based companies. There are many startups being founded in Northern Colorado due to the proximity to Colorado's top universities, Colorado State University in Fort Collins and University of Colorado in Boulder, as well as access to a diverse and skilled workforce. The Loveland-Fort Collins area is the second densest metropolitan area for high-tech startups in the nation, with continued growth.[12] Surveys found that, of the businesses that participated, over 97% subscribe to internet services and over 93% consider it to be an essential service.

[11] spectrum.ieee.org/tech-talk/telecom/internet/popular-internet-of-things-forecast-of-50-billion-devices-by-2020-is-outdated
[12] www.cityofloveland.org/home/showdocument?id=16677

When benchmarking business attributes, similar trends to the residential surveys were found when surveying Loveland businesses. The business community responded that the strongest attribute of their current ISP provider was reliable service and speed was evenly split between the ratings. Customer service continued to be the weakest attribute for the incumbent providers. As was seen in the residential survey, this indicates that although customers are generally satisfied with reliability of service, there is an opportunity for competition in the areas of speed and improved customer service offerings.

For your current business internet service provider (ISP), rate your ISP on each of these dimensions.



Small and medium businesses are utilizing the internet more than ever before. Businesses employ many productivity, management, billing, and other software platforms. Software used to be “installed” or “desktop” based software, but with the increased use of the internet, those applications are becoming either completely web-based or require constant internet connectivity. With online applications, consumers are able to have the most recent and updated version, allowing access to new features, timely security fixes, and accessible data from anywhere in the world with an internet connection. These applications use the cloud and have data stored in virtual offsite data centers or as back-ups for the original data. The use of the cloud takes significant bandwidth and most non-fiber-optic networks struggle to handle the continuous flow of information. Many business applications such as design software are computationally intensive, utilize cloud based software, and data storage. These applications do not work well in an environment that shares bandwidth with many other users. Therefore high bandwidth internet connections are becoming more important for this type of business applications.

Large Business and Key Accounts

LWP identifies 33 key account entities that fall into this category. Loveland’s large businesses and key accounts include the Thompson School District, Medical Center of the Rockies, Walmart locations and their distribution center, Rocky Mountain Innovation Center, The Ranch Events Complex, Centerra, Hach, and others. Each entity has their own unique needs including bandwidth, number of connections, and redundancy.

Magellan Advisors and City staff conducted interviews with the large employers and key accounts to identify their current and future needs, as well as identify areas where they are currently underserved. In total, 20 interviews were conducted in the fall of 2016.

The emerging themes from these interviews were:

1. **Competition:** Only two incumbent providers currently control most of the large business and key account market. These providers actively compete to serve companies and similar local organizations at a national level.
2. **Redundancy:** Incumbent providers are not meeting the infrastructure redundancy needs of businesses that have mission-critical systems for constant communication.
3. **Connection for Employees/Students/Customers:** Even though most of the large organizations have high-speed internet provided by fiber-optic cable, leaders within each organization expressed concerns over the lack of connection for their staff, students, and customer base at the same or similar speeds. The range of these issues depends on the type of organization, but consistent need for high-speed connection to the home of each employee, student, or customer greatly impacts their current and future business models.

The concern over a lack of broadband competition is a growing trend among large organizations due to the potential financial risk and stagnation of growth. Although most large businesses and key accounts have access to fiber-optic connections, their needs for long-term sustainability and constant, predictable growth within the community are not being met. With more employees and students working and learning from home, access to reliable and high-speed internet is an essential part of offering flexibility within their unique lifestyles.

Take Rate Analysis

One of the measures of success for a municipal broadband project is the "take rate". This number is found not by the simple question of "would you take the service if it was offered," but by looking at the entirety of the responses and formulating a robust metric. Of particular concern is the price associated with the service offered. The Magellan survey estimated a take rate of 41% for residential customers and 27% for business customers, while the survey conducted by Insights2Use projected a take rate of 42.5% and 27% respectively for residential and business customers.

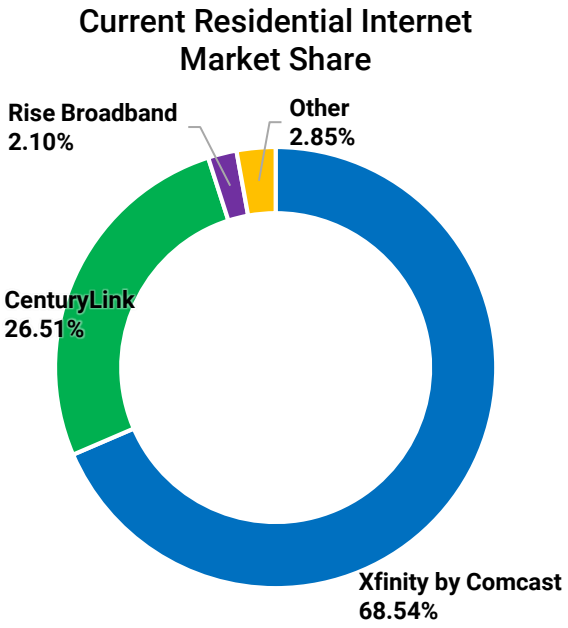
Take Rate	Magellan Advisors	Insights2Use
Residential	41%	42.5%
Business	27%	27%

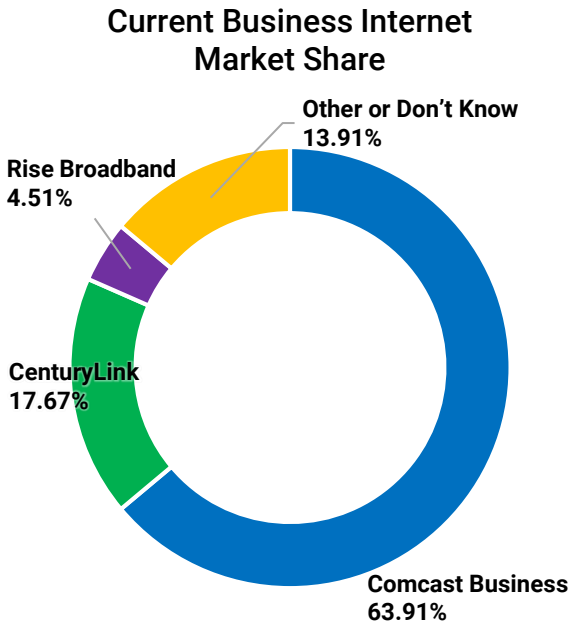
How does these take rates compare with other Front Range communities? Longmont's expected take rate was 37% while their actual take rate after three years is approximately 56%. Fort Collins is estimating a take rate of 28%. Both Longmont and Fort Collins have a different demographic, internet market, and proposed pricing plans than Loveland. Even though Loveland is close to each of the above cities, residential and business customers are all unique and have different needs and reflected internet offerings.

The City has observed that the take rate found from municipal surveys is often conservative. The initial take rate can be reached within three to five years on average, if the utility is competitive within the market. Given the statistical validation of the two surveys, feedback from residents and businesses, and overall interest of the public from our education and outreach campaign, the City is confident that residents and businesses would take this service consistent with the take rate. Nevertheless, it is still important to plan for contingencies and risk mitigation. Because the take rate is so imperative within a working broadband utility, the City took extra precaution in planning for a potential lower and higher take rate. More information can be found in Scenarios (Page 34). For the entirety of the business plan, a take rate of **42% for residents** and **27% for businesses** will be used for business and financial modeling.

Competition

Two major providers, CenturyLink and Comcast, dominate the current internet market in Loveland. Other providers such as Rise Broadband, Front Range Internet, Dish Network, and Verizon, among others, make up a small percentage.





The incumbents will likely respond to increased competition in the broadband arena, as they have in other communities with municipally-owned broadband networks. Both CenturyLink and Comcast have extensive financial resources, marketing and advertising teams, and operational capabilities that will actively compete with the new broadband utility.

CenturyLink is primarily a digital subscriber line (DSL) internet provider. With DSL being one of the more outdated and least future-proof infrastructures, they have begun installing FTTP primarily in new development and multi-dwelling units with high-density and a higher return on investment. CenturyLink shared that, based on their research, consumers only need at most 75 Mbps. CenturyLink also stated they do not intend to build a fiber network throughout the entire city.

Comcast is a cable TV and internet provider that uses a type of infrastructure called hybrid fiber-coaxial (HFC). Only at some select businesses does Comcast offer FTTP in Loveland. Comcast has no plans to deploy fiber to every home and business, but they have publicly stated that they plan to utilize technology to help solve the need for greater bandwidth.

Though CenturyLink and Comcast have extensive fiber backbone networks throughout Loveland, they do not plan on operating within the FTTP space for all residents and businesses. Currently their operational model is to continue using their legacy infrastructure and to invest in technologies that provide more speed and bandwidth – technologies with future-proof limitations and only accessible to a percentage of Loveland.

Competing Technologies

HFC is a type of infrastructure where fiber is deployed to a node in a neighborhood; coaxial cable is used then between the node and the home or business. Similarly, DSL companies deploy fiber to a node and twisted copper cable is used from the node to the home or business. Distance and physical condition of the infrastructure can greatly impact the ability to transmit data. Copper can support very high bandwidth

for short distance, however the longer the signal has to travel on copper, the lower the bandwidth becomes. A method for solving this problem is data over cable service interface specification (DOCSIS).

Although DOCSIS technology is based on coaxial cable, it is important to describe the most recent version of this standard separately as it has been successful in allowing cable TV companies to greatly increase broadband speeds without replacing large portions of their existing infrastructure. The newest version of this standard is DOCSIS 3.1, which promises speeds up to 10 Gbps for download and up to 1 Gbps upload. There is also a symmetrical version currently under development, known as Full Duplex DOCSIS 3.1, which promises speeds up to 10 Gbps for download and up to 10 Gbps upload speeds. Actual speeds for DOCSIS technology have varied. However, ISP's are slowly improving infrastructure and providing customers with high-speed options.

Wireless internet connectivity is most widely available through two types of technologies: mobile and fixed Wi-Fi. Wireless technologies transmit information through radio frequencies. Mobile wireless technologies are used to connect cellular phones, smart phones, and other mobile devices. Fixed wireless is designed to connect homes and businesses to broadband services.

Wireless technology is particularly susceptible to interference from environmental factors such as vegetation, moisture in the air (snow or rain), "crosstalk" interference from multiple devices, buildings, and other obstructions in the line of sight. The higher frequencies needed to obtain increased bandwidth and speeds, increase the likelihood of interference issues, and higher frequencies come with significantly shorter ranges, such as the early 5G wireless. These limitations make it unlikely that wireless technologies will be able to provide a community-wide solution to broadband connectivity and will instead be a supplemental and complementary technology to wired networks for the foreseeable future and as wireless technologies generally need a high-speed fiber backbone to service the network.

Fiber-Optic Network

The communications industry generally agrees that fiber-optic cable is the most robust and flexible technology to meet the growing needs of any community. Fiber has virtually unlimited capacity for data transport, with engineers and scientists continuously discovering higher transportation bandwidths, and fiber is the most future-proof technology currently known.

FTTP offers far more bandwidth, reliability, flexibility, and security than other available technology. It also has a longer economic life than other types of broadband technologies. Despite the comparable deployment costs, it is less expensive to own and operate. For this reason, fiber forms the backbone of most, if not all, internet, cable TV, telephone, and private business networks.

The annual Visual Networking Index prepared by Cisco, tracks and forecasts global data and connection needs both in the U.S. and the rest of the world.[13] This report projects that the data bandwidth needs of users will increase nearly two fold between now and 2021, and the number of connected devices per person will increase from an average of 7 to over 13.

Architecture, Topology, and Equipment

Fiber-optic cable is made up of strands of glass that transmit information via pulses of light. A single fiber can carry multiple streams of information at the same time by utilizing different wavelengths or colors of light simultaneously.

FTTP can be generally categorized into two types of systems: passive or active. Active systems require powered devices throughout the system to power the switches and routers that actively route bandwidth

[13] http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/complete-white-paper-c11-481360.html

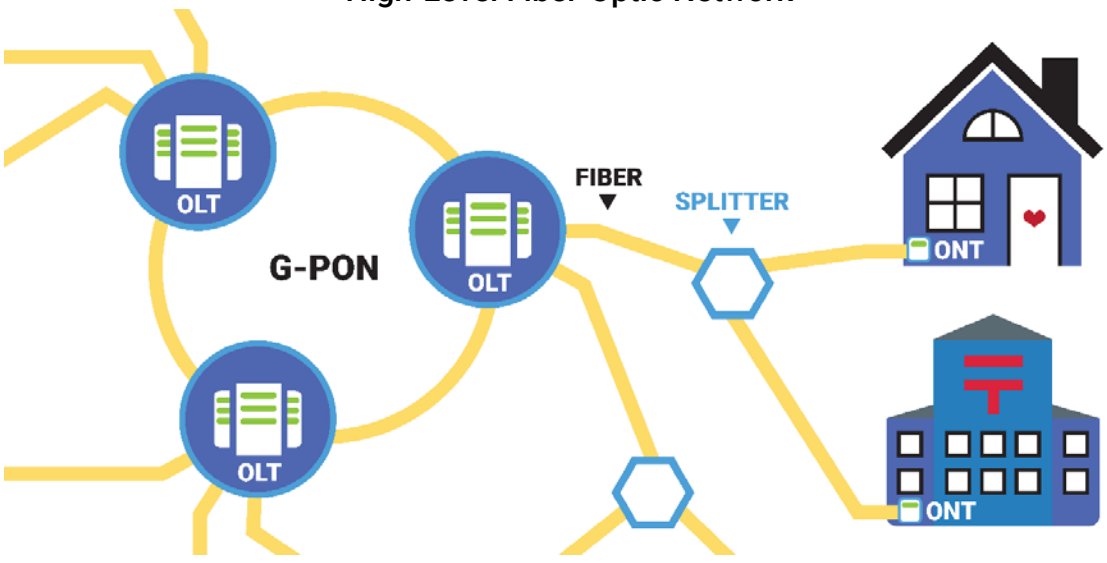
and traffic. This type of system is most commonly used in corporate networks, campuses, and data centers due to the flexibility and control of data transmission. However, these are not commonly used for large system deployments due to the increased cost of equipment, requirement for electrical power through the system, and the increased cost to operate and maintain the system.

Most network operators utilize a Passive Optical Network (PON). PON networks, as the name implies, use passive devices throughout the network to split and route broadband traffic. An Optical Line Terminal (OLT) or "server room", is in a central location, and communicates with the customer's premise device called an Optical Network Terminal (ONT), similar to a cable or DSL modem. The OLT and ONT send pulses of light back and forth to communicate and to upload and download data from the internet. From a high-level view the network looks like a nervous system, sending information to whomever is requesting it. In Loveland this network will closely follow the electric network already routing through the city.

Every network is built to fit the specific and unique needs of the community it serves. Although they are using standard design practices, each physical topology is completely different. Given the physical requirements of Loveland and the City Council's vision statements, it was clear that a ring topology with added capacity for future growth was the most logical solution. Along with the ring topology, a Gigabit Passive Optical Network or G-PON architecture, is planned to provide symmetrical 1 Gbps (1000 Mbps) connections, with the ability to convert network equipment to Next-Generation Passive Optical Network 2 (NG-PON2), which will provide a network throughput of 10 Gbps – a truly future-proof network.

Speed, redundancy, and city-wide accessibility are the governing factors of the design process. The City decided to employ standard and best practices to ensure the design has been thoroughly tested and will perform as expected. Three OLT's will be distributed throughout Loveland being connected by a ring topology. Fiber-optic cables will radiate from each OLT to small, low-profile fiber cabinets spread throughout the city. Inside the cabinets are optical splitters that allow for less fiber within the system, dropping the cost and time of deployment. Fiber will then run past every home and business, only connecting to customers who choose to subscribe. If a customer chooses to subscribe, a dedicated fiber will be run from the curb to the outside of the house where the fiber will be terminated and brought into the home where the ONT is connected.

High-Level Fiber-Optic Network



City of Loveland Assets

The City has significant amounts of conduit that have been installed along major corridors and street, railroad, ditch, and river crossings in the last five to ten years. However, conduit in not sufficiently installed within most neighborhoods or business districts for full deployment of a fiber system and additional

conduit installations would be required in these areas for such deployment. The City will follow the requirements and standards it is creating to best utilize the current and available infrastructure. Some existing fiber conduits have adequate “air-space” within the conduit to allow for more fiber to be installed.

Electric substations and City-owned land will be used for the large OLT or server rooms. Several of the substations have adequate space to install additional equipment for broadband without impacting the current or future needs of these sites for the electric utility. These spaces provide access to enough electricity, and an enclosed area with security and entrance/exit protocols.

Platte River Asset Background and Ownership Transfer

In the late 1990s, Platte River installed fiber-optic cable throughout its distribution system connecting Loveland, Fort Collins, Longmont, and Estes Park. The fiber is used for electric substation supervisory control and data acquisition (SCADA) communication, replacing a radio and telephone line system that was outdated and unreliable. Each city has a local fiber route connecting each of its substations to the network, as well as connecting each local loop to the other cities. As Loveland is in the middle of the four cities, the fiber long-haul from the surrounding communities and Platte River connects with Loveland’s local loop.

Platte River installed the fiber infrastructure with additional capacity than was needed to support the electrical utility needs to allow for additional uses of the system by each community. Doing this allowed future potential use of the fibers throughout the cities. Additionally, the City has installed approximately 12 miles of laterals off of this ring with fiber counts between 48 and 144 strands to serve City-owned facilities. These fibers are used by various City departments including LWP, Traffic, and IT, as well as leased to third-party entities such as Larimer County, hospitals, and other carriers.

Platte River has maintained this infrastructure from the time it was installed and although they will be transferring ownership of the local fiber loops to the respective communities, including Loveland, Platte River will continue to maintain the infrastructure going forward. The City of Loveland will be able to continue to utilize this loop to support the needs of the network and the community.

Organizational Structure

Broadband Utility

In February 2018, City Council approved Ordinance 6185 to amend the Electric Utility Charter and include communications services, thereby establishing the City of Loveland Electric and Communications Enterprise. The broadband utility will operate as an enterprise utility and will be located within LWP, allowing the broadband and electric utilities to utilize and maximize resources and economies of scale. These can include institutional and technical knowledge as well as asset resources. This structure is similar to what has been successful in other municipally-owned broadband utilities such as Longmont, Colorado’s NextLight™ utility, Wilson, North Carolina’s Greenlight utility, and many more.

The broadband utility will be fully owned and operated by the City of Loveland with complete ownership of all network infrastructure. Combining the best of both potential businesses models of a retail and public-public partnership, the end result recommended is a retail model with regional collaboration.

The City of Loveland broadband utility will be marketed under a distinctive brand designed to clearly communicate what customers can expect from the services while differentiating the Loveland broadband utility from competitors. The brand strategy and broadband utility operations will continue to uphold the strong brand equity that the City of Loveland already possesses in the community and continue to strengthen the distinctive City of Loveland brand as a whole.

Directors and Key Advisors

Many people have made this project a success thus far, a few are mentioned below. With their management and leadership of this project, the broadband utility will contain people with experience and passion for the success of the new broadband utility.

Steve Adams
City Manager

Steve Adams has served as the Loveland City Manager since July, 2016. Prior to his appointment, Steve served as Loveland's Water and Power Director. As the City Manager, Steve is the chief executive officer of the City, appointed by City Council. He is responsible for the execution of the City Council policies, directives, and legislative action. All City staff report to Steve as the City Manager, except the Municipal Court and City Attorney's Office.

Joe Bernosky
Director of Water and Power

Joseph "Joe" Bernosky is the Loveland Water and Power Director, overseeing the water, wastewater, and electric utilities for the City of Loveland. Joe is a water engineer with two decades of public and private engineering experience. Prior to joining the City in 2017, Joe worked as the water treatment program manager for the North Texas Municipal District in Wylie, Texas.

Brieana Reed-Harmel
Senior Electrical Engineer & Broadband Project Manager

Brieana Reed-Harmel is a Senior Electrical Engineer for Loveland Water and Power and for the last three years has served as the project manager for the broadband project. She brings extensive knowledge of operations, management, budgeting, project management, design, and construction from the electric utility industry. This background will help ensure the integration of the broadband utility into the electric utility and will meet the needs of both.

Jim Lees
Utility Accounting Manager

Jim Lees has served as the Utility Accounting Manager for Loveland's Water and Power Department since 2005. He is responsible for the oversight of the development of the annual budget, long-range financial plans and updating of the rates, charges and fees, as well as oversight of the day-to-day accounting functions of the Loveland Water and Power. Jim has a total of 30 years of experience with the City's electric utility, and the last 24 years have included the water and wastewater utilities, as well.

Alan Krcmarik
Executive Fiscal Advisor

Alan Krcmarik currently serves as the Executive Fiscal Advisor for the City of Loveland and is also serving as Acting Director of Finance. Alan comes from a rich background of finance, investment and strategic planning, government, policy, and economic development. He has previously worked for the City of Fort Collins as their Finance Officer, leading the Finance Team to issue bonds for a multitude of projects.

The City of Loveland has also engaged other advisors to help assist and vet the assumptions and proposed business plan from third parties and impartial perspectives.

Colman Keane is the Executive Director for the City of Fort Collins' broadband network, Connexion. Prior to joining Fort Collins he served as the Director of Fiber Technology for EPB, a non-profit agency of the City of Chattanooga, Tennessee. Colman is a certified public accountant by trade and brings more than twenty years of experience in IT and project management. Colman has worked with the City of Loveland as an advisor to the broadband initiative since 2017.

Jim Manire, Director, Hilltop Securities Inc., provides municipal financial advisory services to the City of Loveland in the development and issuance of new debt and financing obligations. He has advised dozens of Colorado cities, counties, and special districts, on their debt transactions over the last twenty years, including the issuance of enterprise debt, general governmental debt, and annually-appropriated lease transactions. He has recently worked with the City of Longmont and the City of Fort Collins in the successful financing of municipal broadband systems.

The Loveland Communications Advisory Board (LCAB) was created by City Council on February 20, 2018, with their first meeting in July 2018. LCAB is a nine member board who serves three year terms. They act as an advisory body to City Council on all issues and matters related to communications services, including high-speed broadband services, and provide policy recommendations to the City Manager and Director of the Water and Power Department consistent with any previously adopted City Council policies concerning communications services. LCAB holds regular monthly meetings.

Richard Bilancia currently serves as Chairman on the Loveland Communications Advisory Board. Richard has a vast background in IT, accounting, and management covering a diverse range of industries including healthcare, automotive, aerospace, building, hospitality management, insurance, non-profit, retail and communications. He is an active member in several technology associations and previously served on the City of Loveland's Citizen's Finance Advisory Commission (CFAC).

Paul Langfield currently serves as Vice-Chairman on the Loveland Communications Advisory Board. Paul's background includes mental health, higher education, non-profit, IT, and technology start-ups. His current role is founder and CEO of an organizational development firm called Cohesive SOULutions. Paul served on the Broadband Task Force in an advisory role during the 2016-2017 Broadband Feasibility Analysis conducted by the City, and is invested within the community to understand broadband's potential as a positive economic development impact.

Governance

Unlike the other City-owned utilities, the broadband utility must operate in a uniquely competitive environment. Services will be voluntary and will be directly competing with other service providers in the community. Through research, discussions, and case study analysis of other communities that have had varying degrees of success, the topic of governance becomes central.

In a regulated and non-competitive market such as the water, wastewater, and electric utilities, the deliberative and public process is imperative to ensure that rates, charges, and fees are thoroughly discussed, vetted and approved through a traditional governmental process. This ensures that expectations and needs of the community are being met and that there is sufficient oversight. However in a competitive market, such as broadband, customers have the ability to vote with their dollars. If a service is not competitive in price, customer service, or service offerings, customers can easily chose to move to another provider. Customers will provide their feedback of whether the broadband utility is living up to its expectations by either continuing services or choosing to subscribe to a competitor.

This difference in the marketplace necessitates a difference in governance than the other established City-owned utilities. The broadband utility will need to be nimble in order to remain competitive on pricing, promotions, service offerings, and staffing levels. Certain tasks, such as rate setting and negotiation,

promotional pricing, and marketing decisions may require immediate proactive or reactive response in order to stay competitive with the other providers in our community. Based on staff research of other communities as well as recommendations from our consultants and financial advisors, the City Manager must have as much latitude as possible to make adjustments to ensure success and should be empowered by City Council to offer promotional rates, waive certain fees or charges for installation, negotiate special rates or fees for unique developments or customers, and otherwise quickly react to market pricing and needs.

In the interests of transparency to the Loveland community, City Council should set parameters, guidelines, or ranges for the broadband service rates, fees, and charges, with the City Manager delegated the authority to set particular rates within those parameters, waive certain fees, negotiate agreements, or offer promotional rates as determined in their best judgment and in order to succeed in a competitive marketplace while still ensuring that the rates and fees charged for services will be sufficient to pay the costs of the enterprise. Additionally, the City Manager should have latitude to make decisions regarding marketing, promotions and specials, and operational and staffing-level decisions within established budgets approved by City Council.

Regional Collaboration

The City of Loveland is at unique and timely position for a regional collaboration. As mentioned before, our neighboring cities, Longmont, Estes Park, and Fort Collins have already or are in the process of implementing a municipally-owned broadband utility to their communities. With each utility around the startup phase, the ability for regional collaboration from the start of Loveland's broadband utility allows for immediate cost savings and operational efficiencies.

Loveland and its neighboring cities have many of the same goals such as afterhours call centers, long-haul wholesale internet transport, and design standards and requirements. Due to the fact that each community is at a slightly different stage in development, the proposal for regional collaboration will be iterative over time. Shared long haul and internet transport will be the first item that Loveland will collaborate regionally on, followed by an agreement to share resources and staffing during emergency periods, and exchange of information on standards and design practices for mutual support. Everything from design to maintenance protocols, fiber-splicing, locating, database and naming conventions, etc., can be potentially shared amongst the four cities and Platte River.

Ultimately, Loveland and the other communities would move towards shared resources such as after-hours call center and service support once each community is operational and through the initial construction and build out phases. There may be other opportunities for the cities to collaborate in the future that will be discovered with time and experience. Though every collaboration will not be immediate, having an objective to work towards to offer each of their respective cities cost savings and more added value to their communities is quantitatively and qualitatively improved. This will greatly maximize every community's ability to provide quality broadband and maintaining and operating fiber infrastructure.

Startup and Operational Plan

Forecasted Staffing

Given the broadband utility organizational structure, new staff will be needed to run, operate, and manage the new utility. As stated before, the broadband utility would be housed within LWP. This structure allows for the leveraging of existing workflows, departmental groups, and management, as well as creating the most cost effective and staff efficient structure. Benefit overhead and an annual raise equivalent to each position are used within the financial modeling – a standard for the City.

Position Title	Salary	Year 1	Year 2	Year 3
Deputy Director of Broadband	$135,900	1	1	1
Broadband Engineering Manager	$112,800	1	1	1
Network Engineer	$90,350		1	2
Network Operations Controller	$78,800		1	2
Technical Services Representative	$63,500		1	2
Broadband Operations Supervisor	$103,000	1	1	1
Field Services Technicians	$53,200	1	2	3
Installation Technician	$47,900	3	3	3
Customer Connections Manager	$112,800		1	1
Customer Experience Coordinator	$71,600			1
MDU & BDP Account Manager	$71,600		1	1
Communications & Marketing Coordinator	$71,600	1	1	1
Strategic Sales & Marketing	$57,900			1
Customer Service Representative Supervisor	$62,000	1	1	1
Customer Service Representative	$47,900	3	6	6
GIS Specialist	$63,500	1	1	1
Accountant & Utility Rate Analyst	$71,600		1	1
Buyer	$53,200	1	1	1
Utility Locator	$47,900	1	1	1
Business Services Professional	$47,900		1	1
Total FTE		**15**	**26**	**32**

The head-count will vary during the ramp-up period to align with start-up activities. As it is challenging to model expected staffing needs for certain positions, we are including several termed employees during the start-up of the organization. Install Technicians are the face of the organization and these employees interact with customers throughout the installation process. It is important that the broadband utility hire these employees directly rather than contract to an additional firm. A total of four termed Install Technicians, two two-year and two one-year, are planned in the financial model. Various contractors are included in capital expenses and will fluctuate given the work and skill needed.

Position Description and Purpose

Each member of the broadband utility has their own specific purpose and goal. Like all beginnings, some of the expectations of each position may shift to meet the needs of the organization. However, from examining other municipally-owned broadband networks as well as the current incumbents, each position has its purpose, been thoroughly tested in the market, and is the nature of properly building and managing a broadband utility.

Position Title	Description and Purpose
Deputy Director of Broadband	The Deputy Director of Broadband is the leader in directing all activities of the broadband utility. This position determines the objectives and establishes operating procedure to create and maintain utility soundness while ensuring optimum service to customers. The Deputy Director of Broadband serves in a supportive role to the Director.

Broadband Engineering Manager	The Broadband Engineering Manager provides supervisory work over the Network Engineers, Network Operations Controllers and Technical Services Representatives. They provide professional and technical support over broadband services including network architecture, reliability, cost evaluations, risk mitigation, and construction design for fiber-optic network to ensure optimum service to customers.
Network Engineer	The Network Engineer performs a variety of complex tasks in analysis, design, testing, installation, monitoring, integration and maintenance of the fiber network. They install, maintain and integrate all core network and server infrastructure as required. This position also provides escalation support for Technical Service Representatives.
Network Operations Controller	The Network Operations Controller is responsible for overall network engineering support, including diagnosing, troubleshooting and resolving issues through monitoring, testing, and servicing equipment. This position works directly with engineering to provide specifications for network architecture, evaluate technologies to enhance capabilities, and perform needs assessments.
Technical Services Representative	Technical Services Representatives are responsible for assisting broadband utility customers with high-level troubleshooting, technical support, provisioning new accounts, issuing service orders to field personnel, and making account modifications. This position integrates with engineering, field services, and customer service.
Broadband Operations Supervisor	The Broadband Operations Supervisor provides technical and supervisory functions for the Field Services Technicians and Installation Technicians. They coordinate the installation of fiber infrastructure with Engineering, the MDU & BDP Account Manager, Designers and Warehouse personnel to ensure accurate and efficient construction activities.
Field Services Technician	Field Services Technicians are primarily responsible for the installation of fiber, including fiber drops to residential and business customers. They coordinate with engineering, the MDU & BDP Account Manager, Designers and Warehouse personnel to ensure accurate and efficient construction activities.
Installation Technician	Installation Technicians are primarily responsible for fiber and equipment installation, and troubleshooting for customer fiber installations. This involves working inside, underneath and around customer's homes and businesses to install wiring, outlets and equipment as needed. This position will work with customers to demonstrate equipment, troubleshoot, and explain service features.
Customer Connections Manager	The Customer Connections Manager has a passion for customers with a customer-focused vision of identifying, developing and maintaining customer connection approaches. This position manages the customer service group who has an overall goal of attracting and retaining customers.

Customer Experience Coordinator	The Customer Experience Coordinator is responsible for maintaining customer loyalty through high-quality interactions by continually revising and improving the customer experience, with the goal of increasing customer satisfaction. They also identify, develop, and implement programs designed to attract and retain various customer segments. These programs may focus on areas such as bridging the digital divide, E-rate programs and low income programs.
MDU & BDP Account Manager	The MDU & BDP Account Manager (multi-dwelling unit, business and development programs) works closely with all customer service positions to build the market position of the broadband utility. This position actively works to build and maintain strong relationships with builders, developers, property owners, homeowner associations and commercial businesses to maximize service installations.
Communications & Marketing Coordinator	The Communications & Marketing Coordinator coordinates the marketing, branding, advertising, sales and public relations for the broadband utility. They utilize multiple marketing techniques to reach a broad range of customers with a goal of enhancing brand awareness, driving website traffic and engaging and acquiring customers. They are responsible for supervisor functions over the Strategic Sales & Marketing Coordinator.
Strategic Sales & Marketing Coordinator	The Strategic Sales & Marketing Coordinator works with the marketing team to provide strategy, execution and reporting for marketing initiatives in order to attract and retain broadband utility customers. This position is also responsible for identifying potential customers, developing relationships and facilitating customer engagement.
Customer Service Representative Supervisor	The Customer Service Representative Supervisor provides supervisory work over the Customer Service Representatives. This includes scheduling and assigning of work, hiring and training, implementing new work methods, billing processes, regulatory compliance, refining procedures and reviewing work. This position works closely with the Customer Experience Coordinator to promote exceptional customer service.
Customer Service Representative	The Customer Service Representative assists customers over the phone and in-person with a wide variety of questions, requests and troubleshooting regarding their broadband utility service. This position works closely with the Customer Experience Coordinator to promote exceptional customer service.
GIS Specialist	The GIS Specialist supports the broadband utility's Geographic Information System (GIS) by creating and updating broadband GIS features based on construction drawings and field data. They perform a high level of work and maintenance on GIS and other integrated systems to accurately perform asset management for the broadband utility.
Accountant & Utility Rate Analyst	The Accountant & Utility Rate Analyst performs a variety of analytical duties. These include strategic financial planning and scenario analysis, gathering data for rate studies and fee updates, assembling and maintaining long-range financial planning, assembling annual budgets and producing various general accounting reports. This position will support and enhance the work of the current Utility Financial staff and operations.

Buyer	The Buyer is responsible for procuring inventory for the utility including what is needed for maintenance and new construction. They are responsible for maintaining levels of inventory necessary to meet demand and standardization of materials.
Utility Locator	The Utility Locator performs utility locates on all phases of water, wastewater, stormwater, electrical, broadband and traffic facilities. This position will support and enhance the work of the current Utility Locating staff and operations.
Business Services Professional	The Business Services Professional provides administrative support and completes high level projects and analysis to support the broadband utility as needed for the Water and Power Department. This position serves as the Recording Secretary for the Loveland Communications Advisory Board (LCAB).

Facilities

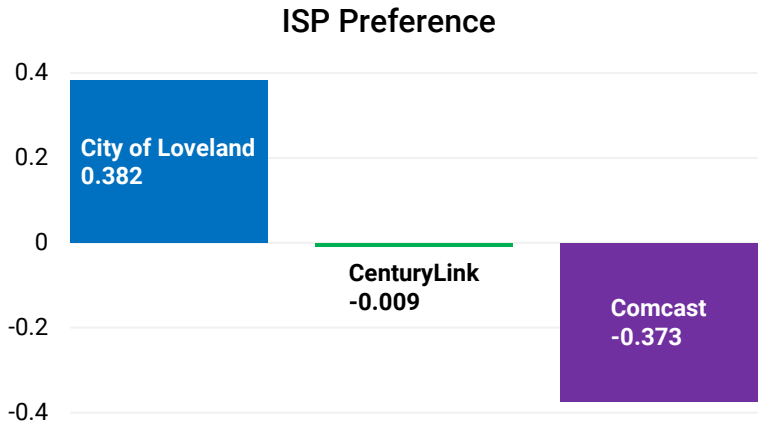
A broadband utility office that includes facilities for office staff and field personnel will be required. Adequate space is not currently available within the Loveland Service Center campus and will eventually require the addition of a new building. Because the building is not already built, and the need to house staff is sooner than the completion of the broadband utility building, leasing space is a necessity.

The Loveland Service Center is a desirable location due to proximity and connection to existing City-owned fiber infrastructure, as well as enough physical space to house any additional LWP utility needs. As the Electric and Communications Enterprise is closely intertwined with the water and wastewater utilities to leverage economies of scale, it is a natural fit that all the utilities be housed on the same campus. In order to fully evaluate the current and future needs of the entire department, as well as allow for planning a budgeting of the new facility, the broadband utility will lease space for the interim.

The City has determined multiple potential lease options. As leases are extremely time dependent, we have averaged the cost of a 7000 sq. ft. lease until a permanent facility is determined. That associated time and cost is factored into the operational cost of the utility.

Brand and Marketing

The most recent survey conducted by Insights2Use found that the Loveland community, both residential and business, are value-oriented. The City of Loveland has strong brand equity when compared to the other incumbent service providers. City of Loveland's brand equity is roughly twice as preferred in comparison to Comcast's brand equity. Note that negative utility score represents unfavorable preferences, while a positive utility score represents favorable preference to brand name.



The consistently high ratings of utility services in the annual Quality of Life survey conducted by the City shows the City of Loveland name already has strong brand equity.[14] A cornerstone of the marketing and customer service plan will be to leverage the position of City-provided utilities as reliable, stable, efficient, and quality products to the broadband service offerings. The City will leverage its strong local and recognizable brand in defining its broadband services to the community. The trust built by electric utility brands has been a major driver of success in similar municipal-owned broadband networks.

Market share will be obtained and maintained by focusing on promotion, delivering the service advertised, and providing excellent customer service. It has been shown that spending less on advertising and marketing and putting more money into offering better services is a better approach to customer approval and satisfaction. This model has been tested with many private businesses as well as municipally-owned broadband providers. The marketing and sales objectives are governed by the minimum take rate of 32% by the end of year four. Of course, a higher market share of 42% has been validated by both surveys and planned for.

Initial Capital Requirements

Designing and constructing a fiber-optic network is difficult to build in pieces, as fiber-optic physical networks do not scale as efficiently as other types of infrastructure. The entire network needs to be considered or opportunities for efficiency and effectiveness could be lost. With that said, City staff along with Nokia and Bear Communications, designed a complete fiber-optic network coverage of Loveland to better understand the complete cost of the project. As the network construction is the largest capital expense of the project, it is imperative that the accuracy of the capital requirements can be used for the Financial Model (Page 32).

Capital Requirements	Cost
Build Ready Network Design	*$2,170,137*
Engineering and As-Built Documentation	$1,068,586
Network Construction	$52,412,397
Network Headend and Equipment	$3,365,514
Fiber Drops and Premise Connections	$13,304,859
Total	**$72,321,493**

The accuracy of the cost estimate was accomplished through a build-ready design with associated labor and materials cost. As with each engineering and design number, there is associated lifespan. The City and Nokia see the lifespan of these costs to be accurate within six months; any time after the six month period, the accuracy of the costs exceeds the percentage of contingency and inflation, and another updated design cost estimate will need to occur.

Costing Analysis

Passing Cost

The “passing cost” is the cost of building a network to pass by every property, business, or residence for connection to the network. This cost is fixed and is determined solely by the design created by Nokia in conjunction with City staff. Important design-based decisions were made by applying the methodology of value-engineering. This methodology is used when resources can and should be saved. Lowering the passing cost lowers the overall network construction while still creating a quality network.

[14] www.cityofloveland.org/government/public-information/quality-of-life-surveys

The estimated cost of installing fiber throughout the city limits is calculated by analyzing the system, neighborhood layout, premise density, and existing overhead or underground infrastructure. Multi-dwelling units (MDU) and multi-tenant units (MTU) were included, although the cost for installation to these types of sites is slightly lower and unique due to the high density nature. With Loveland's soil conditions and geography, City staff added a typical 10% contingency for projects of this size and nature as Nokia and Bear Communications have also included contingency within construction and miles added.

Passing Cost	
Network Construction	$52,412,397
Residential Premises	32,097
Business Premises	4,600
Total Premises	36,697
Average Cost per Passing	**$1,428**

These number are more conservative than estimates from Fort Collins of $984 and Longmont's actual costs averaging $825, however are in line with average costs for similar electric utility lines costs across the city averaging $1,078.

Drop Cost

The passing cost is fixed and can be calculated based on the number of premises and the community layout. However, the "drop cost" is variable and is dependent on the number of customers that choose to connect to the network. In other words, the take rate is the most cost-differentiating variable for total premise connections (This cost is not incurred until the resident or business chooses to sign-up for services).

The drop costs have two essential components: the pre-installation and the premise installation cost. Pre-installation includes trenching and underground installation of fiber in a micro-duct from the network at the edge of the property to the side of the building on the premise. The premise installation includes connection of equipment within the customer's building. This cost includes materials such as the ONT, electronics, connectors, and other hardware. It also includes labor costs for inside and outside the home or business. Contract labor will likely be used for the pre-installation with City staff performing a majority of the premise installation.

Drop Cost	Average per Drop
Materials (avg. 200 ft.)	$196
Equipment	$140
Labor	$420
10% Contingency	$76
Total Average Drop Cost	**$832**

These number are also more conservative than estimates from Fort Collins of $592 and Longmont's actual costs averaging $900, however are in line with average costs for similar electric service drops across the city averaging $958.

Services and Subscriptions

Fast, reliable, and robust networks are typically built with fiber because of their flexibility in use. The City is currently proposing internet and voice to be offered to all residents and businesses. Though the City

may decide that more services could be offered in the future, for business and financial modeling purposes only, internet and voice are the only services options.

Pricing Assumptions

Costs were determined based on competitive market pricing of similar products in the Loveland market and the requirements to cover costs of operating the utility and debt services. The surveyed take rate was found given these pricing models for both residents and businesses. Actual pricing may differ slightly once the services are launched due to changes in the market and competition, but the principles will remain the same.

Residential

When surveying Loveland in 2016 and 2017, the City of Loveland found that residents thought the pricing models for the current incumbents were expensive or confusing. City staff sought to make the City's offerings easier to understand and more affordable. Under City Council's vision statements, these were the result of design and business iterations:

- Symmetrical upload and download speeds
- No data cap
- No hidden fees
- No hidden installation costs

Every subscription includes an ONT with the price, but each resident can decide whether to also include a Wi-Fi access point from the City or purchase their own network-supported device for Wi-Fi. All costs of service are included within the listed pricing over the lifetime of the subscription. Device and service subscription details will continue to be improved as feedback from customers is heard.

Residential Subscription Pricing*	
25 Mbps	$19.95
300 Mbps	$49.95
1 Gbps (1000 Mbps)	$79.95
Voice	$19.95

Low income and fixed income services and prices are currently being assessed. Governmental assistance programs and non-profits such as Lifeline, ConnectHome, and EveryoneOn are a few potential programs that can help Loveland explore potential payment assistance programs and continue to bridge the digital divide.

Business

Similar comparisons to residential subscriptions such as symmetrical upload and download speeds as well as no data caps are also in the business subscriptions. Commercial service pricing plans are more difficult to model due to the complex and diverse needs of a business versus a residential customer. Commercial services will include a full range of possibilities that include various speeds and business support services. Some of these options could include:

- Dedicated or shared capacity connection over a G-PON connection
- Contractual or non-contractual agreements with service level agreement (SLA)
- High capacity direct fiber access connections
- Point to point or active Ethernet connections
- Customized access solutions for multi-site or campus businesses and organizations

* This pricing is for business and financial modeling purposes only. Actual prices or subscriptions may differ.

Given the wide range of commercial possibilities, it is not practical to model each option at this stage as it produces diminishing returns with false precision. Therefore, the model focuses on the standard business plan options that will account for the majority of the commercial customers.

Business Subscription Pricing*	
50 Mbps	$49.95
100 Mbps	$109.95
250 Mbps	$199.95
500 Mbps	$399.95
1 Gbps (1000 Mbps) – Dedicated	$799.95
Voice (3 Lines)	$119.95

Potential Future Services

Although internet and voice are the only revenues taken into account for the financial modeling, industry shows that other services can be offered from a network with this capacity and operational model. Other municipally-owned networks have allowed for other revenue streams such as dark fiber leases, open access, white label internet to other providers, bandwidth leasing to other carriers both wired and wireless, Wi-Fi in parks and congested areas such as downtown, and many others.

All of the extra value propositions listed above add value and revenue to the overall broadband utility. However, due to issues such as equipment and technology, needed staff, and inability to time such service, these services are being considered potential future services.

Risk Factors and Mitigation Tools

Inadequate Capital

Time and Cost Overruns

Due to the size and complexity of the project, if left unmanaged, time and cost overruns can dramatically take over the project. Whatever the scope may be, a well-managed project requires time, cost, and quality management. The City has selected Keith Meyer and his team from Ditesco to aid in project and construction management prior to and during the years of network construction. Ditesco has experience with many large capital construction projects, and most recently with the City of Loveland's Foundry project, water plant expansion, and wastewater treatment plant upgrade. Ditesco has also managed several large fiber construction projects in Larimer County and will provide additional expertise and staffing resources to mitigate delays or cost overruns. Costs associated with project and construction management have been factored into the business and financial model.

Take Rate not Met

There is a possibility, although very slim, that the take rate does not meet even the minimum sustainable break-even value of 32%. This has only happened in communities that have seen changes to the political landscape and are no longer allowed to proceed with the original business model. An example of this scenario is Provo Utah. Should this scenario happen, the broadband utility may need to be restructured, the debt may need to be restructured, and other alternative methods would need to be explored to address the cause of the take rate not being met. The financing mechanism for this project is based on electric revenue backed bonds, and in order to prevent a negative impact on the electric utility, options such as lease or sale of the system could be considered as a last resort. The fiber infrastructure, once

installed, is an asset that has monetary value. Again, City staff and consultants agree that the risk of this happening is very low and the response would be tailored based on the severity and the cause.

Competition

In a truly competitive market, businesses are constantly lowering their service prices and increasing their service options, all while providing the customer with more value. Loveland's broadband utility will have to compete with the current incumbents within the market. With a potential of 42% of the customer base in Loveland migrating to the City broadband service, much is at stake for the current incumbents. Their profit margins for this region would shrink and in order for their market share to remain stable, a lowered price offering and increased service options would need to occur.

In short, the incumbents will have to compete, and depending on how aggressive they price their services, it could become a potential risk for Loveland's broadband utility. As was seen in Longmont throughout the buildout of NextLight's™ network, their main competitor, Comcast, lowered their prices by more than 20% in an effort to retain customers. In Loveland, the incumbents are likely to lower their prices and engage in promotional or other techniques to maintain their market share. This has been seen in other communities across the country that have launched community-owned broadband services, and it is expected to be no different in Loveland. However, price is not the only variable when deciding which service provider to use. Factors such as customer service and brand can also impact choice. In order to account for the additional competition expected and the potential for lower take rates than anticipated, Scenarios (Page 34) have been considered to ensure that the business can be sustainable at much lower take rates.

Open Access and White Labeled Services

Open access and white labeled services can be discussed jointly in that they both entail allowing other ISPs to operate over the City-owned fiber network. White labeled services are very common in communities that offer FTTP, and mean that an ISP would pay the City for the use of the network to their customer and that ISP would offer services directly. The customer often does not know that the fiber infrastructure is not owned by their provider. This opportunity could allow the current incumbents, as well as smaller ISP providers, to be more competitive in the community without the need to invest in additional infrastructure. Open access is a new take on this model in that the ISP providers are decoupled from the infrastructure provider, however the premise is essentially the same. In the open access scenario, Loveland would charge each provider for access to the system which would most likely be passed onto the customer, but services would be offered by the independent ISP and not by a city operated ISP. Because the City owns the entire network, both these scenarios are options and will further increase the use of the network over time either directly or indirectly.

Technological Developments

As technology increases at an even higher rate, certain technological developments stand to create risk for the broadband utility. Whether that technology is wireless or wired connections, new developments in either category pose a potential risk. This being more of a competitive risk rather than the ability to dramatically increase connection speeds or decrease service costs. A FTTP connection is the most future-proof solution currently known, offering speeds which cannot be reached by current technologies. With wireless or other wired connections trying to match the current offered speeds of FTTP, and if customers are requesting higher and higher speeds than the previous years, soon wireless and other wired connections would not be able to compete with FTTP technology.

As wireless offers the ability to go further than an infrastructure connection and allows the customer to bring their services virtually anywhere, wireless technology offers a higher threat than other wired infrastructure which is future-proof limited. Though wireless technology has the ability to take the customer's service anywhere, implementing higher speeds at greater coverages is becoming recognized

as limited and impractical due to physical infrastructure increase and large capital costs. Thousands of small-cell towers would be required to cover the City in order to compete with the same service area that the broadband utility's FTTP infrastructure would deliver.

Having fiber throughout the entire city will make wireless deployment easier and make the City more likely to be an early deployment site. This will ultimately benefit the residents and businesses of the City, and these data-intensive wireless technologies could potentially be additional users of a city-wide fiber infrastructure — which could lead to additional revenue streams for the fiber network. The City believes that wireless technology promises great value to the customer and is seen as a supplemental and complimentary service, and not a direct competitor to FTTP.

Business Cycles

Economic, Social, or Political Developments

Legislative changes could impact the City of Loveland from providing retail broadband services. This has happened in other communities such as several projects in the state of Utah, and is a difficult problem to mitigate. It often requires restructuring of the business model to accommodate the change in landscape. The City of Loveland will need to remain active in lobbying organizations such as Colorado Municipal League (CML), CAMU, and others to help our state Legislature understand the needs of the City of Loveland and the new broadband utility.

Recessions and Economic Downturn

Economic downturns are difficult situations for any resident or business to go through. Hard times require action and often involve creative ways to save costs without limiting your capability. Everyone, regardless of their financial standing, work, or demographic can be impacted by recessions or economic downturns.

From the perspective of the City, a recession can mean a cut in consumer spending which directly relates to a cut in general funds and slowed growth. This exact occurrence happened with Chattanooga, Tennessee EPB as they were in the middle of building their fiber network. But because of contractors in need of work, they ended up negotiating better construction costs due to lowered demand. Anecdotally, they have shared that the spillover from the large fiber construction project included high occupancy rates at their hotels and other temporary lodging, and stable levels of activity in their restaurants and other service industry sectors. This helped mitigate the impacts of the larger recession within their community. This is similar to effects seen in Loveland and Estes Park after the 2014 Flood. Although occupancy from tourism was drastically reduced, the needs from the construction to repair damaged roads and other facilities lessened the financial impact to the community.

During the last recession of 2007-2009, 69% of all Americans were termed, "online economic users." These users have used the internet for recession-related purposes. Price comparisons, online retail savings, seeking financial professionals, and possibly the most intriguing are improving skills for a job, looking for new jobs, or earning money through the internet as an additional income are only but a few ways the internet was used during the recession.[15] From this research, Americans have better weathered the economic hardship due to the ability to access the internet, not just for searching for new work, but creating new work through a lowered barrier to entry and ease of accessing the appropriate market that the global network offers.

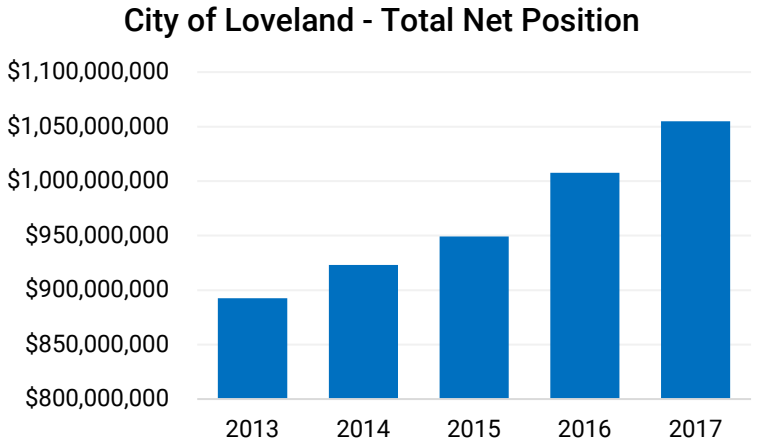
[15] www.pewinternet.org/2009/07/15/the-internet-and-the-recession/

Financial Model

Current Financial Position

The City as a whole, is in a strong and improving financial position. The City-wide income statement shows consistent growth from 2013-2017. Total City Net Position reached $1 billion in 2016 and added another 4.7% of growth in 2017. It is also expected that 2018 will bring continued growth as seen in previous years.

Simplified Income Statement	2013	2014	2015	2016	2017
Revenue	$206,526,207	$239,318,183	$238,724,237	$265,701,816	$276,976,054
Expenses	190,753,516	208,654,735	209,952,968	217,492,438	233,660,923
Increase in Net Position	**15,772,691**	**30,663,448**	**28,771,269**	**48,209,378**	**43,315,131**
Net Position – Beginning	876,746,565	892,519,256	920,428,674	959,493,498	1,007,702,876
Net Position – Beginning as Restated	0	0	0	0	3,928,113
Net Position – Ending	**$892,519,256**	**$923,182,704**	**$949,199,943**	**$1,007,702,876**	**$1,054,946,120**



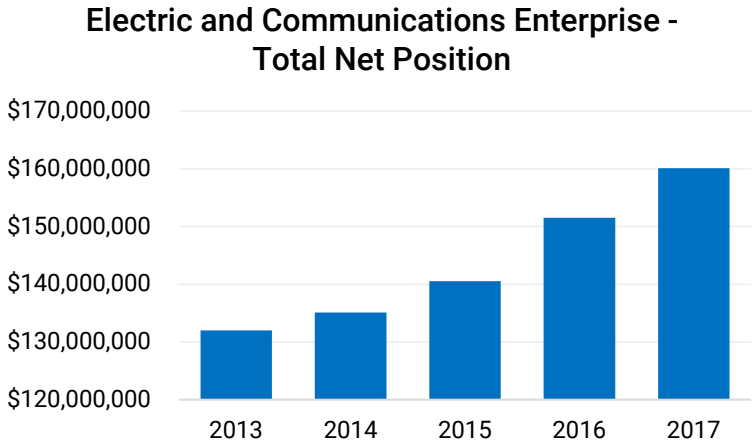
The City plans to have its financing package rated by Standards & Poor's Global Rating (S&P). S&P will first look at the strength of the City of Loveland as a whole and then the performance of the Electric and Communications Enterprise. Because of this, it is also important to understand the Electric and Communications Enterprise financial position.

The Electric and Communications Enterprise is also in a strong and improving financial position. The electric component of the enterprise has been operating since 1925 and continues to benefit from the competitively low cost of power from Platte River.

A detailed five-year spreadsheet history of financial performance for the electric side of the enterprise is shown below. The financial performance portrayed in this spreadsheet will be a key focus of the S&P rating process.

Budgetary Summary and Comparison[†]	2013	2014	2015	2016	2017
Operational Revenues:					
Charges for Services	$51,837,088	$52,638,251	$56,138,644	$58,740,724	$62,027,931
Misc.	1,213,073	1,312,654	1,342,318	1,329,709	1,823,984
Total Operating Revenue	**53,050,161**	**53,950,905**	**57,480,962**	**60,070,433**	**63,851,915**
Operating Expenses:					
Personal Services	2,948,375	2,948,551	3,401,279	3,428,300	3,827,441
Supplies	392,033	361,790	580,205	432,399	661,817
Purchased Services	4,723,405	5,734,657	4,274,358	4,798,188	5,552,229
Purchased Power	38,710,505	39,499,067	40,629,266	41,600,100	42,489,833
Payment for Services	3,587,789	3,629,067	3,886,434	4,068,499	4,234,135
Depreciation	3,466,181	4,572,441	3,790,359	3,837,176	4,275,105
Total Operational Expenses	**53,828,288**	**56,745,573**	**56,561,901**	**58,164,662**	**61,040,560**
Net Operating Income (loss)	**-778,127**	**-2,794,668**	**919,061**	**1,905,771**	**2,811,355**
Non-operating Revenues (expenses):					
Investment Earning	-110,421	358,091	279,566	124,022	231,877
Interest Earning	0	0	0	0	0
Bond Expenses	0	0	0	0	0
Intergovernmental	675,790	18,357	0	0	0
Gain (loss) on Sale of Capital Assets	28,369	-342,554	-374,034	-46,773	-3,454,154
Total Non-operating Revenues (expenses)	**593,738**	**33,894**	**-94,468**	**77,229**	**-3,222,277**
Net Income (loss) before Contributions/Transfers	**-184,389**	**-2,760,774**	**824,593**	**1,983,000**	**-410,922**
Capital Contributions:					
System Impact/Development Fees	2,119,638	2,515,344	2,784,483	2,938,398	2,477,214
Contributed Assets	658,328	552,287	402,506	1,004,829	305,620
Aid in Construction	969,638	685,794	1,429,573	505,258	2,945,663
Capital Grant Contributions	0	0	2,144	4,707,566	3,424,538
Transfers In	7,058	13,668	103,583	2,050	6,330
Transfers Out	-106,009	-110,808	-162,174	-144,161	-117,276
Insurance Recoveries	1,491,200	2,180,824	32,461	0	0
Total Capital Contribution	**5,139,853**	**5,837,109**	**4,592,576**	**9,013,940**	**9,042,089**
Change in Net Position	**4,955,464**	**3,076,335**	**5,417,169**	**10,996,940**	**8,631,167**
Total Net Position – Beginning	**127,061,117**	**132,016,581**	**135,092,916**	**140,510,085**	**151,507,025**
Prior Period Adjustment	0	0	0	0	0
Net Position – Beginning as Restated	127,061,117	132,016,581	135,092,916	140,510,085	151,507,025
Total Net Position – Ending	**$132,016,581**	**$135,092,916**	**$140,510,085**	**$151,507,025**	**$160,138,192**
Annual Growth Rate	3.90%	2.33%	4.01%	7.83%	5.70%

[†] City of Loveland CAFR, Electric and Communications Enterprise – Power Fund, years 2013-2017.



Information about the electric utility, including audited financial statements, budgets, continuing disclosures, and operating indicators can be found in the City's Comprehensive Annual Financial Reports (CAFR).[16] Additional information on the City's budgets and comprehensive annual financial reports is available in the City's Financial Reports.[17]

After review of the City's proven historical financial performance of the Electric Enterprise, S&P will focus on the reasonableness of the expected performance of the Communications Enterprise (broadband utility). Through the financial planning and take rate studies, the City will demonstrate the high probability for success in providing retail broadband services.

Scenarios

This process of financial modeling a range of scenarios allows the utility to understand different feasible results and financial outcomes, especially if there are potentially favorable or unfavorable events. Generating scenarios will aid in the decision-making process prior to and during the startup and operation process of the broadband utility.

Sales and Profitability Objectives

This scenario reflects our anticipated business objective for the business model, or in other words a base-case scenario. Given the surveyed take rate outcomes of 42% of residential and 27% of businesses will take the service if it was offered to them, the scenario assumes that bonds would be issued as soon as January 2019.

- Take Rate: 42% of Residential and 27% of Businesses
- Total Network Construction Cost: $52.4 M
- Total Drop Capital Cost: $13.3 M
- Bond Total: $93 M
- Bond Interest Rate: 3.85% for Tax-Exempt and 5.05% for Taxable
- Bond and Capitalized Interest Total: $155.6 M
- Positive Net Operational Income: Year 5
- Ability to Service Bond Prior to Bond Maturity: Yes – 3 Years Early

All of the financial modeling, financial metric charts, and Pro Forma reflect the same data as the sales and profitability objectives, base-case, unless otherwise stated.

[16] www.cityofloveland.org/departments/finance/administration/financial-reports/comprehensive-annual-financial-report-cafr
[17] www.cityofloveland.org/departments/finance/administration/financial-reports/

Break-Even Analysis

A break-even analysis is crucial to understanding the flexibility of the provided business plan. Rather than using data from surveys and expected outcomes, this model considers the minimum financial metrics for a fully operational and successful broadband utility. This can be considered the lower boundary case of the business plan.

- Take Rate: 32% of Residential and 27% of Businesses
- Total Network Construction Cost: $52.4 M
- Total Drop Capital Cost: $10.1 M
- Bond Total: $93 M
- Bond Interest Rate: 3.85% for Tax-Exempt and 5.05% for Taxable
- Bond and Capitalized Interest Total: $155.6 M
- Positive Net Operational Income: Year 8
- Ability to Service Bond Prior to Bond Maturity: No

The variables of the financial metrics were changed to meet the minimum debt services payback and extend to the end of the 20-year bond. From that the take rate was derived and the break-even analysis was reached. Due to the difference in needs of operation, the broadband utility would react accordingly in staffing and other operational expenses.

Fast-Growth Analysis

There is a potential for a greater than anticipated market share. This could be due to customer perception of the City of Loveland brand having higher satisfaction and confidence than expected. Though this does mitigate the risk of the take rate being too low to meet the debt services payback and an increase in operations due to new staff, an increased cash flow would give the utility the ability to restructure its debt if it made business and financial sense.

- Take Rate: 53% of Residential and 35% of Businesses
- Total Network Construction Cost: $52.4 M
- Total Drop Capital Cost: $16.7 M
- Bond Total: $93 M
- Bond Interest Rate: 3.85% for Tax-Exempt and 5.05% for Taxable
- Bond and Capitalized Interest Total: $155.6 M
- Positive Net Operational Income: Year 4
- Ability to Service Bond Prior to Bond Maturity: Yes – 10 Years Early

For many businesses, fast-growth signals success. It can create new opportunities and can possibly generate a faster return on investment. But growing quickly isn't without risks, such as higher advertising costs, potential lowered service quality, and diminution of prices which can lower overall profit. This could imply that prices were set artificially lower than their market equivalent or their customers are valuing your service over other providers more strongly than anticipated. However, if the higher than expected take rate is due to brand value and excellent service, and not a lower service price, this would allow the broadband utility to restructure its debt sooner and create even more competitive services.

Delayed Project

This scenario accounts for a delayed project, including design, bonding, construction, and market analysis. There is a potential that this decision is left to the public voters provided through a special election in spring of 2019. In this case we assume that we have the ability to issue bonds during May or June 2019 and that construction starts immediately after the bonds have been issued and funding is received.

- Take Rate: 42% of Residential and 27% of Businesses
- Total Network Construction Cost: $54.7 M
- Total Drop Capital Cost: $13.8 M
- Bond Total: $99 M
- Bond Interest Rate: 4.35% for Tax-Exempt and 5.55% for Taxable
- Bond and Capitalized Interest Total: $174.5 M
- Positive Net Operational Income: Year 5
- Ability to Service Bond Prior to Bond Maturity: No

The construction capital cost includes 4% extra contingency and inflation due to it being after the six month lifespan of that number, as we have seen an increase in cost of materials and construction in recent years. Bond interest rates have continued to rise throughout 2018, 0.25% every quarter, and they are anticipated to continue with four additional raises every quarter in 2019. By the time the bond would be issued an additional 0.50% will be added to the bond interest, for a total of 4.35% for tax-exempt and 5.55% for taxable. This dramatically increases the bond and capitalized interest total, and extends when the debt is paid off. If a delayed project were to take place, additional expenses such as a special election, added construction contingency cost, increased bond and capitalized interest cost, and general inflation could amount to over $18.9 million.

Funding and Expenses

Bonding‡

The City issued an RFP in April 2018 for an underwriter and investment banker for the City of Loveland Electric and Communications Utility Enterprise revenue bond series. Through an extensive interview process, J.P. Morgan was chosen to be the underwriter and senior manager for the transaction of revenue bonds if Loveland choses to move forward with the project.

The City together with J.P. Morgan has found a workable approach to the unique wants of the community and City Council. Within the bonding package, there will be three bond series: taxable, tax-exempt, and small denomination bonds. This gives the Loveland community the ability to interact with the broadband utility from the very beginning of the project, and local, small and large retail, and institutional buyers will have the opportunity to purchase bonds that meet their individual investment needs. A total of $93 million will be issued to cover the cost of capital and operational expenses.

Bonding Breakdown	
Tax-Exempt *(including small denomination bonds)*	$65.1 M
Taxable	$27.9 M
Bond Total	**$93 M**

The small denomination bonds will be offered through a separate program than the traditional bonds, and will be provided at $500 increments. City staff have worked with J.P. Morgan to offer the local community an easy and straightforward way to purchase bonds to engage with and support the project.

Repayment of the debt service from subscriptions to broadband customers will begin after the capitalized interest is used – the second half of 2022, assuming a January 2019 bond issuance. Three years of capitalized interest will be used as a mechanism for the broadband utility to become cash flow positive. Therefore the debt service on the 20-year bond begins in year 3 and will continue to the end of year 24.

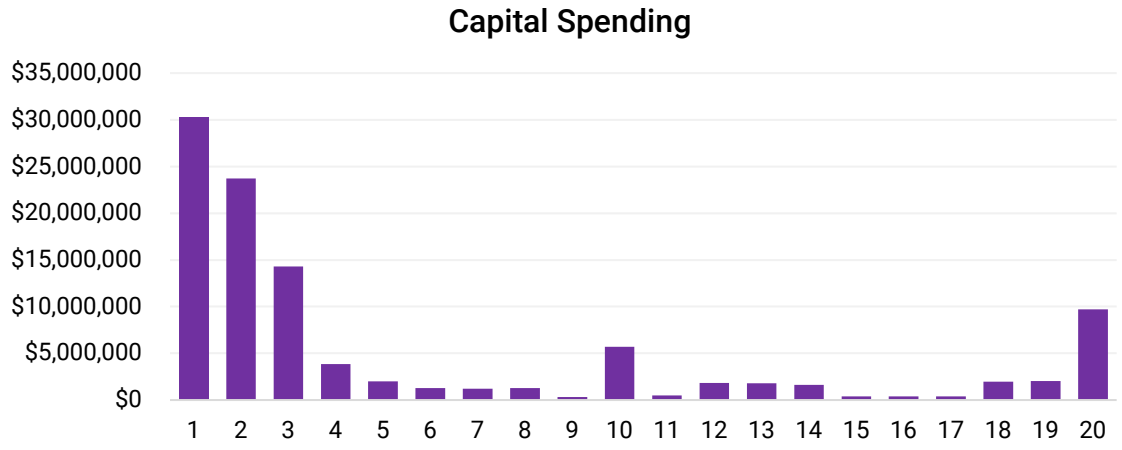
‡ The information provided in the Bonding section is not a bond official statement from the City of Loveland, advisors, or consultants, but rather a shortened purposed bond offering.

The assumed credit rating range is from A+ to A-, upper medium investment-grade bonds. This assumed rating has been used for financial modeling. Should the City decide to bond, a final credit rating performed solely by S&P will need to occur, though it may be different than the credit rating assumed by J.P. Morgan, advisors, and City staff.

Capital Spending Timeline

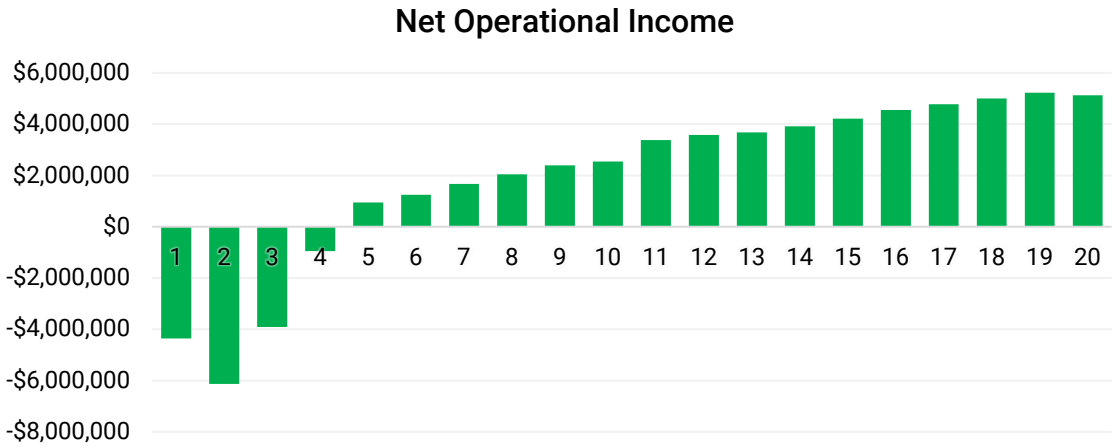
The capital spending timeline will focus on the sales and profitability objectives scenario breakdown and can also be seen graphically in the capital spending timeline chart – our base case for the project. The only items of focus are network construction, network headend and equipment, and fiber drops and premises connections.

Timeline	
Year 1	Construction expenses, material acquisition, and the construction of the network headend will be the focus during the first year. • Network Construction: $24.0 M • Network Headend and Equipment: $3.3 M • Fiber Drops and Premises Connections: $1.1 M
Year 2	Construction expenses and material acquisition will also be the focus during the second year. Fiber-to-the-premise installs are less expensive this year than in the future, due to the network still under construction. • Network Construction: $19.5 M • Fiber Drops and Premises Connections: $2.7 M
Years 3-5	With the majority of the network mostly deployed, fiber-to-the-premise installs and maintaining customer approval and loyalty will be the focus. • Network Construction: $8.9 M • Fiber Drops and Premises Connections: $9.5 M
Years 5+	Once the network is completely built out and the initial customers are connected, the project will enter into the operations phase. Expenses during this phase will be primarily from staffing, maintenance and upkeep, and marketing and customer service activities. Capital investments to replace the network headend and electronic equipment will also be major expenses expected in year 10 and 20, with other smaller capital replacement costs spread out throughout the lifetime of the network.

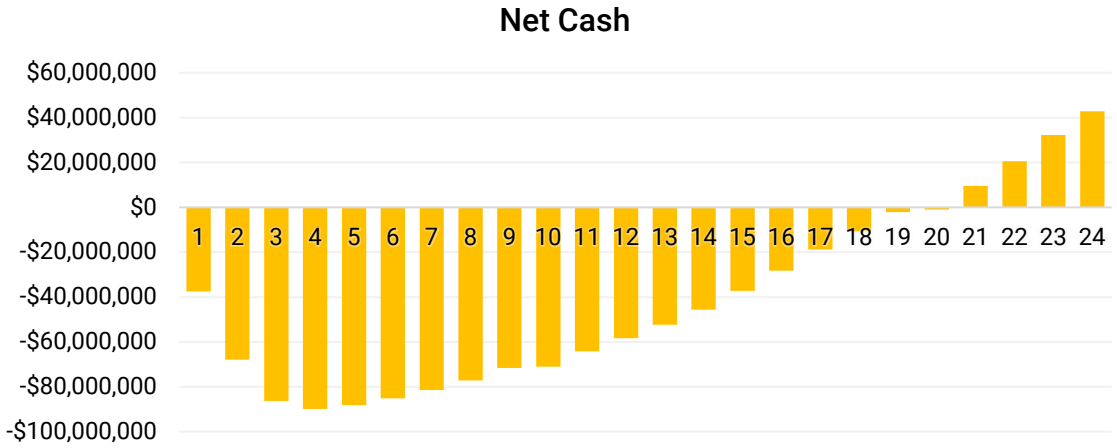


Financial Metrics

Positive cash flow will begin in year one as the first customers are added to the network, though the majority of customers will be added in years two through four. The broadband utility will be net operating income positive in year five.



Net cash is the financial metric that measures total cash minus total liabilities and is a common metric to indicate the financial stability and health of the overall utility. With the proposed model and sales and profitability objectives, the utility will have more cash on hand than total liabilities at the end of year 21 – though the 20-year bond will end in year 24. At this time a multitude of potential opportunities arise, such as the broadband utility can have a large capital reinvestment within the overall network or organization, or the utility has the ability to reinvest in additional services and offerings. Certain items such as an increase in staff and a significant increase in operations and maintenance (O&M) of the network have not been modeled due to the complexity and level of uncertainty towards the latter projected years.



Pro Forma

The assumptions and key facts listed are the assumptions that will be used in the Pro Forma as seen in the Appendix.

Assumptions and Key Facts	
Current Total Premises	• Residential Premises: 32,097 • Business Premises: 4,600
Take Rate	• Residential Internet: 42% • Business Internet: 27% • Residential Wireless Gateway: 75% • Business Wireless Gateway: 25%
Borrowing Assumption	$93 M Total 20-Year Electric Utility Revenue Bond • Capitalized interest only for the first three years • $65.1 M as Tax-Exempt at 3.85% • $27.9 M as Taxable at 5.05%
General Inflation Adjustment	3.50%
Operating Reserves	15% of Operating Expenses
1% for Arts	1% of Capital Construction Expenses (Estimated $1 M in Arts in Public Places Program over 20 years)
Payment-in-lieu-of-Taxes (PILT)	7% of Revenue (Estimated over $25 M in PILT to General Fund over 20 years)
Building Lease	7,000 sq. ft. building at $17.50 per sq. ft. with 3.0% inflation
Growth from New Development	Growth rate consistent with other utilities
Service Rate Increase	2.0% per Year
Network Construction	$52.4 M
Drop Cost	$832 per Drop
Staffing	32 full-time, benefited employees (FTE) (In addition to current LWP staff's percentage allocation to the broadband utility)

Glossary

BDP	Business and Development Programs
CAFR	Comprehensive Annual Financial Report
CAMU	Colorado Association of Municipal Utilities
DOCSIS	Data over Cable Service Interface Specification
DSL	Digital Subscriber Line
FCC	Federal Communications Commission
FTE	Full Time Employee
FTTP	Fiber-to-the-Premise
Gbps	Gigabits per second
G-PON	Gigabit Passive Optical Network
HFC	Hybrid Fiber-Coaxial
IEEE	Institute of Electronics and Electrical Engineers
IoT	Internet of Things
ISP	Internet Service Provider
LCAB	Loveland Communications Advisory Board
Mbps	Megabits per second
MDU	Multi-Dwelling Unit
MTU	Multi-Tenant Unit
NG-PON2	Next Generation Passive Optical Network 2
OLT	Optical Line Terminal
ONT	Optical Network Terminal
Platte River	Platte River Power Authority
PON	Passive Optical Network
RFP	Request for Proposal
SB 152	Senate Bill 152
SCADA	Supervisory Control over Data Acquisition
SLA	Service Level Agreement

LOVELAND WATER AND POWER
BROADBAND
FINANCIAL FORECAST
2019 - 2048

Appendix

	BUDGET 2019	Projected 2020	Projected 2021	Projected 2022	Projected 2023	Projected 2024	Projected 2025	Projected 2026	Projected 2027	Projected 2028	Projected 2029	Projected 2030	Projected 2031	Projected 2032	Projected 2033	Projected 2034	Projected 2035	Projected 2036	Projected 2037
BEG'G WORKING CASH BALANCE:	**$0**	**$58,386,219**	**$28,535,276**	**$10,329,863**	**$5,519,797**	**$4,463,077**	**$4,420,925**	**$4,862,771**	**$5,640,013**	**$7,695,160**	**$4,523,960**	**$7,407,158**	**$9,164,749**	**$11,049,544**	**$13,335,891**	**$17,165,722**	**$21,327,410**	**$25,703,016**	**$28,730,032**
REVENUES & SOURCES:																			
Service - Residential	193,159	1,543,545	4,595,388	7,974,153	10,945,761	11,737,340	12,243,049	12,693,767	13,157,527	13,622,708	13,959,594	14,301,046	14,641,820	14,988,687	15,341,025	15,698,321	16,060,849	16,423,692	16,786,699
Service - Business	57,993	481,216	1,456,535	2,532,139	3,477,892	3,713,451	3,878,202	4,024,040	4,177,906	4,334,841	4,433,379	4,533,959	4,657,835	4,760,042	4,864,625	4,992,122	5,104,348	5,216,249	5,317,187
Service - Key Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Installation - Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Installation - Business	6,930	26,962	39,552	40,343	19,932	3,935	2,676	2,729	2,784	2,839	1,448	2,954	3,013	1,537	3,135	3,198	1,631	3,327	1,697
Installation - Key Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wireless Gateway - Residential	23,310	182,700	533,295	907,245	1,220,895	1,283,535	1,312,560	1,334,160	1,355,760	1,376,190	1,396,215	1,416,150	1,435,590	1,455,030	1,474,470	1,493,910	1,513,350	1,532,205	1,550,565
Wireless Gateway - Business	700	5,520	16,350	27,870	37,485	39,315	40,200	40,920	41,640	42,360	42,885	43,440	44,160	44,685	45,240	45,960	46,485	47,040	47,565
Wireless Gateway - Key Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fiber Leases	100,000	102,000	104,040	106,121	108,243	110,408	112,616	114,869	117,166	119,509	121,899	124,337	126,824	129,361	131,948	134,587	137,279	140,024	142,825
Source - Interest on Investments	1,534,983	831,125	281,358	145,116	121,562	141,230	164,442	201,235	281,711	169,812	278,036	344,009	414,757	500,577	644,334	800,548	964,791	1,078,413	1,198,121
Source - Bonds Issued	93,000,000																		
TOTAL REVENUES	**$94,917,076**	**$3,173,067**	**$7,026,517**	**$11,732,987**	**$15,931,770**	**$17,029,214**	**$17,753,745**	**$18,411,719**	**$19,134,494**	**$19,668,259**	**$20,233,456**	**$20,765,896**	**$21,323,999**	**$21,879,919**	**$22,504,777**	**$23,168,646**	**$23,828,731**	**$24,440,949**	**$25,044,658**
OPERATING EXPENSES:																			
Wholesale Costs	14,062	94,975	272,845	473,984	656,995	715,455	756,056	796,845	839,334	880,304	922,788	971,122	1,016,098	1,068,721	1,119,245	1,172,611	1,229,692	1,287,918	1,350,788
Distribution	1,320,289	2,041,124	2,844,600	2,550,141	2,742,375	2,836,663	2,952,505	3,053,152	3,192,174	3,317,471	3,471,164	3,611,822	3,801,805	3,911,447	4,044,634	4,151,937	4,302,648	4,426,664	4,577,645
Customer Relations	556,150	1,114,026	1,359,818	1,386,996	1,452,745	1,496,961	1,532,426	1,562,773	1,637,356	1,687,204	1,726,982	1,760,861	1,845,473	1,901,672	1,946,286	1,984,098	2,080,097	2,143,458	2,193,490
Admin	799,226	816,485	835,903	861,727	898,680	922,263	944,106	973,286	1,015,224	1,041,805	1,066,374	1,099,349	1,146,948	1,176,909	1,204,546	1,241,811	1,295,840	1,329,612	1,360,698
Workers Comp & Gen'l Liability	275,000	284,625	294,587	304,897	315,569	326,614	338,045	349,877	362,122	374,797	387,915	401,492	415,544	430,088	445,141	460,721	476,846	493,536	510,810
1% for Arts Transfer	284,802	220,958	127,486	38,533	20,049	12,788	12,207	12,612	3,334	57,116	3,383	15,262	15,775	16,227	3,794	3,907	3,936	19,714	20,290
Payment in-lieu-of taxes PILT	26,746	163,936	472,161	811,151	1,106,715	1,182,159	1,231,251	1,274,734	1,319,695	1,364,891	1,396,879	1,429,532	1,463,647	1,496,554	1,530,231	1,565,767	1,600,476	1,635,378	1,669,258
Services rendered-other depts.	200,000	362,250	530,179	548,735	567,941	587,819	608,392	629,686	651,725	674,535	698,144	722,579	747,869	774,045	801,136	829,176	858,197	888,234	919,323
Building Lease	122,500	126,175	129,960	133,859	137,875	142,011	146,271	150,660	155,179	159,835	164,630	169,569	174,656	179,895	185,292	190,851	196,577	202,474	208,548
Debt Service - Internal Loan Power	67,500	75,000	70,000	67,500	70,000	555,000	555,000	555,000	555,000	555,000	0	0	0	0	0	0	0	0	0
Debt Issuance Cost	650,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt Service	1,957,650	3,999,123	3,999,123	5,504,662	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200
TOTAL OPERATING EXP'S (excl depn)	**$6,273,926**	**$9,298,677**	**$10,936,662**	**$12,682,185**	**$14,979,143**	**$15,787,933**	**$16,086,459**	**$16,368,824**	**$16,741,344**	**$17,123,159**	**$16,848,460**	**$17,191,789**	**$17,638,016**	**$17,965,757**	**$18,290,505**	**$18,611,080**	**$19,054,509**	**$19,437,187**	**$19,821,048**
NET OPERAT'G REV/(LOSS) (excl depn)	**$88,643,150**	**($6,125,609)**	**($3,910,144)**	**($949,198)**	**$952,628**	**$1,241,281**	**$1,667,285**	**$2,042,895**	**$2,393,151**	**$2,545,101**	**$3,384,995**	**$3,574,107**	**$3,685,983**	**$3,914,161**	**$4,214,272**	**$4,557,566**	**$4,774,222**	**$5,003,763**	**$5,223,610**
CAPITAL EXPENDITURES	30,256,931	23,725,333	14,295,269	3,860,868	2,009,348	1,283,433	1,225,439	1,265,653	338,004	5,716,301	501,798	1,816,516	1,801,187	1,627,815	384,440	395,877	398,616	1,976,747	2,034,471
NET CHANGE IN WRK'G CASH BAL	$58,386,219	($29,850,943)	($18,205,413)	($4,810,066)	($1,056,720)	($42,152)	$441,846	$777,242	$2,055,147	($3,171,200)	$2,883,198	$1,757,591	$1,884,796	$2,286,346	$3,829,831	$4,161,688	$4,375,606	$3,027,016	$3,189,139
(Net Oper Rev/(Loss) less Cap Exp)																			
ENDING WORKING CASH BALANCE	**$58,386,219**	**$28,535,276**	**$10,329,863**	**$5,519,797**	**$4,463,077**	**$4,420,925**	**$4,862,771**	**$5,640,013**	**$7,695,160**	**$4,523,960**	**$7,407,158**	**$9,164,749**	**$11,049,544**	**$13,335,891**	**$17,165,722**	**$21,327,410**	**$25,703,016**	**$28,730,032**	**$31,919,171**
Operating Reserve (15% of Operating Exp)	$941,089	$1,394,801	$1,640,499	$1,902,328	$2,246,871	$2,368,190	$2,412,969	$2,455,324	$2,511,202	$2,568,474	$2,527,269	$2,578,768	$2,645,702	$2,694,864	$2,743,576	$2,791,662	$2,858,176	$2,915,578	$2,973,157
Fav/(Unfav) to Desired Balance	$57,445,130	$27,140,475	$8,689,364	$3,617,469	$2,216,205	$2,052,735	$2,449,802	$3,184,689	$5,183,958	$1,955,486	$4,879,889	$6,585,980	$8,403,842	$10,641,027	$14,422,146	$18,535,748	$22,844,840	$25,814,454	$28,946,014
Loan Balance	94,957,650	94,957,650	94,957,650	93,452,112	90,378,109	87,175,580	83,839,063	80,362,859	76,741,025	72,967,356	69,035,381	64,938,349	60,669,214	56,220,623	51,584,907	46,754,060	41,719,728	36,473,194	31,005,359

A	Growth from New Development - Res & Bus	1.29%	1.00%	1.78%	1.78%	1.73%	1.69%	1.66%	1.62%	1.57%	1.47%	1.44%	1.41%	1.38%	1.35%	1.32%	1.29%	1.26%	1.23%	1.21%
B	Residential Churn Rate	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
C	Service Rate Increase - Residential		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Service Rate Increase - Business		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Service Rate Increase - Anchor Institutions		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Installation Rate Increase Business		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Installation Rate Increase Anchor Institutions		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Wireless Gateway Rate Increase - Residential		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Wireless Gateway Take Rate - Residential	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%
	Fiber Lease Increase		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
D	Interest on Investments	2.70%	3.00%	2.80%	2.70%	2.80%	3.30%	3.50%	3.70%	3.80%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%
E	Payment in Lieu of Taxes (PILT)	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
F	General Inflation Rate	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%

Appendix

LOVELAND WATER AND POWER
BROADBAND
FINANCIAL FORECAST
2019 - 2048

	Projected 2038	Projected 2039	Projected 2040	Projected 2041	Projected 2042	Projected 2043	Projected 2044	Projected 2045	Projected 2046	Projected 2047	Projected 2048
BEG'G WORKING CASH BALANCE:	**$31,919,171**	**$27,337,905**	**$32,095,864**	**$36,954,639**	**$42,177,692**	**$46,092,402**	**$57,354,296**	**$69,060,255**	**$83,394,495**	**$98,399,329**	**$113,892,966**
REVENUES & SOURCES:											
Service - Residential	17,154,898	17,529,353	17,916,649	18,314,310	18,719,658	19,130,514	19,540,519	19,958,189	20,373,782	20,783,741	21,200,240
Service - Business	5,437,207	5,577,965	5,698,886	5,808,658	5,957,518	6,081,636	6,210,678	6,326,208	6,463,279	6,592,969	6,731,319
Service - Key Accounts	0	0	0	0	0	0	0	0	0	0	0
Installation - Residential	0	0	0	0	0	0	0	0	0	0	0
Installation - Business	3,461	3,530	1,800	3,673	3,746	1,911	3,897	1,988	4,055	2,068	4,219
Installation - Key Accounts	0	0	0	0	0	0	0	0	0	0	0
Wireless Gateway - Residential	1,568,925	1,587,285	1,606,230	1,625,670	1,645,110	1,664,550	1,683,405	1,702,350	1,720,620	1,737,900	1,755,180
Wireless Gateway - Business	48,120	48,840	49,365	49,920	50,640	51,165	51,720	52,245	52,800	53,325	53,880
Wireless Gateway - Key Accounts	0	0	0	0	0	0	0	0	0	0	0
Fiber Leases	145,681	148,595	151,567	154,598	157,690	160,844	164,061	167,342	170,689	174,102	177,584
Source - Interest on Investments	1,026,158	1,204,753	1,387,133	1,583,186	1,730,129	2,152,856	2,592,252	3,130,303	3,693,526	4,275,097	4,458,006
Source - Bonds Issued											
TOTAL REVENUES	**$25,384,450**	**$26,100,321**	**$26,811,629**	**$27,540,014**	**$28,264,490**	**$29,243,475**	**$30,246,531**	**$31,338,625**	**$32,478,751**	**$33,619,203**	**$34,380,428**
OPERATING EXPENSES:											
Wholesale Costs	1,414,633	1,479,445	1,549,592	1,620,924	1,698,938	1,776,658	1,859,702	1,947,263	2,036,659	2,129,045	2,223,175
Distribution	4,698,868	4,869,845	5,010,130	5,181,297	5,318,253	5,512,240	5,670,939	5,865,008	6,019,749	6,239,861	6,419,405
Customer Relations	2,235,683	2,344,611	2,416,048	2,472,153	2,519,223	2,642,831	2,723,377	2,786,286	2,838,783	2,979,064	3,069,882
Admin	1,402,814	1,464,148	1,502,216	1,537,182	1,584,784	1,654,416	1,697,329	1,736,657	1,790,463	1,869,524	1,917,899
Workers Comp & Gen'l Liability	528,688	547,192	566,344	586,166	606,682	627,915	649,892	672,639	696,181	720,547	745,766
1% for Arts Transfer	97,009	4,439	4,578	4,832	23,907	24,613	25,460	5,361	5,405	5,447	112,868
Payment in-lieu-of taxes PILT	1,705,080	1,742,690	1,779,715	1,816,978	1,857,405	1,896,343	1,935,800	1,974,582	2,014,966	2,054,087	2,094,570
Services rendered-other depts.	951,499	984,801	1,019,269	1,054,944	1,091,867	1,130,082	1,169,635	1,210,572	1,252,942	1,296,795	1,342,183
Building Lease	214,804	221,249	227,886	234,723	241,764	249,017	256,488	264,182	272,108	280,271	288,679
Debt Service - Internal Loan Power	0										
Debt Issuance Cost	0	0	0	0	0	0	0	0	0	0	0
Debt Service	7,010,200	7,010,200	7,010,200	7,010,200	7,010,200	0	0	0	0	0	0
TOTAL OPERATING EXP'S (excl depn)	**$20,259,279**	**$20,668,619**	**$21,085,978**	**$21,519,398**	**$21,953,023**	**$15,514,116**	**$15,988,621**	**$16,462,551**	**$16,927,255**	**$17,574,641**	**$18,214,427**
NET OPERAT'G REV/(LOSS) (excl depn)	**$5,125,172**	**$5,431,702**	**$5,725,651**	**$6,020,617**	**$6,311,467**	**$13,729,360**	**$14,257,910**	**$14,876,074**	**$15,551,495**	**$16,044,562**	**$16,166,001**
CAPITAL EXPENDITURES	9,706,438	673,743	866,877	797,564	2,396,757	2,467,465	2,551,951	541,834	546,661	550,925	11,293,127
NET CHANGE IN WRK'G CASH BAL	($4,581,266)	$4,757,959	$4,858,775	$5,223,053	$3,914,710	$11,261,894	$11,705,959	$14,334,240	$15,004,834	$15,493,637	$4,872,873
(Net Oper Rev/(Loss) less Cap Exp)											
ENDING WORKING CASH BALANCE	**$27,337,905**	**$32,095,864**	**$36,954,639**	**$42,177,692**	**$46,092,402**	**$57,354,296**	**$69,060,255**	**$83,394,495**	**$98,399,329**	**$113,892,966**	**$118,765,840**
Operating Reserve (15% of Operating Exp)	$3,038,892	$3,100,293	$3,162,897	$3,227,910	$3,292,953	$2,327,117	$2,398,293	$2,469,383	$2,539,088	$2,636,196	$2,732,164
Fav/(Unfav) to Desired Balance	$24,299,013	$28,995,572	$33,791,742	$38,949,782	$42,799,449	$55,027,179	$66,661,962	$80,925,112	$95,860,241	$111,256,770	$116,033,676
Loan Balance	25,306,729	19,367,393	13,177,008	6,724,779	(563)	-	-	-	-	-	-

A	Growth from New Development - Res & Bus	1.19%	1.16%	1.19%	1.21%	1.19%	1.16%	1.14%	1.12%	1.00%	1.00%	1.00%
B	Residential Churn Rate	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
C	Service Rate Increase - Residential	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Service Rate Increase - Business	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	Service Rate Increase - Anchor Institutions	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Installation Rate Increase Business	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Installation Rate Increase Anchor Institutions	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Wireless Gateway Rate Increase - Residential	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Wireless Gateway Take Rate - Residential	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%
	Fiber Lease Increase	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
D	Interest on Investments	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%	3.90%
E	Payment in Lieu of Taxes (PILT)	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
F	General Inflation Rate	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%