City Council Worksession Agenda

May 22, 2018 at 5:00 p.m.
School District Six Board of Education Meeting Room – 1025 9th Avenue Greeley, Colorado

1. City Broadband Feasibility Study Results and Recommendations (5:00 – 6:00 p.m.)

   Mark Hoekstra, IT Director

2. Citizens' Capital and Operating 20 Year Plan (6:00 – 6:30 p.m.)

   Victoria Runkle, Assistant City Manager

3. Nuts and Bolts: Budget (6:30 – 7:15 p.m.)

   Victoria Runkle, Assistant City Manager

4. Monthly Financial Report (7:15 – 7:30 p.m.)

   Victoria Runkle, Assistant City Manager

5. Scheduling of Meetings, Other Events

   Roy Otto, City Manager

A City Achieving Community Excellence
Greeley promotes a healthy, diverse economy and high quality of life responsive to all its residents and neighborhoods, thoughtfully managing its human and natural resources in a manner that creates and sustains a safe, unique, vibrant and rewarding community in which to live, work, and play.

Worksession Agenda Summary

May 22, 2018 (5:00 – 6:00 p.m.)
Agenda Item Number 1
Key Staff Contact: Mark Hoekstra, IT Director, 350-9305

Title
City of Greeley & Town of Windsor Broadband Planning

Background
2016 City Initiative to review high-speed broadband services
2017 Approval and kickoff of broadband feasibility study
2017 Citizen vote to exempt Greeley from Senate Bill 152
2018 Collaboration with regional broadband committees
2018 Completion of feasibility study

Council Direction Requested
Review of feasibility study and provide input on staff recommendations for next steps.

Attachments
City of Greeley, Town of Windsor Broadband Roadmap
Executive Summary, City of Greeley, Town of Windsor Broadband Roadmap
Summary Responses, Broadband Survey
PowerPoint

NEO CONNECT

CITY OF GREELEY AND TOWN OF WINDSOR, BROADBAND ROADMAP

May 2018

Abstract

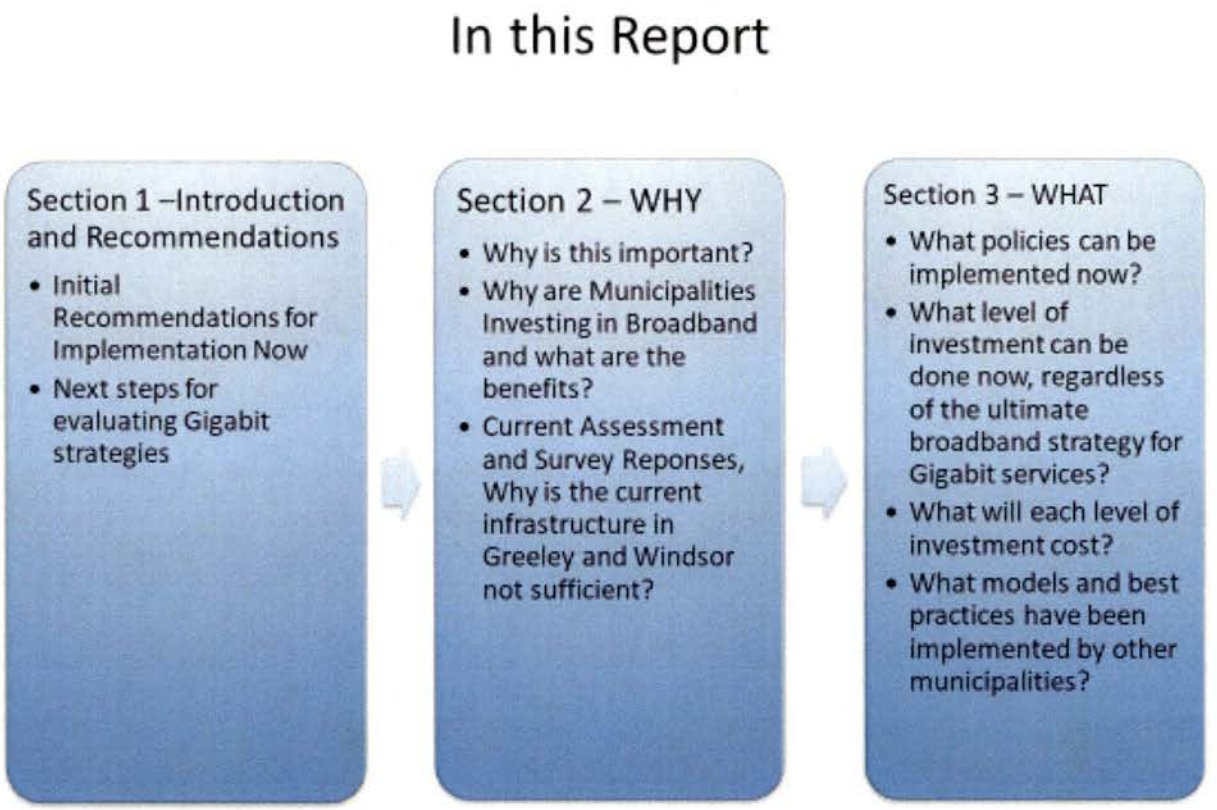
Municipalities are taking a more active role in ensuring their communities have reliable, abundant and affordable broadband services for their citizens. Additionally, smart city applications are requiring local governments to plan for robust infrastructure to support these emerging technologies. This white paper discusses models and approaches for the City of Greeley and the Town of Windsor to consider and provides a platform to evaluate financial implications, levels of investment, models and strategies, and options for implementation.

Prepared for the City of Greeley and the Town of Windsor,
by Diane Kruse, NEO Connect

Contents

About this Report

The following report is a roadmap for improving broadband services within the City of Greeley and the Town of Windsor. This report is divided into three sections.



Section 1 of this report provides an introduction and background on the City of Greeley's and the Town of Windsor's ("City/Town") joint broadband study. This section provides a call to action for consideration; essentially the recommendations that can be implemented now to facilitate and lower the costs for broadband implementation and a summary of the costs of implementing a level of investment in infrastructure to connect key facilities, smart city applications and government locations. These initial recommendations lay the foundation for improving broadband infrastructure within both communities, regardless of whether the City/Town decides to move forward with a Gigabit broadband strategy or not.

Section 2 provides answers to many of the "why" questions. It addresses why having abundant and affordable broadband services is important, why municipalities are investigating building broadband infrastructure for their communities, and what Greeley and Windsor citizens are saying regarding their current services. This section also details the current assessment and

findings regarding what existing services and infrastructure are available today. The current assessment provides information regarding identified gaps in availability of broadband service and what the incumbent providers, Comcast and CenturyLink are offering within the study area.

Section 3 of this report describes "what" to consider. This section discusses what levels of investment may be required to upgrade the existing infrastructure to support a variety of broadband, cellular backhaul, smart city and e-government applications. It provides a detailed analysis of several levels of broadband infrastructure investment and what each level of investment may cost. This section also discusses the considerations to implement a Gigabit broadband strategy or connecting homes and businesses with fiber, the estimated capital costs for doing so and what other municipalities have done or are considering doing for implementation of a Gigabit broadband strategy. This section discusses several types of public private partnership models and examples of other municipalities that have implemented them.

Following this report, a companion report will be provided that will discuss the financial considerations and implications of various Gigabit strategies. Financial projections, staffing considerations and financing strategies will be discussed for each model. Additionally, the companion report will address funding and financing options for consideration.

This report and the companion report are included in the initial scope of work with NEO Connect.

Section 1 – Introduction and Initial Recommendations

Background Information

The City of Greeley and the Town of Windsor have hired NEO Connect to provide strategic planning for facilitation of better broadband services for the communities. In parallel with NEO's engagement, the City of Greeley and the Town of Windsor staff have conducted high-level surveys from citizens regarding their thoughts on current broadband services, what is important and their opinion regarding the role of government in solving broadband gaps.

Additionally, NEO and City staff have conducted community engagement meetings with the public for feedback. NEO's team provided a current assessment of the broadband landscape in Greeley and Windsor. NEO researched the existing services, pricing and availability of broadband service within both communities and identified gaps in service availability provided by the incumbent providers.

There are many levels of investment that may be considered by a local government to improve broadband services. The first level of investment may be to implement policies and ordinances that reduce the cost of broadband deployment. Another level of investment may be to connect various government and anchor institutions within each community. These strategies lay the foundation for connecting important facilities and help create a broadband distribution system that can further be expanded. Another level of investment may be to extend the broadband distribution system into neighborhoods to connect homes and businesses with fiber.

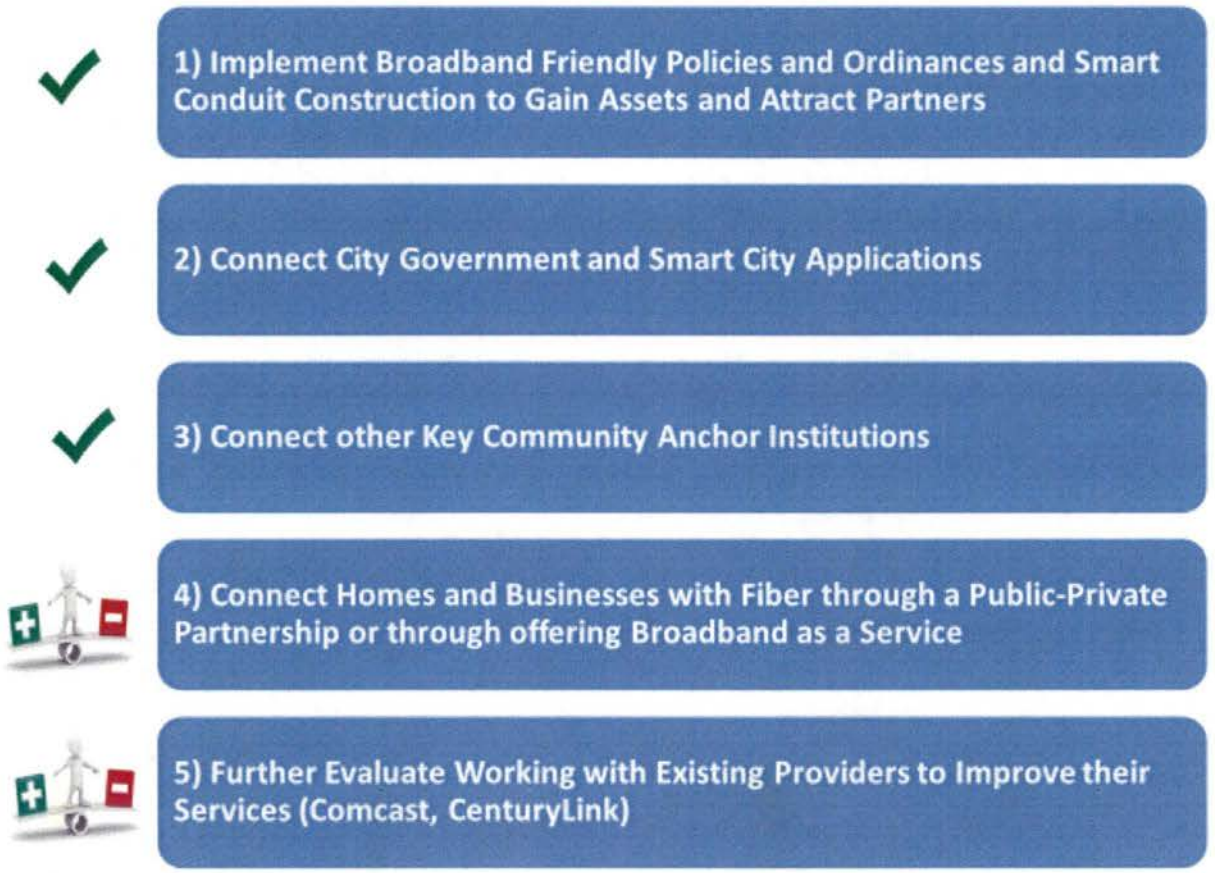
To identify the costs of various levels of investment, NEO's team gathered information regarding the City of Greeley's and the Town of Windsor's smart city, traffic management, capital improvement projects, and other government communication needs. NEO identified and mapped existing assets that could potentially be leveraged to improve broadband services and identified key community anchor institutions that could benefit from having fiber built directly to their locations. We then provided a high-level design and capital cost projection for several levels of broadband infrastructure development and investment.

In addition to the above set of tasks, NEO's scope of work included providing models for public-private partnerships and best practices regarding what other municipalities are doing or have done to improve broadband services.

Initial Recommendations

As discussed, there are several levels of investment that may facilitate better broadband services within a City/Town. Here are the various levels of investment that were evaluated as part of this study.

Levels of Investment



Based upon the initial findings of the broadband plan, NEO and staff recommend the first three levels of investment be implemented now. The first three recommendations will facilitate and lower the costs for broadband implementation and lay the foundation for improving broadband infrastructure within both communities, regardless of whether the City/Town decides to move forward with a Gigabit broadband strategy to connecting homes and businesses, or not.

Connecting city government locations (water monitoring systems, public safety and other government buildings), smart city applications (traffic lights and parking meters) and key community anchor institutions (i.e. hospitals, schools, and universities) with fiber will greatly enhance communications and broadband speeds for these locations, while dramatically reducing communications costs. While these key facilities are being connected with fiber, both communities will gain more fiber assets that can be leveraged for building out to neighborhoods to connect homes and businesses with fiber. Implementing a shadow conduit/dig once policy will allow the City/Town to facilitate further broadband development

by reducing the costs of broadband expansion, by levering existing public works or construction by other entities.

All of these first three levels of investment will improve communications for applications that will be needed regardless of whether or how the City/Town moves forward with a more ubiquitous Gigabit broadband strategy. Additionally, these strategies will lower the overall cost of further expansion and will provide assets (conduit and fiber) for the City/Town to use as leverage to potentially negotiate a public-private partnership for further expansion.

NEO and staff recommend that investigation into how to implement a ubiquitous Gigabit broadband strategy for homes and businesses be further evaluated (item #4 and #5 above under Levels of Investment.) This would include weighing the pros and cons of various public-private partnership models or providing broadband services directly to citizens and businesses or working with the incumbent providers Comcast and CenturyLink to improve their availability of Gigabit broadband services.

The companion report will provide the financial implications and considerations for implementation of connecting homes and businesses with fiber. Financial models for public-private partnerships or for the City/Town to offer broadband services directly to citizens and businesses will be provided.

Summary of Capital Costs for the Various Levels of Investment

Below is a summary of the capital costs for implementation of the various levels of investment.

The projected capital costs for the City of Greeley's build for items #2 and #3 is shown below.

With the Use of Existing Fiber				
Description	**Eng. & Construction Management**	**Labor**	**Materials**	**Project Total**
Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City"	$ 270,043	$ 1,161,935	$ 260,223	$ 1,692,201
Water Meter Locations outside City Limits	$ 41,358	$ 183,964	$ 50,488	$ 275,810
Adding on All Other Anchor Institutions	$ 230,184	$ 1,166,545	$ 351,754	$ 1,748,483
Total	**$ 541,585**	**$ 2,512,444**	**$ 662,465**	**$ 3,716,493**

As a New Build				
Description	Eng. & Construction Management	Labor	Materials	Project Total
Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City"	$ 624,146	$ 3,260,450	$ 758,316	$ 4,642,912
Water Meter Locations outside City Limits	$ 41,358	$ 183,964	$ 50,488	$ 275,810
Adding on All Other Anchor Institutions	$ 473,049	$ 2,095,045	$ 516,856	$ 3,084,950
Total	**$ 1,138,553**	**$ 5,539,459**	**$ 1,325,660**	**$ 8,003,673**

A summary of the projected capital costs for the Town of Windsor's build for #2 and #3 is shown below.

With the Use of Existing Fiber				
	Eng. & Construction Management	Labor	Materials	Total
Public Safety, SCADA, Smart City	$ 11,532	$ 72,844	$ 27,709	$ 112,085
Adding on All Other Anchor Institutions	$ 11,160	$ 93,390	$ 43,481	$ 148,031
Total	**$ 22,692**	**$ 166,234**	**$ 71,190**	**$ 260,116**

As a New Build				
	Eng. & Construction Management	Labor	Materials	Total
Public Safety, SCADA, Smart City	$ 150,660	$ 604,032	$ 131,811	$ 886,503
Adding on All Other Anchor Institutions	$ 139,965	$ 588,167	$ 132,224	$ 860,356
Total	**$ 290,625**	**$ 1,192,199**	**$ 264,035**	**$ 1,746,859**

Most Fiber-to-the-Premise network use a Gigabit Passive Optical Network (GPON) architecture with active connections to large businesses, mission critical or government locations. Active or passive simply refers to powered electronics in the field. In other words, with a passive architecture, there are no electronics located between the network operations center and the home.

Capital costs will increase when the market share or take rate percentage increases. Below are the projected capital costs with various take rate percentages.

Summary, Windsor Fiber to the Premise Capital Costs			
Take Rate Percentages	Total Construction Costs	Total Equipment Costs	Total Capital Costs
10%	$ 39,685,019	$ 2,336,684	$ 42,021,704
20%	$ 40,797,243	$ 2,579,875	$ 43,377,118
30%	$ 41,906,853	$ 2,846,086	$ 44,752,939
40%	$ 43,016,463	$ 3,093,389	$ 46,109,851
50%	$ 44,129,690	$ 3,357,522	$ 47,487,212
60%	$ 45,238,296	$ 3,711,603	$ 48,949,899

Summary, Greeley Fiber to the Premise Capital Costs			
Take Rate Percentages	Total Construction Costs	Total Equipment Costs	Total Capital Costs
10%	$ 91,877,838	$ 7,438,297	$ 99,316,135
20%	$ 95,308,477	$ 9,475,631	$ 104,784,107
30%	$ 98,737,505	$ 11,803,153	$ 110,540,658
40%	$ 102,168,144	$ 14,006,794	$ 116,174,938
50%	$ 105,603,404	$ 16,097,703	$ 121,701,107
60%	$ 109,034,043	$ 18,535,591	$ 127,569,634

As the capital costs and financial risk is high for building fiber to homes and businesses, NEO and City/Town staff recommending further investigation into various strategies and models for implementing this approach.

A Quick Lesson in Broadband, Speeds and Technologies Available

Before we go much farther, it may be helpful to include a quick lesson on broadband, speeds and broadband technologies. The following section is a reference for understanding the "basics" about broadband.

Speeds

There is much debate occurring in the U.S. on how to properly define "broadband". Prior to February 2015, the Federal Communications Commission (FCC) defined broadband as having the ability to download 4 Mbps of data and upload 1 Mbps of data. In February of 2015, the FCC increased the definition of broadband by raising the minimum download speeds needed from 4 Mbps to 25 Mbps and the minimum upload speed from 1 Mbps to 3 Mbps[1]. The current definition of broadband can be supported by a number of technologies – including wireless, cable modem, DSL, and fiber optic technologies.

Although the current FCC definition for broadband is 25 Mbps download and 3 Mbps in upload speeds, it should be noted that broadband demand and consumption of broadband is growing very rapidly every year. The gold standard for bandwidth capability is quickly becoming offering Gigabit services or speeds that support 1,000 Mbps in both download and upload speeds. Fiber optic networks or more specifically, building fiber directly to homes and businesses is the predominant way to achieve Gigabit download and upload speeds. This is

[1] *2016 Broadband Progress Report*, Federal Communications Commission, https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf.

referred to in the industry as "Fiber to the Premise," or "Fiber to the Home," or "Fiber to the Business."

For example, The City of Longmont has built a fiber network to homes and businesses within the city and is offering Gigabit broadband services at very affordable rates. Longmont's Gigabit fiber network is nationally known as a model of success. Dubbed "NextLight," this Gigabit fiber network is owned and operated by the City and its power utility, Longmont Power & Communications (LPC).

Many of the cable networks are being upgraded to a technology called DOCSIS 3.1, which will support Gigabit levels in download speeds by not in upload speeds.

There have been dramatic improvements in wireless technologies and although we are now seeing the ability for wireless to support Gigabit speeds, the wireless access points need to be fed with fiber and have a Gigabit reach of less than 500 feet. Gigabit players, Google Fiber and AT&T have announced plans to trial Gigabit wireless services in select markets in the U.S. for serving homes and businesses but are not yet commercially available. Siklu is a company that is currently providing wireless equipment that supports Gigabit capacity; again, wireless access points need to be fed with fiber.

Why do we Care about Upload Speeds?

Incumbent providers typically advertise one number – their download speeds. But upload speeds are very important too. Put simply, upload speeds represent the amount of data that can be shared or sent in a given second. Upload speeds are important for content creators – people who create and send pictures, files, engineering drawings, videos, and the like.

Many applications require fast download and upload speeds. Online, real-time games, Voice over IP (phone calls using the internet), interactive web videos and/or web conferences require constant and fast two-way communications. Without fast upload speeds, video and voice services are stuttered or every third or fourth word is heard. If a business is running any of its own servers -- such as a Web, game, or email server -- available upload bandwidth will limit performance for people trying to access the information on the server.

Therefore, having fast upload speeds reflects a business' ability to create and share their content. Upload speeds have a great impact on economic development and business creation.

Description of Broadband Technologies

Below is a brief description of the various technologies used in broadband deployment:

DSL (Digital Subscriber Line) uses existing copper phone lines to deliver download and upload broadband speeds typically of 1.5 Mbps to 7 Mbps. DSL speeds diminishes as distance

increases from the telephone company's central office. Homes or businesses located more than three miles from the central office will not receive as fast of speeds. There have been many improvements to DSL technologies to improve the speed available. In general, most forms of DSL service improvements support up to 10 Mbps. VDSL (Very High Bit Rate Digital Subscriber Line) can support up to 30 Mbps, but most Internet service providers do not support this type of service, including providers in the region.

Cable modem service uses coaxial cables already installed by the cable TV operators to provide broadband service. Most cable networks support speeds comparable to DSL. Cable operators are upgrading their cable networks by installing fiber optic cable closer to neighborhoods. These network improvements allow cable modem service to be able to support up to 30 Mbps. This connection type is a shared service, meaning, as more people are on the network within a neighborhood, the speed available to each customer diminishes. As discussed above, many cable companies are upgrading their cable networks to DOCSIS 3.1 which supports Gigabit speeds in download capabilities, but not upload capabilities.

Fiber optic technology converts electrical signals carrying data to light and sends the light through glass fibers about the diameter of a human hair. Fiber transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps. Fiber is the best way to provide abundant broadband, but it often is the most capital-intensive to build. As fiber optic technology transmit pulses of light, more bandwidth can be delivered on a fiber optic network by adding various colors of light or additional spectrum. Fiber is unique because it can carry high bandwidth signals over long distances without signal or bandwidth degradation and it can provide that capacity in both directions – for both upload and downloading information.

Wireless broadband connects a home or business to the Internet using a radio link between the customer's location and the service provider's facility. Wireless technologies using longer-range directional equipment provide broadband service in remote or sparsely populated areas where DSL or cable modem service would be costly to provide or fiber network installations may be too capital intensive.

Wireless broadband can be mobile or fixed. Wireless speeds are generally comparable to DSL and cable modem. Wireless services can be offered using both licensed spectrum and unlicensed devices. Wi-Fi networks typically use unlicensed spectrum. Wi-Fi networks use wireless technology from a fixed point and often require direct line-of-sight between the wireless transmitter and receiver. Wi-Fi networks can be designed for private access within a home or business or be used for public Internet access at "hot spots" such as restaurants, coffee shops, hotels, airports, convention centers, and city parks. Using licensed spectrum, greater amounts of bandwidth can be delivered and often do not require direct line-of-sight.

In some communities, especially sparse, geographically diverse rural communities, small providers build out a wireless solution since wireless infrastructure is not as capital-intensive as

building out a fiber optic infrastructure. While wireless technology does have its limitations, needing to be designed to get around "line of sight' requirements as well as to support "shared" bandwidth on the network, smart engineering can deliver good connectivity.

Cellular 4G and LTE. Cellular service is often referred to as wireless service and it can be confused with Wi-Fi. Cellular and Wi-Fi are both wireless systems, meaning both use radio frequencies to transmit and receive data. But Wi-Fi has a radio transmitter and receiver that operates only at a range of 200 feet or so. The range of cellular is measured in miles. Wi-Fi's transmitter and receiver is called an access point. It is mounted in the corner of a room, or on a lamp post, or in a hotel lobby. A cellular transmitter and receiver is called a cell site, or a base station and can transmit for miles.

"4G" refers to the fourth-generation technology for data transmission over a cellular network. It can support greater data speeds than most public Wi-Fi networks and is used primarily when a customer is out of the range of a Wi-Fi network. LTE, which stands for "Long Term Evolution," is the fastest, most consistent variety of 4G.

"5G" cellular service is the fifth and latest generation for data transmission over a cellular network. 5G supports higher amounts of bandwidth, but in order to support 5G capabilities, more small cell sites need to be deployed because the bandwidth can only be sustained for short distances.

To date, the cellular companies have charged for data usage either by the amount of data used or with a flat fee for unlimited data use.

Cell sites need to be connected with fiber in order to support high bandwidth speeds.

Wireless Local Area Networks (WLANs) provide wireless broadband access over shorter distances and are often used to extend the reach of a "last-mile" wireline or fixed wireless broadband connection within a home, building, or campus environment. An in-home Wi-Fi network is a WLAN – it does not use spectrum, rather it sends radio waves at a limited range. Mobile wireless broadband services are also becoming available from mobile telephone service providers. These services are generally appropriate for highly-mobile customers and require a special wireless card with a built-in antenna that plugs into a user's laptop computer. Generally, they provide lower speeds, in the range of several hundred Kbps.

Satellite broadband is another form of wireless broadband and is useful for serving remote or sparsely populated areas. Typically, a consumer can expect to receive (download) at a speed of about 500 Kbps and send (upload) at a speed of about 80 Kbps. These speeds are slower than DSL and cable modem, but they are about 10 times faster than the download speed with dial-up Internet access. Service can be disrupted in extreme weather conditions and are typically oversubscribed.

With the tremendous growth in broadband demand, plans for long-term implementation of infrastructure must take into consideration the need for more fiber networks to be deployed and expanded.

Section 2 – "Why"

This section provides answers to many of the "why" questions. It addresses why having abundant and affordable broadband services is important, why municipalities are investigating building broadband infrastructure for their communities, and what Greeley and Windsor citizens are saying regarding their current services. This section also details the current assessment and findings regarding what existing services and infrastructure are available today. The current assessment provides information regarding identified gaps in availability of broadband service and what the incumbent providers, Comcast and CenturyLink are offering within the study area.

Why is this Important and Why are Municipalities Looking into Improving Broadband?

Having access to very high-speed broadband and Internet services has become one of the most critical components for education, government services, economic development, healthcare, utility operations, first responders and business operations. The demand for more bandwidth continues to grow. By 2021, there will be over 30 billion devices connected by the Internet of Things (IoT). Each person will have over 13 connected devices on average, including their cell phones, tablets, clothing, and their cars. The global Internet traffic continues to explode. In 1992, global Internet traffic per ***day*** was 100 Gigabits. In 2016, the global Internet traffic per ***second*** was 26,600 Gigabits. It is projected that global Internet use will continue to expand dramatically.

Global Internet Traffic	
1992	100 GB per DAY
1997	100 GB per HOUR
2002	100 GB per SECOND
2007	2,000 GB per SECOND
2016	26,600 GB per SECOND
2021	105,800 GB per SECOND

Internet, data and cellular growth will continue to double in bandwidth every one to two years. Although some of the existing Internet Service Providers (ISP) have invested in their networks to keep up with demand, the majority of networks built by cable and phone companies are maxed out. As the Internet drives all things regarding economic development and vitality, simply put, connectivity is essential.

Coupled with the ever-growing importance of the Internet, the convergence of new smart city applications, traffic management needs, the growth of and application for small cellular site installation and the soon-coming

implementation of self-driving vehicles, municipalities are seeking strategies to facilitate and coordinate investment.

Recently, the FCC overturned Net Neutrality rules that govern the availability and access to content and bandwidth. These rules prevented ISP's from blocking certain types of content or placing specific websites or applications in preferential "fast lanes." The FCC's overturning these rules could help the large or incumbent providers stifle the ability of smaller internet companies to compete. Some critics of FCC's decision worry that the large ISPs will begin prioritizing certain websites, applications, content and services over others, either by charging customers to access that content or charging Internet companies to access customers. Internet websites could be "packaged" or "channelized" similar to the way cable companies provide a roster of channels and programming.

The Cities of Longmont, Boulder, Loveland and Ft. Collins are implementing locally-run Internet services as a way of ensuring their citizens and businesses are not impacted by the overturning of Net Neutrality rules. These cities are stating that the Internet would remain open and equitable, serving as a countermeasure to corporations potentially taking over the Internet.

Another reason why local governments invest in broadband infrastructure is to address the availability of advanced broadband services throughout the entire city or town boundary. In many instances, the incumbent cable and phone companies have invested in some part of the municipality, but much of the community does not have adequate services. Municipalities invest to ensure that all citizens and businesses have access to advanced broadband services at affordable prices and that no one is left out of participating in the digital economy.

Municipal facilitation can take the form of implementing broadband friendly policies and ordinances to reduce the cost of implementation by the private sector, to investing and implementing fiber for government applications and to key anchor institutions, to entering into a public-private partnership to promote a ubiquitous Gigabit strategy, to a full-blown implementation and operations of a municipally-owned Internet Service Provider.

Considerations that impact a local government's broadband strategy and involvement include the level or amount of municipal investment, examination of models and approaches implemented by other communities, exploration of how networks are typically implemented, constructed and operated, as well as exploration of public-private partnership models that are emerging in the industry and possible financing strategies for implementation.

Summary of the Survey Results

Below is a summary of the residential survey results that were facilitated by the Town of Windsor and the City of Greeley staff.

643 residential surveys responses were received. The surveys were posted on the City of Greeley's and the Town of Windsor's websites and social media sites. Although the survey was filled out most likely from residences that care about Internet services, or potentially have an issue with their current Internet services, the survey results strongly suggest the following:

- Reliability is the most important factor for the community, followed by speed and price.
- The community wants to see more reliable, faster, and more abundant broadband services. 81-82% of the respondents stated that the download and upload speeds are too slow either sometimes, most of the time or always. Speeds vary throughout the day as more users are on the Internet and there are times when respondents cannot get on the Internet.
- 54% of the residential respondents telecommute, having either one or more people working from home, providing insight into the broadband needs of homes within the communities.
- 62% of the respondents were Comcast customers using cable modem service; followed by 21% of the respondents using CenturyLink's DSL services.
- When asked to rank the local government's role with respect to broadband access, 57% of the respondents ranked "to build network for the public: homes, businesses and government locations" as the primary role of government, with 16% stating the government's role should be to "partner with current providers" as the primary role.
- 66% of the respondents stated they would support a small monthly utility fee to pay for broadband infrastructure build out.
- The survey stated that the City of Longmont recently became Colorado's first "Gig City," building a fiber network that provides residents with reasonably priced Gigabit service to the home. The survey asked "Would you support the City of Greeley and the Town of Windsor offering Gigabit service to the home." 73% answered "Yes" and 19% answered that more information would be needed. Only 8% replied "No."
- 21% of the respondents said they would potentially move if adequate broadband was not available and 5% said they would definitely move.

Although Comcast has stated that Gigabit speeds (1000 Megabit per second (Mbps)) are available throughout Greeley and Windsor, of the respondents that indicated that they are Comcast customers, none of the speed tests conducted were at Gigabit speeds. The highest speed test result was 350 Mbps in download speeds. The average speed test results for Comcast customers were 71.45 Mbps in download speeds and 8.99 Mbps in upload speeds.

The reasons for the discrepancy between Comcast's speed test results and their stated available speeds are varied. Either customers are signing up for a lower service speed through Comcast, Comcast is not delivering Gigabit speeds, the devices do not support these high bandwidths, Comcast's network was constrained as more users were on the Internet, or Gigabit services are not offered by Comcast in their neighborhoods. There is not an easy way to determine why higher speeds were not achieved by the speed tests.

The FCC definition for broadband is 25 Mbps in download speeds and 3 Mbps in upload speeds. The average speed test for CenturyLink customers was 11.88 Mbps in download speeds and 2.04 Mbps in upload speeds. None of the CenturyLink customers that participated in the survey and speed test met the FCC's definition of broadband service.

Most of the survey respondents also provided comments – All of the comments that were received are included within the Appendix A of this report. Results of the survey are provided within a separate document.

To summarize, most of the comments received were in support of the City of Greeley and the Town of Windsor to invest in a ubiquitous Gigabit fiber initiative. There were a handful of comments that discouraged the government from getting into the broadband business. Many of the responses discussed concern over the existing services not being available, fast enough, or providing the level of services that were subscribed. Many comments discussed the lack of customer care or service available from the incumbent providers. Some responses discussed how no broadband service is available within their neighborhoods and that Comcast does not serve their home with cable TV or broadband service. A good portion of the comments encouraged the City/Town to follow what the City of Longmont has done and what the Cities of Boulder, Loveland and Fort Collins are considering.

Current Assessment, Existing Services and Gaps

Although the survey results provide a good summary of the current providers in the market, a number of entities collect and map broadband availability by state in the U.S.

The **FCC** collects information from facilities-based Internet providers – providers that own their own network facilities. Facilities-based providers include telephone companies, cable system operators, wireless, satellite service providers and other facilities-based providers of advanced telecommunications capability. All facilities-based providers are required to file data with the FCC twice a year (Form 477) regarding where they offer Internet access service at speeds exceeding 200 kbps in at least one direction.[2]

Additionally, the National Telecommunications and Information Administration (NTIA), through the **Broadband USA Mapping Tool,** collects broadband datasets to be included in NTIA's National Broadband Map. This effort was started in 2009 and was kept updated through June 30, 2014 and is no longer being updated. The Federal Communications Commission (FCC) sought funding for Fiscal Year 2016 to continue to maintain and update the National Broadband Map, but this request was not granted.

---

[2] *FCC mapping data on Form 477 is reported on a census-block basis rather than based upon whether or not service is available at a particular home, business or other location within the census-block.*

BroadbandNow is a website that summarizes datasets provided by NTIA, the FCC and other sources regarding broadband availability, speeds, government spending and pricing information.

The **State of Colorado's Office of Information Technology (OIT)** compiles actual speed test results from across the state and datasets are available for select cities and counties.

Additionally, NEO has gathered information across the state and the U.S. from meetings and correspondence with the various service providers.

Windsor Market

The incumbent cable company in Windsor is Comcast, serving approximately 77% of Windsor; 12.1% of Windsor receive TDS cable services. The incumbent phone company is CenturyLink, with 98.2% of the community having access to DSL services. Rise Broadband is a fixed wireless provider in Windsor and satellite services are available through HughesNet and Viasat. Business Internet providers include CenturyLink, Comcast, Rise Broadband, as well as MHO, another fixed wireless provider in Windsor and Electric Lightwave, Birch Communications and GTT Communications.

According to BroadbandNow, the average download speed in Windsor is 26.82 Mbps. Speed test data is based upon 6,072 speed tests from IP verified users who took speeds test in Windsor between April 2017 and March 2018. Windsor's average download speed is 24.7% slower than the average in Colorado and 17.5% slower than the national average.

12.6% of the Windsor homes have one or fewer wired Internet providers available to them. In other words, these homes have only 1 choice or no options for Internet services.

Greeley Market

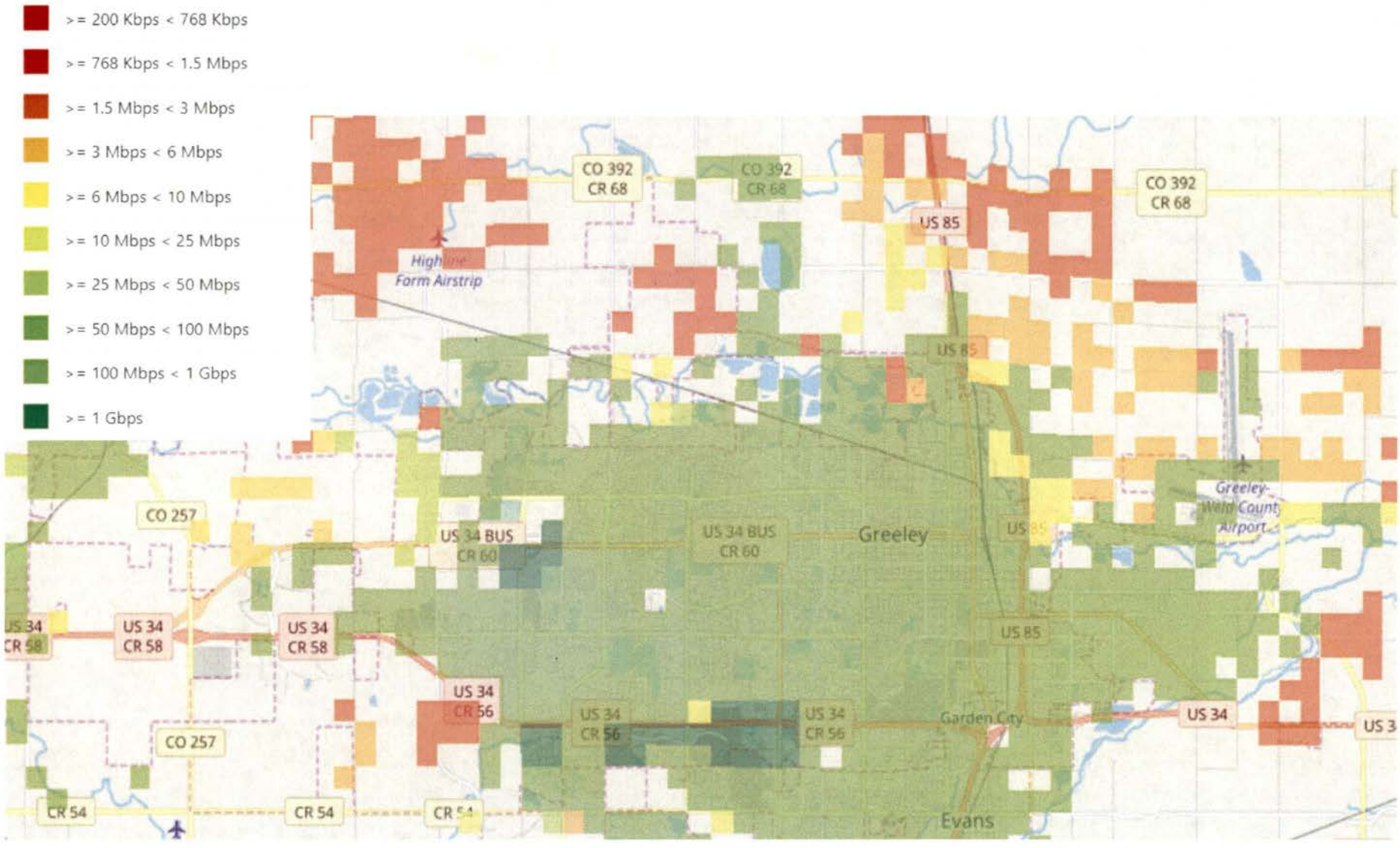
Residential providers in Greeley include Comcast, CenturyLink, Rise Broadband and Windstream. Satellite providers are HughesNet and Exede Internet. Blue Lightning provides fiber services to 1.1% of the residential community. Business Internet providers include all of the providers listed in Windsor, as well as Level 3 Communications, NewCloud and MegaPath.

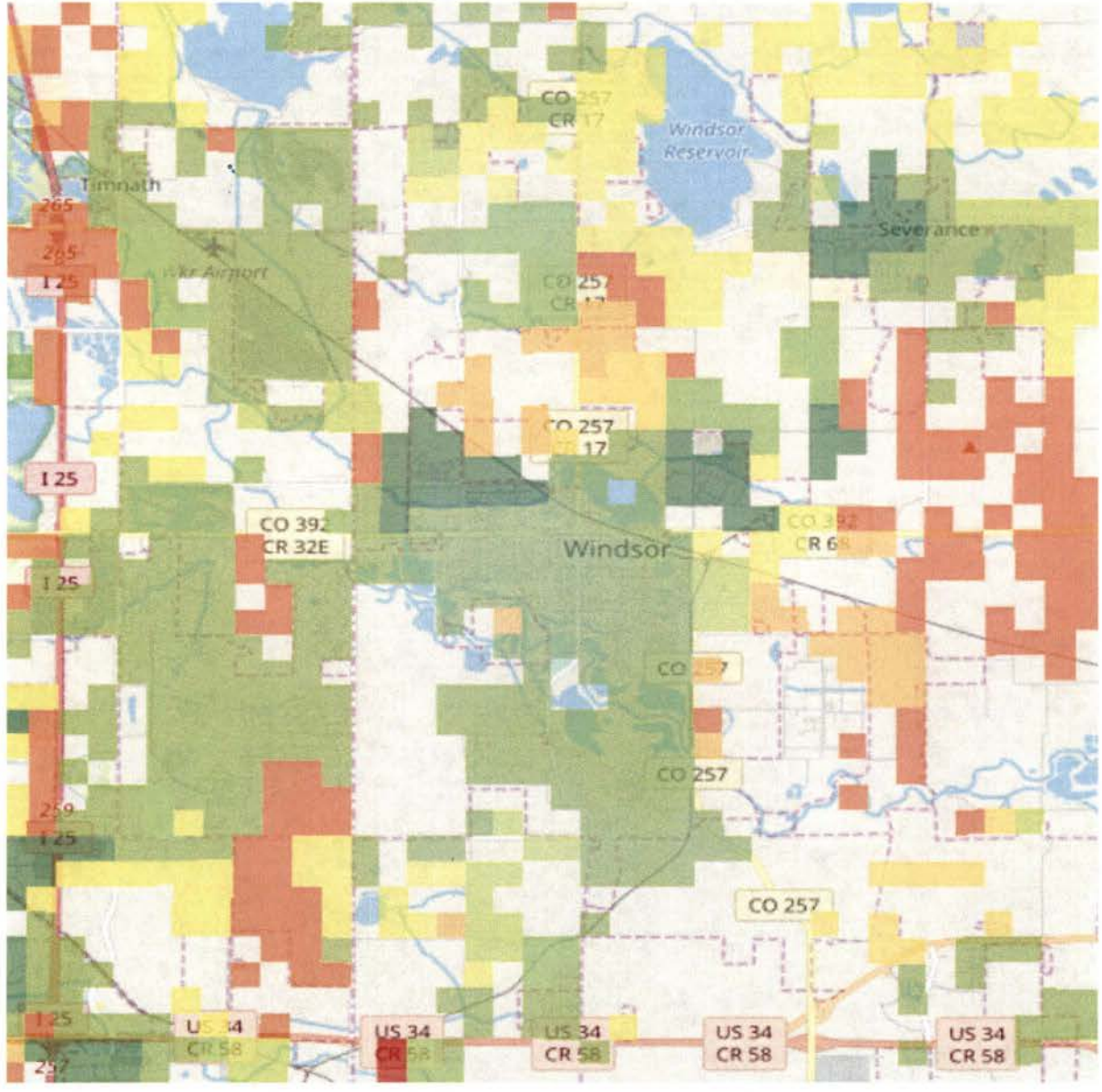
As in Windsor, 12.1% of the consumers in Greeley have access to one or fewer providers. Based upon 26,262 speed tests from April 2017 to March 2018, the average download speed in Greeley is 35.73 Mbps. This is 6.4% faster than the average in Colorado and 11.8% faster than the national average.

Current Speeds and Availability

Comcast states that it offers Gigabit broadband services within Greeley and Windsor, but Gigabit services are not currently available ubiquitously throughout both communities. For this study, Comcast has committed to providing coverage maps of their Gigabit service offerings.

According to the State of Colorado's OIT broadband map, the following maps shows what services are available throughout both communities. Areas shown in dark green have access to up to 1 Gigabit of service.


>= 200 Kbps < 768 Kbps
>= 768 Kbps < 1.5 Mbps
>= 1.5 Mbps < 3 Mbps
>= 3 Mbps < 6 Mbps
>= 6 Mbps < 10 Mbps
>= 10 Mbps < 25 Mbps
>= 25 Mbps < 50 Mbps
>= 50 Mbps < 100 Mbps
>= 100 Mbps < 1 Gbps
>= 1 Gbps
CO 392 CR 68
CO 392 CR 68
CO 392 CR 68
US 85
Highline Farm Airstrip
US 85
Greeley-Weld County Airport
CO 257
US 34 BUS CR 60
US 34 BUS CR 60
Greeley
US 85
US 34 CR 58
US 34 CR 58
US 34 CR 58
US 85
US 34 CR 56
US 34 CR 56
US 34 CR 56
Garden City
US 34
CO 257
CR 54
CR 54
Evans



- >= 200 Kbps < 768 Kbps
- >= 768 Kbps < 1.5 Mbps
- >= 1.5 Mbps < 3 Mbps
- >= 3 Mbps < 6 Mbps
- >= 6 Mbps < 10 Mbps
- >= 10 Mbps < 25 Mbps
- >= 25 Mbps < 50 Mbps
- >= 50 Mbps < 100 Mbps
- >= 100 Mbps < 1 Gbps
- >= 1 Gbps

The maps are created by the State of Colorado's OIT department based upon reports that are submitted biannually by the service providers to the Federal Communications Commission (FCC). The maps are notorious for being inaccurate because they are self-reported by the various services providers and because the maps depict ***advertised speeds*** by census block. Service providers may offer advertised speeds to one address within the census block; however, not all addresses may be able to receive that level of service. This causes the reported services to be inflated compared to what services are actually available at an address. Additionally, as more households use the network at the same time, during peak times of internet use, the network slows down because of network congestion. This network congestion occurs with most non-fiber broadband technologies.

The maps also do not show which carrier offers what services but given that there are small sections of both communities that show available Gigabit broadband service, it is clear that Gigabit broadband is not available throughout all of either community.

Current Pricing and Service Offerings

Comcast and CenturyLink are the primary providers within Greeley and Windsor. Their pricing and service offerings, along with the City of Longmont's for comparison, is shown below:

Residential Services

Xfinity, Comcast		CenturyLink		City of Longmont's NextLight	
15 Mbps	$ 29.99	20 Mbps	$ 45.00	25 Mbps	$ 39.95
60 Mbps	$ 39.99	80 Mbps	$ 55.00	1000 Mbps	$ 69.95
150 Mbps	$ 54.99	140 Mbps	$ 65.00		
250 Mbps	$ 69.99			Charter Members	$ 59.95
400 Mbps	$ 84.99				
2000 Mbps	$ 299.95				

Commercial Services

Xfinity, Comcast		CenturyLink		City of Longmont's NextLight	
25 Mbps	$ 69.95	20 Mbps/2 Mbps	$ 65.00	25/5 Mbps	$ 49.95
75 Mbps	$ 99.95	50 Mbps/50 Mbps	$ 104.00	Add Sym Upstream (25 Mbps)	$ 10.00
150 Mbps	$ 139.95	100 Mbps/100 Mbps	$ 164.00	50/10 Mbps	$ 99.95
250 Mbps	$ 199.95	500 Mbps/500 Mbps	$ 389.00	Add Sym Upstream (50 Mbps)	$ 30.00
1000 Mbps	$ 499.95	1000 Mbps/1000 Mbps	$ 509.00	100/20 Mbps	$ 179.95
				Add Sym Upstream (100 Mpbs)	$ 50.00
				Add BGP Routing	$ 100.00
				500/250 Mbps	$ 599.95
				Add Sym Upstream (500 Mbps)	$ 150.00
				1000/500 Mbps	$ 799.95
				Add Sym Upstream (1000 Mbps)	$ 200.00

CenturyLink's fiber services are not available everywhere.[3] For the City of Longmont's pricing, "Sym" is short for symmetrical, which means both download and upload speeds are the same speed.

Plans to follow Longmont's model are underway with the Cities of Boulder, Ft. Collins, Estes Park and Loveland.

Existing Infrastructure Assets

The City of Greeley and the Town of Windsor have built fiber throughout their respective communities and the private sector has also built fiber infrastructure within each community.

City of Greeley Fiber

In Greeley, the town's traffic lights are connected with fiber that was implemented through the Congestion Mitigation and Air Quality grant from the North Front Range Metropolitan

[3] CenturyLink terms: "Services and offers not available everywhere. Building locations that are not served with CenturyLink fiber or not designated for inclusion in this offer are not eligible for Fiber+ Internet service. A residential address is not eligible for Fiber+ Internet service, even if business is conducted at such residential location. Offer, plans, and stated rates are subject to change and may vary by service area. CenturyLink may modify or discontinue pricing at the conclusion of the service term for each service. Upgrades and additional Fiber + Internet services after the initial order(s) may be subject to then-current pricing and terms. If CenturyLink determines after entering into the Agreement or after accepting an order form that a Customer location is not eligible for service, CenturyLink has no obligation to provide service at that location."

Planning Organization (NFRMPO). The City installed 144-counts of fiber and is currently using 12-16 fiber strands for the traffic network.

City of Greeley Fiber and Zayo's Network

Zayo and the City of Greeley worked together to install an extensive fiber network throughout the community by exchanging use of each other's conduit. The City had installed and owns approximately 17.6 miles of existing two-inch conduit. The City allowed use of this conduit by Zayo in exchange of using approximately 14 miles of new 1.25" duct that Zayo installed.

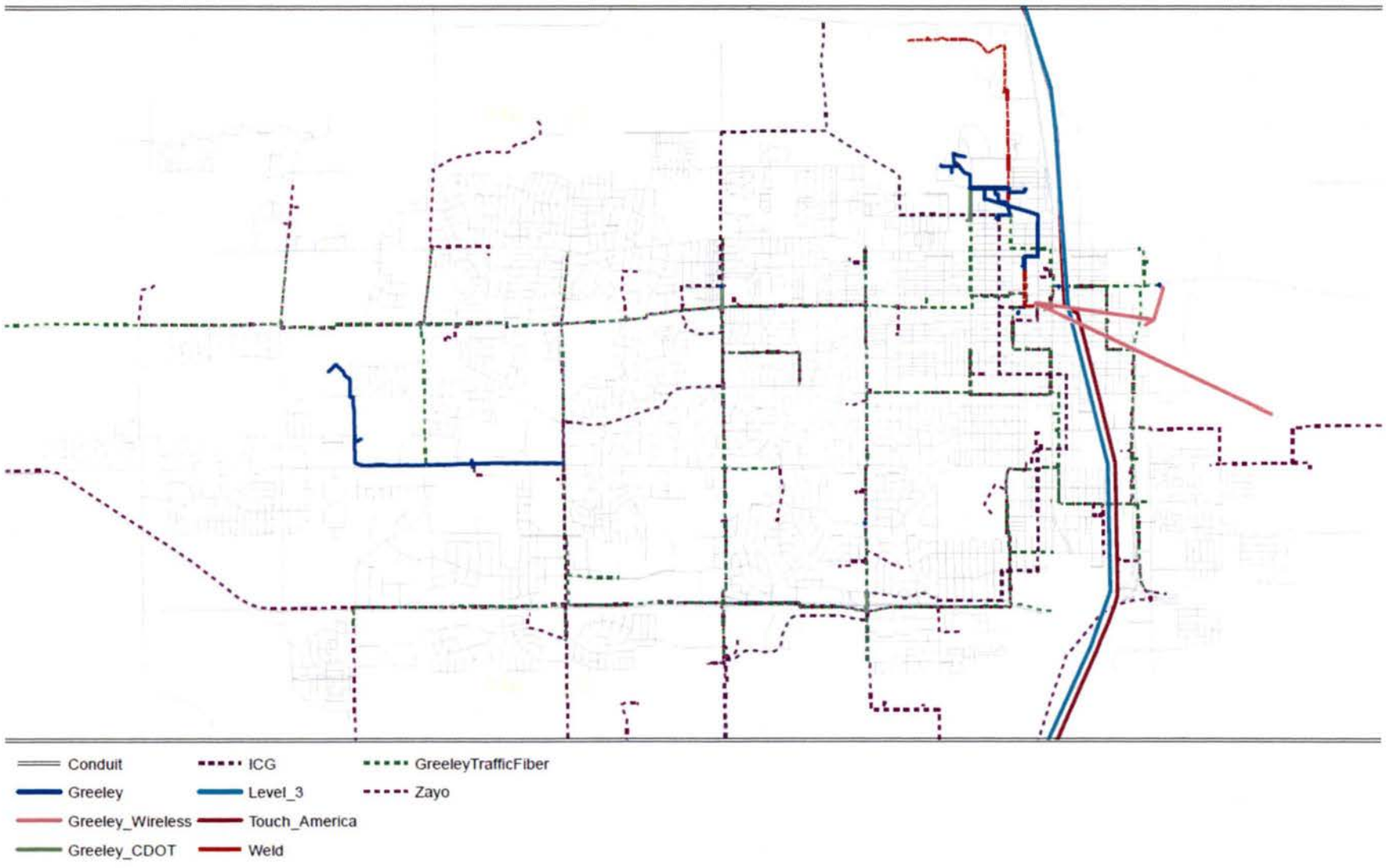
Other Fiber Assets

ICG, Level 3 and Touch America have all deployed fiber throughout the City of Greeley. The City of Greeley has an agreement to use some of the ICG fiber throughout the city. ICG is now owned by Level 3 and Level 3 is currently being acquired by CenturyLink.

Weld County also owns fiber within the City of Greeley. Additionally, Comcast and CenturyLink have fiber optic facilities within Greeley; however, maps of their network are not publicly available.

Below is a map of the known fiber optic assets located within the City of Greeley.

Greeley, CO
Existing Fiber Assets



Town of Windsor, School District Fiber

In Windsor, the Town has connected several of its primary locations and the schools. The Town's Public Works facility, Town Hall, the Police Station, the Parks Maintenance Facility and the Community Recreation Center are connected with this fiber network. The school network includes fiber to Grandview Elementary, Windsor High School, Weld County school district offices, Tozer Elementary, Skyview Elementary, Mountain Elementary and the Middle School.

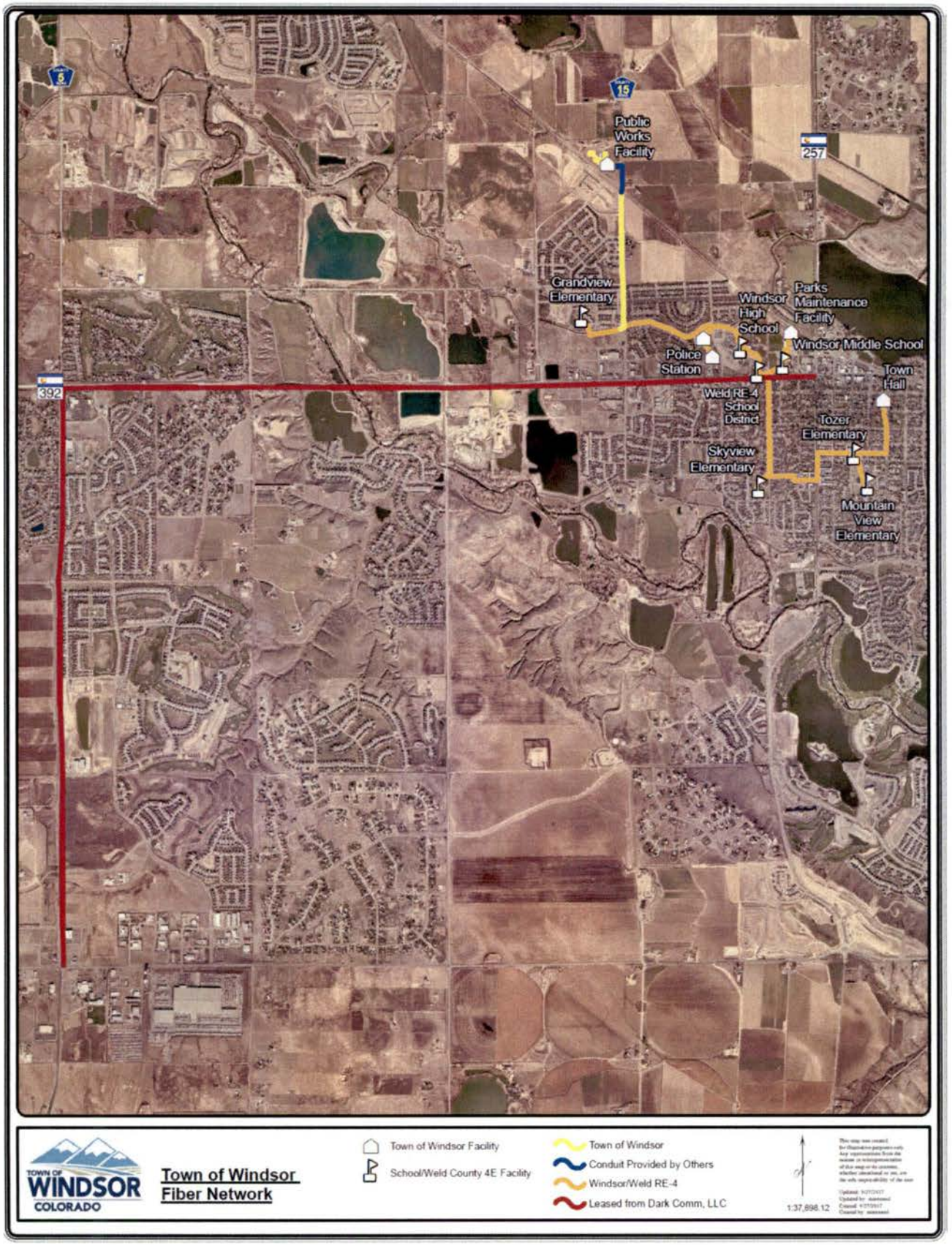
The Town of Windsor also leases fiber through Dark Comm.

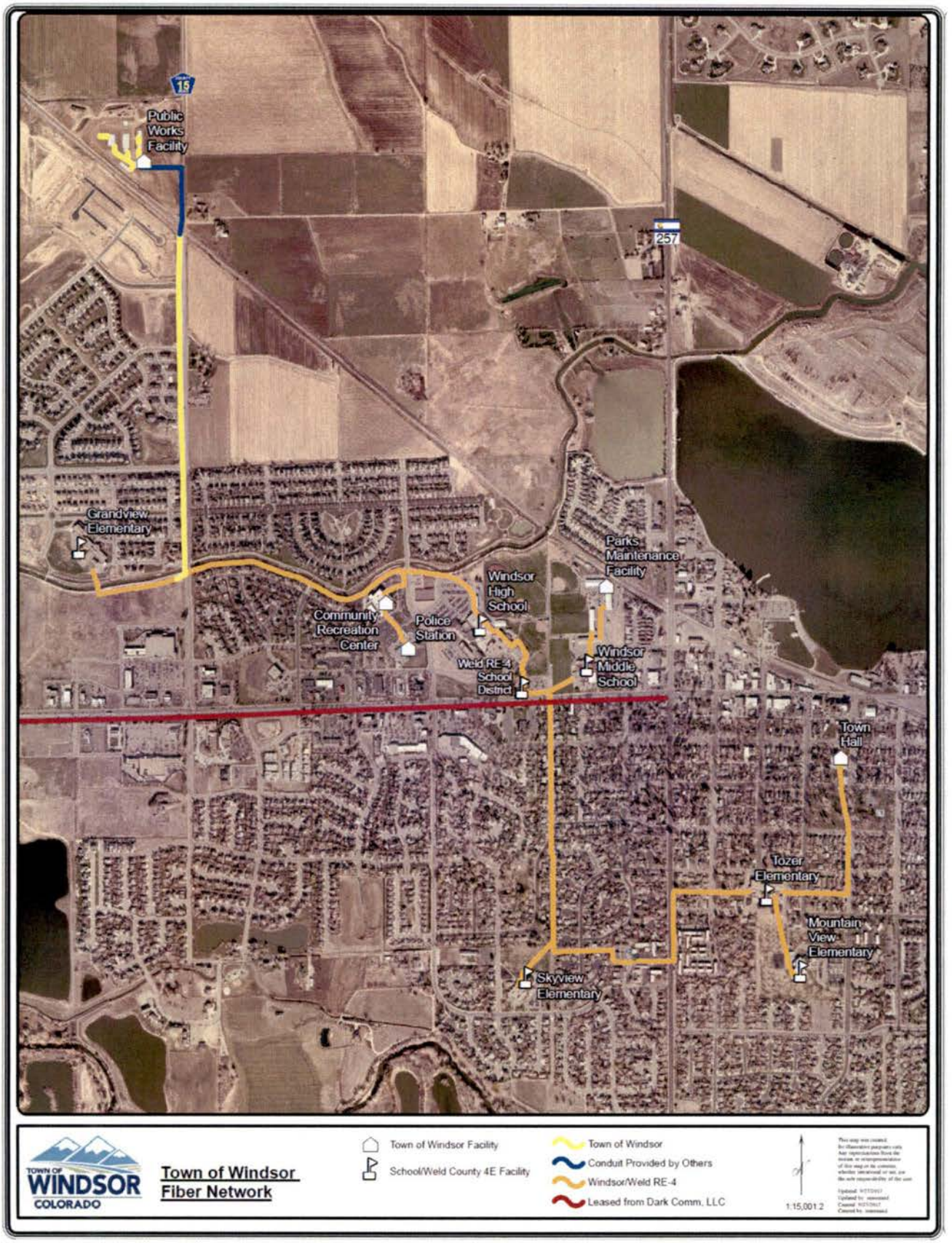
The map on the next page shows a high-level view of the network. After that, on the following page is a zoomed-in picture of this network, showing the various locations described above and their fiber connections.

Other Fiber Assets

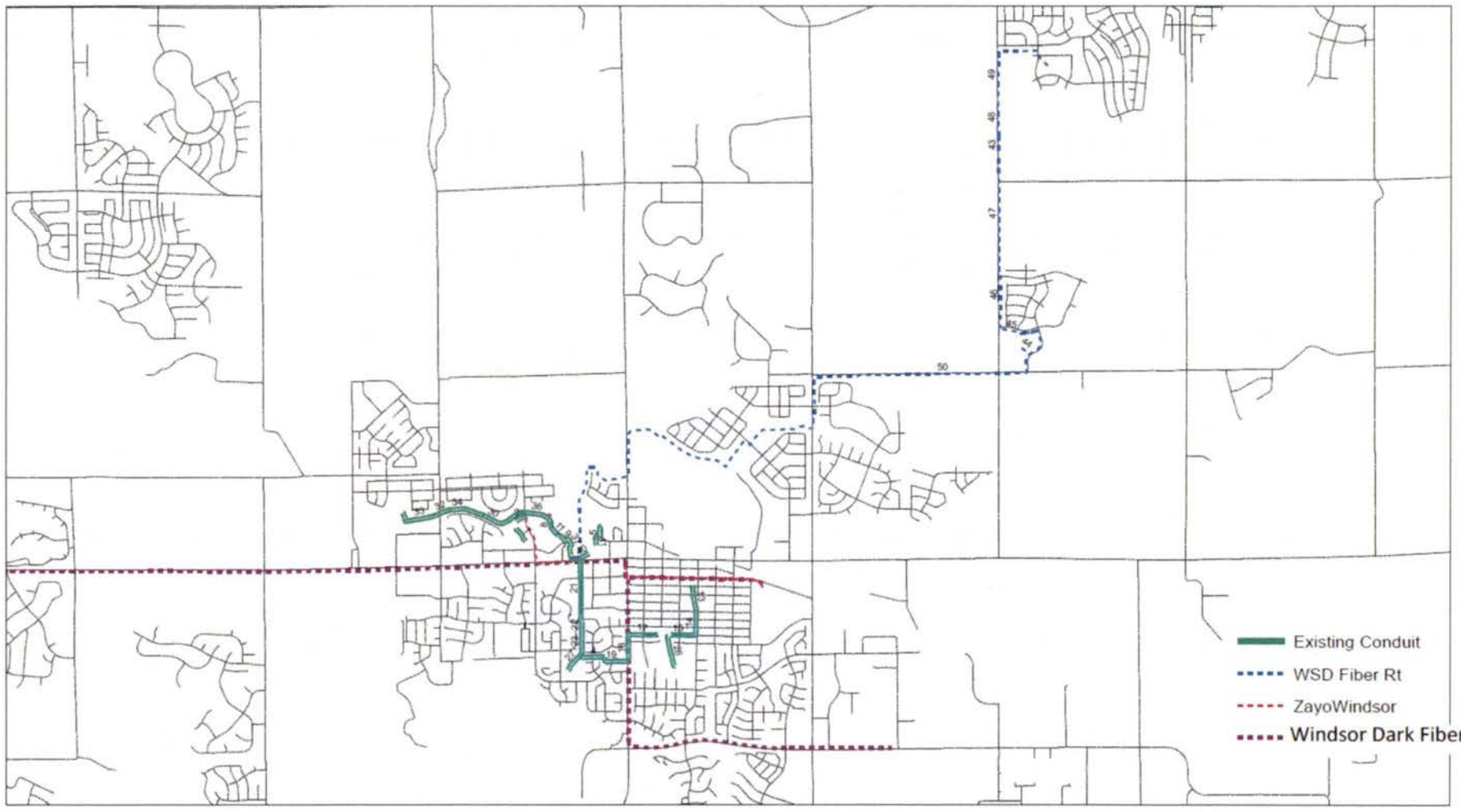
In addition to the Town of Windsor and the school district's fiber facilities, Zayo has installed fiber within the Town and there is existing conduit within the Town that have mapped and identified.

As noted above, Comcast and CenturyLink have fiber installed within the Town, but these maps are not publicly available.


5
15
257
392
Public Works Facility
Grandview Elementary
Windsor High School
Parks Maintenance Facility
Windsor Middle School
Police Station
Town Hall
Weld RE-4 School District
Tozer Elementary
Skyview Elementary
Mountain View Elementary
TOWN OF WINDSOR COLORADO
Town of Windsor Fiber Network
Town of Windsor Facility
School/Weld County 4E Facility
Town of Windsor
Conduit Provided by Others
Windsor/Weld RE-4
Leased from Dark Comm, LLC
1:37,898.12


Public Works Facility
257
Grandview Elementary
Parks Maintenance Facility
Windsor High School
Community Recreation Center
Police Station
Weld RE-4 School District
Windsor Middle School
Town Hall
Tozer Elementary
Mountain View Elementary
Skyview Elementary
TOWN OF WINDSOR COLORADO
Town of Windsor Fiber Network
Town of Windsor Facility
School/Weld County 4E Facility
Town of Windsor
Conduit Provided by Others
Windsor/Weld RE-4
Leased from Dark Comm, LLC
1:15,001.2

Windsor, CO
Existing Fiber Assets



Section 3 – "What"

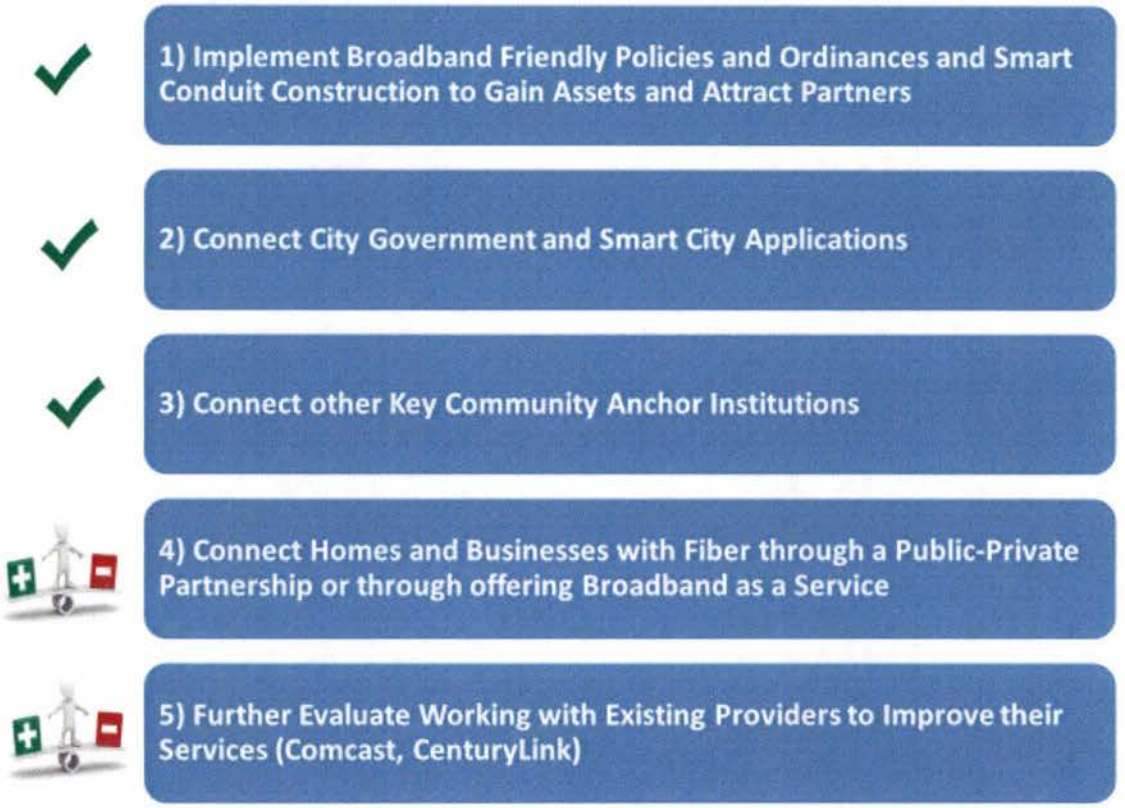
The following section describes "what" to consider. This section discusses what levels of investment may be required to upgrade the existing infrastructure to support a variety of broadband, cellular backhaul, smart city and e-government applications. It provides a detailed analysis of several levels of broadband infrastructure investment and what each level of investment may cost. This section also discusses the considerations to implement a Gigabit broadband strategy or connecting homes and businesses with fiber, the estimated capital costs for doing so and what other municipalities have done or are considering doing for implementation of a Gigabit broadband strategy. This section discusses several types of public private partnership models and examples of other municipalities that have implemented them.

Best Practices and Levels of Investment

Municipalities are considering various approaches to prepare for future capacity and to facilitate better broadband services for their communities. These approaches and various levels of investment are discussed in detail below and examples of what other cities and local governments are doing are provided within each consideration for investment.

In summary, here are the various levels of investment that are considered within this plan. NEO and City/Town staff suggest that the City/Town go forward with options 1-3 below and further evaluate the pros and cons of option 4 and 5.

Levels of Investment



The first three recommendations will facilitate and lower the costs for broadband implementation and lay the foundation for improving broadband infrastructure within both communities, regardless of whether the City/Town decides to move forward with a Gigabit broadband strategy to connecting homes and businesses, or not.

Connecting city government locations (water monitoring systems, public safety and other government buildings), smart city applications (traffic lights and parking meters) and key community anchor institutions (i.e. hospitals, schools, and universities) with fiber will greatly enhance communications and broadband speeds for these locations, while dramatically reducing communications costs. While these key facilities are being connected with fiber, both communities will gain more fiber assets that can be leveraged for building out to neighborhoods to connect homes and businesses with fiber. Implementing a shadow conduit/dig once policy will allow the City/Town to facilitate further broadband development by reducing the costs of broadband expansion, by levering existing public works or construction by other entities.

All of these first three levels of investment will improve communications for applications that will be needed regardless of whether or how the City/Town moves forward with a more ubiquitous Gigabit broadband strategy. Additionally, these strategies will lower the overall

cost of further expansion and will provide assets (conduit and fiber) for the City/Town to use as leverage to potentially negotiate a public-private partnership for further expansion.

NEO and staff recommend that investigation into how to implement a ubiquitous Gigabit broadband strategy for homes and businesses be further evaluated (item #4 and #5 above under Levels of Investment.) This would include weighing the pros and cons of various public-private partnership models or providing broadband services directly to citizens and businesses or working with the incumbent providers Comcast and CenturyLink to improve their availability of Gigabit broadband services.

The companion report will provide the financial implications and considerations for implementation of connecting homes and businesses with fiber. Financial models for public-private partnerships or for the City/Town to offer broadband services directly to citizens and businesses will be provided.

1) Implement Broadband Friendly Policies and Ordinances and Smart Conduit Construction to Gain Assets and Attract Partners

Often a municipality does not have the capital to invest in a comprehensive broadband network, but it will have the ability to provide in-kind contributions, tax and other economic incentives, use of existing assets, and to enact policies and ordinances that are broadband-friendly. All of these strategies have the effect of lowering the cost for a private carrier to deploy a fiber or wireless network within a community, with little to no investment directly from the municipality.

Policies and Ordinances

Municipalities have the power to significantly reduce the capital costs of broadband infrastructure deployment by implementing policies and ordinances that are broadband-friendly. NEO has provided a white paper describing in detail these recommended policies to the City of Greeley and the Town of Windsor staff. These recommendations include implementation of a Dig Once Policy, Shadow Conduit Requirements, Joint Trench and Joint Build Agreements, Abandoned Fiber and Conduit Policy, Land Use Policies for New Developments, Streamlined Permitting Processes, and One-Touch Make Ready Requirements.

These policies can be implemented to facilitate investment from the private sector and can also be used to gain substantial assets owned by the City of Greeley and the Town of Windsor that can be leveraged for future broadband deployment.

Other municipal facilitation to encourage and support investment could include removing roadblocks and creating efficiencies that a private company cannot achieve on its own.

Use of Existing Assets. Existing assets can include tower facilities, water towers, land, rights of way, existing conduit and existing fiber. Sixty to eighty percent of a fiber optic network's capital costs are in opening a trench or in burying conduit that will house fiber optic cable. Using existing conduit therefore, substantially reduces the capital costs of network deployment. If a municipality has existing conduit or fiber, these assets can be leveraged to entice further deployment of investment by the private sector. New networks can and are built on the foundation a community's already existing fiber and/or conduit as well as available land.

Economic Incentives. Economic incentives as well as logistic assistance from a city can help pave the way for more powerful broadband service. Most tax incentives are implemented at the State-level, but the City could influence the State's consideration of providing tax incentives in the form of accelerated depreciation, reduced property taxes and reduced sales taxes.

Establishing broadband friendly policies and ordinances will cost the City of Greeley and the Town of Windsor very little to implement, except potentially administrative and legal costs. Sample policies and ordinances that have been adopted by other municipalities have been provided to City/Town staff by NEO Connect.

These policies can be implemented to facilitate investment from the private sector and can also be used to gain substantial assets owned by the City of Greeley and the Town of Windsor that can be leveraged for future broadband deployment.

Smart Conduit Construction to Gain Assets and Attract Partners

Giving access to existing conduit owned by the City of Greeley and the Town of Windsor can be leveraged to attract potential partners that may be willing to deploy an all-fiber network. The City of Greeley and the Town of Windsor have a relatively small amount of conduit already installed within the community; however, given the interest in new construction within each of the communities, the City/Town should implement a shadow conduit policy that requires installation of additional conduit whenever work is being done within the City's right of way. By creating and implementing a shadow conduit policy, the City will gain additional conduit that can be used to leverage further investment.

This strategy could also be used as leverage if the municipality chooses to pursue a strategy to work with the incumbent providers to offer ubiquitous Gigabit broadband services. The municipality can gain conduit assets that may be used at a later time if the City/Town decides to become an infrastructure provider for broadband services or if the City/Town decides to enter into a public private partnership with one or many other internet service providers. Either way, the costs for building new conduit and fiber would be greatly reduced and this could be used as leverage with the incumbent providers. If the incumbent providers do not build out, or if net neutrality rules are not followed, or for whatever reason the City/Town needs to pivot on working with the incumbent providers, the City/Town could more easily do so with existing assets that could be used for fiber construction.

There are hundreds of examples of municipalities that are using smart conduit construction to gain assets and attract potential partners. In Centennial, CO, the City began a fiber optic and conduit initiative in 2008 as a public works effort connecting city buildings, traffic signals and other public facilities. The City implemented a dig once policy that required additional conduit be installed when work was being done in the right of way. To date, the City has installed more than 60 miles of conduit and fiber optic infrastructure suitable for broadband deployment while spending less than $600,000. This network is currently valued well over $6 Million. The City recently engaged in a formal process to incent providers to deploy a Gigabit-enabled fiber network to every home and business within the city limits. The City announced an agreement with Ting, where Ting would be able to use existing conduit and fiber to roll out its Gigabit services to the community.

As the community of Mesa, Arizona, began to grow, community leaders recognized that telecommunications would be a key element to its success. Mesa was an early adopter of "dig once" policy, placing conduit whenever streets were excavated for any other infrastructure purpose. Mesa has also taken advantage of non-traditional existing infrastructure, planting fiber in abandoned conduit that had been used for other utility purposes. This resulted in a network of 150 - 200 miles of fiber throughout the community. The investment has paid off in a number of ways over time and helped the city establish a broadband-friendly environment for economic development, allowing private sector companies to use the existing conduit and fiber to reduce their overall costs of infrastructure deployment.

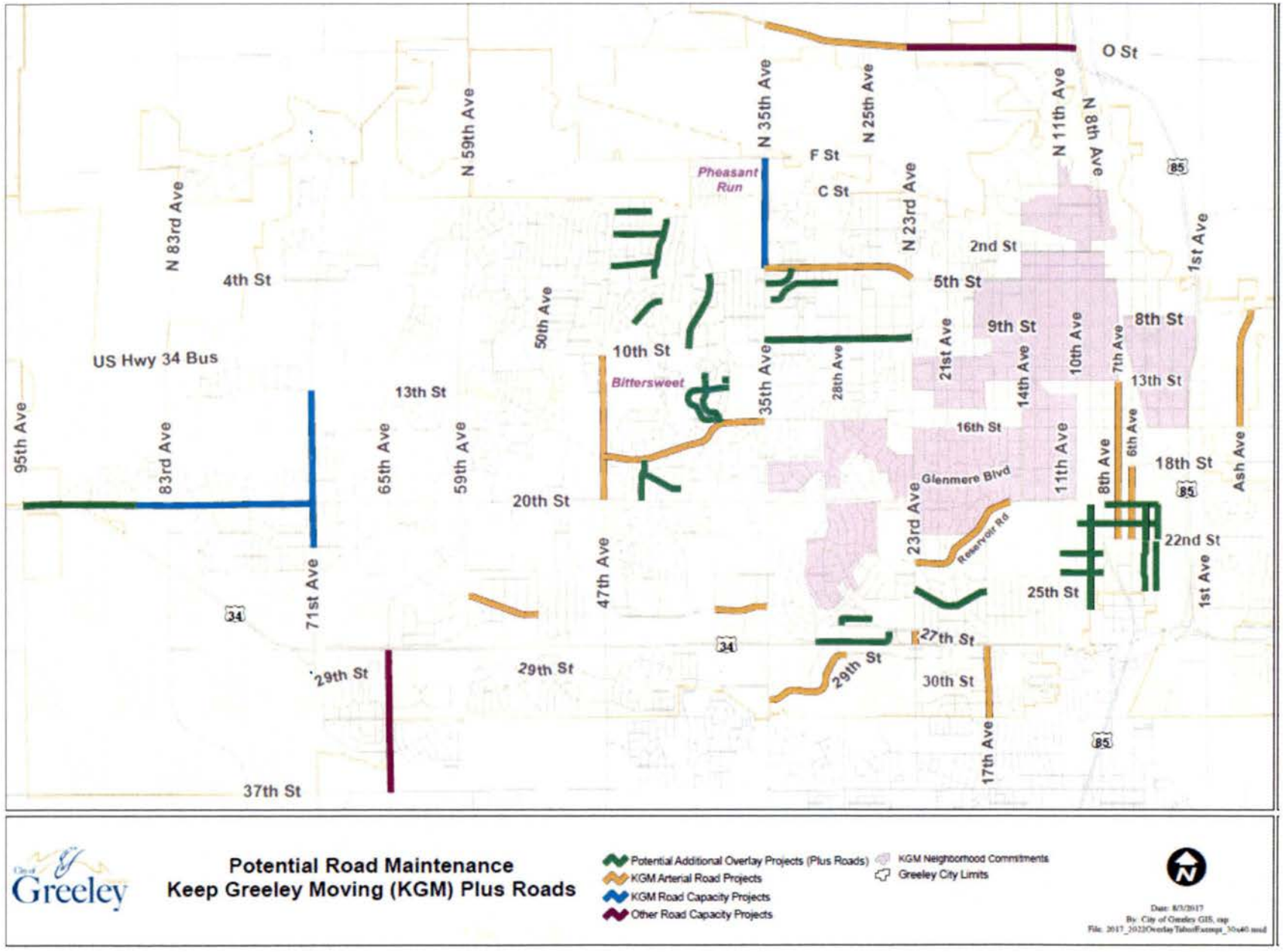
Bozeman, MT invested in multi-duct conduits, making it possible for nonprofit Bozeman Fiber, who leases the conduit, to reach more residences and businesses with service. Lincoln, Nebraska invested $700,000 to install a conduit system in 2012. Since then, their conduit network has grown to more than 300 miles and has served as a key component to attracting multiple (six) private carrier providers who lease the conduit, helping to pay off the initial investment.

Financial Implication to the City of Greeley and the Town of Windsor:
$3.00 - $6.50 per foot vs. $30 - $35 per foot in cost. Resulting in $28.50 per foot in cost savings

Putting in shadow conduit when work is being done in the right of ways would cost the City the incremental costs of the conduit (estimated at $1.50 - $3.50 per foot) plus the incremental cost for construction (estimated at $1.50 – 3.00 per foot). Consequently, if the City of Greeley and the Town of Windsor were to build conduit when trenches are not open, or when work is not being done in the right of way, costs for conduit material and labor would be approximately $30 - $35.00 per foot.

Each community should set aside budget for implementation of a shadow conduit policy. Typically, shadow conduit represents 1-2% of a road improvement's total project budget.

Below is a map of the City of Greeley's capital improvement projects.


O St
N 35th Ave
N 25th Ave
N 11th Ave
N 8th Ave
N 59th Ave
N 83rd Ave
F St
C St
Pheasant Run
N 23rd Ave
2nd St
1st Ave
4th St
5th St
9th St
8th St
50th Ave
10th St
21st Ave
10th Ave
7th Ave
US Hwy 34 Bus
Bittersweet
35th Ave
28th Ave
14th Ave
13th St
95th Ave
83rd Ave
65th Ave
59th Ave
16th St
6th Ave
18th St
Ash Ave
Glenmere Blvd
11th Ave
8th Ave
20th St
23rd Ave
Reservoir Rd
22nd St
47th Ave
71st Ave
25th St
1st Ave
34
27th St
29th St
29th St
29th St
30th St
37th St
17th Ave
85
Greeley
Potential Road Maintenance
Keep Greeley Moving (KGM) Plus Roads
Potential Additional Overlay Projects (Plus Roads)
KGM Arterial Road Projects
KGM Road Capacity Projects
Other Road Capacity Projects
KGM Neighborhood Commitments
Greeley City Limits
N

Projects that were for Road Capacity Projects, and "Other" Road Capacity Projects could be leveraged to install shadow conduit. If the City of Greeley installed shadow conduit when work is being done in the right of way, the City would save over $1 Million in broadband construction costs.

The following chart shows the cost of building fiber for a new build (Total of $1.386 Million) versus installing shadow conduit ($288,396) resulting in a savings of $1.098 Million.

NEO Connect
City of Greeley, Town of Windsor
Shadow Conduit Policy

Description	Unit Rate	Conduit/Fiber, New Build			Shadow Conduit Build			Savings with Shadow Conduit Policy
		Quantity		Subtotal	Quantity		Subtotal	
Engineering Capital Improvement Projects	$ 0.31	27,070.00	FT	$ 8,378.94	27,070.00	FT	$ 8,378.94	$ -
Construction Management and As-Builts	$ 0.72	27,070.00	FT	$ 19,368.83	27,070.00	FT	$ 19,368.83	$ -
Materials								
1.25" SDR 11 HDPE Duct	$ 0.46	27,070.00	FT	$ 12,421.57	27,070.00	FT	$ 12,421.57	$ -
24"x36"x24" Polycrete Handhole with 1 Piece 20K Lid	$ 382.39	54.00	EA	$ 20,649.08	54.00	EA	$ 20,649.08	$ -
Labor								
Joint build construction	$ 6.50	-	FT	$ -	27,070.00	FT	$ 175,955.00	$ 175,955.00
Bore and Place 2 - 1.25" SDR 11 HDPE Duct	$ 47.06	27,070.00	FT	$ 1,274,007.09	-	FT	$ -	$ (1,274,007.09)
Place 24"x36"x24" handhole with gravel and soil removal	$ 955.98	54.00	EA	$ 51,622.70	54.00	EA	$ 51,622.70	$ -
Total				**$ 1,386,448.22**			**$ 288,396.12**	**$ (1,098,052.09)**

Windsor also provided the capital improvement projects that are planned. Current projects for road improvement are crack repair, sealing and overlay, which most likely refers to surface grind and asphalt overlay. None of these current projects are good candidates for shadow conduit, as there is not an open trench.

2) Connect City Government Facilities, Smart City Applications

Another level of investment may be for the City and Town to connect their other government facilities, public safety locations and their smart city applications. Smart city applications may include connecting traffic lights, traffic management, and smart journey planning. Smart journey planning systems use open city data in order to recommend how individuals can best navigate from one place to the next. The systems are becoming sophisticated enough to take into consideration personal preferences such as cost, safety concerns and CO2 footprint, as well as real-time traffic congestion and traffic patterns.

Other smart city applications may include connecting smart parking meters, automated meter reading and utilities management. Street lights are often connected with fiber and applications are emerging that allow active safety; increasing light levels in city centers when the light system detects individuals or motion, at bus stops or along walkways.

Another top smart city application is environmental monitoring, where a city that uses monitoring stations for pollution or weather conditions can now connect and use these systems for real time data collection and can pinpoint potential sources of pollution or weather issues and quickly react and efficiently deal with potential problems.

Other smart city applications are emerging around transport sharing, whether it is sharing bikes or cars or rideshare. Smart cars and electric cars will be a key enabler for wider adoption of city center car sharing, providing information to individuals about location and availability of shared cars and up-to-date information of pick up times for rideshare applications.

City of Greeley Traffic Lights, Public Safety, and Smart Parking Locations

A design to connect the City of Greeley remaining traffic lights, public safety locations, smart parking locations and the water metering or SCADA systems was conducted.

The City of Greeley has already connected most of their traffic lights. There are (3) traffic lights that are not currently connected on the fiber network. These are located at the following locations:

- 71st Ave & 20th St,
- 65th Ave & 20th St,
- Hwy 34 & 83rd Ave.

The City of Greeley would like fiber connectivity to downtown locations that may be potential smart parking meter kiosks. These are located at 5th St on the north, 11th Ave on the west, 7th Ave on east and 11th St on the south.

The design also connects the City of Greeley public safety locations and City offices that are not yet connected to fiber.

Here are the public safety locations for the City of Greeley.

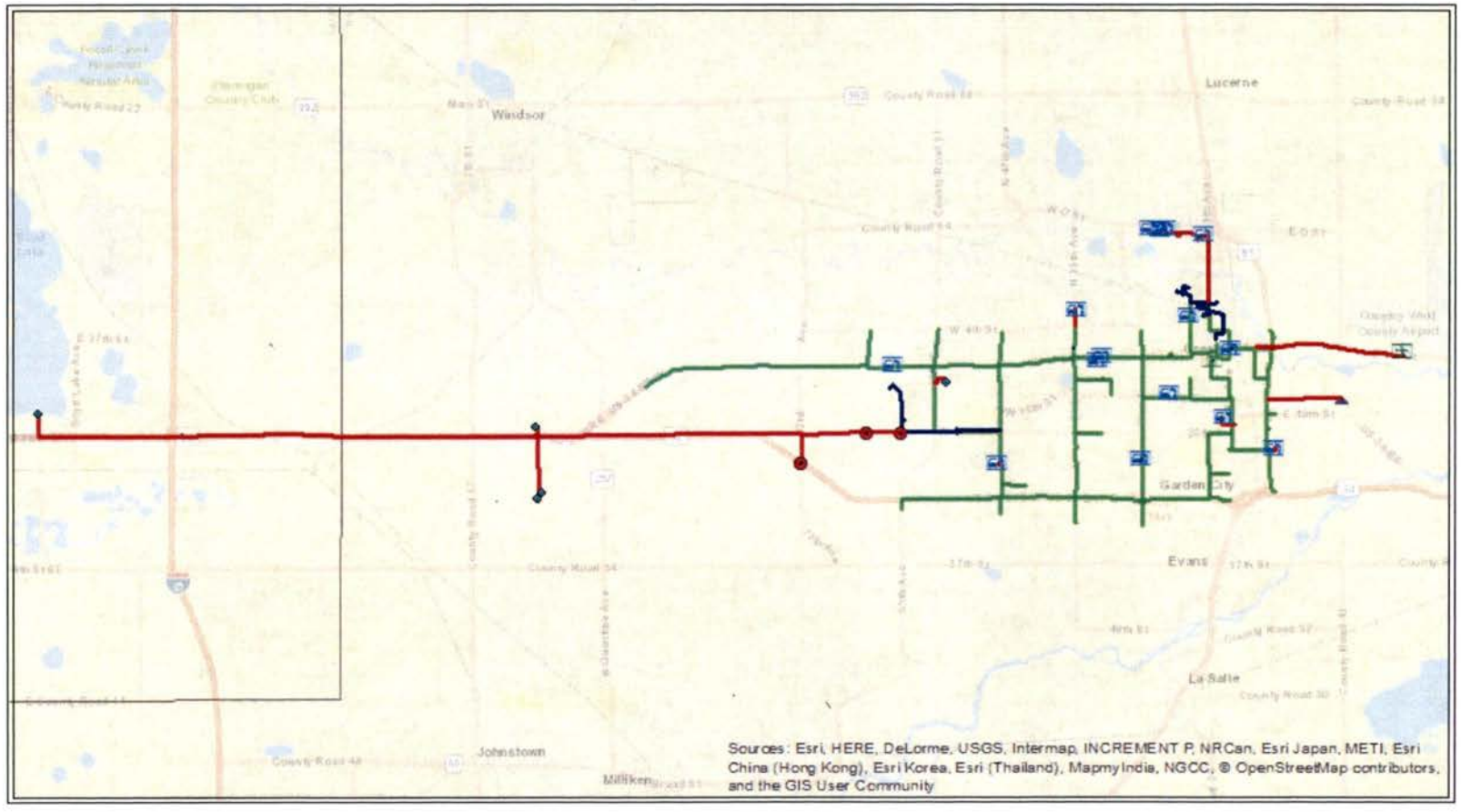
Colorado State Patrol - District Three: Northeast Colorado/Troop 3A	10601 West 10th Street
Weld County Paramedics Service Station 1	1121 M Street
Greeley Fire Department Station 1	1420 2nd Street
Greeley Fire Department Station 3	150 35th Avenue
Airlife Of Greeley	1801 16th Street
North Colorado Med Evac	1801 16th Street
University Of Northern Colorado Police Department	1813 8th Avenue
Greeley-Weld County Regional Communications Center	1950 O Street
Weld County Sheriffs Office District 1 / District 4	1950 O Street
Weld County Jail	2110 O Street
Greeley Fire Department Station 4	2191 1st Avenue
Platte Valley Youth Services Center	2200 O Street
Greeley Fire Department Station 2	2301 Reservoir Road
Greeley Police Department	2875 10th Street
Greeley Fire Department Station 5	4701 West 24th Street
Greeley Fire Department Station 7	6623 West 10th Street
Linn Grove Cemetery	1700 Cedar Avenue
Weld County Airport	635 Airport Road
Adult Parole Location - Greeley Office	800 8TH Avenue Suite 140

Additionally, fiber connectivity is considered for the Weld County Airport (635 Airport Rd, Greeley) and the Linn Grove Cemetery (1700 Cedar Ave, Greeley).

Further, NEO provided the cost estimates to connect the City of Greeley's water metering system or SCADA system. There are a few water meters that are located outside of the City limits. These were not included in the design.

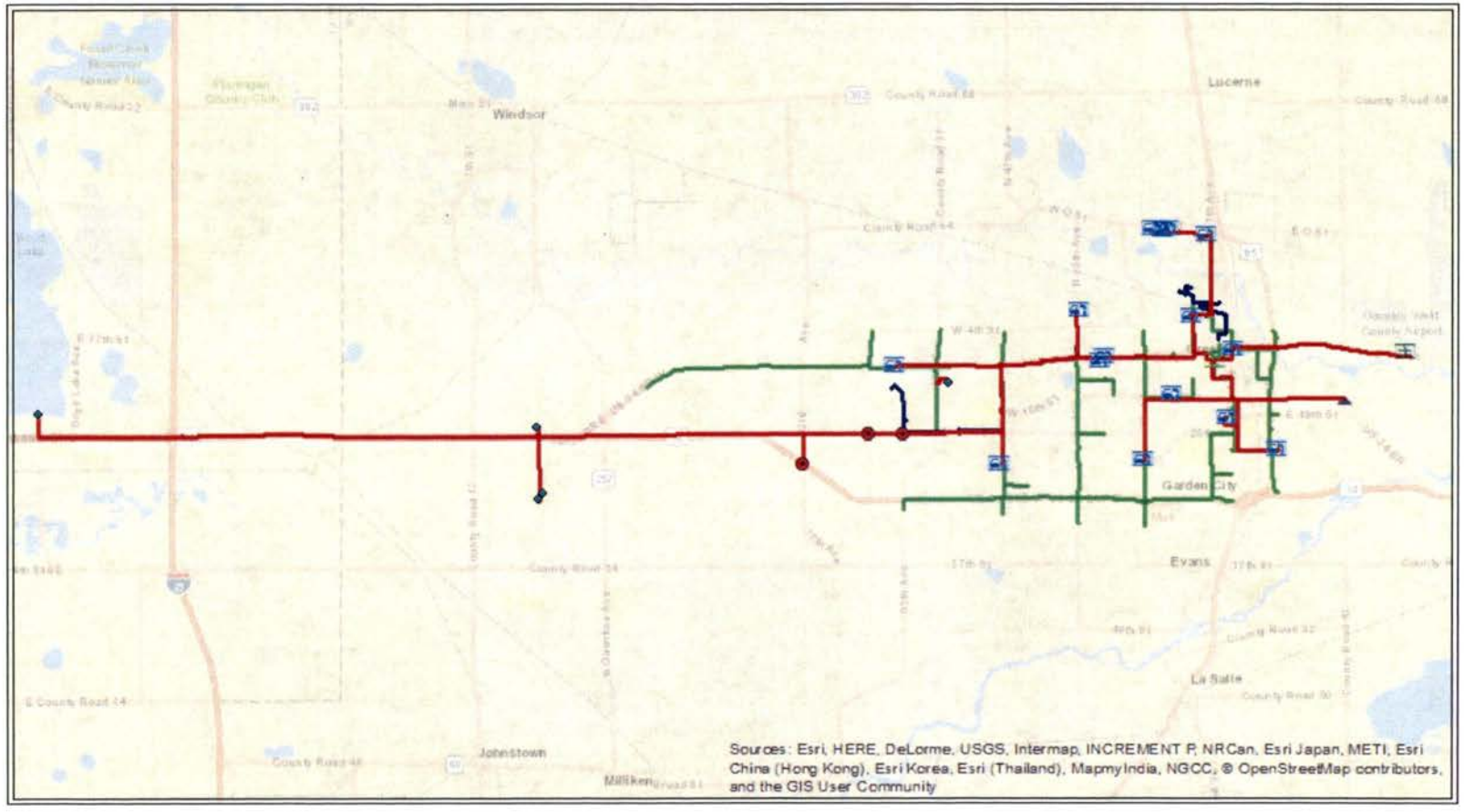
NEO's team provided a high-level design with the use of the existing fiber that the City of Greeley has access to, as well as a high-level design without the use of existing assets. The first map on the following page shows the design of using existing assets. The second map shows the design of a new build, or without the use of existing assets.

City of Greeley
Smart City - Extensions



- Smart City Existing Fiber Rts
- Greeley
- GreeleyTraffic
- Traffic_Lights
- Airports
- Cementery
- Government
- Public_Safety
- WaterMonitorSites

City of Greeley
Smart City - New Build



- Smart_Rt
- Greeley
- GreeleyTraffic
- Traffic_Lights
- Airports
- Cementery
- Government
- Public_Safety
- WaterMonitorSites

Below is a further breakdown of these costs for each of the options listed above.

Greeley, Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City" Applications

			With the Use of Existing Fiber			As a New Build		
Item #	UOM	Description	Unit Price	Estimated Quantity	Extended Cost	Estimated Quantity	Extended Cost	Notes
ENGINEERING & CONSTRUCTION MANAGEMENT								
0000	Linear Feet	Engineering (DE,FE,Permit,GIS)	$1.25	83,090	$ 103,863	192,045	$ 240,056	
0001	Linear Feet	Construction Management (QC,Tracking)	$2.00	83,090	$ 166,180	192,045	$ 384,090	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 270,043**		**$ 624,146**	
CONSTRUCTION LABOR		**Total Linear Footage**		**54,874**		**163,829**		
		Water Meters Inside City Limits		**28,216**		**28,216**		
2001	Linear Feet	Rock Adder (All types)	$38.00	0	$ -	0	$ -	
2002	Square Feet	Cut and Restore Asphalt or Concrete	$25.00	1,098	$ 27,450	3,277	$ 81,925	
2003	Linear Feet	Install Tracer Tape	$0.35	83,090	$ 29,082	192,045	$ 67,216	
2004	Linear Feet	Directional Bore - 2" Conduit	$15.00	56,149	$ 842,235	165,104	$ 2,476,560	
		Directional Bore - 2" Conduit - Dual	$8.00		$ -	8,430	$ 67,440	
		Water Meter Rts						
	Linear Feet	Directional Bore - 2" Conduit/Crossing Streets & Driveways Inside City Limits	$15.00	2,100	$ 31,500	2,100	$ 31,500	
2007	Fiber Feet	Pull Fiber Through Conduit	$1.00	56,149	$ 56,149	173,534	$ 173,534	
		Directed Buried						
2006	Fiber Feet	Water Meters - Inside City Limits	$1.50	26,941	$ 40,412	26,941	$ 40,412	
2008	Each	Vault	$300.00	112	$ 33,600	330	$ 99,000	
3001	Each	Splice Closure Preparation	$195.00	52	$ 10,140	58	$ 11,310	
3002	Each	Single Fusion Fiber Splicing	$39.00	912	$ 35,568	3,936	$ 153,504	
3005	Each	Install Patch Panel & Prep Cables	$375.00	52	$ 19,500	58	$ 21,750	
4001	Each	Core Building	$250.00	22	$ 5,500	22	$ 5,500	
4002	Linear Feet	Install Indoor Conduit	$5.25	2,200	$ 11,550	2,200	$ 11,550	
4004	Linear Feet	Pull Drop Fiber through existing or new conduit	$1.75	11,000	$ 19,250	11,000	$ 19,250	
TOTAL CONSTRUCTION LABOR					**$ 1,161,935**		**$ 3,260,450**	
MATERIALS								
5000	Linear Feet	288 Count Fiber	$2.14		$ -	42,654	$ 91,280	
5001	Linear Feet	144 Count Fiber	$1.24		$ -	36,323	$ 45,041	
5002	Linear Feet	96 Count Fiber	$0.90	14,860	$ 13,374	27,856	$ 25,070	
5003	Linear Feet	48 Count Fiber	$0.75		$ -	25,173	$ 18,880	
5004	Linear Feet	24 Count Fiber	$0.50	43,144	$ 21,572	48,435	$ 24,218	
5004	Linear Feet	24 Count Fiber - Water Meters Inside City Limits	$0.50	29,380	$ 14,690	29,380	$ 14,690	
5005	Linear Feet	12 Count Fiber Drop	$0.38	11,000	$ 4,180	11,000	$ 4,180	
							$ -	
5041	Linear Feet	2" Conduit	$1.00	54,874	$ 54,874	172,259	$ 172,259	
		Directional Bore - 2" Conduit/Crossing Streets & Driveways Inside City Limits	$1.00	2,100	$ 2,100	2,100	$ 2,100	
5046	Each	Vault	$600.00	112	$ 67,200	330	$ 198,000	
5047	Linear Feet	#12 Locate wire	$0.18	83,090	$ 14,956	192,045	$ 34,568	
							$ -	
5061	Each	FOSC 450 B Gel Enclosure	$265.00	52	$ 13,780	58	$ 15,370	
5067	Each	D Gel Trays	$18.23	912	$ 16,621	3,936	$ 71,734	
5065	Each	Splice Heat Shrink Sleeves	$0.30	52	$ 16	58	$ 17	
5081	Each	Patch Panel	$675.00	52	$ 35,100	58	$ 39,150	
5083	Linear Feet	1" Indoor Conduit for Drop fiber	$0.80	2,200	$ 1,760	2,200	$ 1,760	
		Freight						
		Sales Tax						
TOTAL MATERIALS					**$ 260,223**		**$ 758,316**	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 270,043**		**$ 624,146**	
TOTAL LABOR					**$ 1,161,935**		**$ 3,260,450**	
TOTAL MATERIALS					**$ 260,223**		**$ 758,316**	
TOTAL					**$ 1,692,201**		**$ 4,642,912**	

With the use of existing fiber, the total project capital costs are $1.692 Million. As a new build, the projected capital costs are $4.643 Million. There are a few water meters that are located outside of the City limits. To add on the meters outside of the City limits, the incremental costs of $275,810 are shown below.

GREELEY - Adding on the Water Meters outside of City Limits

Item #	UOM	Description	Unit Price	Estimated Quantity	Extended Cost
ENGINEERING & CONSTRUCTION MANAGEMENT					
0000	Linear Feet	Engineering (DE,FE,Permit,GIS)	$0.35	41,358	$ 14,475
0001	Linear Feet	Construction Management (QC,Tracking)	$0.65	41,358	$ 26,883
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 41,358**
CONSTRUCTION LABOR		**Water Meters Outside City Limits - Weld**		**15,563**	
		Water Meters Outside City Limits - Larimer		**25,795**	
2001	Linear Feet	Rock Adder (All types)	$38.00	0	$ -
2002	Square Feet	Cut and Restore Asphalt or Concrete	$25.00	0	$ -
2003	Linear Feet	Install Tracer Tape	$0.35	41,358	$ 14,475
2004	Linear Feet	Directional Bore - 2" Conduit	$15.00	0	$ -
		Water Meter Rts			
	Linear Feet	Directional Bore - 2" Conduit/Crossing Streets & Driveways Inside City Limits	$15.00	4,700	$ 70,500
		Railroad Crossing - 2" Steel Conduit	$23.00	1,000	$ 23,000
		Railroad Permits	$1,000.00	2	$ 2,000
2007	Fiber Feet	Pull Fiber Through Conduit	$1.00		$ -
		Directed Buried			
2006	Fiber Feet	Water Meters	$1.50	41,358	$ 62,037
2008	Each	Vault	$300.00	3	$ 900
3001	Each	Splice Closure Preparation	$195.00	5	$ 975
3002	Each	Single Fusion Fiber Splicing	$39.00	168	$ 6,552
3005	Each	Install Patch Panel & Prep Cables	$375.00	5	$ 1,875
4001	Each	Core Building	$250.00	1	$ 250
4002	Linear Feet	Install Indoor Conduit	$5.25	100	$ 525
4004	Linear Feet	Pull Drop Fiber through existing or new conduit	$1.75	500	$ 875
TOTAL CONSTRUCTION LABOR					**$ 183,964**
MATERIALS					
5000	Linear Feet	288 Count Fiber	$2.14		$ -
5001	Linear Feet	144 Count Fiber	$1.24		$ -
5002	Linear Feet	96 Count Fiber	$0.90		$ -
5003	Linear Feet	48 Count Fiber	$0.75		$ -
5004	Linear Feet	24 Count Fiber	$0.50		$ -
5004	Linear Feet	24 Count Fiber - Water Meters	$0.50	43,020	$ 21,510
5005	Linear Feet	12 Count Fiber Drop	$0.38	500	$ 190
5041	Linear Feet	2" Conduit	$1.00		$ -
		Directional Bore - 2" Conduit/Crossing Streets & Driveways Inside City Limits	$1.00	4,700	$ 4,700
		Railroad Crossing - 2" Steel Conduit	$7.00	1,000	$ 7,000
5046	Each	Vault	$600.00	3	$ 1,800
5047	Linear Feet	#12 Locate wire	$0.18	41,358	$ 7,444
5061	Each	FOSC 450 B Gel Enclosure	$265.00	5	$ 1,325
5067	Each	D Gel Trays	$18.23	168	$ 3,062
5065	Each	Splice Heat Shrink Sleeves	$0.30	5	$ 2
5081	Each	Patch Panel	$675.00	5	$ 3,375
5083	Linear Feet	1" Indoor Conduit for Drop fiber	$0.80	100	$ 80
		Freight			
		Sales Tax			
TOTAL MATERIALS					**$ 50,488**

TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT	**$ 41,358**
TOTAL LABOR	**$ 183,964**
TOTAL MATERIALS	**$ 50,488**
TOTAL	**$ 275,810**

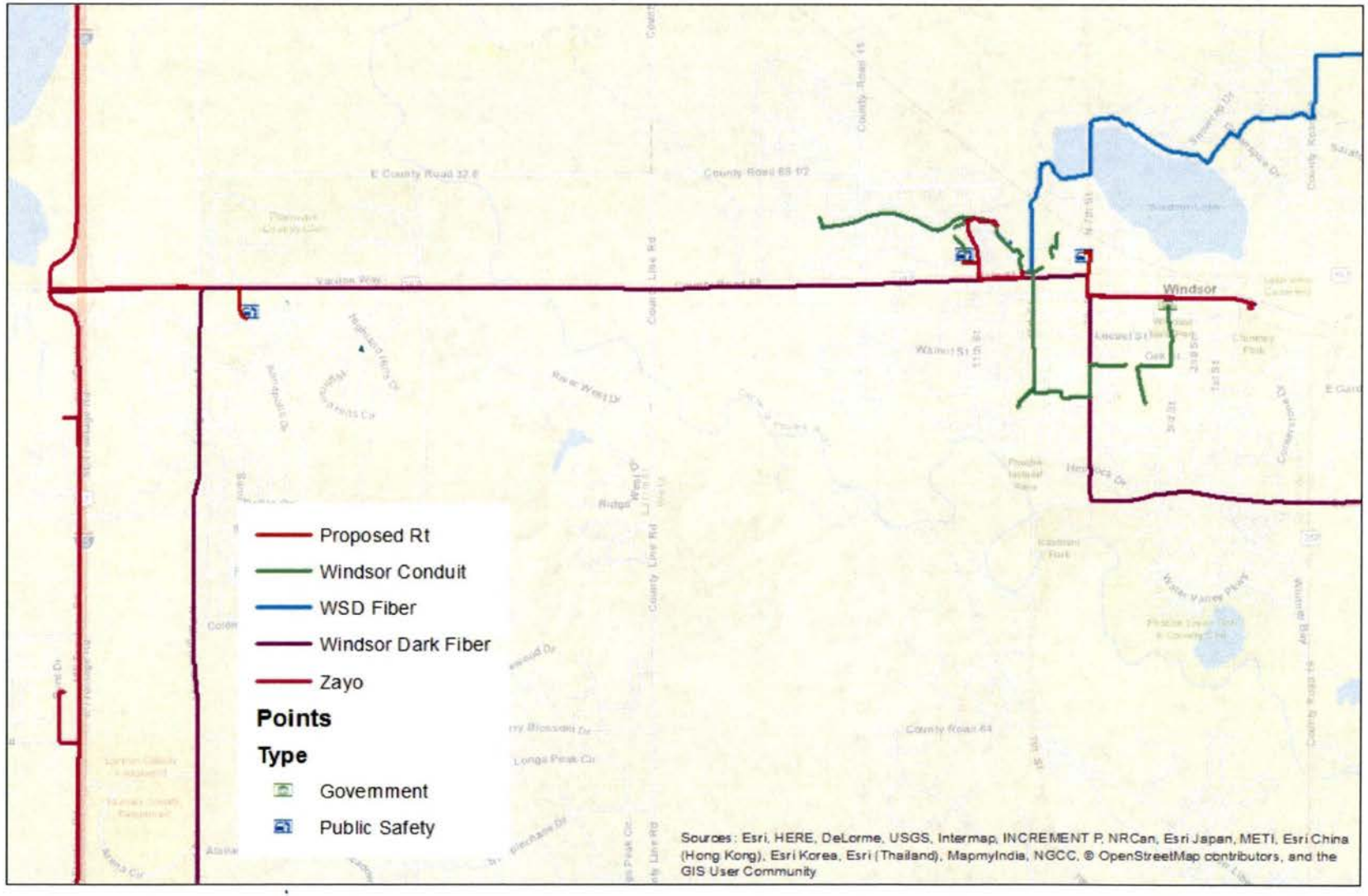
Town of Windsor Public Safety, SCADA, Government Offices and Smart City Applications

The Town of Windsor would like their public safety locations and water SCADA systems to be included in a fiber design. Here are the public safety locations:

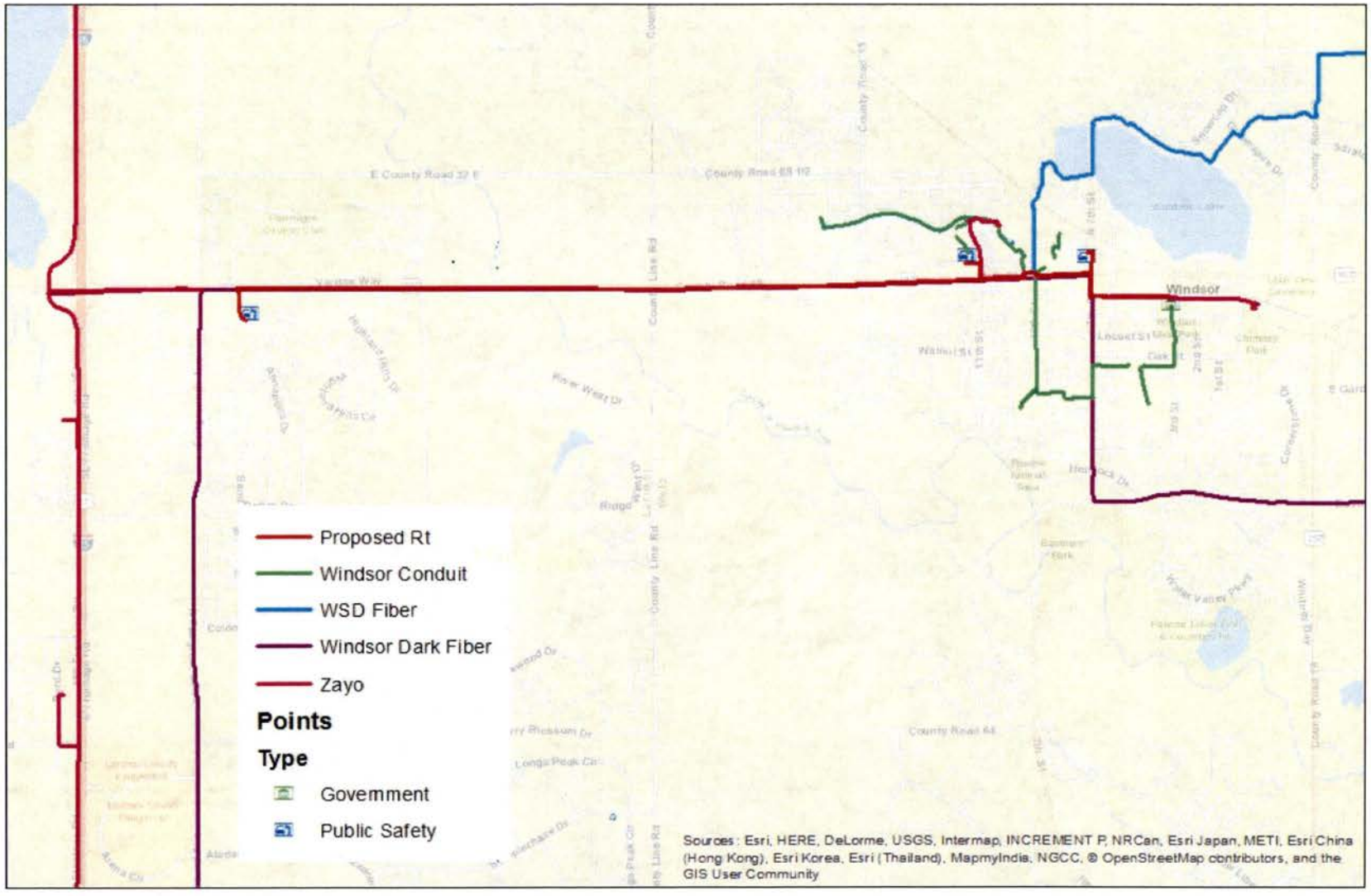
Windsor Severence Fire & Rescue Station 1	100 7th Street
Windsor Police Department	200 North 11th Street
Windsor Severance Fire & Rescue Station 3	7790 Rea Parkway

A map of their SCADA locations was provided for the study. NEO's team provided a high-level design with the use of the existing fiber that the Town of Windsor has access to, as well as a high-level design without the use of existing assets. The first map on the following page shows the design of using existing assets. The second map shows the design of a new build, or without the use of existing assets.

City of Windsor
Smart City - Extension



City of Windsor
Smart City - New Build



WINDSOR - Public Safety, SCADA, Smart City

			With the Use of Existing Fiber			As a New Build		
Item #	UOM	Description	Unit Price	Estimated Quantity	Extended Cost	Estimated Quantity	Extended Cost	Notes
ENGINEERING & CONSTRUCTION MANAGEMENT								
0000	Linear Feet	Engineering (DE,FE,Permit,GIS)	$1.90	2,480	$ 4,712	32,400	$ 61,560	
0001	Linear Feet	Construction Management (QC,Tracking)	$2.75	2,480	$ 6,820	32,400	$ 89,100	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 11,532**		**$ 150,660**	
CONSTRUCTION LABOR		**Total Linear Footage**		**2,480**		**32,400**		
2001	Linear Feet	Rock Adder (All types)	$38.00	0	$ -	0	$ -	
2002	Square Feet	Cut and Restore Asphalt or Concrete	$25.00	50	$ 1,240	648	$ 16,200	
2003	Linear Feet	Install Tracer Tape	$0.35	2,480	$ 868	32,400	$ 11,340	
2004	Linear Feet	Directional Bore - 2" Conduit	$15.00	2,480	$ 37,200	32,400	$ 486,000	
2007	Fiber Feet	Pull Fiber Through Conduit	$1.00	2,480	$ 2,480	32,400	$ 32,400	
2008	Each	Vault	$300.00	5	$ 1,500	65	$ 19,500	
3001	Each	Splice Closure Preparation	$195.00	14	$ 2,730	20	$ 3,900	
3002	Each	Single Fusion Fiber Splicing	$39.00	384	$ 14,976	528	$ 20,592	
3005	Each	Install Patch Panel & Prep Cables	$375.00	14	$ 5,250	20	$ 7,500	
4001	Each	Core Building	$250.00	4	$ 1,000	4	$ 1,000	
4002	Linear Feet	Install Indoor Conduit	$5.25	400	$ 2,100	400	$ 2,100	
4003	Linear Feet	Rod and Rope existing conduit	$1.95		$ -			
4004	Linear Feet	Pull Drop Fiber through existing or new conduit	$1.75	2,000	$ 3,500	2,000	$ 3,500	
TOTAL CONSTRUCTION LABOR					**$ 72,844**		**$ 604,032**	
MATERIALS								
5000	Linear Feet	288 Count Fiber	$2.14		$ -		$ -	
5001	Linear Feet	144 Count Fiber	$1.24		$ -		$ -	
5002	Linear Feet	96 Count Fiber	$0.90		$ -	7,200	$ 6,480	
5003	Linear Feet	48 Count Fiber	$0.75		$ -	23,800	$ 17,850	
5004	Linear Feet	24 Count Fiber	$0.50	2,600	$ 1,300	3,000	$ 1,500	
5005	Linear Feet	12 Count Fiber Drop	$0.38		$ -		$ -	
							$ -	
5041	Linear Feet	2" Conduit	$1.00	2,480	$ 2,480	32,400	$ 32,400	
5046	Each	Vault	$600.00	5	$ 3,000	65	$ 39,000	
5047	Linear Feet	#12 Locate wire	$0.18	2,480	$ 446	32,400	$ 5,832	
							$ -	
5061	Each	FOSC 450 B Gel Enclosure	$265.00	14	$ 3,710	20	$ 5,300	
5067	Each	D Gel Trays	$18.23	384	$ 6,998	528	$ 9,623	
5065	Each	Splice Heat Shrink Sleeves	$0.30	14	$ 4	20	$ 6	
5081	Each	Patch Panel	$675.00	14	$ 9,450	20	$ 13,500	
5083	Linear Feet	1" Indoor Conduit for Drop fiber	$0.80	400	$ 320	400	$ 320	
		Freight						
		Sales Tax						
TOTAL MATERIALS					**$ 27,709**		**$ 131,811**	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 11,532**		**$ 150,660**	
TOTAL LABOR					**$ 72,844**		**$ 604,032**	
TOTAL MATERIALS					**$ 27,709**		**$ 131,811**	
TOTAL					**$ 112,085**		**$ 886,503**	

3) Connecting other Key Community Anchor Institutions

Local governments and state agencies have been connecting their community anchor institutions with fiber optic networks for over twenty years. Community anchor institutions are state, county and local government offices and buildings, schools and libraries, hospitals, medical facilities and first responders. In fact, in the U.S., thousands of schools, libraries, community centers, and public health and safety providers obtain their broadband connectivity from local government and state non-profit networks, including state research and education networks.

Connecting these anchor institutions with fiber allows each location to receive very high-speed Internet and data connectivity while eliminating or drastically reducing the monthly lease or access costs paid to the private sector service providers. Anchor institutions often cannot afford to purchase high-capacity circuits from the private sector service providers and therefore, simply cap their bandwidth purchased. Capping their bandwidth requires the anchor institutions to choose which applications to deploy and limits their ability to use applications that require high bandwidth. Building a municipally-owned fiber network to anchor institutions allows these critical key facilities to have the bandwidth they need to support all of their applications and once these networks are in place, additional bandwidth needs can easily be met without additional capital cost for construction.

The municipalities could consider connecting their community anchor institutions with fiber to ensure that they have the highest-quality broadband connectivity. This could be done in collaboration with the other agencies to share in the cost of construction. Then, once these networks are built, the City/Town could also consider leasing excess capacity of conduit or of fiber to the private sector for last mile build out and use. Once a network is built that serves schools, government offices, fire districts and the like, generally, this network reaches deep into neighborhoods and past business parks. These networks can then serve as an opportunity to allow the private sector to lease excess capacity and in turn serve homes and businesses with high-speed fiber. This trend is fast accelerating as hundreds of municipalities make available spare fiber optic capacity to private sector companies at rates designed to incentivize new private sector investment and opportunity.

Region 10 is a non-profit organization based in Montrose. Region 10 consists of six counties in western Colorado (Delta, Montrose, Hinsdale, San Miquel, Ouray and Gunnison) and the municipalities located within these counties. Region 10 received grant funding for broadband implementation from the Department of Local Affairs (DOLA) to build a network connecting the communities within their region with fiber as well as their key community anchor institutions. The project has pulled in several partnerships with electric cooperatives and companies that have existing fiber in place, as well as partnerships with many of the local Internet Service Providers for collaboration. Once completed, the network will support 1 Gbps

and 10 Gbps connectivity between all points on the network, providing abundant, reliable and affordable Internet and data services throughout the region.

Delta Montrose Electric Cooperative, one of Region 10's partners, will also be deploying Fiber to the Premise to connect homes and businesses in Delta and Montrose Counties, offering Gigabit services for $50 - $70 per month for homes and $500 per month for businesses.

Here are the other key anchor institutions for the City of Greeley.

Anchor Name	Street Address
Lincoln Park Library	1012 11th Street Suite B
Farr Regional Library	1939 61st Avenue
Centennial Park Library	2227 23rd Avenue
High Plains Library District - Administration	2650 West 29TH Street
North Range Behavioral Health - Monfort Children's Clinic	100 North 11th Avenue
Sunrise Clinic - Family Dental	1006 A Street
Sunrise Clinic - Adelante Clinic	1010 A Street
NRBH - Crisis Stabilization Services Program	1140 M Street
NRBH - BASIC	1260 H Street
Sunrise Clinic - North Range Clinic (hosted at North Range Behavioral Health)	1300 North 17th Avenue
North Range Behavioral Health - Adult Rec. Prog./Assertive Comm. Treatment	1306 11th Avenue
NRBH - Acute Treatment Unit	1309 10th Avenue
NRBH-Frontier House	1407 8th Avenue
Weld County Prenatal Clinic (CDPHE)	1551 North 17th Avenue
Weld County Department of Public Health & Environment	1555 North 17th Avenue
Sunrise Clinic - Weld County Prenatal Clinic (hosted at Weld County Health Dept)	1555 North 17th Avenue
North Colorado Rural Family Medicine	1600 23rd Avenue
Centennial Health Care Center	1637 29th Avenue Place
Fairacres Manor Inc.	1700 18th Avenue
North Colorado Medical Center (Banner)	1801 16th Street
Grace Pointe Continuing Care Sr Campus Skilled Nursing	1919 68th Avenue
NRBH - Kathleen Paointer Littler Center	2350 West 3rd Street Road
Life Care Center Of Greeley	4800 West 25th Street
NRBH - Adult Recovery Program (SPOT)	510 13th Avenue #6
NRBH - Assertive Community Treatment (TOPS Day Reporting Center)	515 13th Avenue
University Colorado Health Center	6767 29th St
Good Samaritan Society -Bonell Community	708 22nd Street
Kenton Manor	850 27th Avenue
North Range Behavorial Health - CRT	928 12th Street

Colorado Department of Transporation - Region 4	10601 West 10th Street
Employment Services of Weld County - Greeley	315 North 11th Avenue Building I
Colorado Department of Agriculture - State Conservation Board - Northeast Region	4302 West 9th Street Road
Producers Livestock Marketing Auditorium	711 O Street
Weld County	915 10th Street

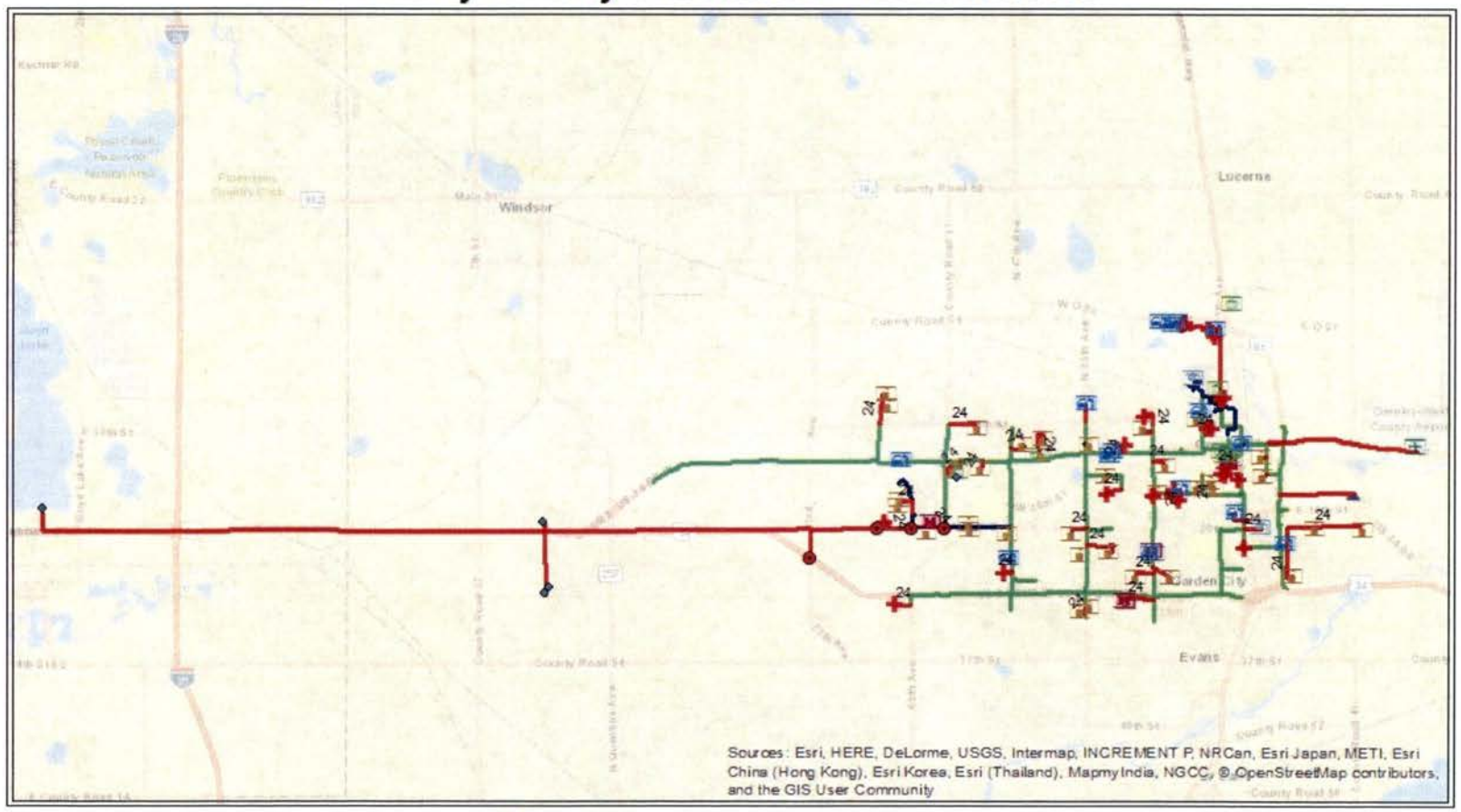
University Of Northern Colorado	501 20th Street
CSU Extension - Weld County	525 North 15th Avenue
Aims Community College	5401 West 20th Street

The schools in Greeley are not yet connected to fiber. Here is a list of the Greeley schools:

Northridge High School	100 71st Avenue	School - K through 12
Greeley 6	1025 9th Avenue	School - K through 12
Engage Online Academy	1025 9th Avenue 4th Floor	School - K through 12
ABC East	1028 5TH Avenue	School - K through 12
Salida del Sol Academy	111 East 26th Street	School - K through 12
Greeley-Evans Alternative Program	1113 10th Avenue	School - K through 12
Maplewood Elementary School	1201 21st Avenue	School - K through 12
JEFFERSON HIGH SCHOOL	1315 4th Avenue	School - K through 12
Bella Romero Academy of Applied Technology - 4-8 Campus	1400 East 20th Street	School - K through 12
Jefferson Junior High School	1424 13th Avenue	School - K through 12
ABC Central	1511 12TH Avenue	School - K through 12
Greeley Central High School	1515 14th Avenue	School - K through 12
Union Colony Preparatory School	2000 Clubhouse Drive	School - K through 12
Jackson Elementary School	2002 25th Street	School - K through 12
Monfort Elementary School	2101 47th Avenue	School - K through 12
Monfort BSAC	2101 47th Avenue	School - K through 12
Meeker Elementary School	2221 28th Avenue	School - K through 12
Heath Middle School	2223 16th Street	School - K through 12
Saint Mary's Catholic School	2351 22nd Avenue	School - K through 12
Greeley West High School	2401 35th Avenue	School - K through 12
Frontier Academy K-5 Charter School	2560 West 29th Street	School - K through 12
Brentwood Middle School	2600 24th Avenue Court	School - K through 12
Centennial BOCES High School - Greeley Campus	2863 35th Avenue	School - K through 12
Scott Elementary School	3000 13th Street	School - K through 12
Scott BSAC	3000 13th Street	School - K through 12
Scott Preschool at Scott Elementary	3000 13th Street	School - K through 12
TRINITY LUTHERAN SCHOOL	3000 35TH Avenue	School - K through 12
Winograd K-8 Elementary School	320 North 71st Avenue	School - K through 12
Martinez Elementary School	341 14th Avenue	School - K through 12
DAYSPRING CHRISTIAN SCHOOL	3734 West 20th Street	School - K through 12
Shawsheen Elementary School	4020 West 7th Street	School - K through 12
Shawsheen BSAC	4020 West 7th Street	School - K through 12
#1 Child Enrichment Center	4601 West 9TH Street	School - K through 12
Madison Elementary School	500 24th Avenue	School - K through 12
ABC's Bright School-Age Centers - Main Office	5000 11th Street	School - K through 12
Early Childhood Preschool Aims Campus	5401 West 20th Street	School - K through 12
Early College Academy	5590 West 11th Street	School - K through 12
McAuliffe STEM Academy	600 51st Avenue	School - K through 12
McAuliffe BSAC	600 51st Avenue	School - K through 12
Bella Romero Academy of Applied Technology - K-3 Campus	614 East 20th Street	School - K through 12
West Ridge Academy Charter School	6200 West 20th Street	School - K through 12
University Schools	6525 West 18th Street	School - K through 12
Frontier Academy 6-12 Charter School	6530 West 16th Street	School - K through 12
Franklin Middle School	818 35th Avenue	School - K through 12
Shepherd of the Hills Lutheran School	950 43rd Avenue	School - K through 12

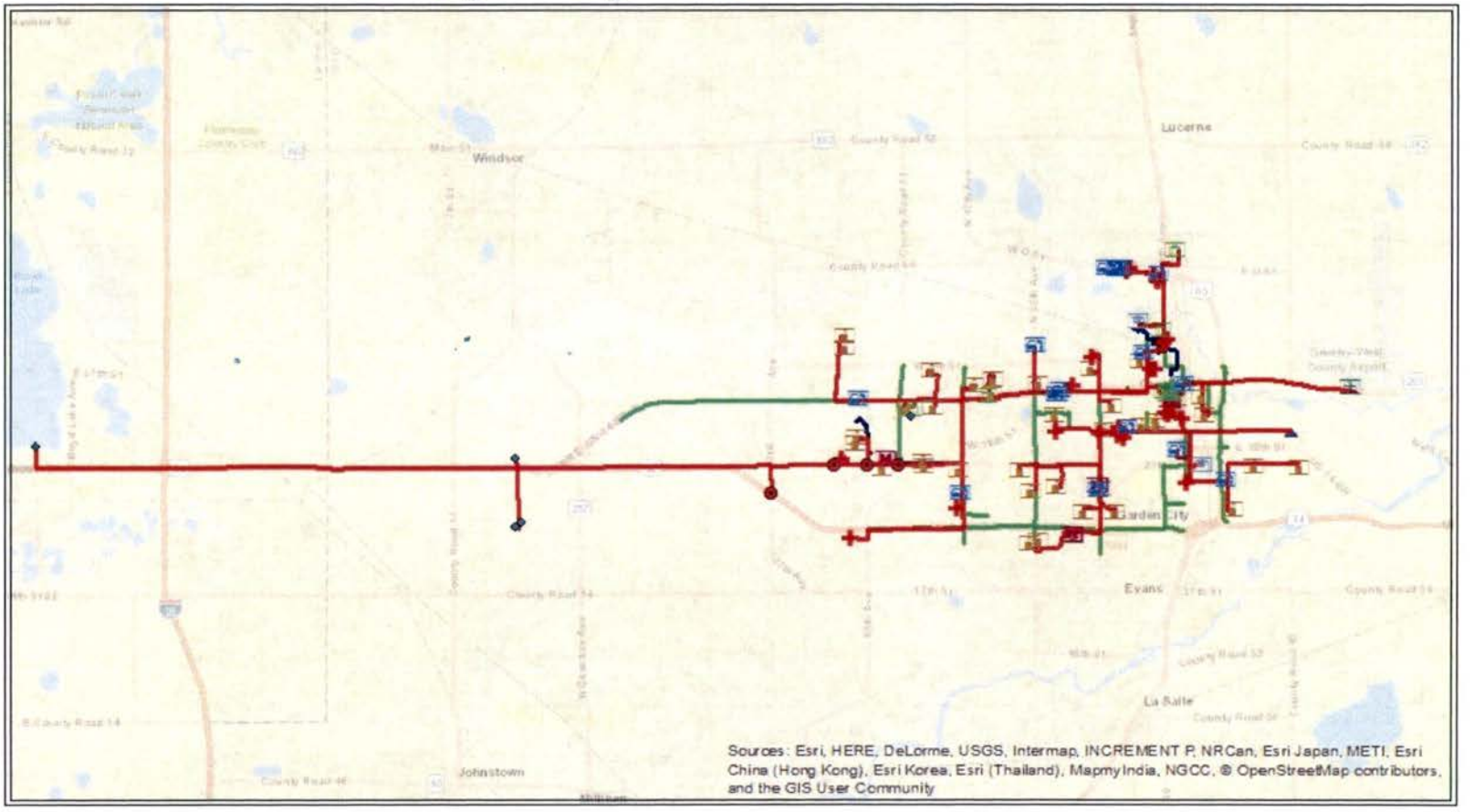
NEO's team provided a high-level design with the use of the existing fiber that the City of Greeley has access to, as well as a high-level design without the use of existing assets. The first map on the following page shows the design of using existing assets. The second map shows the design of a new build, or without the use of existing assets.

City of Greeley
Smart City & City Facilities - Extensions



- Proposed Rts
- Greeley
- GreeleyTraffic
- Traffic_Lights
- Airports
- Cementery
- Government
- Public_Safety
- WaterMonitorSites
- Post_Secondary
- Library
- Healthcare
- Schools

City of Greeley
Smart City & City Facilities - New Build



- Proposed Rt
- Greeley
- GreeleyTraffic
- Traffic_Lights
- Airports
- Cementery
- Government
- Public_Safety
- WaterMonitorSites
- Post_Secondary
- Library
- Healthcare
- Schools

The projected capital costs for adding the additional key anchor institutions identified above is shown below. With the use of existing fiber, the total project capital costs are $1.7 Million. As a new build, the projected capital costs are $3.84 Million. Adding on the other key anchor institutions, the following incremental costs apply:

GREELEY - Adding on All Other Anchor Institutions

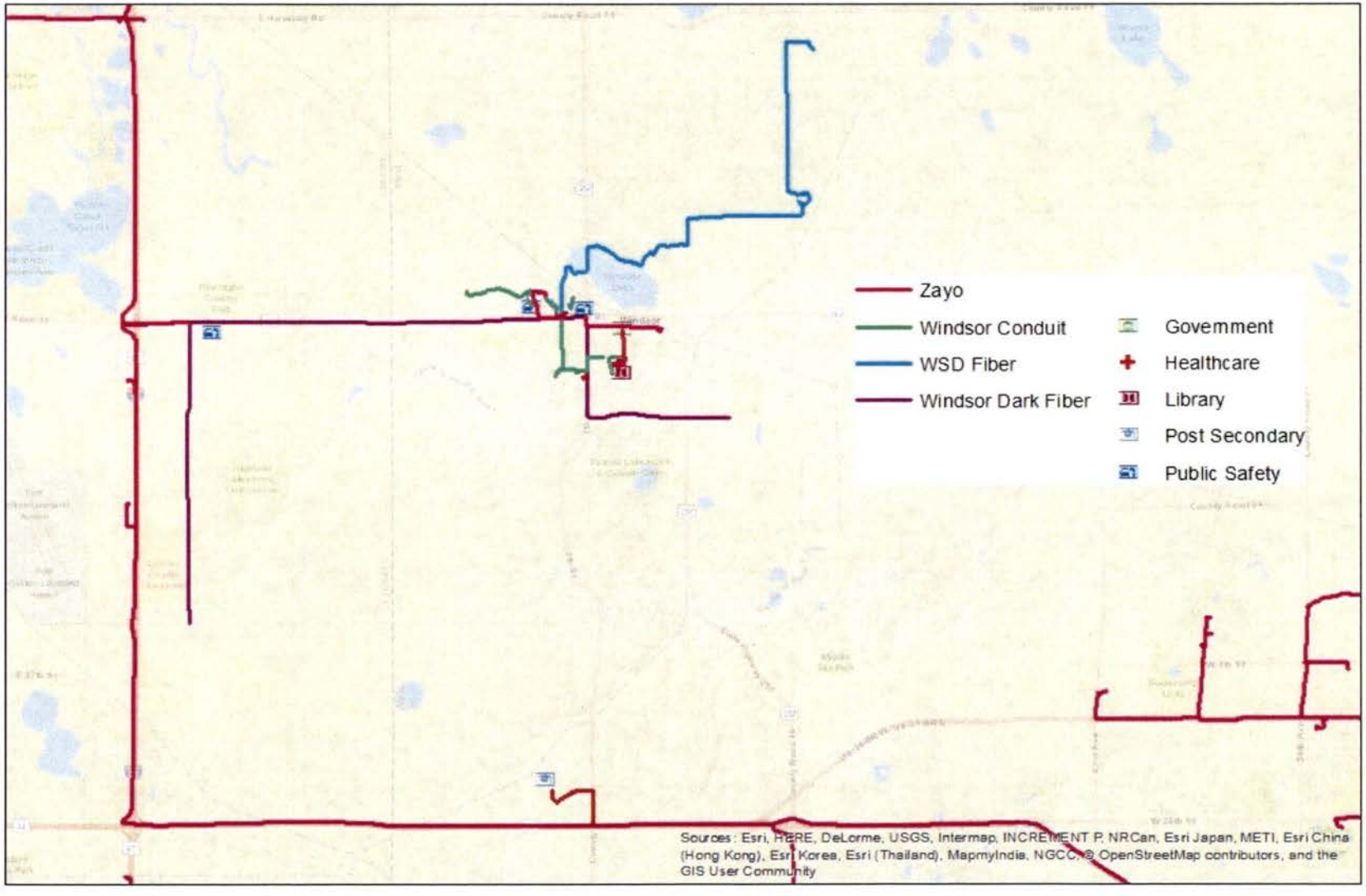
			With the Use of Existing Fiber			As a New Build		
Item #	UOM	Description	Unit Price	Estimated Quantity	Extended Cost	Estimated Quantity	Extended Cost	Notes
ENGINEERING & CONSTRUCTION MANAGEMENT								
0000	Linear Feet	Engineering (DE,FE,Permit,GIS)	$1.90	49,502	$ 94,054	101,731	$ 193,289	
0001	Linear Feet	Construction Management (QC,Tracking)	$2.75	49,502	$ 136,131	101,731	$ 279,760	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 230,184**		**$ 473,049**	
CONSTRUCTION LABOR	**Total Linear Footage**			**49,502**		**101,731**		
2001	Linear Feet	Rock Adder (All types)	$38.00	0	$ -	0	$ -	
2002	Square Feet	Cut and Restore Asphalt or Concrete	$25.00	991	$ 24,775	2,035	$ 50,875	
2003	Linear Feet	Install Tracer Tape	$0.35	49,502	$ 17,326	101,731	$ 35,606	
2004	Linear Feet	Directional Bore - 2" Conduit	$15.00	49,502	$ 742,530	101,731	$ 1,525,965	
2007	Fiber Feet	Pull Fiber Through Conduit	$1.00	49,502	$ 49,502	101,731	$ 101,731	
2008	Each	Vault	$300.00	100	$ 30,000	204	$ 61,200	
3001	Each	Splice Closure Preparation	$195.00	159	$ 31,005	163	$ 31,785	
3002	Each	Single Fusion Fiber Splicing	$39.00	2,088	$ 81,432	2,472	$ 96,408	
3005	Each	Install Patch Panel & Prep Cables	$375.00	159	$ 59,625	163	$ 61,125	
4001	Each	Core Building	$250.00	79	$ 19,750	79	$ 19,750	
4002	Linear Feet	Install Indoor Conduit	$5.25	7,900	$ 41,475	7,900	$ 41,475	
4004	Linear Feet	Pull Drop Fiber through existing or new conduit	$1.75	39,500	$ 69,125	39,500	$ 69,125	
TOTAL CONSTRUCTION LABOR					**$ 1,166,545**		**$ 2,095,045**	
MATERIALS								
5000	Linear Feet	288 Count Fiber	$2.14		$ -		$ -	
5001	Linear Feet	144 Count Fiber	$1.24		$ -		$ -	
5002	Linear Feet	96 Count Fiber	$0.90		$ -	1,363	$ 1,227	
5003	Linear Feet	48 Count Fiber	$0.75		$ -	13,408	$ 10,056	
5004	Linear Feet	24 Count Fiber	$0.50	48,900	$ 24,450	86,960	$ 43,480	
5005	Linear Feet	12 Count Fiber Drop	$0.38	39,500	$ 15,010	39,500	$ 15,010	
							$ -	
5041	Linear Feet	2" Conduit	$1.00	49,502	$ 49,502	101,731	$ 101,731	
5046	Each	Vault	$600.00	100	$ 60,000	204	$ 122,400	
5047	Linear Feet	#12 Locate wire	$0.18	49,502	$ 8,910	101,731	$ 18,312	
							$ -	
5061	Each	FOSC 450 B Gel Enclosure	$265.00	159	$ 42,135	163	$ 43,195	
5067	Each	D Gel Trays	$18.23	2,088	$ 38,054	2,472	$ 45,052	
5065	Each	Splice Heat Shrink Sleeves	$0.30	159	$ 48	163	$ 49	
5081	Each	Patch Panel	$675.00	159	$ 107,325	163	$ 110,025	
5083	Linear Feet	1" Indoor Conduit for Drop fiber	$0.80	7,900	$ 6,320	7,900	$ 6,320	
		Freight						
		Sales Tax						
TOTAL MATERIALS					**$ 351,754**		**$ 516,856**	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 230,184**		**$ 473,049**	
TOTAL LABOR					**$ 1,166,545**		**$ 2,095,045**	
TOTAL MATERIALS					**$ 351,754**		**$ 516,856**	
TOTAL					**$ 1,748,483**		**$ 3,084,950**	

Here are the other key anchor institutions for the Town of Windsor:

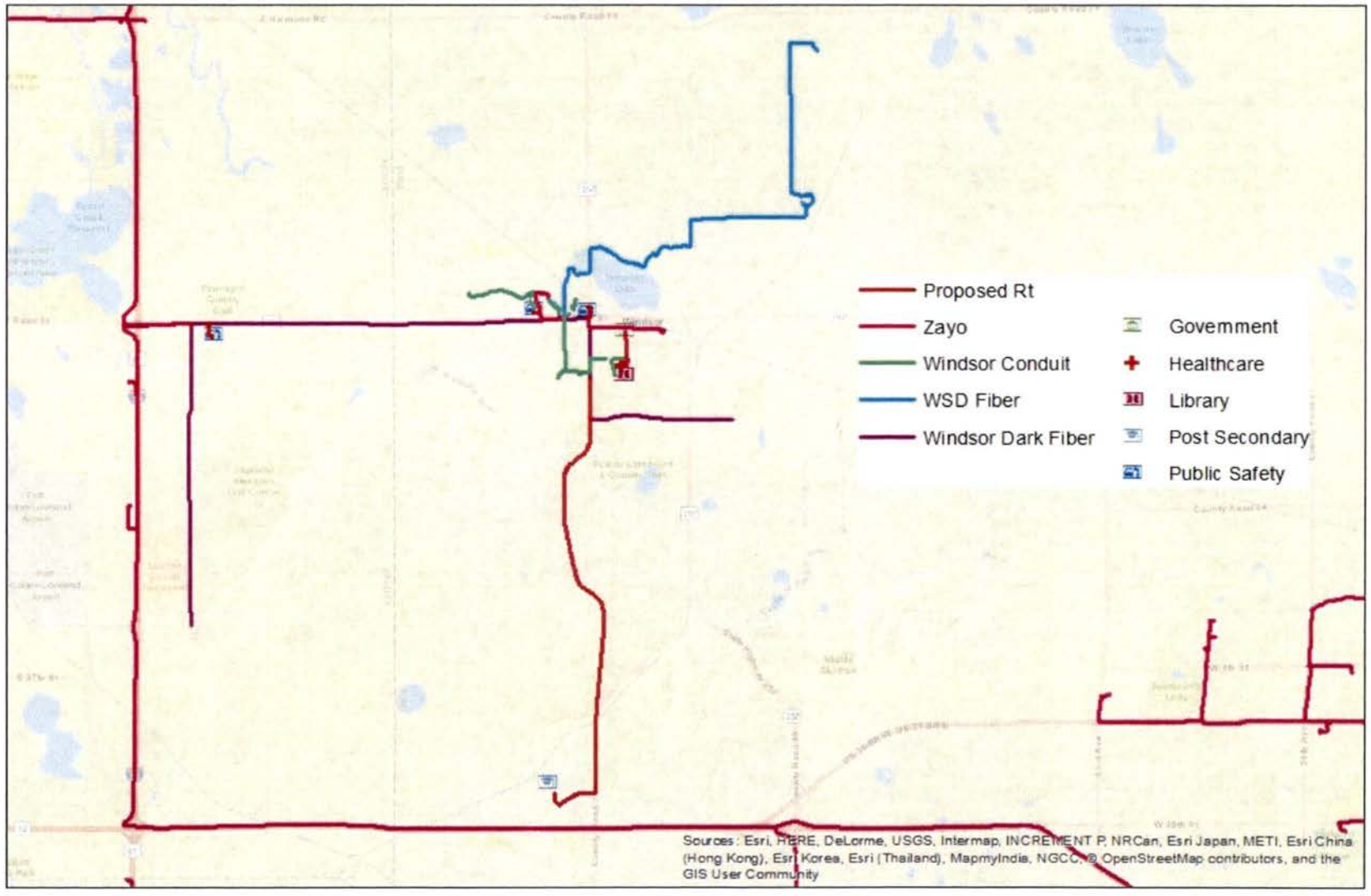
Clearview Library District (Windsor-Severance)	720 Third Street
Windsor Health Care Center	710 3rd Street
Aims Community College - Windsor Campus	1120 Southgate Drive

NEO's team provided a high-level design with the use of the existing fiber that the Town of Windsor has access to, as well as a high-level design without the use of existing assets. The first map on the following page shows the design of using existing assets. The second map shows the design of a new build, or without the use of existing assets.

City of Windsor
All Anchors - Extention



City of Windsor
All Anchors - New Build

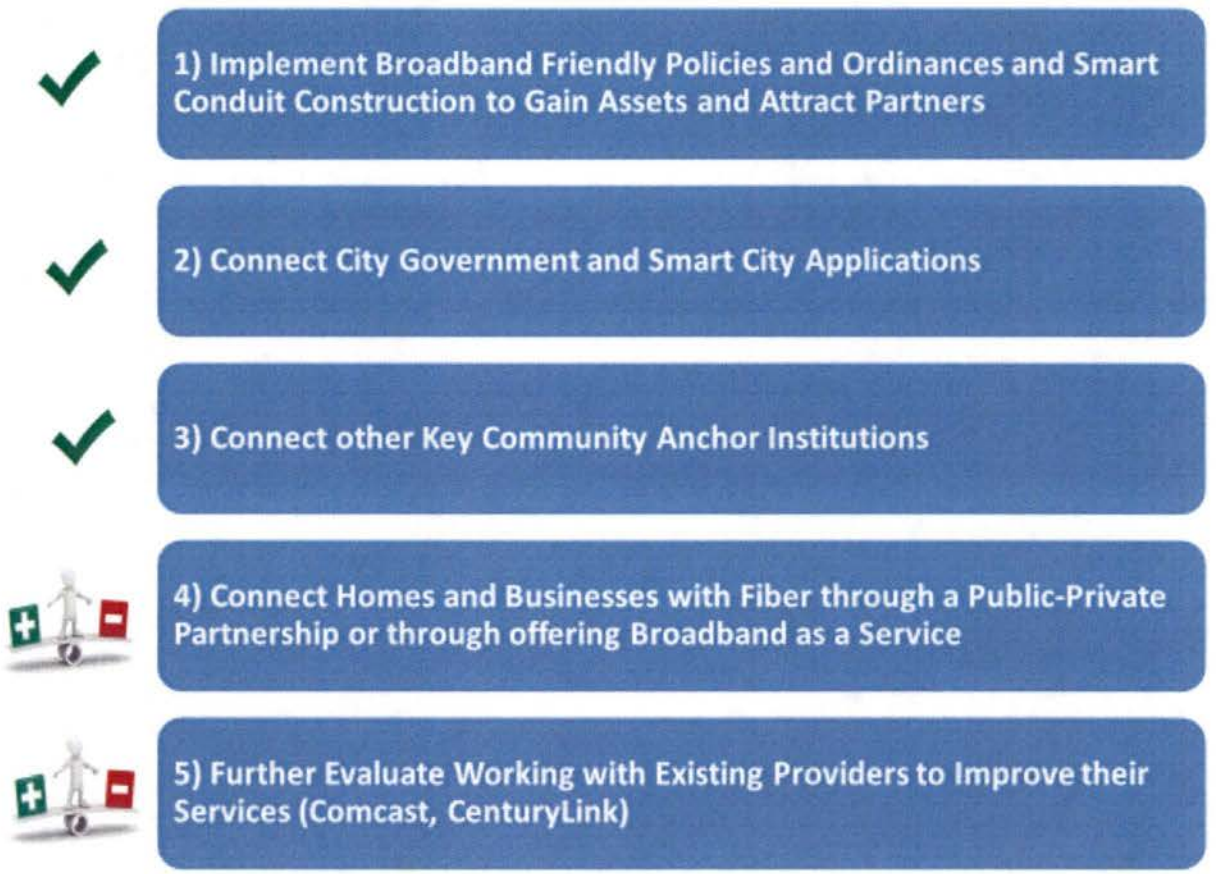


The projected capital costs for the Town of Windsor's additional anchor institution build is shown below. With the use of existing fiber, the total project capital costs are $148,031. As a new build, the projected capital costs are $860,356.

WINDSOR - Incremental Costs for Build to all Other Anchor Institutions

			With the Use of Existing Fiber			As a New Build		
Item #	UOM	Description	Unit Price	Estimated Quantity	Extended Cost	Estimated Quantity	Extended Cost	Notes
ENGINEERING & CONSTRUCTION MANAGEMENT								
0000	Linear Feet	Engineering (DE,FE,Permit,GIS)	$ 1.90	2,400	$ 4,560	30,100	$ 57,190	
0001	Linear Feet	Construction Management (QC,Tracking)	$ 2.75	2,400	$ 6,600	30,100	$ 82,775	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 11,160.00**		**$ 139,965.00**	
CONSTRUCTION LABOR		**Total Linear Footage**		**2,400**		**30,100**		
2001	Linear Feet	Rock Adder (All types)	$ 38.00	0	$ -	0	$ -	
2002	Square Feet	Cut and Restore Asphalt or Concrete	$ 25.00	48	$ 1,200	602	$ 15,050	
2003	Linear Feet	Install Tracer Tape	$ 0.35	2,400	$ 840	30,100	$ 10,535	
2004	Linear Feet	Directional Bore - 2" Conduit	$ 15.00	2,400	$ 36,000	30,100	$ 451,500	
2007	Fiber Feet	Pull Fiber Through Conduit	$ 1.00	2,400	$ 2,400	30,100	$ 30,100	
2008	Each	Vault	$ 300.00	5	$ 1,500	61	$ 18,300	
3001	Each	Splice Closure Preparation	$ 195.00	28	$ 5,460	28	$ 5,460	
3002	Each	Single Fusion Fiber Splicing	$ 39.00	360	$ 14,040	648	$ 25,272	
3005	Each	Install Patch Panel & Prep Cables	$ 375.00	28	$ 10,500	28	$ 10,500	
4001	Each	Core Building	$ 250.00	13	$ 3,250	13	$ 3,250	
4002	Linear Feet	Install Indoor Conduit	$ 5.25	1,300	$ 6,825	1,300	$ 6,825	
4004	Linear Feet	Pull Drop Fiber through existing or new conduit	$ 1.75	6,500	$ 11,375	6,500	$ 11,375	
TOTAL CONSTRUCTION LABOR					**$ 93,390**		**$ 588,167**	
MATERIALS								
5000	Linear Feet	288 Count Fiber	$ 2.14		$ -		$ -	
5001	Linear Feet	144 Count Fiber	$ 1.24		$ -	2,200	$ 2,728	
5002	Linear Feet	96 Count Fiber	$ 0.90		$ -		$ -	
5003	Linear Feet	48 Count Fiber	$ 0.75		$ -		$ -	
5004	Linear Feet	24 Count Fiber	$ 0.50	2,500	$ 1,250	36,400	$ 18,200	
5005	Linear Feet	12 Count Fiber Drop	$ 0.38	6,500	$ 2,470		$ -	
							$ -	
5041	Linear Feet	2" Conduit	$ 1.00	2,400	$ 2,400	30,100	$ 30,100	
5046	Each	Vault	$ 600.00	5	$ 3,000	61	$ 36,600	
5047	Linear Feet	#12 Locate wire	$ 0.18	2,400	$ 432	30,100	$ 5,418	
							$ -	
5061	Each	FOSC 450 B Gel Enclosure	$ 265.00	28	$ 7,420	28	$ 7,420	
5067	Each	D Gel Trays	$ 18.23	360	$ 6,561	648	$ 11,810	
5065	Each	Splice Heat Shrink Sleeves	$ 0.30	28	$ 8	28	$ 8	
5081	Each	Patch Panel	$ 675.00	28	$ 18,900	28	$ 18,900	
5083	Linear Feet	1" Indoor Conduit for Drop fiber	$ 0.80	1,300	$ 1,040	1,300	$ 1,040	
		Freight						
		Sales Tax						
TOTAL MATERIALS					**$ 43,481**		**$ 132,224**	
TOTAL ENGINEERING & CONSTRUCTION MANAGEMENT					**$ 11,160**		**$ 139,965**	
TOTAL LABOR					**$ 93,390**		**$ 588,167**	
TOTAL MATERIALS					**$ 43,481**		**$ 132,224**	
TOTAL					**$ 148,031**		**$ 860,356**	

As a reminder, here are the various levels of investment being considered.



The capital costs for implementing #4, Connecting homes and businesses with fiber are now discussed.

4) Connect Homes and Businesses with Fiber through a Public-Private Partnership or through offering Broadband as a Service

A community anchor institution network could be expanded to also connect key business locations, industrial parks, incubators or co-working spaces. This enables a community to target key industries and geographies for economic advancement. Having access to very high-speed Internet is the number one criteria for a business looking to relocate. The City/Town could place various business locations on a priority list for fiber connectivity and connect these locations while building to key anchor institutions.

Below are the capital cost projections for building fiber to the City/Town's businesses. The estimate below assumes 30% of the businesses will take a service from the network.

Greeley - FTTP Construction Costs						
		Cost per Mile		Extended Cost		
		Labor	Material	Labor	Material	Total
Fiber to the Premise	**Rt Miles**					
Ring	15.1	$ 120,718	$ 24,176	$ 1,822,842	$ 365,058	**$ 2,187,899.4**
InterConnect between Windsor and Greeley	5.7	$ 120,718	$ 24,176	$ 688,093	$ 137,803	**$ 825,895.8**
FTTP Distribution	510	$ 120,718	$ 24,176	$ 61,566,180	$ 12,329,760	**$ 73,895,940**
Service Entrances						
Residential - 4 Fiber Drop	0	$ 735.00	$ 138.00	$ -	$ -	$ -
MDU - 12 Fiber Drop	0	$ 2,036.00	$ 237.00	$ -	$ -	$ -
Business						
4 Fiber Drops	1020	$ 735.00	$ 138.00	$ 749,700	$ 140,760	**$ 890,460**
12 Fiber Drop	113	$ 2,036.00	$ 237.00	$ 230,068	$ 26,781	**$ 256,849**
Other - 4 Fiber Drop	0	$ 735.00	$ 138.00	$ -	$ -	$ -
Outside Plant Total				**$ 65,056,882**	**$ 13,000,162**	**$ 78,057,044**
Final Design and Engineering						**$ 11,708,557**
Total With Engineering						**$ 89,765,601**

The above costs do not include costs for equipment. With equipment, the following capital costs would apply to build to all of the businesses with a 30% take rate percentage.

Summary, Greeley Fiber to the Business Capital Costs			
Take Rate Percentages	**Total Construction Costs**	**Total Equipment Costs**	**Total Capital Costs**
30%	**$ 89,765,601**	**$ 6,078,049**	**$ 95,843,650**

Windsor - FTTP Construction Costs						
		Cost per Mile		Extended Cost		
		Labor	Material	Labor	Material	Total
Fiber to the Premise	**Rt Miles**					
Ring	11.7	$ 120,718	$ 24,176	$ 1,412,401	$ 282,859	$ **1,695,260**
InterConnect	5.7	$ 120,718	$ 24,176	$ 688,093	$ 137,803	$ **825,896**
FTTP Distribution	214.1	$ 120,718	$ 24,176	$ 25,845,724	$ 5,176,082	$ **31,021,806**
Service Entrances						
Residential - 4 Fiber Drop	0	$ 735.00	$ 138.00	$ -	$ -	$ -
MDU - 12 Fiber Drop	0	$ 2,036.00	$ 237.00	$ -	$ -	$ -
Business						
4 Fiber Drops	170	$ 735.00	$ 138.00	$ 124,950	$ 23,460	$ **148,410**
12 Fiber Drop	19	$ 2,036.00	$ 237.00	$ 38,684	$ 4,503	$ **43,187**
Other - 4 Fiber Drop	0	$ 735.00	$ 138.00	$ -	$ -	$ -
Project Total				$ **28,109,851**	$ **5,624,707**	$ **33,734,559**
Engineering						$ **5,060,184**
Total With Engineering						$ **38,794,742**

The above costs do not include costs for equipment. With equipment, the following capital costs would apply to build to all of the businesses with a 30% take rate percentage.

Summary, Windsor Fiber to the Business Capital Costs			
Take Rate Percentages	**Total Construction Costs**	**Total Equipment Costs**	**Total Capital Costs**
30%	**$ 38,794,742**	**$ 2,133,346**	**$ 40,928,088**

The most ambitious strategy for a municipality to consider is the opportunity to connect all homes and businesses with fiber. More challenging geographies are sometimes forced to utilize wireless technologies to deliver service with a hybrid fiber/wireless network. Cities are building or facilitating Fiber to the Premise networks or "Gigabit-enabled" networks, allowing for Internet speeds of 1,000 Mbps or 1 Gbps in both upload and download speeds for all homes and businesses within a city's boundary.

There are a number of models to finance, design, construct and operate a Fiber to the Premise network. One of the models in the industry is when the municipality designs, builds, owns and operates a network and becomes the Internet Service Provider to homes and businesses. This model is often referred to as a Retail Model and is discussed in detail below. Another model is one in which the municipality builds and owns the fiber network and Internet services are provided directly by the private sector. This has often been referred to as a Wholesale Model, and again, is discussed in detail below.

Fiber to the Premise, Retail Model

In this model, the municipality and/or municipal utility designs, builds, owns and operates the network, and essentially becomes the Internet Service Provider. An increasingly prevalent case for investing in building municipal broadband is being made by advocates defining the Internet as a "utility" and thus a necessity for the public sector to provide when otherwise unavailable.

Most municipalities that have deployed a retail, Fiber to the Premise strategy have been providing electric services to their constituents. Municipal electric utilities have an easier implementation path because they already have the access to utility poles and other infrastructure, billing processes in place, customer service centers operational, and business relationships with each and every homeowner and business.

The City of Longmont's model has been discussed earlier in this report. Longmont has deployed a Gigabit fiber network and is offering Internet and voice services directly to homes and businesses. The City of Longmont's project is nationally known as a model of success. Dubbed "NextLight," this Gigabit fiber network is owned and operated by the City and its power utility, Longmont Power & Communications (LPC). Longmont opted out of Colorado's SB 152 law in November of 2011 with 60% of the vote. Two years later, Longmont voters approved a $40.3 million bond issuance to cover the startup costs and network build.

Longmont followed Google Fiber's marketing strategy by launching a pre-build sign-up campaign. The neighborhood with the most market share or "take rate" would be the first area where Longmont would build. The first neighborhood received a 72% take rate prior to construction. Longmont's 38,000 homes and businesses now have symmetrical Gigabit service for $50 per month for those who signed up early. The $50 per month is guaranteed for the lifetime of the home as well as the owner/tenant of the home if he/she moves within the City limits. Longmont's business service includes symmetrical 100 Mbps for $230 per month and symmetrical 250 Mbps service for $500 per month.

Longmont is experiencing an average take rate percentage of 56%. The initial feasibility study conducted in 2013 predicted a 27% take rate. Late in 2016, the City voted to increase LPC's budget by $7 million, sourced from the Electric and Broadband Utility Fund balance, to hire staff needed to support take rates twice as high as initially predicted.

Meanwhile NextLight is helping businesses and fostering growth by providing connectivity that's enabling the community to successfully compete with its neighbor to the south, Boulder. Local businesses that were looking to expand outside the city elected to stay and grow in Longmont thanks to the Gigabit network. The network is also attracting regional work-from-home Coloradans looking for an ideal place to work and raise their family.

Fiber to the Premise – Wholesale Model or Public Private Partnership, Shared Capital Costs and Shared Revenue

Municipalities can take several approaches with the wholesale model, owning the fiber only or owning the fiber and the equipment it takes for it to run or be "lit." Fiber optic cable that does not have equipment on the ends of it is referred to as "dark" fiber. Fiber optic cable that has equipment in place is referred to as "lit" fiber.

Whether the municipality provides dark or lit fiber, the wholesale model assumes at least one and possibly multiple service providers are available to provide Internet services. The municipality owns the network, and in some cases, the equipment to light the network, and the service provider(s) pay a lease fee to the municipality in the form of a monthly payment or in the form of a revenue share, a percentage of the gross revenues generated by service fees on the network.

This ownership by a municipality, run by a private entity approach is nothing new; it has been prevalent for decades with toll roads that are managed privately. What is a new and emerging trend, is communities funding a network and turning it over to a traditional carrier to manage and operate the network.

As part of the Northwest Colorado Regional Broadband Strategic Plan effort, Rio Blanco County identified that broadband service in the County was inadequate to sustain 21st century economic development. Rio Blanco County is deploying a wholesale Fiber to the Premise model. In 2014, Rio Blanco County voted to opt out of SB 152 and reclaimed their local telecommunications authority. Shortly after opting out, Rio Blanco received grant funding with the Colorado Department of Local Affairs (DOLA) to build out the network. The County and some of the local community anchor institutions are providing the match funding required by the grant. The County is building fiber infrastructure to the block in Rangely and Meeker and service providers will finish the build-out to each home or business. In the more rural parts of the county, subscribers will be served by wireless infrastructure and technologies.

Subscribers have the option to choose between two providers which are offering services on Rio Blanco's network. Local Access Internet (LAI) and Cimarron Telecommunications are offering symmetrical Gigabit Internet access (1,000 Mbps or 1 Gbps) for $70 per month.

In addition to the retail and wholesale Fiber to the Premise models, there are a number of emerging public-private partnership models that are just being introduced in the industry. A description of typical funding mechanisms for municipalities will be discussed below as well as a description of the emerging public-private partnership models.

Fiber-to-the-Premise Capital Cost Estimates

NEO's team put together preliminary design and projected capital cost estimates for building a fiber-to-the-premise network that is capable of handling symmetrical Gigabit broadband

speeds. Our team separated both communities into sections of approximately 1,000 units each. We assumed there would be a primary network operation center that would house the equipment to "light up" the fiber in each community. Secondary network operation centers would potentially be added for redundancy after each community reached a critical mass of customers.

Most Fiber-to-the-Premise network use a Gigabit Passive Optical Network (GPON) architecture with active connections to large businesses, mission critical or government locations. Active or passive simply refers to powered electronics in the field. In other words, with a passive architecture, there are no electronics located between the network operations center and the home.

Capital costs will increase when the market share or take rate percentage increases. Below are the projected capital costs with various take rate percentages.

Summary, Windsor Fiber to the Premise Capital Costs

Take Rate Percentages	Total Construction Costs	Total Equipment Costs	Total Capital Costs
10%	$ 39,685,019	$ 2,336,684	$ 42,021,704
20%	$ 40,797,243	$ 2,579,875	$ 43,377,118
30%	$ 41,906,853	$ 2,846,086	$ 44,752,939
40%	$ 43,016,463	$ 3,093,389	$ 46,109,851
50%	$ 44,129,690	$ 3,357,522	$ 47,487,212
60%	$ 45,238,296	$ 3,711,603	$ 48,949,899

Summary, Greeley Fiber to the Premise Capital Costs			
Take Rate Percentages	Total Construction Costs	Total Equipment Costs	Total Capital Costs
10%	$ 91,877,838	$ 7,438,297	$ 99,316,135
20%	$ 95,308,477	$ 9,475,631	$ 104,784,107
30%	$ 98,737,505	$ 11,803,153	$ 110,540,658
40%	$ 102,168,144	$ 14,006,794	$ 116,174,938
50%	$ 105,603,404	$ 16,097,703	$ 121,701,107
60%	$ 109,034,043	$ 18,535,591	$ 127,569,634

Preliminary Financial Results, What Works and Best Practices

Most Fiber to the Premise model have the following attributes and benefits to the community.

- Google-like FTTP symmetrical gigabit services
- $60 to $100 pricing for residential customers and
- $500 to $750 pricing for business customers are being offered in cities and towns across the country and not just by Google.
- Options to enter into Public-Private Partnerships, variety of models
- Models are driven mostly to mitigate debt coverage risk – driven by take rate – driven by pricing
- City involvement, capital and ownership is negotiable

NEO's team ran initial financial models to determine what would be financially feasible. If pricing was implemented using the range of pricing shown above, the financial model will be financially feasible with the following attributes.

- Take rate percentage
  - 30% within 3 years for the City of Greeley
  - 35% within 3 years for the Town of Windsor
- Utility Fee of $5 - $7 per Customer
- Residential revenue of $50 - $80 per month for shared Gigabit services
- Similar business revenue as Longmont's NextLight project

Detailed financial models will be discussed in the companion report. Initial findings provide results that are feasible and can be financed.

5) Work with Existing Providers to Improve Broadband Services – Comcast and CenturyLink

One strategy that could be pursued is to work with the existing incumbent providers to expand their services ubiquitously throughout both communities. During meetings with stakeholders, many residents indicated that Comcast cable and Comcast internet services were not available at their address, especially in the Town of Windsor. Pursuant to Comcast's Franchise with the Town of Windsor, Comcast is required to provide cable service to all residents within the Town of Windsor subject to a density requirement of 40 residents within 1 cable mile (*See* Town of Windsor Comcast Franchise Agreement, Section 3.12). Similarly, pursuant to Comcast's Franchise with the City of Greeley, Comcast is required to provide cable service to all residents within the City of Greeley subject to a density requirement of 25 residents within 1 cable mile (*See* City of Greeley Comcast Franchise Agreement, Section. 12.1(C)).

NEO and City/Town staff met with Comcast to try to identify where Comcast does not serve, and where Comcast provides Gigabit services within the study area. Comcast has stated that it will assemble maps of their coverage area for this study. The municipalities could work with Comcast to share in the costs of building fiber further into neighborhoods that do not meet the density level requirement per the franchise agreements to obtain better broadband services. Additionally, the cities could work with Comcast to obtain the goal of ubiquitous Gigabit services.

CenturyLink is also engaged with this study and has offered to provide information regarding collaborating with the municipalities to improve broadband services through a public private partnership.

As of the date of this report, neither Comcast or CenturyLink have provided enough detail regarding where their existing networks are located and where within each City/Town they provide various service levels. The City/Town will continue to work with both incumbent providers to better understand how the City/Town could facilitate further expansion of their Gigabit service offerings.

Financing Municipal Broadband Networks

There are several strategies local governments have used to finance municipal broadband networks. Municipalities can sometimes appropriate funds available through the general fund, to cover the capital costs of network builds. Funds can be appropriated either on a one-time or multi-year basis.

If there is not sufficient funding available in the general fund, a number of municipalities have used general obligation bonds, revenue bonds, or certificates of participation to finance the network build-out. Other financing options include New Market tax credits, for which

allocations would have to be secured; economic development retail sales tax funds, internal loans, TIF, economic development financing programs, and crowd sourcing.

There is also a growing interest among private financial institutions willing to invest in municipal networks. Local governments may be able to find alternative means of financing government anchor networks using private capital.

Grant Funding

Grant funding is available from a number of state and national sources. At the federal level, E-rate and the Rural Healthcare Grants are provided through the Universal Service Administrative Company (USAC). USAC is an independent, not-for-profit organization, designated by the FCC to administer the Universal Service Fund. This fund receives approximately $10 billion annually and is used to deliver funding through four programs (E-rate, the Rural Healthcare Program, Lifeline Program and the High Cost Program). The E-rate program will pay for 40-60% of the capital costs to build fiber to schools and libraries. The Rural Healthcare Program will pay for 60-65% of the capital costs to build fiber to qualifying medical facilities. The Town of Windsor's schools are already connected with their own fiber. The City of Greeley could work with the school district to potentially build fiber to the schools within the City. Although there are strict rules through USAC and the E-rate Program regarding the use of excess fiber deployed through the grant, there may be opportunities to obtain a waiver of this rule, allowing the City to partner with school district on portions of their build.

Another federal program for financing broadband is the Economic Development Administration (EDA). EDA will fund development for partnership planning, local technical assistance and economic adjustment assistance. EDA will fund implementation and construction of broadband networks for public works projects and economic adjustment assistance projects. Other federal programs are offered through the US Housing and Urban Development. A variety of funding sources and funding mechanisms are available through HUD for planning and implementation of broadband networks.

At the state level, the Colorado Department of Local Affairs (DOLA) in 2015 announced a $20 Million broadband implementation grant program for regional councils of governments and municipalities. DOLA has not yet announced funding availability for 2016 or 2017 specifically for broadband implementation; however, applicants are encouraged to apply for funding through the Energy and Mineral Impact Fund. DOLA has three rounds of financing applications with deadlines for grant submission being April 1st, August 1st and December 1st.

Other Potential Sources of Funding, Supplemental Tax Revenues, Streaming and Over-the-Top Services

Across the U.S., cable companies are seeing their customers cancel their traditional broadband TV services and choose to receive their entertainment through over-the-top services or streaming services such as Hulu, Amazon Video, Netflix and HBO Go. As cord-cutting

increases, some municipalities have been trying to recoup lost franchise fees received from cable companies by charging taxes on over-the-top services.

Within the past year, approximately 45 cities in California are implementing or planning to implement a tax on streaming services and video games, using their city's existing tax rate for cable providers. Their tax rates on video services range from 4.5 to 11 percent. Already taxing these services at rates from 6% - 9.4% include communities in Pennsylvania, Minnesota and Chicago.

There has been push-back from content and streaming providers on this tax and it is likely that these taxes will be challenged in court. An argument can be made that taxes on Internet sales are not allowed without a physical address within states, and therefore, this streaming and gaming tax could be struck down as well.

Charging Fees for Use of Right of Ways

Cities in Oregon have started charging private and public entities for use of their right of ways as a means to fund infrastructure improvements. The fee amount varies based on the kind of utility and how many facilities are used in the right-of-way. Charging right of way fees may be another funding mechanism for cities to build broadband infrastructure.

Public Private Partnerships

In addition to the above funding sources, there are a number of public-private partnership models that have recently emerged that allow the municipality to pursue a Gigabit-enabled network, while sharing in the risk, rewards and capital cost outlay of the network.

When evaluating public-private partnerships, municipalities need to balance the tension between control, risk and reward against the City's goals for the project. Control, in this context, refers to ownership of the network or how much capital the municipality is willing to invest. A municipality must consider how much control or capital is needed to be invested to minimize risks and maximize rewards. Risks are associated primarily with financial risks such as debt and debt coverage, as well as implementation, execution and operational risks. Reward is often associated with where and how fast a network is constructed, coupled with what type of services will be offered and at what price. There may be other benefits that are classified under "reward" such as fiber built for the city's benefit at no cost or construction and operational efficiencies gained from the potential partnership.

Partners can include private for-profit companies, local non-profits, other anchor institutions (such as school district) and even local residents. In some instances, the municipality may have a very limited role in a partnership and may only provide access to rights of way or other city infrastructure such as conduit, excess fiber, water or public safety towers, licensed spectrum, light poles or local government buildings. In other cases, a municipality may agree to become an anchor tenant and pay for service on the network for a contracted term, providing a guaranteed revenue source for the network project partner to justify the business plan to build out further in the community. In more extensive partnerships, the municipality can play a larger role, such as providing capital for part or all of the network construction. In some public partnership models, the private sector provides financing, while the municipality shares in some of the risk. In other models, the municipality pays for a substantial portion or all of the network build and contracts the operation of the network to the project partner. Sharing in the financial and operational risks and in the associated benefits of a project can allow communities to pursue broadband endeavors that may otherwise be unattainable.

Below are examples of three public partnership models that have been implemented by communities in the recent years.

Google Fiber, No Capital Outlay from the Municipality (and no Control)
Perhaps the most coveted example of a public-private partnership is the Google Fiber project in the Kansas City area. Google chose Kansas City, KS and Kansas City, MO as the community to embark upon its first foray into building fiber infrastructure. Kansas City, KS committed to facilitate access to local infrastructure and conduit that it owned and provided access to its rights of way. Kansas City, MO committed to waive local permitting fees and provided Google with unfettered access to dedicated city staff to support the project.

In return, Google has agreed to build and operate a fiber-to-the-premise network and provide Internet access service with 1 Gbps speeds to homes at $70 per month and to businesses at $300 per month. Google Fiber did not commit to ubiquitous coverage in Kansas City, but agreed to build out fiber in neighborhoods (called "fiberhoods") that met a predetermined take rate percentage prior to construction.

Google Fiber used this same approach in Austin, TX and in Provo, Utah. Although in the past three years Google has announced plans to replicate this model in 35 other cities, Google has recently announced that it is pulling back its fiber-to-the-premise strategy and is experimenting with Gigabit wireless technologies. Currently Gigabit wireless technology is limited to 500 feet; meaning, fiber optic cable still needs to be installed very close to homes and businesses for the wireless technology to deliver Gigabit bandwidth. Nevertheless, Google's pull back has caused some trepidation in the industry. Google is evaluating other models for partnership with cities and their pause in fiber-to-the-premise implementation should not be taken as an indication of their appetite for collaboration with cities.

In the Google Fiber KS model, the local governments do not commit capital to build the network. This limits the cities' financial risk substantially, but it also curbs the control they have over how and where the network is built. The municipalities in the Google Fiber projects have no say over prices charged to the customers, how the network is built or how fast. Google makes all of the decisions regarding current and future operations, and whether or not they pull out of a market. Given their most recent announcements of pulling back their plans, this has proven to be a substantial risk to the communities. Critics of Google's fiberhood approach claim that Google has "cherry-picked" more affluent neighborhoods to build its fiber and has left economically challenged neighborhoods off its build list.

As the Fiber-to-the-Premise market is fairly saturated; meaning, most municipalities are trying to implement some type of approach, companies like Google are targeting cities where very little capital outlay is required from them. Therefore, the Google model of having another company come in a build the network is unlikely. Leaning on the incumbent providers, such as Comcast, may be a more viable approach for this model.

Ting, Municipality Builds the Fiber Network, Ting pays for Equipment and Operates the Network

Canada's Ting has recently made a name for itself as a private carrier that will deliver fiber-to-the-premises services over a city-owned network. Already underway in Westminster, MD, Santa Cruz, CA, and Huntsville, AL, Ting is now partnering with Centennial, CO to bring Gigabit fiber Internet access to Centennial's 107,000 residents and its local businesses.

In this model the municipality provides the capital to build, own and maintain the "dark" fiber throughout the community and to every home and business. Ting "lights" the fiber by providing capital for the equipment. Ting provides Gigabit services to homes for $89 per month and to businesses for $139 per month. In order for the city to pay down its debt associated with building the fiber network, Ting pays the city a fee for homes and businesses that are fiber-ready or have been passed with fiber and another fee when homes and businesses start subscribing to Internet services.

While the fiber network is the property of the city and eventually an "open network," meaning several service providers can use it to offer services to homes and businesses, Ting partnerships typically feature an "exclusive right to operate network" for a minimum amount of time. While the build is the responsibility of the respective cities, Ting will lease and light the fiber and provide all equipment and Internet access. Cities partnering with Ting are mitigating risk and staying out of the challenging ISP business, but have more control over where, how and how fast the network is built. The cities also have control over pricing and services offered and can require that the network is available for others to use after an initial period of time.

Other companies are now replicating this model. Companies in Colorado that have stated they would enter into public-private partnerships similar to Ting's model include Cedar Networks,

Allo, FastTrack and Forethought. Others may also offer a similar model if asked to respond to a formal Request for Information or Proposal.

Long-term Lease, Shared Take Rate Risks or Utility Fee
Private firms including SiFi and Symmetrical Networks will fund a network build, and will oversee design, engineering, construction and operation of the network with a 20-year exclusive lease agreement. These firms are forecasting that the subscription rates they receive will provide healthy returns on their investment. And for extra measure, they ensure a sufficient return by requiring cities to guarantee take rates or pay the difference. The good news is that these potential city paybacks have a long ramp-up time before ever going into effect. Additionally, the guaranteed take rate is typically more than achievable at somewhere between 30-38%, depending on the negotiated terms. At the end of the negotiated years, the city owns the network free and clear but can continue to lease the fiber to their established partner(s).

Macquarie Capital will also work with communities to establish a fiber network using a similar model to that described above or with a utility fee structure model. This utility fee structure model was recently used to rescue Utah's Utopia network from its financial woes. In the Utopia project, Macquarie charges a flat utility fee for every home and business that the network passes, whether the home or business signs up for services or not. Terms of the deal were reported to be $22.60 per month for five cities. In terms of revenue sharing, each city is able to keep 75% of wholesale revenue after the first $2M per year. This arrangement is expected to wipe out Utopia's debt by 2021 if the network sees a 24% take rate for premium services

Macquarie Capital is also providing financing, design, engineering, construction and operations for an anchor institutions network for the State of Kentucky. This "concessionaire model" provides a long-term agreement of 30 years where Macquarie is the lead vendor coordinating all financing and implementation for the project and the State of Kentucky, in turn, shares in the risks and rewards of the project.

How is the Network Implemented and Operated?

As discussed, there are a myriad of ways that a public-private partnership can be funded. In the same vein, implementation and operation models vary. In many instances, the municipality has staff and resources that are already providing utilities to their constituents or are already maintaining roads and right of ways. With this being said, designing, building and operating a fiber network is not always in a municipality's wheelhouse. Often a municipality will outsource the design, engineering, permitting, construction of the network and physical turn-up of services. In some cases, the municipality may also contract for operations of the network and in other instances, the municipality may source these functions in-house.

Private entities Macquarie, SiFi, Symmetrical Networks and Fujitsu, that are providing financing for these networks to be built under a public-private partnership model, are also looking for opportunities to work with municipalities who wish to outsource either part or the

entire above list. Other municipalities are choosing to partner with these firms for the financing and operations, by keep the design, engineering and construction services under their control, using standard procurement processes for these functions.

As discussed in the funding section of this paper, each entity has a different model to recoup its investment and meet their business case for success. Usually these arrangements, fees, and exclusive rights contracts are complex and should be reviewed by a firm with extensive experience in multiple cities with a wide variety of business models and contingencies.

Software Defined Network, with an "Opt-In" Twist

Named the community broadband project of the year by the National Association of Telecommunications Officers and Advisors (NATOA), the City of Ammon, Idaho's open access network is obviously making many communities take notice. Ammon's fiber network is a "software defined network," allowing "fiber apps" to be setup and hosted on the network. One such application, is an innovative public safety application that uses the fiber network to coordinate immediate, real-time responses to school shootings. This has led to the City partnering with the University of Utah in a $600,000 initiative to research and develop a series of next-generation networking technologies supporting public safety, including broadband public emergency alerts.

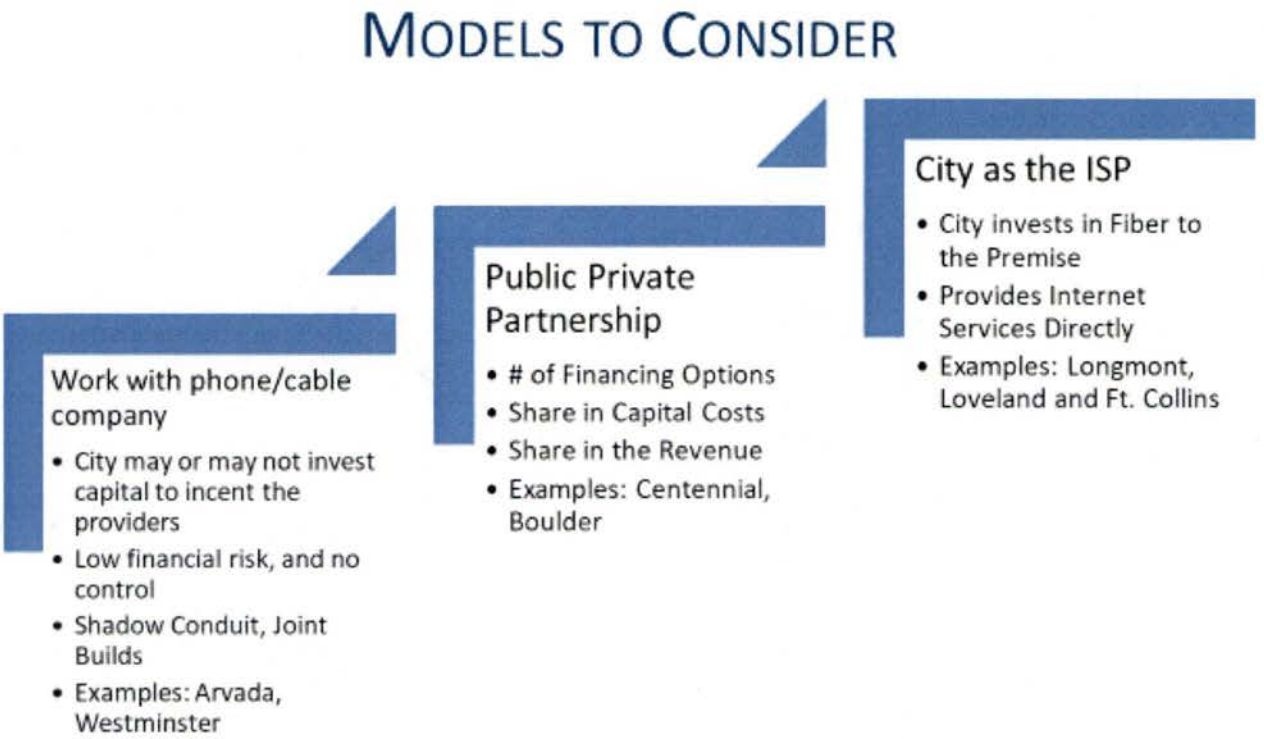
Ammon has created Local Improvement Districts (LIDs) where residents can "opt in" or "opt out" of receiving service from the fiber-to-the-premise network. For those who opt-in, they are charged a monthly fee, where those who are not interested are not charged. The city council's logic is that those who opt-in are investing in an opportunity to increase their property value.

Within a specific LID, improvement bonds are used to cover the expense. Bonds are paid off by an assessment of each participating property. It's estimated that this will result in a $15 to $20 monthly charge for opting-in households.

The open-access network has an accessible online dashboard where Ammon's residents can change providers if they're not happy with their current provider. They can also set up private, high speed "rooms" online, with a few clicks. Virtual connections can be set up between all of the schools, or with the school and the hospital – on the fly, again, with a few clicks. Ammon's open access model offers very high-speed Internet with a number options for providers, but more importantly, it also supports a number of growing data applications, allowing collaboration with anyone on the network at any time.

In Summary

There are a number of things to think about when pursuing a municipal broadband strategy. To summarize the various options above, the following chart provides information regarding potential models to consider.



The purpose of this report is to showcase the various approaches, give examples of communities that are using these various approaches and provide a general understanding of each of the models and financing alternatives. As mentioned, a more detailed report regarding the financial implications of these strategies has been compiled for the City of Greeley and the Town of Windsor based upon preliminary design of various levels of investment. Please refer to the companion report, "Financial Considerations, City of Greeley and the Town of Windsor Broadband Models" for a deeper dive into the financial projections of these various approaches.

Appendix A – Comments from the Survey

In general, it sucks and is upsetting that we pay what we do for pitiful internet, and cell service is also abysmal!

Data caps are important and ignored by this survey. The assumption being that municipal internet would not have one should be a much more prominent point than it currently is.

We have Rise Broadband currently and their service and customer service is horrible. There is currently a big forum about our broadband on next door with a lot of people complaining. North of the lake we only have Hughes or Rise Broadband as options. TDS are saying there are permitting issues. We DESPERATELY need help in getting decent service up here. In addition, we pay for a 25MB plan and they don't deliver anywhere near that yet I saw that the first paragraph of your survey home page says they must deliver a minimum of 25MB. They are saying they "try" for that but typically would expect 60% of their target. They're not even delivering that but they're charging me for it and I'm currently disputing with them. The "perception" on our forum is that they are overselling service in our area and ignore our complaints and are now even charging people overage fees for going over their contracted data limits but they won't even provide you with details on what you're using and when saying they don't track it. None of this makes any sense to me. Any help you could give us in making Rise accountable, providing alternate options (preferable) would be greatly appreciated. I feel like our hands our tied behind our backs up here with no ability to do anything. I truly appreciate the town doing this survey and hope that you will be able to help define and implement a solution that works for us. THANK YOU!!

Thank you for the Survey.

CenturyLink deleted >2GB of 13 yrs of my archived Email that I was unable to open due to their Email host "No_Such_Blob" error message ... thus would really like to eliminate CenturyLink as ISP. They claimed they had no backup. We pay too much for CenturyLink Internet and LandLine phone. Would switch to Comcast but have no cable trenched to our home .. only have a phone line. Considering eliminating CenturyLink Landline phone and using Trackfones only.

The cost keeps going up and we are Senior Citizens who find it hard to pay the increase in prizes.

COMCAST SUCKS!

Gigabit service would be the perfect compliment to the new convention center downtown, and has the potential to attract significant new business to the city given the already high quality of life and very reasonable cost of living.

I had to try taking this 3 times, my internet slowed down and sometimes would freeze up midway. What a saw of the Longmont service looks really good. Hope this works. Thanks & Good Luck!

Low income pricing is a must.

I think we already pay too much for more service than we really need. I would settle for less speed at a cheaper cost. I would also have to be convinced that the government should be involved at all before I support government provided/supported internet service.

Price controls critical

It's very costly and quite unpredictable.

I think if progress merits this then go for it!

Comcast/Xfinity is effectively a monopoly which gives them no incentive to reduce prices or improve infrastructure. Their well-known attitude is "We're Comcast. We don't care, we don't have to."

Unable to get my speeds rom the State site, thus unable to answer some of the questions.

High speed low cost

Comcast has been our only internet provider for 17 years being here they increase our rates but not performance, they throttle are internet and have neglected to fix our dropping internet speed without fiber internet this cant be fixed.

Thank you
I really hope that we can make this happen.I would love to volunteer my time to help!

Over this past year, the frequency of drops in the Internet service has significantly increased.... at least 3-5 times a week during work hours.

Thanks so much for taking the time to do this survey, America needs a fast, secure connection to the internet like it needs clean drinking water. We need to make this happen nation wide.

I lived in Greeley until the 17th of November this month and voted in favor of "opting out" so Greeley could pursue municipal broadband. I moved to Evans. I desperately hope that the City of Evans would be included in this. I'd immediately end my subscription with Comcast/Xfinity and sign up for gigabit internet.

Wish we got more channel choices from out provider without costing an arm and a leg.

My current internet provider also provides Norton Security, at no additional cost. This is a very important to me in considering an internet provider. It keeps my computer and devices secure from viruses and in general makes the internet safer from viruses spreading.

Lead or be left behind.

We had to switch from Centurylink to Comcast. No comparison in the service. Comcast is far superior. Since I work from home for an online company, I have to have fast reliable service. I don't want less than what I have now even if less expensive. I don't want to move backward to slower or less reliable service.

Digital TV reception sucks on my street also. cannot get reception when I use rabbit ears. Had to pay for cable TV just to get a couple of stations I want. Very expensive. Don't understand streaming internet tv yet or if it would work for me. I have old laptop. Old Tv, Old house with old wiring in an old neighborhood. I want local stations, ABC,NBC,CBS,PBS,CNN and FOXnews. Don't want all the other stuff they insist on bundling with you to get those stations. I pay through the nose for. Most of these stations used to be free with rabbit ears when tv was analog. Now with digital I get only 3 stations with digital rabbit ears. very poor reception in my area sO now I have to pay lots of money to get a few stations. Wish I still had analog options too.

If they city were too dó anything, providing ease of access to install an upgraded infrastructure or allowance of use of city provided to many companies allowing competition to drive prices down and speeds up.

I only have one choice. It's expensive and unreliable

Bring it on. Let the anti gubment types continue to pay high prices for lousy service and let the educated masses have at this

I strongly agree that broadband should be a regulated public utility

Protect net neutrality

While our internet speed it pretty good we pay the price for it. We pay $85 for 75mbps with xfinity. We usually only get 50mbps. And this is a temporary rate. The only reason we have this rate is because we moved into a house so they gave us a deal. Once the year is up we will have to either pay more to keep this speed or drop our speed down so that our internet bill fits into our right budget. Longmont charges $50 for 1,000mbps which is much cheaper, exponentially faster, and does not come has a temporary rate with a plethora ridiculous hidden fees. I'm tired of these big corporations taking advantage of us by charging top dollar for mediocre internet. It's time for us to get fiber internet at a reasonable price like other developed nations have. Internet IS a utility at this point and should be treated as such.

If a government utility can offer cheaper rates than a company trying to maximize shareholder income, I'd like that, assuming speed and service was not worse.

Being in the IT business, I know I'm not getting the speeds I'm paying for. Therefore, I'd like to have more options, competition, to choose from for an ISP.

I have read about the lack of good internet access in rural America, but I live in a city of 100,000 and my best option has been cellular service. I have to take my laptop to work or the library for simple downloads such as software updates. Streaming music or movies could use up my monthly data allowance in one day.

Comcast's business model relies on predatory business practices. They are the only ISP at my location that provides a speed suitable to my needs, so they function as a monopoly. Terrible service, exorbitant fees, and bait-and switch pricing strategies are their standard business practice -- they would be bankrupt if they did not function as a monopoly.

Please build a fiber network! It can't cost more than I already pay Comcast and having that money go into the city is a huge bonus

Please please please do this. Longmont is an excellent model.

The internet drops often and takes forever to load pages and transfer info for work. That is the most concerning. The internet for Netflix and Amazon prime are just annoying but it forces us to watch dvds instead or just turn off the tv. Not that bad. The work issues are really a worry. The cell phone situation is really really bad too.

Determining pricing is an important factor.

Would appreciate updates on the cities' actions in this regard.

This is a service I think should be available in these communities and I hope it comes to fruition

Focus on the crime in Greeley thanks

Please don't partner with Comcast or century Link. They have had decades worth of time to listen to market demands and improve their product. They continuously choose to raise prices and cap speeds. This issue will be especially important now that net neutrality has been removed. Giant ISP's like Comcast know they are our only option and will use that to pinch every penny. We have a small family business that we run out of our home. We rely on quick and open internet to continue to grow our business.

Comcast has a monopoly with respect to broadband service. There are no other options! Anyone who needs serious, reliable internet access will not be adequately served by DSL or wireless options. It would be amazing if the City could serve constituents by providing fast, reliable broadband/fiber services to homes and businesses. I think it would contribute to local economic growth. Thank you very much for exploring this option.

Have a municipal backed broadband service keeps the 3rd party providers from being able to gouge pricing while not introducing better performance. It was only recently that a 1Gbps package was offered through Comcast and the standard price is more than $150 a month which is absurd for an internet only package. Where as other locations providing connections to the same type of package are well below $100 a month.

Don't interfere in the market. This is not the role of government.

Please make this happen.

It's a great idea, especially since the fcc disbanded net neutrality. Having an accountable internet service that also has quality is important.

As a college student who is deciding where his future will go, a robust, fairly priced internet service has become a HUGE factor in where I'd want to live. I've considered Longmont honestly just because of their internet. Greeley and Windsor would be well served with a municipal fiber network that could provide 1gbps at a fair price!

I would like internet service to be cheaper rather than a continual increase in the rate that Comcast does.

Whatever the city decides to do, data caps are probably the biggest thing holding back the residential internet currently.

I think community Broadband is a great idea. I think it will make Greeley a more attractive place for tech companies to want to locate and will help our economy in the long run.

cost is out of control. They have us with no real options and customer service is at an all time low with them removing their offices from Greeley the largest municipality usage. 110.000+ should warrant and office in the city!

You providing Internet service shows how stupid votes are. So called "Free" government services are not free if one pays taxes.

Seems to me the initial Tribune article about the survey did not take into account the speeds that the individual residents or businesses signed up for.

Comcast is too expensive for us. We are retired on a limited income.

Internet service providers have gotten away with terrible customer service and outrageous prices for years. I'm hoping for a better option either provided as a utility, or built through a public-private partnership.

Free WiFi in the downtown Greeley area for everyone would be a HUGE economic draw for that part of town.
Our service is currently fine, but we are frustrated at the lack of competition, rising prices, and now the effect of repeal of net neutrality rules.

The FCC ruling on "net neutrality" makes it more important than ever that we get competition for broadband.

Everyone pays. No entitlements.

Stay out of What You Do Not Understand...

Competition is always better than government involvement.

Wish we had other choices than Comcast. Their business practices and rate changing games are an annual ordeal. Plus local customer service is nearly gone.

Thanks for considering this issue. My primary method of communication now is the internet and I want it to be fast and reliable.

I think the City of Greeley should look into working with Google to provide a City wide Broadband service. I think the area is large enough for them to be interested as well.

Easily available public access to the internet, from anywhere in the city, is a key strategic enhancer for the community's education and economic strength. Performance should be easily adequate for VOIP and file exchange, and perhaps a stretch goal is easily supporting video streaming and movie download/upload.

We have CenturyLink. Speed & Service is terrible. We are considering switching to Comcast / Infinity or possible local wireless / satellite service if available and if it has better speed than what we have now.

When Greeley had at home internet service speed was great. After comcast took over it dropped more then in half and prices went up. would love gig speed!

Please bring affordable gigabit.

No data caps. Xfinity currently has a 1 terabyte data usage cap per house hold.

We are supposedly close to a Centurylink hub which supposedly is supposed to make the internet faster... I don't think it makes it faster however.

Comcast is overpriced and constantly changing prices and options. I would enjoy the long-term stability of a municipality.

The only two wired broadband options available are not acceptable. After growing up in Greeley And moving away only recently coming back to visit nothing has really changed except More residential building. Greeley is not business friendly especially when it comes to IT. Please look at Longmont. They have done great things in a short amount of time. If Greeley wants To grow like they predict in the next 20 years they need to expand Internet options. Example the Microsoft data center that was recently built in Cheyenne. Greeley could attract businesses like that if they really wanted to. Remember back in the 1980s we did have Hewlett-Packard. Bring us out of the stone age and into the information age. Make Greeley great again instead of just a farming and agricultural town. UNC should be involved as many students live off-campus and rely on the Internet.

The prices Comcast (Xfinity) require you to pay after a year are exorbitant. The company ropes customers into a free cable upgrade, then forbids customers from returning to Internet-only options. The resulting price increase is burdensome and unnecessary.

I work using the internet - if it was not reliable and speedy would have to move to keep working

I use a Amazon Echo and Dot in my house to control Smart Lights, WeMo plugs. This technology is just growing and making life easier to function and make your home safer (i.e. creating lighting when not home) but it's also taking up bandwith. Just another thing to consider in terms of individuals growing needs.

Less government, not more. We don't need more government control in the private sector. Leave it alone

only online with compost since july and no problems yet

I have made several attempts at obtaining an alternative source of internet service in Greeley and have found that Comcast essentially controls the entire communities access, offering NO alternatives to access and NO negotiating cost of service. GOOD riddance Comcast...

If anything that needs to happen is to provide competition for Xfinity both in service (speeds) and price.

The city should consider charging for the internet like a utility bill!!

If you do implement broadband, I do not want my choices to be diminished. In other words, if I still want Comcast services, then I will stick with them regardless of what the city does. I don't want to HAVE to subscribe to city broadband above all others. I want to be able to make my own choice.

i think commercial companies drain the consumer while providing the minimal amount of service possible which hold back the american society and culture and leaves us behing even some 3rd world countries due to greed.

Speed is only 1 variable. Jitter and latency is also very important and directly affect VOIP, video chat, gaming and many other realtime person to person internet interactions including teleworkers. This survey didn't ask about the quality of jitter. Any decision by the city should understand networks better as speed is not enough.

Our speed seemed ok until recently. Now, in order to watch a movie on Netflix/Amazon, we have to make sure all other devices are off wifi. CenturyLink told me to connect everything to modem via ethernet cable. Grrr!

needs to be way better, more speed, reasonably priced, need more competition/private sectors, if government could provide higher speeds for lower cost then great but I do not see that happening

do not direct to a speed site that required Flash - because of FlashBlock I could not use it

Net neutrality is critical for all of us. I know that's in the hands of the FCC, but their decision will influence everything internet-related!

Comcast prices are absurd since we had to pay for unlimited data since we are gamers and was going over the 1tb data cap

I pay for 75 but am lucky if I get 40. I'm on the phone with Comcast fighting almost every other week.

Why are you even considering this? Makes no sense for a City to get into such a competitive business.

Windsor should require all internet companies to provide access in the town of Windsor. We live in the town limits but our only option is Rise Broadband. the town to require companies to provide access as part of their permitting process. No access, no permit.

More options would be fantastic. As I said earlier Comcast currently has a monopoly in Greeley if you want anything faster than 7mbps (CenturyLinks current offering for my address). They also just instituted a monthly data cap which impedes use of the service. I feel trapped and to me this has become just as important as any other household utility. Not only is it used for personal means such as social media and streaming but it has become a needed for work and school as well. You can't get by without it. In addition with continued growth and demand likely to increase I think it would only be fair to plan for the future and get some fiber infrastructure to support gig speeds. So happy this is being looked into.

Don't let Comcast exploit us as much as it already has.

Connection

I really don't like how CenturyLink lures you in with introductory prices and then raises them. I don't like trying to reach them on the phone. It doesn't seem like internet should cost so much. It would be nice if you paid for what you actually got, rather than speeds "up to" some hypothetical number. Thank you.

Comcast continually says my payment will be one thing, but due to "promotions", is always trying to add on charges. I have to call about every 3-6 months to negotiate out about $30-40 in costs. Their customer service is terrible.

I used to live in Clarksville, TN which has great gigabit fiber service. Talk to them about implementing such service

Internet service to the side of the house is one thing. Good technical service on the inside of the house is even more important. Do you really thing city employees or contractors can keep up with the technology?

government should not be competing withn private inter-prize.

Greeley is growing fast, and having strong internet infrastructure will be necessary in the near future

Disclaimer: as a household we COULD have faster internet speed, it's available, but we are unwilling to pay any more than the basic rate.

Comcast is way too expensive.

Paying for 25 but getting 10-15. Cost 60$ is too high for actual speed.

I am in favor of a fiber network and do not thing the City or any Government organization should run it. The city or government should initiate the process and make sure the private company(s) stay within preset guidelines. Such as the relationship with Xcel energy. I look forward to receiving what we should have had 10 years ago.

Under no circumstances should the City of Greeley partner with someone else to provide this service. Make the upfront investment to ensure that the internet in Greeley remains in the hands of We The People.

I work from home and pay for Comcast's higher speed, but it does not always achieve the speed that I'm paying for. I cannot use VOIP due to latency issues, which Comcast will not fix.

Businesses would be drawn to our community if we provided fast broadband services.

WE, our neighborhood area, have had problems with Comcast for years. I have files documenting our issues. I get so frustrated with the system and spending time talking with them. Last night they finally expanded our broad width band and changed our channel. Today, so far, the internet is working. The download and upload speeds are based on the repaired system

Have Comcast. Overall, like the speed and reliability but wonder about the cost.

No data caps please. This may be equal to the request for faster speeds

Even if broadband services are not implemented by the city out on East 18th it will probably lower prices for internet in the area and consumers will probably get better deals on internet services.

You have no idea how excited this makes me to be having this opportunity for Greeley. This is something I've been looking to have for years and now that the conversation has begun, this makes me hopeful for Greeley's future!

We actually have considered relocating to Fort Collins once they have their municipal broadband system up, or Longmont. We both work from home and Comcast has terrible upload speeds, regardless of the plan, which is important for us.

It is obvious that Comcast and CenturyLink are not interested in investing into the community with the latest technology--they will increase prices with incremental speed increases. CenturyLink and Comcast need competition and a local government investment is only the beginning--bring it on. This proposed broadband network will be a major plus for Greeley--a forward thinking city that will positively impact and recruit new clean high paying jobs.

We would support the a community broadband for us and for our schools, businesses and other community members. Although, we are not currently heavy users, with increased speed, we might use it more.

My only option for internet is Rise, so I get what they offer

:-(

We voted for this. Let's get it done with the quality that Longmont enjoys.

Adequate, reliable, high speed internet is in my mind one of the basic facets of modern city. My wife and I are both university graduates and we do look at things like what type of internet service is available, we have moved to Greeley for work within the last few years. I would be proud, and ecstatic if we had high speed broadband provided by the city/county government. It constantly seems that we pay more for less service with poorer quality to companies like comcast. They are so big that they can manipulate their customers because we have no other options, I would really prefer to pay for local internet service.

I work from home and may consider having to move. I also believe that as the dependency on Internet increases, the current access in our neighborhood will cause home values to decrease because of it!

Stay out of this business. You are government, not a private business! Stop, just stop this crap. Customers need to pay for what they want and use! No tax money should be spent on this effort.

My subdivision looks to be one of the only one around with such slow internet, I had much better service in a small WY town. This should be addressed by someone!

Unless the town of Windsor partners with a private entity (Internet provider), I seriously doubt a government run program will be anything even close to what we have now, as far as options go. Historically, government involvement = slow, lazy, wasteful, entitled. Thank goodness we have a president that is doing his best to stir it all up, lampoon the left, drain the swamp, and laugh all of the political losers out of town. Very refreshing! Very entertaining. I just wish the president would step up the rhetoric even higher; I loved the Pocahontas resurrection this week!

Entire neighborhood has signed petitions to Century Link for service. They have declined despite plans to provide service to new and near developments.

its terrible

I would like to see us model our broadband service after the community of Longmont.

Rise Broadband previously Skybeam is failing us. The raised prices and removed unlimited data. Customer services is horrible and waits on phone are too long. I pay $85/mo for 50 speeds and even employee to me we'll never see over high 20's. Each week in receive an email about reaching my limits and I'm hit with a surcharge on my bill. This company is running a monopoly as we have no other options in the area.

WE DO NO SUBSCRIBE TO CABLE AND NOT INTERESTED IN BUNDLING SERVICES TO INCLUDE CABLE. Thank you!!!!

Internet is not an utility. It is not the proper role of the government to meddle with the market and create a taxpayers subsidiazed monopoly on the internet service, and limiting the private market choices for consumers in the process.

The government already controls the roads and has a monopoly in the public education system and look at how good that's working ... (sarc)

Thanks, but no thanks.
I have very little faith the city can improve the performance and quality at a lower rate.

Why does this feel like a breach of privacy? The government has my server. Yikes!

What we have now is a virtual monopoly in Comcast. Century Link is completely unreliable. Rise Broadband has terrible customer service, requires a 2 year contract, and randomly accuses customers of exceeding data limits, but can't provide any details regarding the data used. This is a particularly sore spot for me because I terminated my account with Comcast 3 months ago only to run into big problems with Rise only 2 months into my 24 month contract. Rise is so bad that I've already re-subscribed to Comcast and am willing to pay a $200+ early termination fee to Rise just to be done with them. My biggest concern with a public utility type of ISP is that usage will be monitored and/or regulated--the criteria to be determined by bureaucrats and subject to the prevailing political winds.

We currently only have 1 option available in our subdivision and that is RiseBroad Band.

We need options in Steeplechase. We don't have any.

Have contacted Verizon too many times to count. Was told there aren't enough cell phone towers in the area. We have 2700 homes going in to the east of us and a huge apartment complex to the west of us. What will happen to the internet service when all of those people move in? This is a serious issue.

Everyone that lives in Steeplechase will feel the same way!! Our internet is awful and it's either CL or satellite. It's very frustrating to all of us who live here and the companies don't want to spend the money to update it for 200 homes.

Our current provider is Rise Broadband, they are nice people but are oversubscribed, and have huge slowdowns in the evenings and when the wind blows the antenna

We currently appear to only have 2 options, DSL from Century Link, who agrees the technology in my area is outdated but has no plans to improve, or Rise Broadband which I think now operates under a different name but apparently does not have a good reputation with current neighborhood users.

Rise Broadband is currently the only service provider available for my address

As above, I would be leary of any service that came thru city of Windsor... They are simly too greedy!

The city has no business getting into the internet business. They can't deliver any service efficiently.

Had reliability problems at first, but now it is rock solid.

Rise Broadband is HORRIBLE!

Rise Broadband works well for us

Please hurry!

Only isp available. It is absolutely awful

We have NO options with internet in our area and it's TERRIBLE! I feel like we live in a 3rd world country with our connectivity. It's a joke.

Our service is intermittent. Getting consistent service for streaming video is our top priority

They cannot provide adequate service, they know it, and dont seem to have plans to improve it

Deepening on how Windsor structures its internet regarding net neutrality, it will be an easy decision leaving Comcast. Comcast rates will continue to rise because of the lack of net neutrality.

keep price affordable

Fiber to the home is critical for economic development in the changing economy

Vey limited options. Rise Broadband. Bad bad since at least 2-17.

Ours is perfectly fine. We run 3 laptops all day long and rarely have problems.

When we first moved to Windsor 9 years ago we had skybe which was amazing, but we bought a house and to many objects we blocking the microwave towers. We tried century link and we got horrible customer service and hardly any speed. We are with xfinity which is better, but there are times our internet has cut out with them as well. Internet is becoming a a necessity, and it would be nice if we could get something reliable yet affordable. It seems like internet is starting skyrocket in cost like everything else.

I hate the lack of customer service from my provider and the attitude they have. They are completely unhelpful and inaccessible.

Keep it private and encourage competition.

Speed tests are a farce, and what matters most is the ISPs ability (and willingness) to interconnect and support bandwidth at the datacenter level. Net Neutrality plays a huge role in that, and what a better provider to remain neutral than a municipal carrier.

I fully support municipal broadband. I will see you at November's meeting to voice such support.

The town of Windsor should do this!

I very much dislike Comcast and the monopoly it has on internet service in this area.

Have the big ISP's build the fiber optic network that all of us have been paying taxes on our bills since the 90's. Other than that if throttled speeds are in place the isp should only charge for speeds allowed.

Everyone around me has the same issue with internet and it seems that the companies don't care! We feel stuck.

Before investing into this as a service, I would prefer to see more money going to schools or outside, educational programs

Rise Broadband provides the worst service and price gouges everyone around us because we have no other option for severely lacking performance. It's a constant point of discussion at our HOA board meetings.

Contact advoda communications they may have options for you

I 100% support municipal-run broadband in our community. This can be an attractive benefit to potential future residents, and will spur growth in the area.

Internet provider options in the area are lacking, which has led to unnecessary rate hikes and data caps because residents have no alternative options. Pursuing any other option (such as partnering with existing service providers for build out or management of the utility) continue to support the monopoly they have over the community in regards to internet options.

Municipal-run internet can work - Longmont, Colorado and other communities around the country have proven it. I would love to see our community be on the forefront of this technical revolution.

We are very unhappy with comcast. It would be great to have other options

I think provI ding broadband is an excellentirely idea. I'm more than happy to pay some for it especially if it means our more rural neighbors get better service.

I don't like the fact that comcast closed their Greeley office

Frequently lack internet in the mornings

Options are terrible in our subdivision

Horrible internet. Can't stream videos at all. Working from

Home isn't an option because of internet. Please help.

After subscribing to ISP's for over 20 years I am thoroughly sick of their rate and fee games. The only ISPs that have consistent, predictable rates are local.

Then there's the awful "ISP customer service" which should be enough, all by itself -- if they actually operated in a "free market" -- to drive these predators out of business.

I would be willing to have the city of Greeley install the infrastructure for Gigabyte service but let private companies provide services and compete.

Sure, I've had my issues with TDS, but they worked to resolve them. The biggest issue is that they oversold their bandwidth and we all suffered. That should be illegal. If King Soopers sold two people the same bottle of water and were then told to share it, there would be legal action.

I hate Comcast and wish I didn't have to support them, but I dislike ineffective bureaucracy just as much. This can be a great service for our community, and I hope it will be.

Full disclosure: this might sound really lame, but it's been a dream of mine (ever since I was little...I warned you!) to start a telephone company/ISP. It's such a fascinating industry and one that I see that could use improvement. I started a website for class of a fake ISP (https://www.getunitefiber.com/) and it's been a fun sandbox to learn marketing automation and to further my web design skills.

Long story short, I think it would be very cool to be involved with such a project. If you ever need a creative mind, I would love to help!

This is exciting and I look forward to what's ahead! Thanks for all of your hard work.

Broadband is basically a utility now. It would be fiscally responsible for a city to provide infrastructure and services for residents.

Our internet is very inconsistent. Century link has sent 3 different techs out to fix our slow inconsistent speeds and couldnt help. We strongly support community broadband

Internet services here feel to be far behind what should be a modern standard. The service providers seem unwilling to invest in high quality upgrades. I don't feel public investment should be made for a corporate entity to take over and use to pay bloated corporate salaries. I feel that broadband service, among other things, could be better and more appropriately managed by a local municipality.

As an audiobook narrator from home, I really could use faster speeds at a reasonable cost. We would also like faster speed for watching online TV.

The premise is that municipalities have a duty to provide broadband and "close the digital divide." There is sufficient differences in the use of the Internet and participation in the IoT that Internet access should remain a business and personal choice driven by market forces. I cannot envision Windsor engaging in this pursuit without adding bureaucratic overhead, particularly when collaborating with the City of Greeley that may have conflicting interests and other dynamics. I believe that it will be inevitable that subsidies will become part of the implementation model.

I teach extensive online, for years, and have never contemplated that the Town of Windsor was responsible for my Internet service.

Price paid does not equate to speed provided currently.

Rise broadband is the worst. Promises and charges for 25mbs but rarely supplies that. Gov should force Rise or others to guarantee the speeds they say they are providing and be fined or have to credit money back to customers according to speeds. This is false advertising and should be regulated by gov.

Would be great to have something that we're not paying monopolies for, that goes back into our city.

In Water Valley South. Comcast/Xfinity is providing fine service. Wired speeds are very fast. There is significant drop off due to our wireless router and home "dead spots," but that has more to do with the wireless router than the cable provided speed. The town/county should stay out of this. Long-term costs are unpredictable and will become a financial burden for the residents.

I am glad that communities are looking into their options for broadband services. It needs to be available and affordable for everyone.

I have fast and reliable internet. I support broadband for the greater good. I believe it will make Windsor a better community and attract businesses. It's going to happen eventually so we might as well do it. I do not want decreased speeds and/or increased prices.

No real competition. Comcast is really the only option. Seems like a sort of monopoly.

I worked with network infrastructure during my time in the Air Force. I am hoping to get back into the field post graduation, and have a passion for the subject.

I only have one option for broadband (Xfinity). This means that there is no competition, and i have no records when they raise my costs (which has occurred for times in the past year).

I am a strong proponent of municipal broadband, and would be willing to donate time or expertise to aid in such a project.

We own a business and internet is a necessity to run that business. However, internet is not a right and should not be funded by tax dollars or property owners.

Would love to see this happen and bring Comcast some competition. There prices are much too high!

Our internet speed and access is awful. As a neighborhood, we have looked into all kinds of options, with no success.

I find it hard to believe that when this subdivision (Steeplechase) was built they did not install in ground cable so we could have a better choice in service providers.

Comcast offers faster speeds than what I have, however, the my current 100Mbps is unreliable and too costly for what I get, so I will not go up to the next speed tier for a higher price, knowing that I am not getting what I am paying for at my currently level and there are NO other options that offer decent speed levels in Windsor. Comcast/Xfinity has a monopoly here and it's driven prices up.

We have fiber to the home from Centurylink because it's a brand new neighborhood. It is great service. I'm sure I would feel very differently if I lived in an old neighborhood where internet service is lacking.

It is very unfair for govt to compete with private companies who have invested 100's of millions in networks who then have a subsidized competitor

Our provider, Comcast, currently acts like a monopoly with little or no oversight or accountability. This is not a free market, and Comcast's behavior justifies government action of some kind and continuing oversight.

Thank you. I've seen GoogFiber going in around US and was hoping it would come to Windsor.

What I'd really like to see is a State initiative to provide wireless broadband as a utility state wide. Performance and connectivity would vary from very rural to very dense urban. Make Colorado THE tech place to bring business.

Please ignore the FCC's terms for broadband. To say I feel they are under the influence of the big cable companies is an understatement. Let's lead the US to having MODERN broadband speeds.

I strongly support action in this regard. I work from a home office every day that I am not traveling. We use internet for everything. We're building a connected home. Lead, follow, or get out of the way... I'd like to see Windsor lead.

Stop wasting everyones time, first a library now this i get you people have money to blow, but how about on education...25th in the world for godsakes..

I couldn't run a speed test but we've had Xfinity for about 15 years. Their prices keep going up but they are the only reliable broadband provider.

We only have one option for internet at our address and pay a ridiculous amount for just internet. $105.00 per month from Comcast. We do not want tv and phone, but have to pay full price.

1. Century Link has very poor customer service.

2. We are told that 10 mps is the max we can get on our block due to old infrastructure, which CL is unwilling to upgrade.

We need more options for Broadband Internet access,.Currently in Windsor only Xfinity offers speeds above 100 Mbs which I feel is the bare minimum in 2017 and because they have the monopoly they are able to charge whatever they want, consistently increase prices and provide frankly laughable customer service.

Comcast almost has a monopoly on internet service - they are so unreliable and their pricing structure is constantly changing. Internet is more important to us than TV or phone (land line). it is becoming a necessity.

I like my Internet from Century Link but I am tired of having to negotiate a lower price every year. To lock in a fixed price for life, they require you to upgrade even if you are happy with the speed you currently have.

I believe my current internet connectivity is decent. However, I want the city of Greeley to move forward with exploring a state-of-the-art network to serve the community (homes, schools, and public/private sector entities). Comcast/Xfinity has made some good strides in terms of customer service over the past two years, but only as a result of communities considering making internet access a utility. The lack of broadband competition has resulted in higher costs and poor customer service. If Greeley is expected to double in size over the next few decades, we should invest in developing the world-class digital infrastructure that will help attract and retain individuals/families.

The signal fluctuates at different times.

Please analyze what worked/didn't work for Longmont. Their service is far superior to private providers. Issue with apartment complexes being "bought" by private provides so they cannot access Longmont internet. (Longmont has one trash service too, just saying things run smooth there)

Please consider doing what Longmont did!

NEO CONNECT

EXECUTIVE SUMMARY

CITY OF GREELEY AND TOWN OF WINDSOR, BROADBAND ROADMAP

May 2018

Abstract

Municipalities are taking a more active role in ensuring their communities have reliable, abundant and affordable broadband services for their citizens. Additionally, smart city applications are requiring local governments to plan for robust infrastructure to support these emerging technologies. This white paper discusses models and approaches for the City of Greeley and the Town of Windsor to consider and provides a platform to evaluate financial implications, levels of investment, models and strategies, and options for implementation.

Prepared for the City of Greeley and the Town of Windsor,
by Diane Kruse, NEO Connect

Introduction and Initial Recommendations

Background Information

The City of Greeley and the Town of Windsor have hired NEO Connect to provide strategic planning for facilitation of better broadband services for the communities. In parallel with NEO's engagement, the City of Greeley and the Town of Windsor staff have conducted high-level surveys from citizens regarding their thoughts on current broadband services, what is important and their opinion regarding the role of government in solving broadband gaps.

Additionally, NEO and City staff have conducted community engagement meetings with the public for feedback. NEO's team provided a current assessment of the broadband landscape in Greeley and Windsor. NEO researched the existing services, pricing and availability of broadband service within both communities and identified gaps in service availability provided by the incumbent providers.

There are many levels of investment that may be considered by a local government to improve broadband services. The first level of investment may be to implement policies and ordinances that reduce the cost of broadband deployment. Another level of investment may be to connect various government and anchor institutions within each community. These strategies lay the foundation for connecting important facilities and help create a broadband distribution system that can further be expanded. Another level of investment may be to extend the broadband distribution system into neighborhoods to connect homes and businesses with fiber.

To identify the costs of various levels of investment, NEO's team gathered information regarding the City of Greeley's and the Town of Windsor's smart city, traffic management, capital improvement projects, and other government communication needs. NEO identified and mapped existing assets that could potentially be leveraged to improve broadband services and identified key community anchor institutions that could benefit from having fiber built directly to their locations. We then provided a high-level design and capital cost projection for several levels of broadband infrastructure development and investment.

In addition to the above set of tasks, NEO's scope of work included providing models for public-private partnerships and best practices regarding what other municipalities are doing or have done to improve broadband services.

Why this is Important and Why Municipalities are Investing in Broadband

Having access to very high-speed broadband and Internet services has become one of the most critical components for education, government services, economic development, healthcare, utility operations, first responders and business operations. The demand for more bandwidth

continues to grow. By 2021, there will be over 30 billion devices connected by the Internet of Things (IoT). Each person will have over 13 connected devices on average, including their cell phones, tablets, clothing, and their cars. The global Internet traffic continues to explode. In 1992, global Internet traffic per ***day*** was 100 Gigabits. In 2016, the global Internet traffic per ***second*** was 26,600 Gigabits. It is projected that global Internet use will continue to expand dramatically.

Global Internet Traffic	
1992	100 GB per DAY
1997	100 GB per HOUR
2002	100 GB per SECOND
2007	2,000 GB per SECOND
2016	26,600 GB per SECOND
2021	105,800 GB per SECOND

Internet, data and cellular growth will continue to double in bandwidth every one to two years. Although some of the existing Internet Service Providers (ISP) have invested in their networks to keep up with demand, the majority of networks built by cable and phone companies are maxed out. As the Internet drives all things regarding economic development and vitality, simply put, connectivity is essential.

Coupled with the ever-growing importance of the Internet, the convergence of new smart city applications, traffic management needs, the growth of and application for small cellular site installation and the soon-coming implementation of self-driving vehicles, municipalities are seeking strategies to facilitate and coordinate investment.

Recently, the FCC overturned Net Neutrality rules that govern the availability and access to content and bandwidth. These rules prevented ISP's from blocking certain types of content or placing specific websites or applications in preferential "fast lanes." The FCC's overturning these rules could help the large or incumbent providers stifle the ability of smaller internet companies to compete. Some critics of FCC's decision worry that the large ISPs will begin prioritizing certain websites, applications, content and services over others, either by charging customers to access that content or charging Internet companies to access customers. Internet websites could be "packaged" or "channelized" similar to the way cable companies provide a roster of channels and programming.

The Cities of Longmont, Boulder, Loveland and Ft. Collins are implementing locally-run Internet services as a way of ensuring their citizens and businesses are not impacted by the overturning of Net Neutrality rules. These cities are stating that the Internet would remain open and equitable, serving as a countermeasure to corporations potentially taking over the Internet.

Another reason why local governments invest in broadband infrastructure is to address the availability of advanced broadband services throughout the entire city or town boundary. In

many instances, the incumbent cable and phone companies have invested in some part of the municipality, but much of the community does not have adequate services. Municipalities invest to ensure that all citizens and businesses have access to advanced broadband services at affordable prices and that no one is left out of participating in the digital economy.

Municipal facilitation can take the form of implementing broadband friendly policies and ordinances to reduce the cost of implementation by the private sector, to investing and implementing fiber for government applications and to key anchor institutions, to entering into a public-private partnership to promote a ubiquitous Gigabit strategy, to a full-blown implementation and operations of a municipally-owned Internet Service Provider.

Considerations that impact a local government's broadband strategy and involvement include the level or amount of municipal investment, examination of models and approaches implemented by other communities, exploration of how networks are typically implemented, constructed and operated, as well as exploration of public-private partnership models that are emerging in the industry and possible financing strategies for implementation.

Summary of the Survey Results

Below is a summary of the residential survey results that were facilitated by the Town of Windsor and the City of Greeley staff.

643 residential surveys responses were received. The surveys were posted on the City of Greeley's and the Town of Windsor's websites and social media sites. Although the survey was filled out most likely from residences that care about Internet services, or potentially have an issue with their current Internet services, the survey results strongly suggest the following:

- Reliability is the most important factor for the community, followed by speed and price.
- The community wants to see more reliable, faster, and more abundant broadband services. 81-82% of the respondents stated that the download and upload speeds are too slow either sometimes, most of the time or always. Speeds vary throughout the day as more users are on the Internet and there are times when respondents cannot get on the Internet.
- 54% of the residential respondents telecommute, having either one or more people working from home, providing insight into the broadband needs of homes within the communities.
- 62% of the respondents were Comcast customers using cable modem service; followed by 21% of the respondents using CenturyLink's DSL services.
- When asked to rank the local government's role with respect to broadband access, 57% of the respondents ranked "to build network for the public: homes, businesses and government locations" as the primary role of government, with 16% stating the government's role should be to "partner with current providers" as the primary role.

- 66% of the respondents stated they would support a small monthly utility fee to pay for broadband infrastructure build out.
- The survey stated that the City of Longmont recently became Colorado's first "Gig City," building a fiber network that provides residents with reasonably priced Gigabit service to the home. The survey asked "Would you support the City of Greeley and the Town of Windsor offering Gigabit service to the home." 73% answered "Yes" and 19% answered that more information would be needed. Only 8% replied "No."
- 21% of the respondents said they would potentially move if adequate broadband was not available and 5% said they would definitely move.

Although Comcast has stated that Gigabit speeds (1000 Megabit per second (Mbps)) are available throughout Greeley and Windsor, of the respondents that indicated that they are Comcast customers, none of the speed tests conducted were at Gigabit speeds. The highest speed test result was 350 Mbps in download speeds. The average speed test results for Comcast customers were 71.45 Mbps in download speeds and 8.99 Mbps in upload speeds.

The reasons for the discrepancy between Comcast's speed test results and their stated available speeds are varied. Either customers are signing up for a lower service speed through Comcast, Comcast is not delivering Gigabit speeds, the devices do not support these high bandwidths, Comcast's network was constrained as more users were on the Internet, or Gigabit services are not offered by Comcast in their neighborhoods. There is not an easy way to determine why higher speeds were not achieved by the speed tests.

The FCC definition for broadband is 25 Mbps in download speeds and 3 Mbps in upload speeds. The average speed test for CenturyLink customers was 11.88 Mbps in download speeds and 2.04 Mbps in upload speeds. None of the CenturyLink customers that participated in the survey and speed test met the FCC's definition of broadband service.

Most of the survey respondents also provided comments – All of the comments that were received are included within the Appendix A of this report. Results of the survey are provided within a separate document.

To summarize, most of the comments received were in support of the City of Greeley and the Town of Windsor to invest in a ubiquitous Gigabit fiber initiative. There were a handful of comments that discouraged the government from getting into the broadband business. Many of the responses discussed concern over the existing services not being available, fast enough, or providing the level of services that were subscribed. Many comments discussed the lack of customer care or service available from the incumbent providers. Some responses discussed how no broadband service is available within their neighborhoods and that Comcast does not serve their home with cable TV or broadband service. A good portion of the comments encouraged the City/Town to follow what the City of Longmont has done and what the Cities of Boulder, Loveland and Fort Collins are considering.

Current Assessment, Existing Services and Gaps

Based upon information gathered by the FCC, the Broadband USA Mapping Tool, Broadband Now and the State of Colorado, the following provides information regarding current services and gaps of service within Windsor and Greeley.

Windsor Market

The incumbent cable company in Windsor is Comcast, serving approximately 77% of Windsor; 12.1% of Windsor receive TDS cable services. The incumbent phone company is CenturyLink, with 98.2% of the community having access to DSL services. Rise Broadband is a fixed wireless provider in Windsor and satellite services are available through HughesNet and Viasat. Business Internet providers include CenturyLink, Comcast, Rise Broadband, as well as MHO, another fixed wireless provider in Windsor and Electric Lightwave, Birch Communications and GTT Communications.

According to BroadbandNow, the average download speed in Windsor is 26.82 Mbps. Speed test data is based upon 6,072 speed tests from IP verified users who took speeds test in Windsor between April 2017 and March 2018. Windsor's average download speed is 24.7% slower than the average in Colorado and 17.5% slower than the national average.

12.6% of the Windsor homes have one or fewer wired Internet providers available to them. In other words, these homes have only 1 choice or no options for Internet services.

Greeley Market

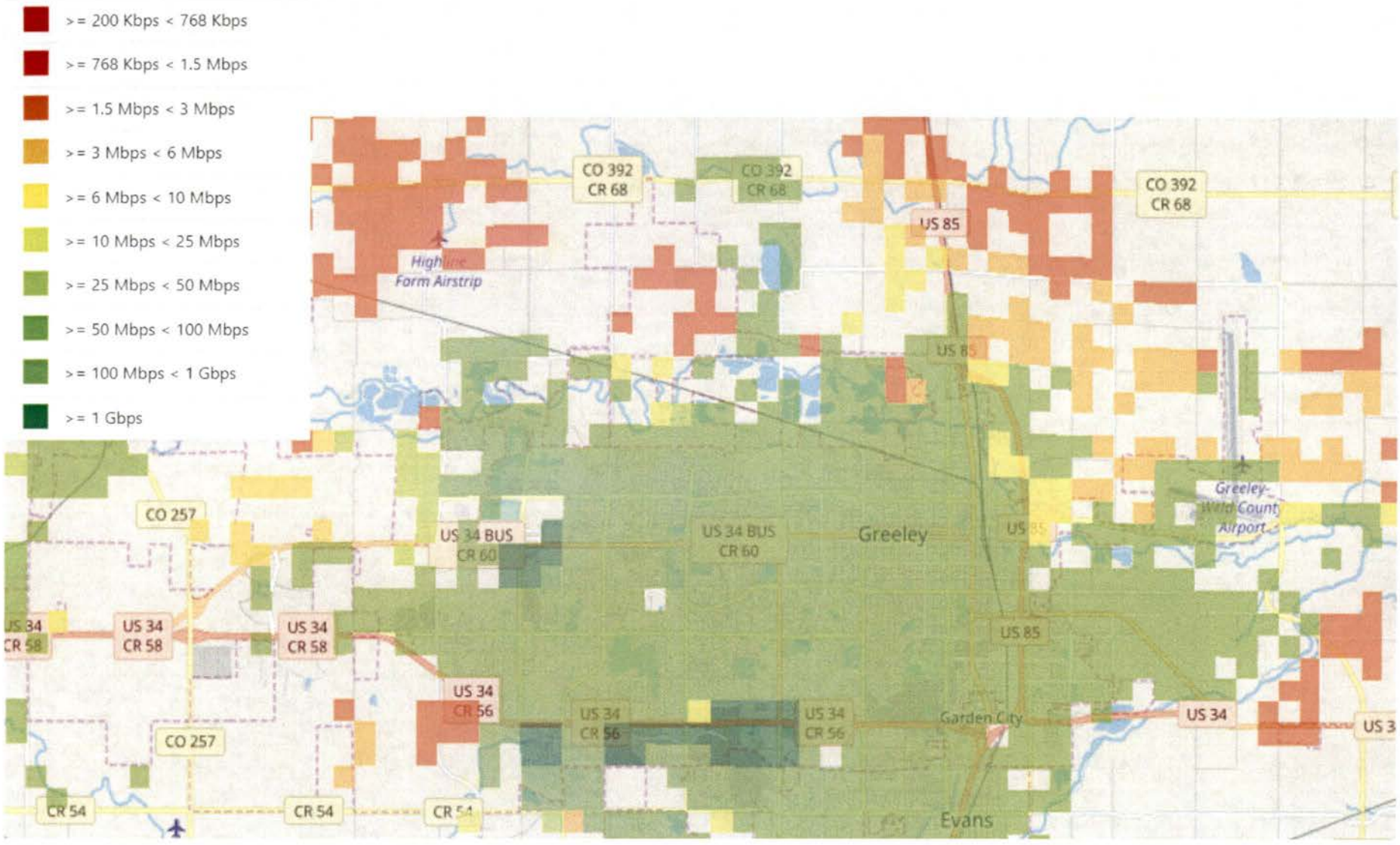
Residential providers in Greeley include Comcast, CenturyLink, Rise Broadband and Windstream. Satellite providers are HughesNet and Exede Internet. Blue Lightning provides fiber services to 1.1% of the residential community. Business Internet providers include all of the providers listed in Windsor, as well as Level 3 Communications, NewCloud and MegaPath.

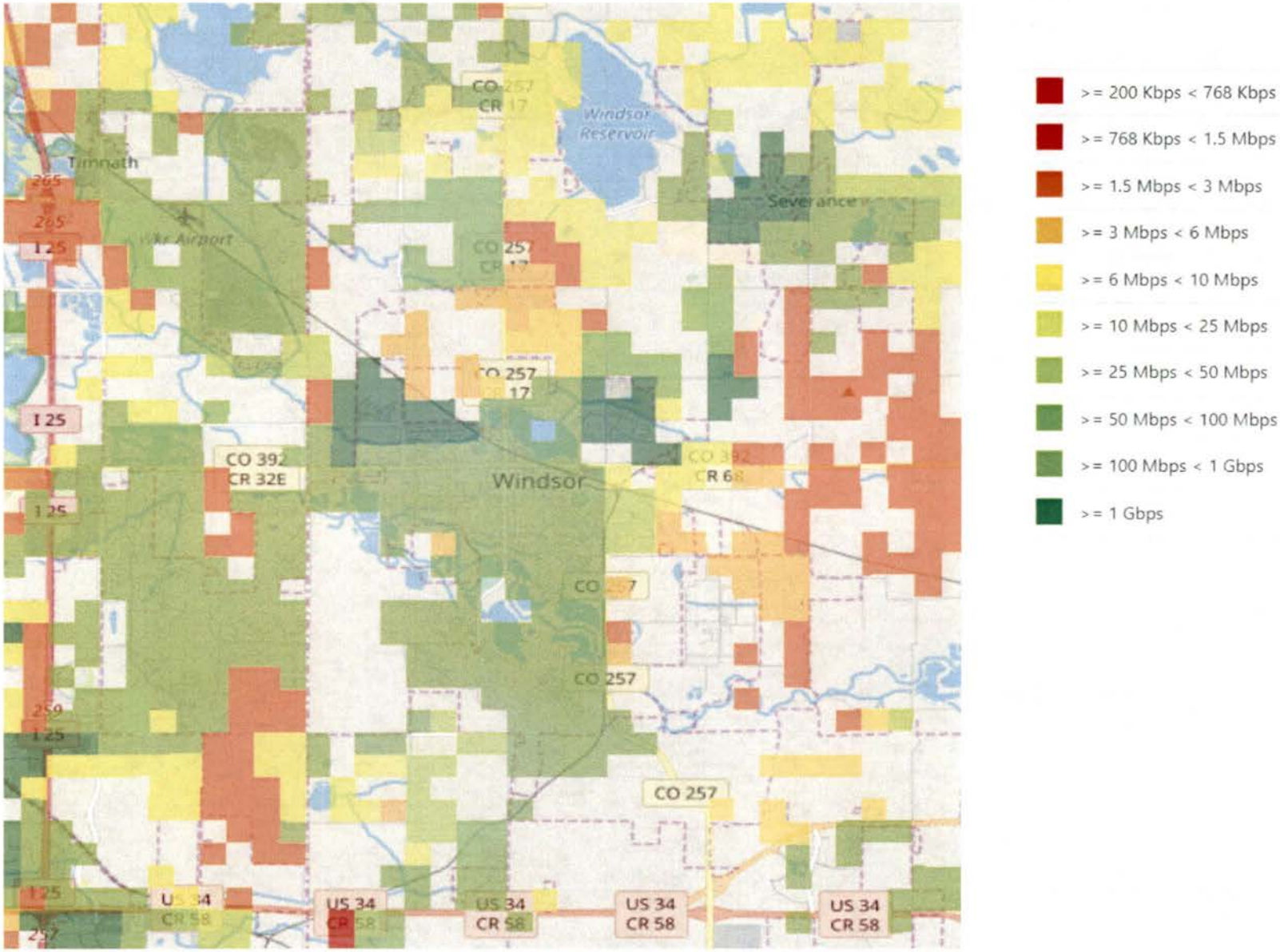
As in Windsor, 12.1% of the consumers in Greeley have access to one or fewer providers. Based upon 26,262 speed tests from April 2017 to March 2018, the average download speed in Greeley is 35.73 Mbps. This is 6.4% faster than the average in Colorado and 11.8% faster than the national average.

Current Speeds and Availability

Comcast states that it offers Gigabit broadband services within Greeley and Windsor, but Gigabit services are not currently available ubiquitously throughout both communities. For this study, Comcast has committed to providing coverage maps of their Gigabit service offerings.

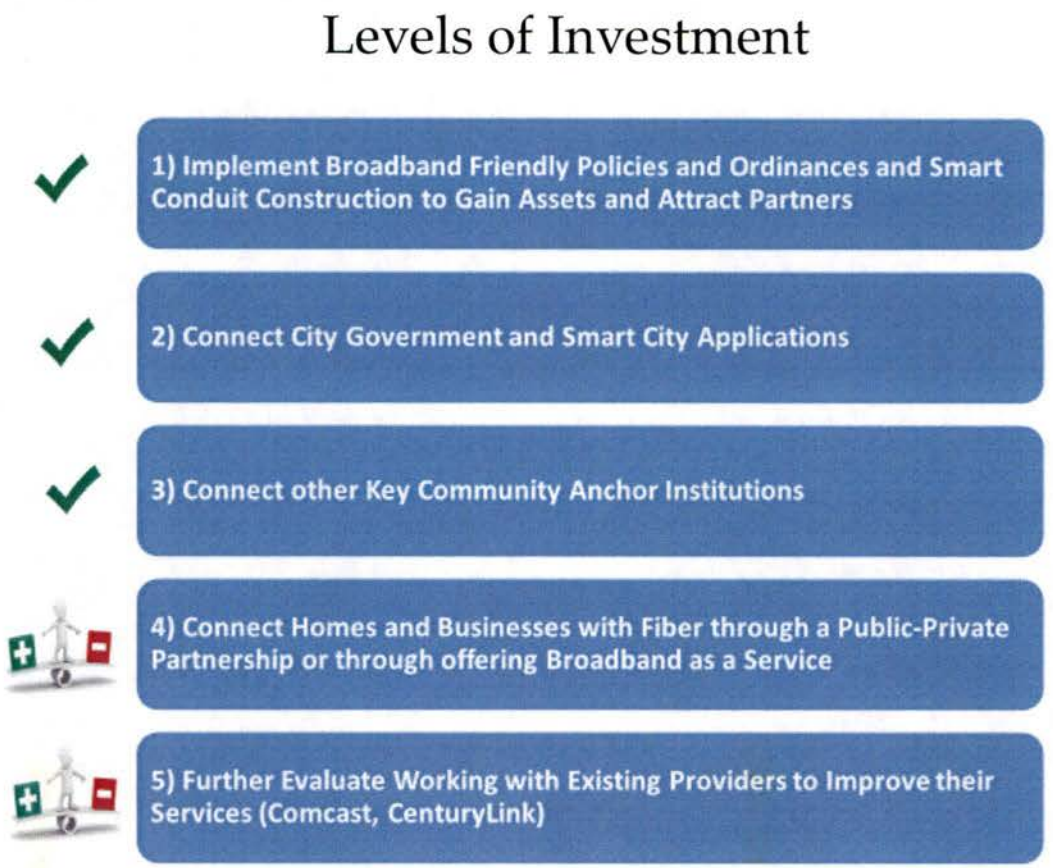
According to the State of Colorado's OIT broadband map, the following maps shows what services are available throughout both communities. Areas shown in dark green have access to up to 1 Gigabit of service.


>= 200 Kbps < 768 Kbps
>= 768 Kbps < 1.5 Mbps
>= 1.5 Mbps < 3 Mbps
>= 3 Mbps < 6 Mbps
>= 6 Mbps < 10 Mbps
>= 10 Mbps < 25 Mbps
>= 25 Mbps < 50 Mbps
>= 50 Mbps < 100 Mbps
>= 100 Mbps < 1 Gbps
>= 1 Gbps
CO 392 CR 68
CO 392 CR 68
CO 392 CR 68
US 85
Highline Form Airstrip
US 85
Greeley-Weld County Airport
CO 257
US 34 BUS CR 60
US 34 BUS CR 60
Greeley
US 85
US 34 CR 58
US 34 CR 58
US 34 CR 58
US 34 CR 56
US 34 CR 56
US 34 CR 56
Garden City
US 34
CO 257
CR 54
CR 54
Evans


Windsor Reservoir
Severance
Timnath
Airport
I 25
CO 257
CR 17
CO 392
CR 32E
Windsor
CR 68
US 34
CR 58
>= 200 Kbps < 768 Kbps
>= 768 Kbps < 1.5 Mbps
>= 1.5 Mbps < 3 Mbps
>= 3 Mbps < 6 Mbps
>= 6 Mbps < 10 Mbps
>= 10 Mbps < 25 Mbps
>= 25 Mbps < 50 Mbps
>= 50 Mbps < 100 Mbps
>= 100 Mbps < 1 Gbps
>= 1 Gbps

Initial Recommendations

As discussed, there are several levels of investment that may facilitate better broadband services within a City/Town. Here are the various levels of investment that were evaluated as part of this study.



Based upon the initial findings of the broadband plan, NEO and staff recommend the first three levels of investment be considered. The first three recommendations will facilitate and lower the costs for broadband implementation and lay the foundation for improving broadband infrastructure within both communities, regardless of whether the City/Town decides to move forward with a Gigabit broadband strategy to connecting homes and businesses, or not.

Connecting city government locations (water monitoring systems, public safety and other government buildings), smart city applications (traffic lights and parking meters) and key community anchor institutions (i.e. hospitals, schools, and universities) with fiber will greatly enhance communications and broadband speeds for these locations, while dramatically reducing communications costs. While these key facilities are being connected with fiber, both communities will gain more fiber assets that can be leveraged for building out to neighborhoods to connect homes and businesses with fiber. Implementing a shadow conduit/dig once policy will allow the City/Town to facilitate further broadband development

by reducing the costs of broadband expansion, by levering existing public works or construction by other entities.

All of these first three levels of investment will improve communications for applications that will be needed regardless of whether or how the City/Town moves forward with a more ubiquitous Gigabit broadband strategy. Additionally, these strategies will lower the overall cost of further expansion and will provide assets (conduit and fiber) for the City/Town to use as leverage to potentially negotiate a public-private partnership for further expansion.

NEO and staff recommend that investigation into how to implement a ubiquitous Gigabit broadband strategy for homes and businesses be further evaluated (item #4 and #5 above under Levels of Investment.) This would include weighing the pros and cons of various public-private partnership models or providing broadband services directly to citizens and businesses or working with the incumbent providers Comcast and CenturyLink to improve their availability of Gigabit broadband services.

Summary of Capital Costs for the Various Levels of Investment

Below is a summary of the capital costs for implementation of the various levels of investment.

The projected capital costs for the City of Greeley's build for items #2 and #3 is shown below.

With the Use of Existing Fiber				
Description	**Eng. & Construction Management**	**Labor**	**Materials**	**Project Total**
Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City"	$ 270,043	$ 1,161,935	$ 260,223	$ 1,692,201
Water Meter Locations outside City Limits	$ 41,358	$ 183,964	$ 50,488	$ 275,810
Adding on All Other Anchor Institutions	$ 230,184	$ 1,166,545	$ 351,754	$ 1,748,483
Total	**$ 541,585**	**$ 2,512,444**	**$ 662,465**	**$ 3,716,493**

As a New Build				
Description	Eng. & Construction Management	Labor	Materials	Project Total
Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City"	$ 624,146	$ 3,260,450	$ 758,316	$ 4,642,912
Water Meter Locations outside City Limits	$ 41,358	$ 183,964	$ 50,488	$ 275,810
Adding on All Other Anchor Institutions	$ 473,049	$ 2,095,045	$ 516,856	$ 3,084,950
Total	**$ 1,138,553**	**$ 5,539,459**	**$ 1,325,660**	**$ 8,003,673**

A summary of the projected capital costs for the Town of Windsor's build for #2 and #3 is shown below.

With the Use of Existing Fiber				
	Eng. & Construction Management	Labor	Materials	Total
Public Safety, SCADA, Smart City	$ 11,532	$ 72,844	$ 27,709	$ 112,085
Adding on All Other Anchor Institutions	$ 11,160	$ 93,390	$ 43,481	$ 148,031
Total	**$ 22,692**	**$ 166,234**	**$ 71,190**	**$ 260,116**

As a New Build				
	Eng. & Construction Management	Labor	Materials	Total
Public Safety, SCADA, Smart City	$ 150,660	$ 604,032	$ 131,811	$ 886,503
Adding on All Other Anchor Institutions	$ 139,965	$ 588,167	$ 132,224	$ 860,356
Total	**$ 290,625**	**$ 1,192,199**	**$ 264,035**	**$ 1,746,859**

Most Fiber-to-the-Premise network use a Gigabit Passive Optical Network (GPON) architecture with active connections to large businesses, mission critical or government locations. Active or passive simply refers to powered electronics in the field. In other words, with a passive architecture, there are no electronics located between the network operations center and the home.

Capital costs will increase when the market share or take rate percentage increases. Below are the projected capital costs with various take rate percentages.

Summary, Windsor Fiber to the Premise Capital Costs			
Take Rate Percentages	Total Construction Costs	Total Equipment Costs	Total Capital Costs
10%	$ 39,685,019	$ 2,336,684	$ 42,021,704
20%	$ 40,797,243	$ 2,579,875	$ 43,377,118
30%	$ 41,906,853	$ 2,846,086	$ 44,752,939
40%	$ 43,016,463	$ 3,093,389	$ 46,109,851
50%	$ 44,129,690	$ 3,357,522	$ 47,487,212
60%	$ 45,238,296	$ 3,711,603	$ 48,949,899

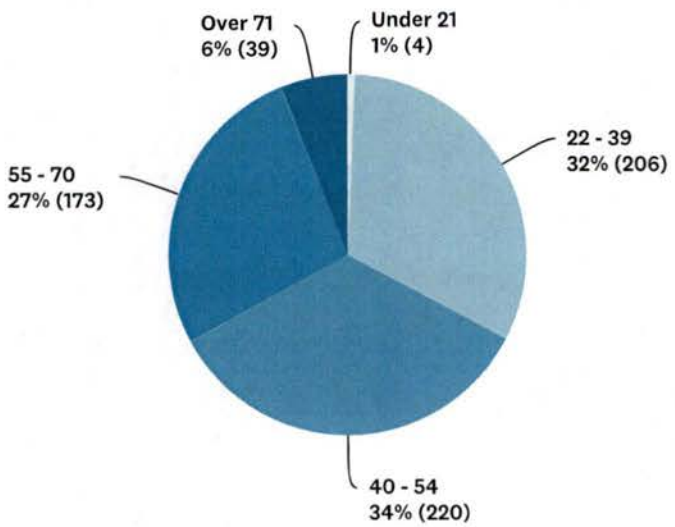
Summary, Greeley Fiber to the Premise Capital Costs			
Take Rate Percentages	Total Construction Costs	Total Equipment Costs	Total Capital Costs
10%	$ 91,877,838	$ 7,438,297	$ 99,316,135
20%	$ 95,308,477	$ 9,475,631	$ 104,784,107
30%	$ 98,737,505	$ 11,803,153	$ 110,540,658
40%	$ 102,168,144	$ 14,006,794	$ 116,174,938
50%	$ 105,603,404	$ 16,097,703	$ 121,701,107
60%	$ 109,034,043	$ 18,535,591	$ 127,569,634

As the capital costs and financial risk is high for building fiber to homes and businesses, NEO and City/Town staff recommending further investigation into various strategies and models for implementing this approach.

Following this report, a companion report will be provided that will discuss the financial considerations and implications of various Gigabit strategies. Financial projections, staffing considerations and financing strategies will be discussed for each model. Additionally, the companion report will address funding and financing options for consideration.

Q1 To which age group do you belong?

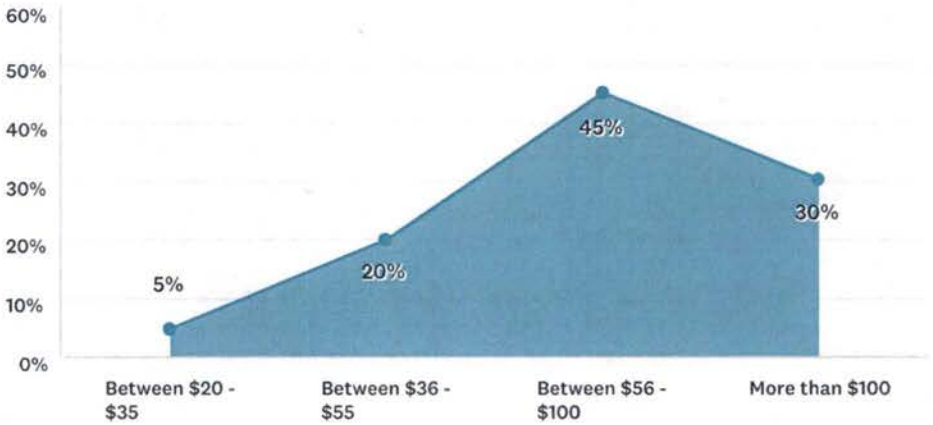
Answered: 642 Skipped: 1



ANSWER CHOICES	RESPONSES	
Under 21	1%	4
22 - 39	32%	206
40 - 54	34%	220
55 - 70	27%	173
Over 71	6%	39
TOTAL		642

Q2 How much do you currently pay for your internet each month?

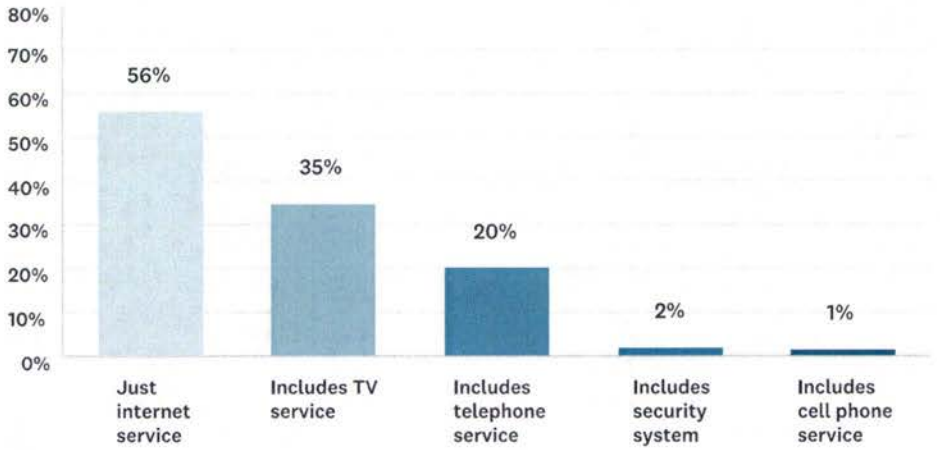
Answered: 641 Skipped: 2



ANSWER CHOICES	RESPONSES	
Between $20 - $35	5%	30
Between $36 - $55	20%	128
Between $56 - $100	45%	289
More than $100	30%	194
TOTAL		641

Q3 Does this cost include other bundled services? (Check all that apply.)

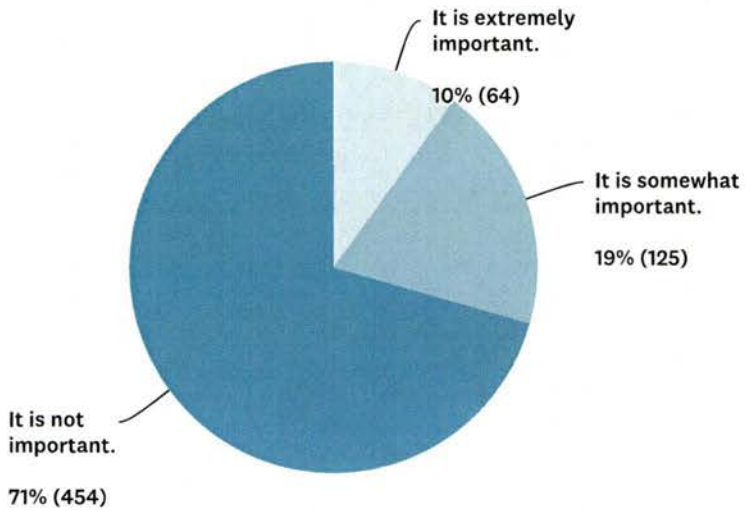
Answered: 641 Skipped: 2



ANSWER CHOICES	RESPONSES	
Just internet service	56%	358
Includes TV service	35%	224
Includes telephone service	20%	130
Includes security system	2%	13
Includes cell phone service	1%	9
Total Respondents: 641		

Q4 How important is it to you to receive one invoice for internet, cable TV and/or phone service?

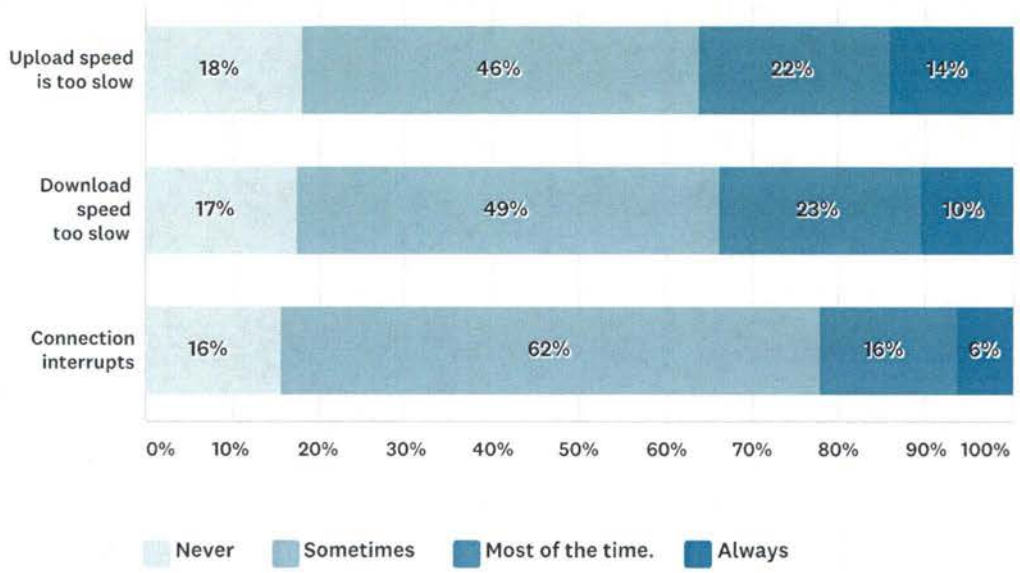
Answered: 643 Skipped: 0



ANSWER CHOICES	RESPONSES	
It is extremely important.	10%	64
It is somewhat important.	19%	125
It is not important.	71%	454
TOTAL		643

Q5 How reliable do you find your current internet connection?

Answered: 643 Skipped: 0



	NEVER	SOMETIMES	MOST OF THE TIME.	ALWAYS	TOTAL	WEIGHTED AVERAGE
Upload speed is too slow	18% 115	46% 291	22% 140	14% 89	635	2.32
Download speed too slow	17% 111	49% 313	23% 148	10% 67	639	2.27
Connection interrupts	16% 100	62% 395	16% 101	6% 39	635	2.12

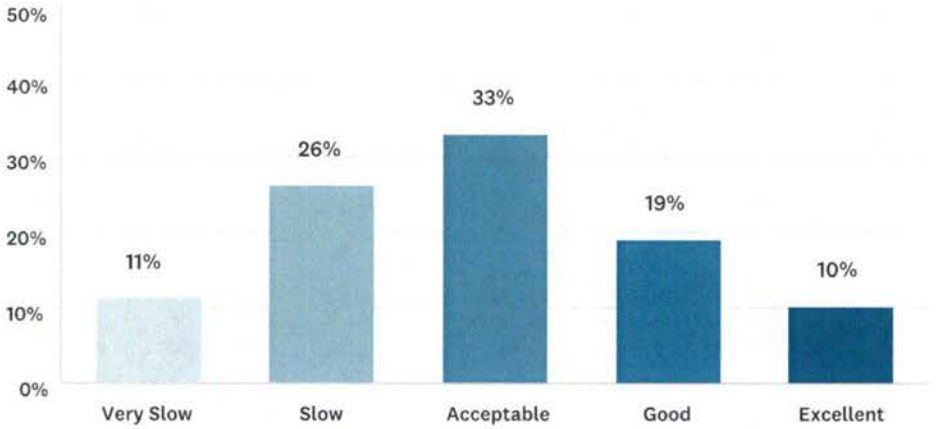
Q6 To measure your current service levels, please take an internet speed test - go to http://maps.co.gov/publicspeed/ and click Begin Test and enter the results. If you are using an Apple or Android device, please connect to WiFi (do not use cellular) and go to http://openspeedtest.com/ for the speed test.

Answered: 548 Skipped: 95

ANSWER CHOICES	RESPONSES	
Download Speed	100%	548
Upload Speed	98%	537

Q7 How would you rate the download speed of your internet?

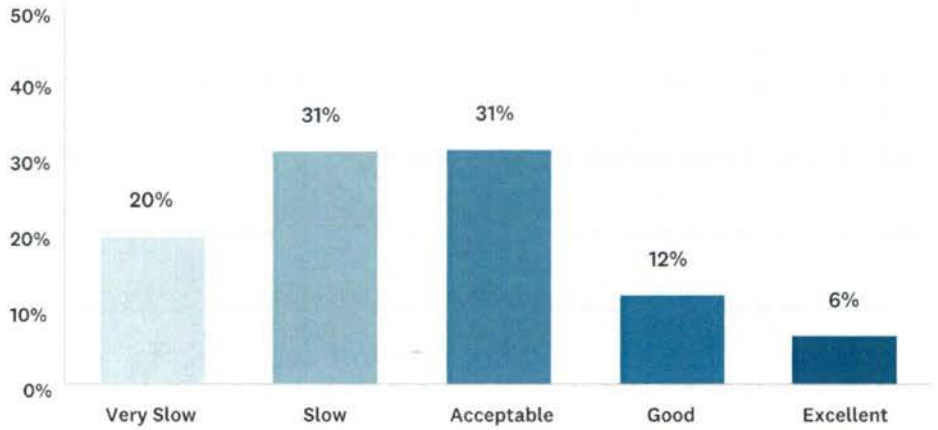
Answered: 637 Skipped: 6



ANSWER CHOICES	RESPONSES	
Very Slow	11%	73
Slow	26%	168
Acceptable	33%	210
Good	19%	121
Excellent	10%	65
TOTAL		637

Q8 How would you rate the upload speed of your internet?

Answered: 638 Skipped: 5



ANSWER CHOICES	RESPONSES	
Very Slow	20%	125
Slow	31%	198
Acceptable	31%	199
Good	12%	75
Excellent	6%	41
TOTAL		638

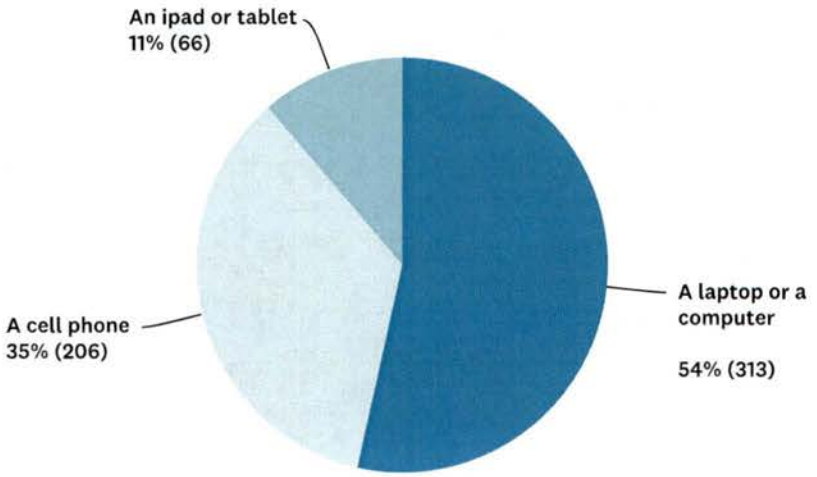
Q9 When did you complete the speed test?

Answered: 557 Skipped: 86

ANSWER CHOICES	RESPONSES	
Date/Time	100%	557

Q10 What device did you use when you conducted the speed test?

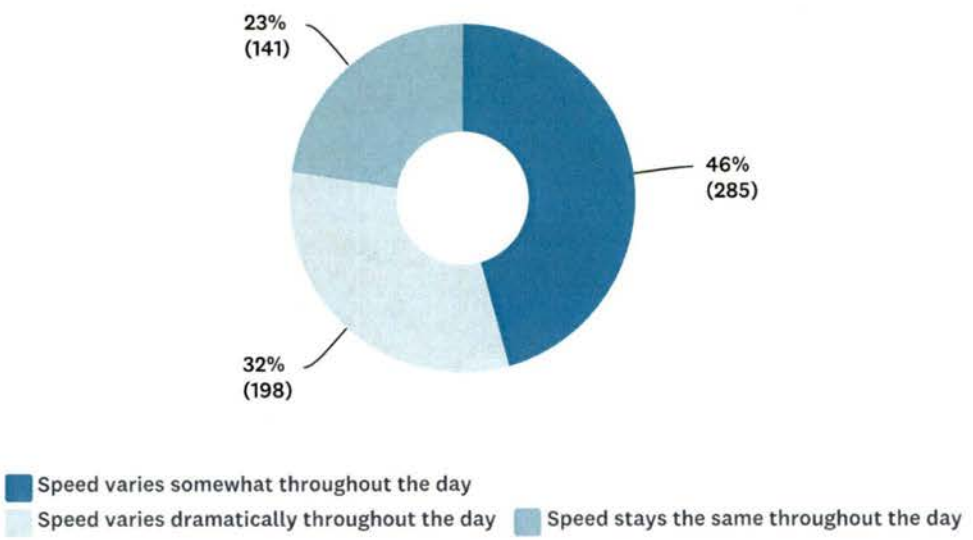
Answered: 585 Skipped: 58



ANSWER CHOICES	RESPONSES	
A laptop or a computer	54%	313
A cell phone	35%	206
An ipad or tablet	11%	66
TOTAL		585

Q11 Does the speed of your internet connection vary during or throughout the day?

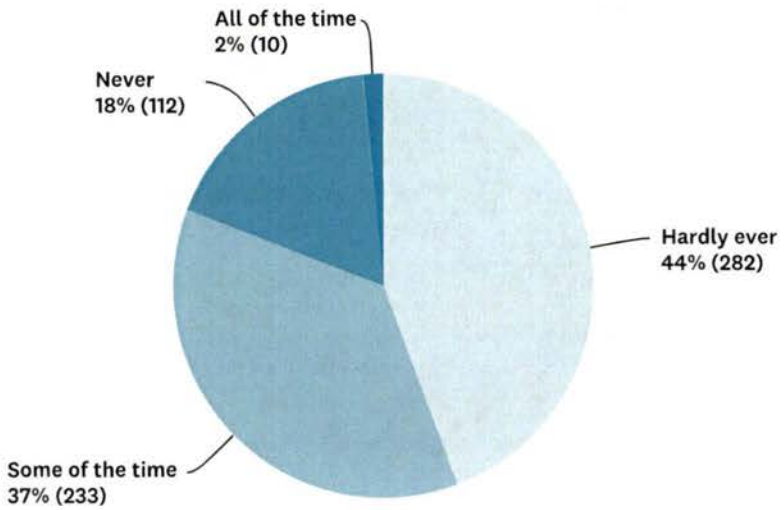
Answered: 624 Skipped: 19



ANSWER CHOICES	RESPONSES	
Speed varies somewhat throughout the day	46%	285
Speed varies dramatically throughout the day	32%	198
Speed stays the same throughout the day	23%	141
TOTAL		624

Q12 Are there times when you cannot get on the internet?

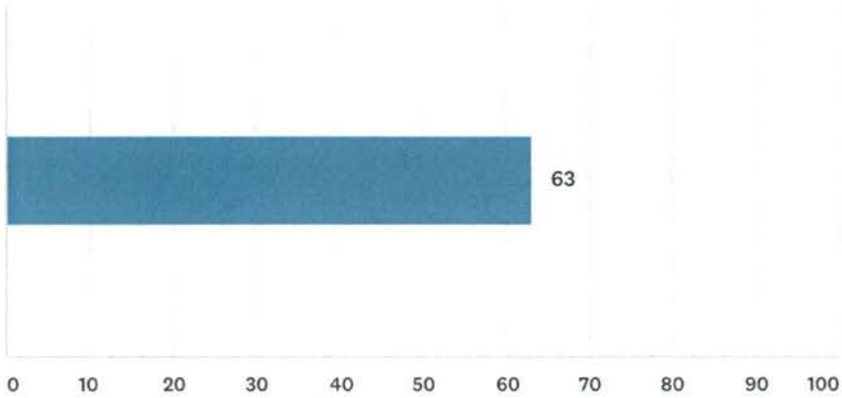
Answered: 637 Skipped: 6



ANSWER CHOICES	RESPONSES	
Hardly ever	44%	282
Some of the time	37%	233
Never	18%	112
All of the time	2%	10
TOTAL		637

Q13 How fast do you think your internet service should be? What service level do you expect or need? Note that in 2015, the Federal Communications Commission ("FCC") revised its definition of broadband) as having the ability to download at 25 Mbps and upload speeds of 3 Mbps. Having access to "advanced broadband," means, at a minimum, having broadband speeds that at least meet the FCC definition.

Answered: 578 Skipped: 65

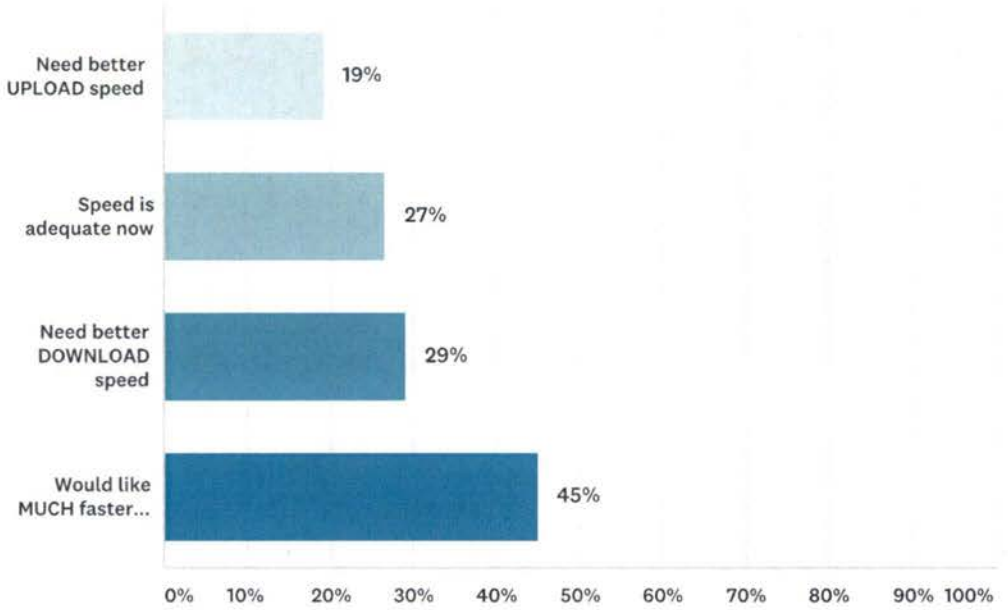


ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	63	36,480	578

Total Respondents: 578

Q14 As a follow-up question to #13 above, if you are unsure of the service level or speed that you need, which of the following best suits your needs?

Answered: 475 Skipped: 168



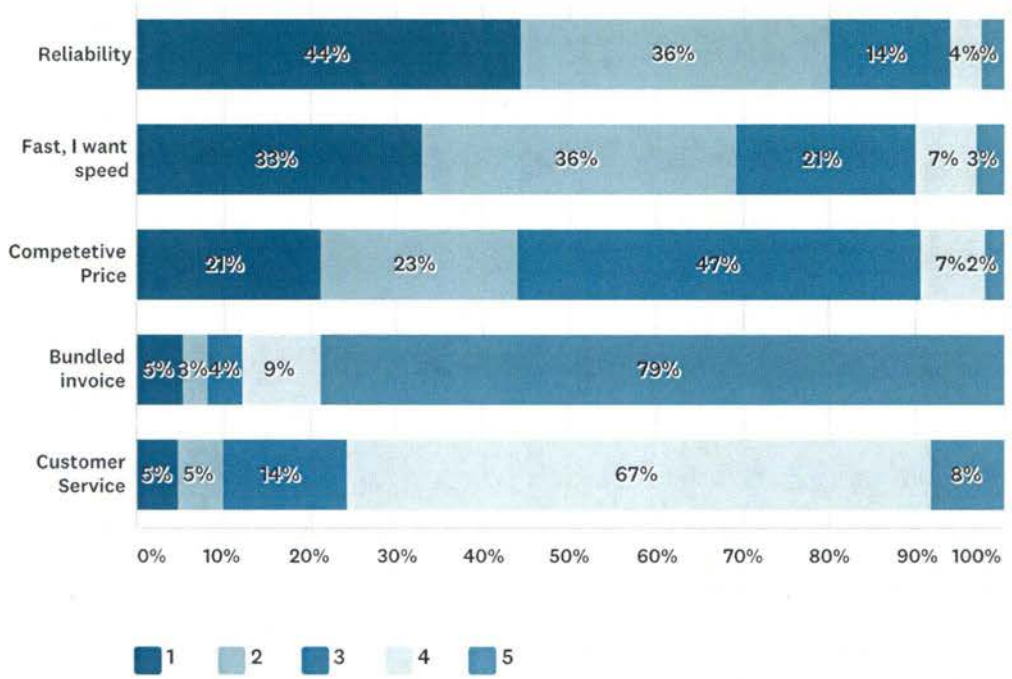
ANSWER CHOICES	RESPONSES	
Need better UPLOAD speed	19%	91
Speed is adequate now	27%	126
Need better DOWNLOAD speed	29%	138
Would like MUCH faster than current speed	45%	214
Total Respondents: 475		

Q15 What would you be willing to pay for the service at this level? Enter a number only.

Answered: 591 Skipped: 52

Q16 What is most important to you regarding your internet service? (Please rank the following choices, with 1 being the most important.)

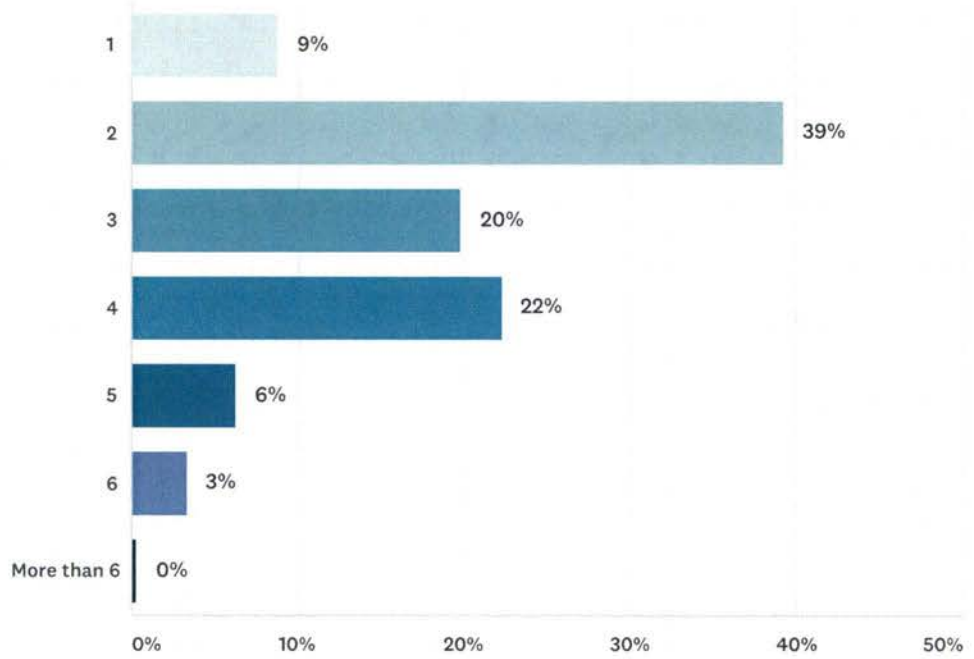
Answered: 632 Skipped: 11



	1	2	3	4	5	TOTAL	SCORE
Reliability	44% 252	36% 202	14% 79	4% 20	2% 14	567	4.16
Fast, I want speed	33% 183	36% 201	21% 115	7% 39	3% 17	555	3.89
Competetive Price	21% 122	23% 129	47% 267	7% 42	2% 12	572	3.54
Bundled invoice	5% 34	3% 17	4% 25	9% 56	79% 488	620	1.47
Customer Service	5% 29	5% 32	14% 85	67% 406	8% 50	602	2.31

Q17 How many people use the internet in your household?

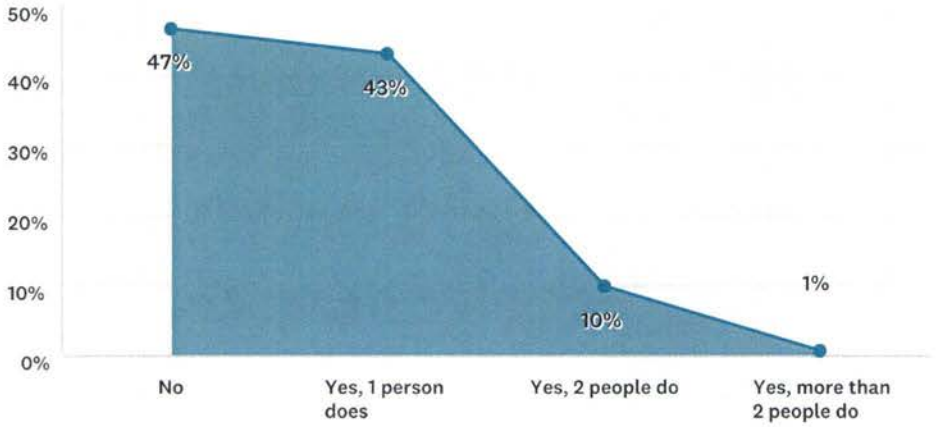
Answered: 637 Skipped: 6



ANSWER CHOICES	RESPONSES	
1	9%	56
2	39%	250
3	20%	126
4	22%	142
5	6%	40
6	3%	21
More than 6	0%	2
TOTAL		637

Q18 Does anyone in your household work from home?

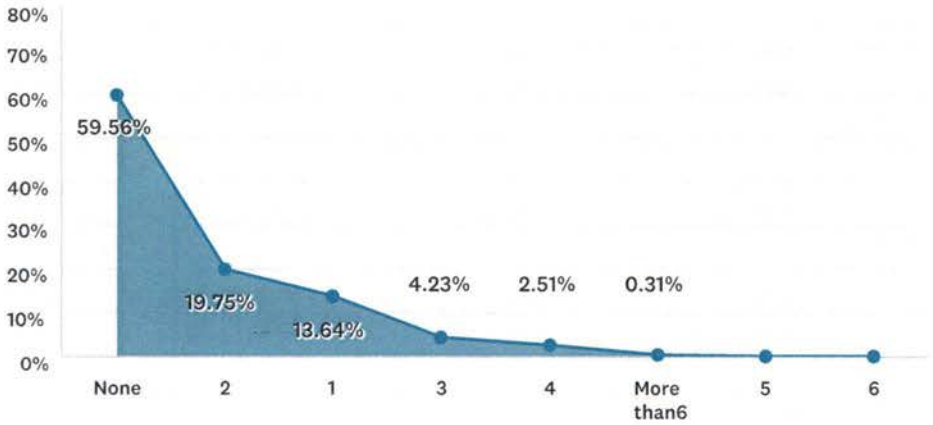
Answered: 640 Skipped: 3



ANSWER CHOICES	RESPONSES	
No	47%	298
Yes, 1 person does	43%	275
Yes, 2 people do	10%	63
Yes, more than 2 people do	1%	4
TOTAL		640

Q19 How many school-aged children live at your home?

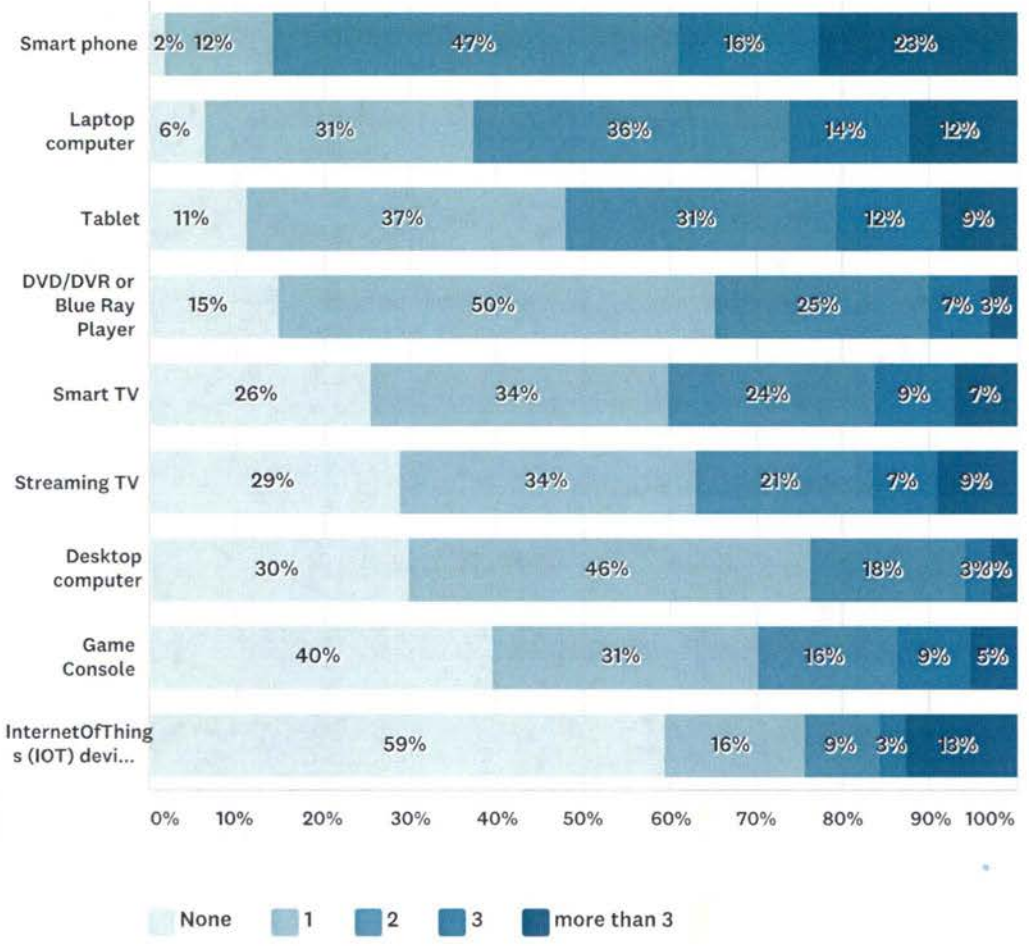
Answered: 638 Skipped: 5



ANSWER CHOICES	RESPONSES	
None	59.56%	380
2	19.75%	126
1	13.64%	87
3	4.23%	27
4	2.51%	16
More than6	0.31%	2
5	0.00%	0
6	0.00%	0
TOTAL		638

Q20 Which of the following devices do you have and how many of these devices do you have in your household?

Answered: 641 Skipped: 2

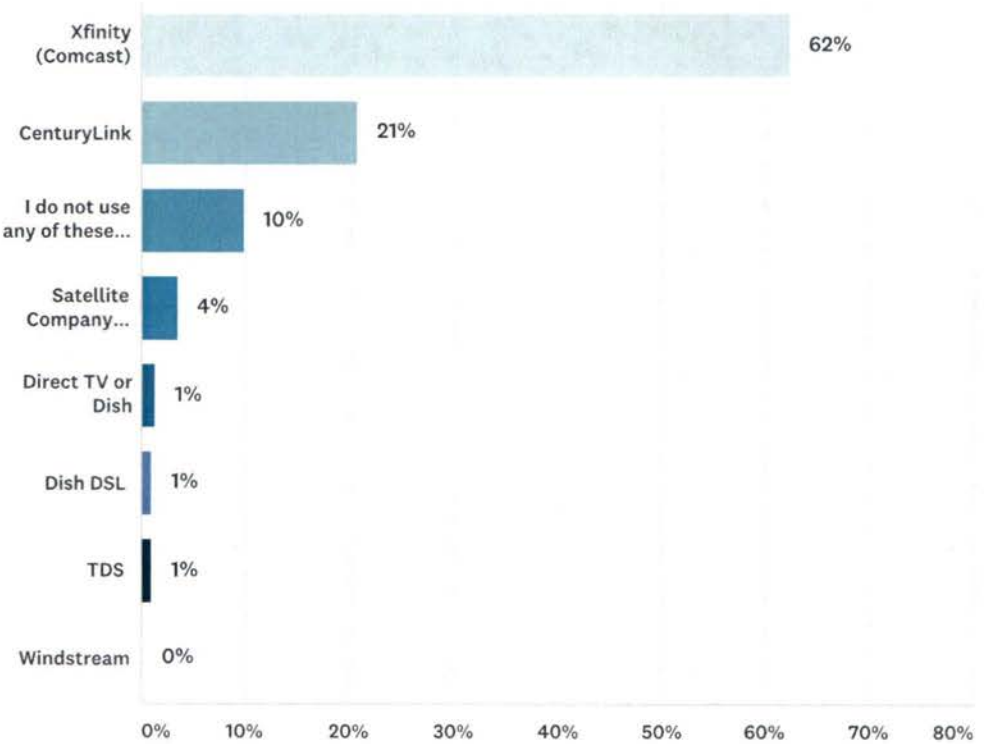


	NONE	1	2	3	MORE THAN 3	TOTAL
Smart phone	2% 12	12% 79	47% 296	16% 103	23% 144	634
Laptop computer	6% 40	31% 193	36% 227	14% 87	12% 76	623
Tablet	11% 70	37% 228	31% 195	12% 74	9% 54	621
DVD/DVR or Blue Ray Player	15% 92	50% 314	25% 154	7% 43	3% 19	622
Smart TV	26% 154	34% 207	24% 144	9% 56	7% 42	603
Streaming TV	29% 174	34% 206	21% 124	7% 44	9% 55	603
Desktop computer	30% 183	46% 282	18% 109	3% 19	3% 17	610

Game Console	40% 237	31% 184	16% 96	9% 51	5% 31	599
InternetOfThings (IOT) devices in your home	59% 361	16% 99	9% 52	3% 18	13% 77	607

Q21 Which of the following internet service providers do you use in your home? If you have more than one internet service provider or more than one home, please select your primary provider at your primary residence.

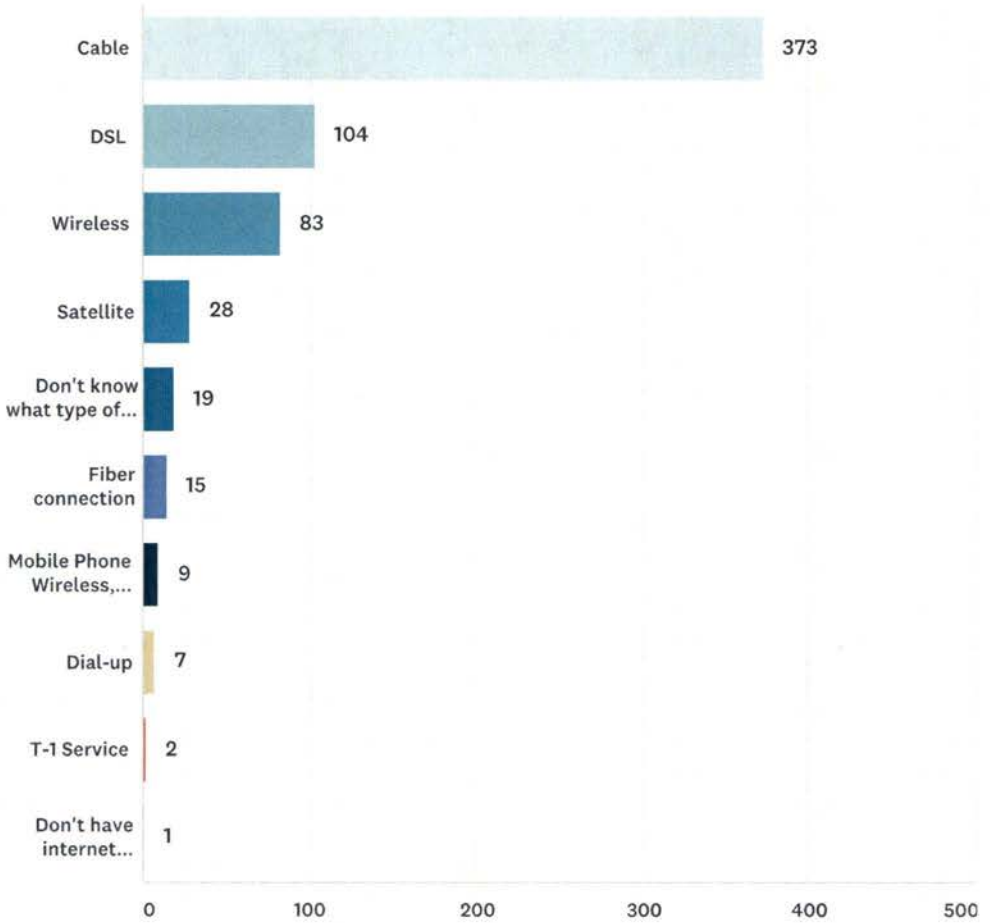
Answered: 642 Skipped: 1



ANSWER CHOICES	RESPONSES	
Xfinity (Comcast)	62%	401
CenturyLink	21%	133
I do not use any of these internet service providers	10%	63
Satellite Company (Hughes, Wild Blue)	4%	23
Direct TV or Dish	1%	9
Dish DSL	1%	6
TDS	1%	6
Windstream	0%	1
TOTAL		642

Q22 For your home, what type of internet service do you currently have?

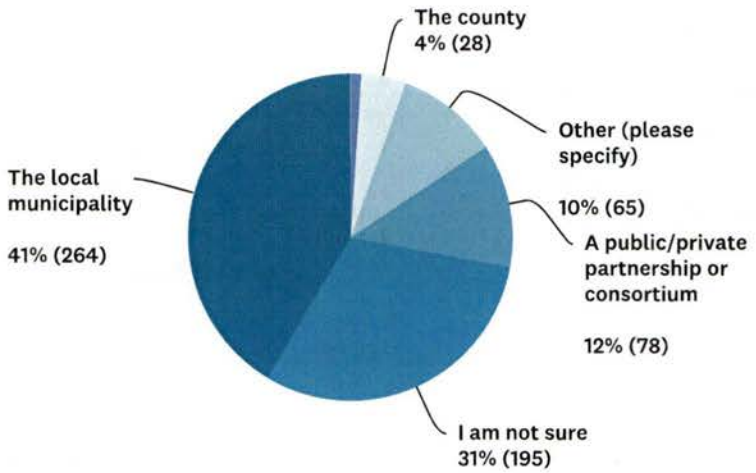
Answered: 641 Skipped: 2



ANSWER CHOICES	RESPONSES	
Cable	58%	373
DSL	16%	104
Wireless	13%	83
Satellite	4%	28
Don't know what type of connection I have at my home.	3%	19
Fiber connection	2%	15
Mobile Phone Wireless, Cellular	1%	9
Dial-up	1%	7
T-1 Service	0%	2
Don't have internet service at home	0%	1
TOTAL		641

Q23 If the private sector (phone, cable, wireless or other company) does not provide adequate and affordable broadband service to your home, who would you want to step in to ensure that better services are available?

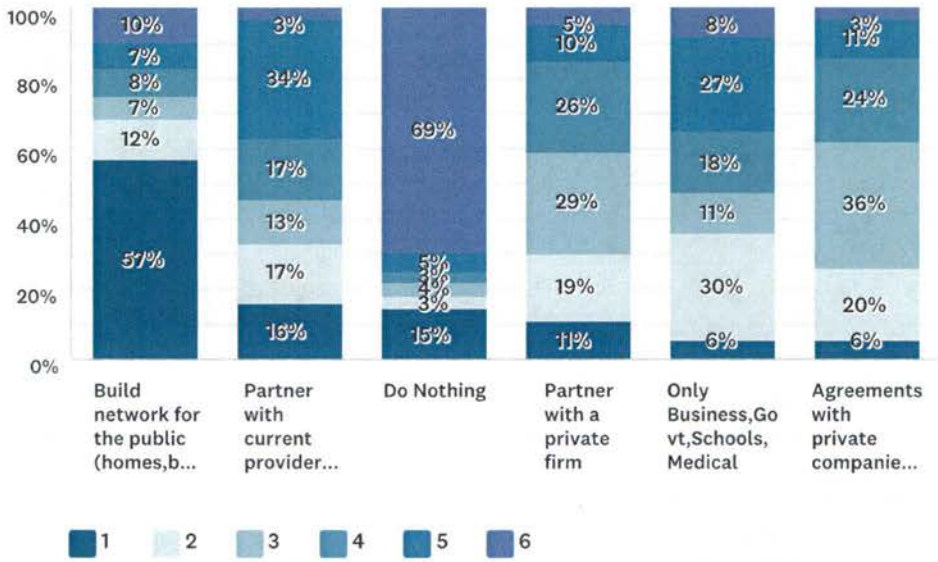
Answered: 637 Skipped: 6



ANSWER CHOICES	RESPONSES	
The electric company	1%	7
The county	4%	28
Other (please specify)	10%	65
A public/private partnership or consortium	12%	78
I am not sure	31%	195
The local municipality	41%	264
TOTAL		637

Q24 Ranking the Government's Role in Broadband. What do you think the primary role for the City or County government should be with respect to broadband access? (Please rank your choices with "1" being your first choice.)

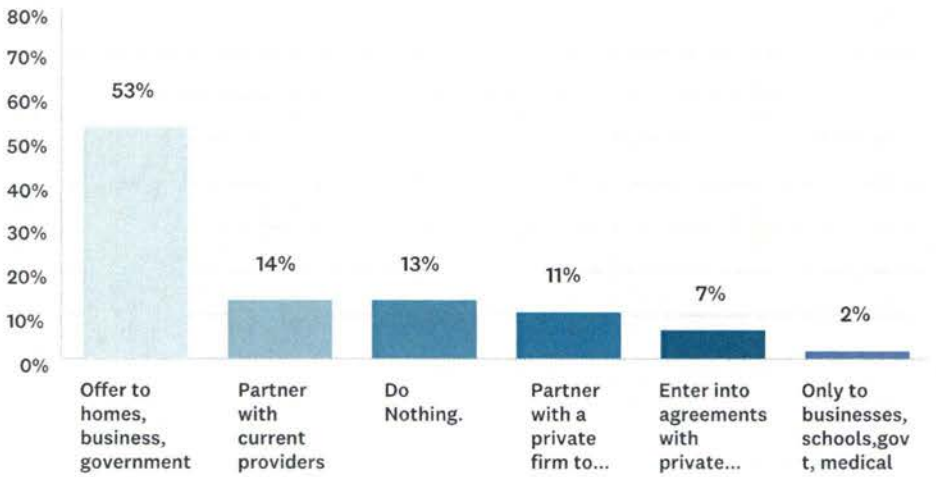
Answered: 604 Skipped: 39



	1	2	3	4	5	6	TOTAL	SCORE
Build network for the public (homes,businesses,govt)	57% 301	12% 62	7% 35	8% 42	7% 38	10% 51	529	4.74
Partner with current providers to improve the speed and reliability	16% 88	17% 92	13% 70	17% 95	34% 188	3% 16	549	3.54
Do Nothing	15% 82	3% 17	4% 23	3% 18	5% 30	69% 386	556	2.10
Partner with a private firm	11% 57	19% 99	29% 152	26% 136	10% 53	5% 24	521	3.81
Only Business,Govt,Schools,Medical	6% 29	30% 156	11% 58	18% 91	27% 140	8% 40	514	3.46
Agreements with private companies to offer services to the public.	6% 29	20% 105	36% 184	24% 123	11% 56	3% 16	513	3.77

Q25 If you could choose only one option, what do you think the primary role for the City or County government should be with respect to broadband access? (Please choose only one)

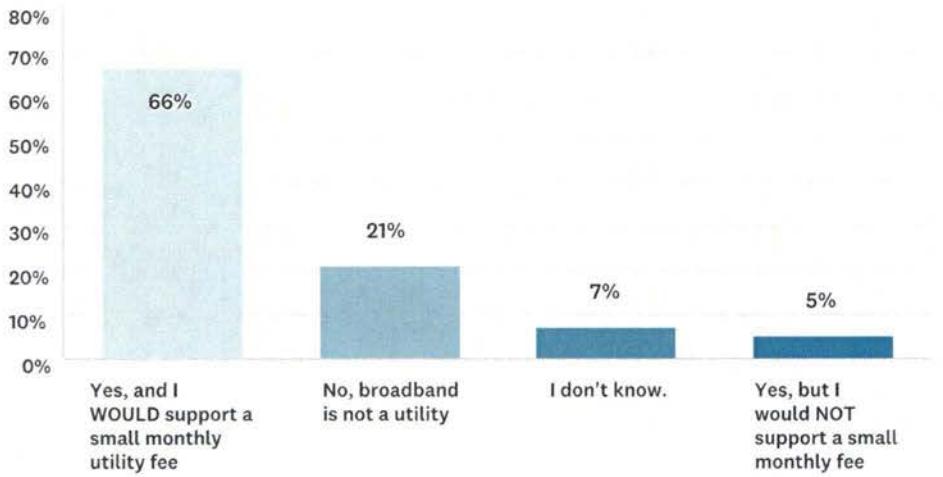
Answered: 619 Skipped: 24



ANSWER CHOICES	RESPONSES	
Offer to homes, business, government	53%	329
Partner with current providers	14%	84
Do Nothing.	13%	83
Partner with a private firm to build a state-of-the-art network.	11%	68
Enter into agreements with private companies to offer services to the public	7%	43
Only to businesses,schools,govt, medical	2%	12
TOTAL		619

Q26 Do you think broadband service is a utility like water and electric? If so, would you support a small monthly utility fee to pay for broadband infrastructure build out?

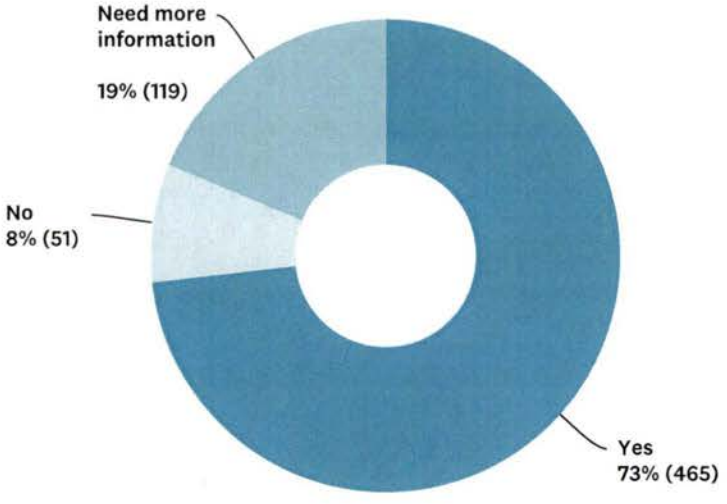
Answered: 633 Skipped: 10



ANSWER CHOICES	RESPONSES	
Yes, and I WOULD support a small monthly utility fee	66%	420
No, broadband is not a utility	21%	134
I don't know.	7%	45
Yes, but I would NOT support a small monthly fee	5%	34
TOTAL		633

Q27 The City of Longmont recently became Colorado's first "Gig City", building a fiber network that provides residents with reasonably priced gigabit service to the home. Would you support the City of Greeley and Town of Windsor offering gigabit service to the home?

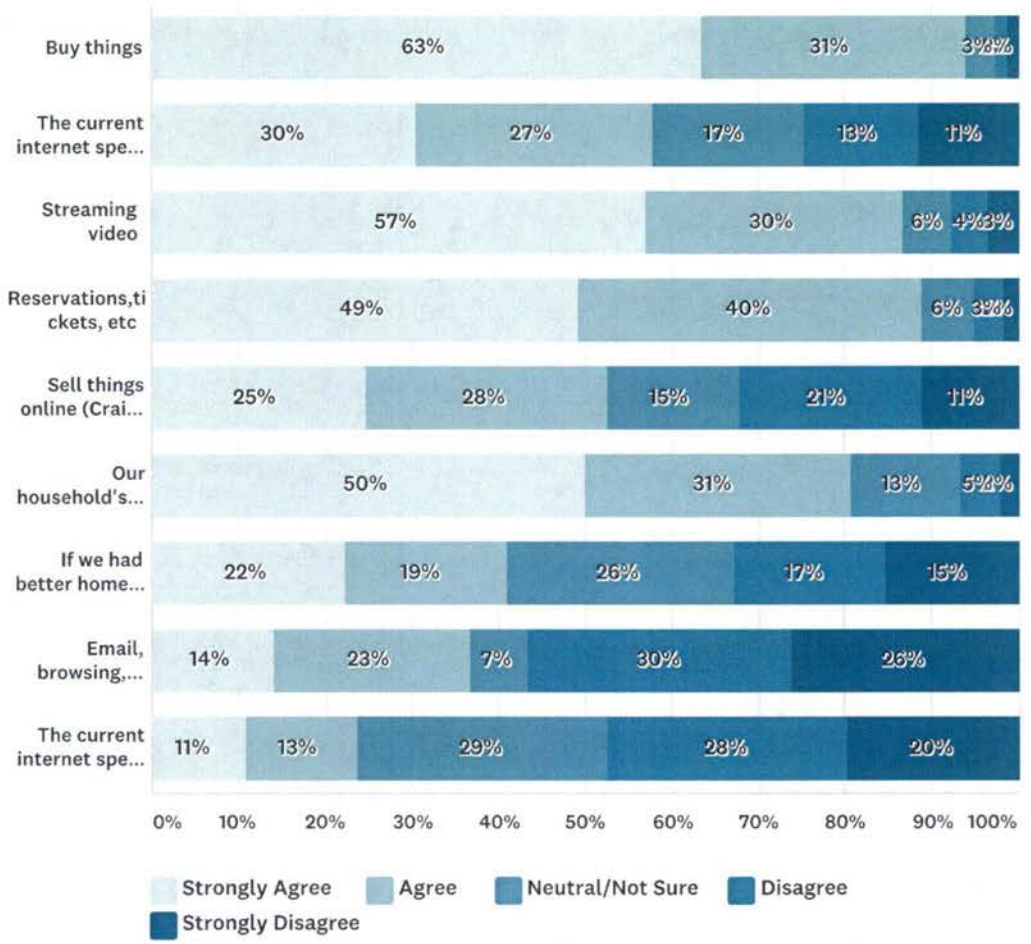
Answered: 635 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	73%	465
No	8%	51
Need more information	19%	119
TOTAL		635

Q28 How would you characterize your relation to your internet service?

Answered: 633 Skipped: 10

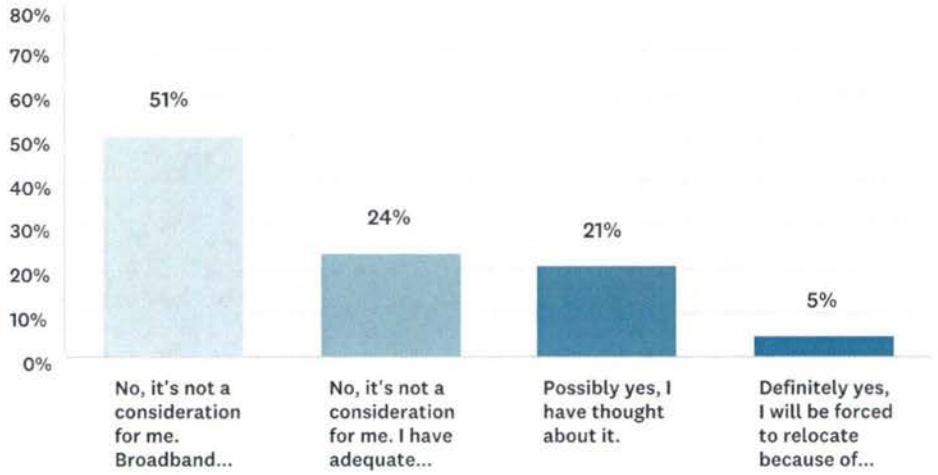


	STRONGLY AGREE	AGREE	NEUTRAL/NOT SURE	DISAGREE	STRONGLY DISAGREE	TOTAL	WEIGHTED AVERAGE
Buy things	63% 400	31% 193	3% 21	2% 10	1% 7	631	4.54
The current internet speed available is holding back our household's entertainment options	30% 192	27% 173	17% 110	13% 84	11% 72	631	3.52
Streaming video	57% 359	30% 188	6% 35	4% 27	3% 21	630	4.33
Reservations,tickets, etc	49% 310	40% 251	6% 37	3% 22	2% 10	630	4.32
Sell things online (Craig's list, eBay, etc.)	25% 156	28% 176	15% 95	21% 134	11% 69	630	3.34
Our household's demands on internet bandwidth and speed is consistently increasing	50% 315	31% 193	13% 80	5% 29	2% 13	630	4.22
If we had better home internet service, one or more of us would work from home more often	22% 140	19% 118	26% 165	17% 110	15% 96	629	3.15

Email, browsing, research	14% 88	23% 143	7% 42	30% 191	26% 164	628	2.68
The current internet speed available is holding back our household's income potential	11% 68	13% 81	29% 181	28% 174	20% 124	628	2.67

Q29 Would you consider leaving the community because it doesn't have adequate broadband?

Answered: 633 Skipped: 10



ANSWER CHOICES	RESPONSES	
No, it's not a consideration for me. Broadband services need to be better here, but I am not planning to move.	51%	320
No, it's not a consideration for me. I have adequate broadband service.	24%	150
Possibly yes, I have thought about it.	21%	132
Definitely yes, I will be forced to relocate because of inadequate broadband service.	5%	31
TOTAL		633

Q30 Optional: To help us analyze broadband speeds by location in the city, please provide your street address and city.

Answered: 430 Skipped: 213

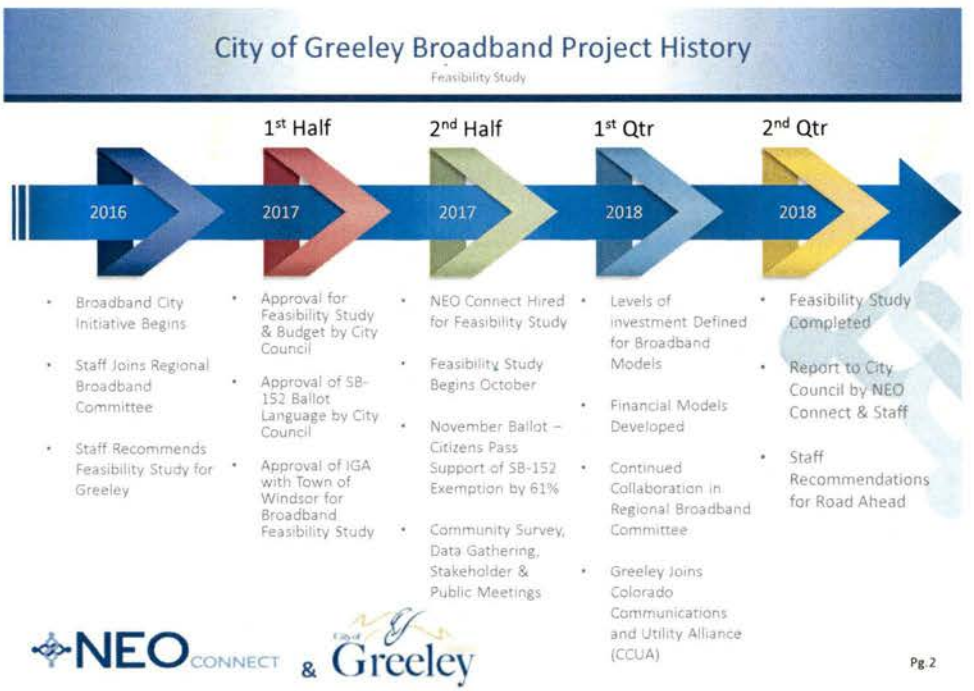
Q31 If you have any other comments regarding your current Internet service or a community broadband service please tell us below:

Answered: 221 Skipped: 422

NEO CONNECT

CITY OF GREELEY, TOWN OF WINDSOR BROADBAND PLANNING

MAY 22ND, 2018



AGENDA

- Why are Municipalities Investing in Broadband?
- Current Assessment, Survey Results
- Levels of Investment, Benefits of Each Level
- Models for Gigabit Strategy
- Initial Recommendations and Possible Next Steps

NEO CONNECT

INTERNET SPEED

- We are talking about the performance of your internet connection, the speed at which data is transferred between you and the information provider
- FCC defines broadband as 25 Megabits per second (Mbps) upload
- 1 Gigabit (GB) speed = 1000 Mbps

NEO CONNECT

Why are Municipalities Investing in Broadband?

- The Internet is Everything
- Bandwidth Demand
  - 79% of all traffic is video (86% in 2021)
  - Facebook is testing "Immersive Video"
  - Virtual Reality and Augmented Reality Applications
  - Ultra-HD video will consume 4 times more bandwidth
- Internet of Things (IoT) will be a key driver of bandwidth demand (home appliances, smart self driving cars, medical monitoring devices, smart cities, robots, artificial intelligence)
  - 1 Billion Connected Devices by 2020
  - 1 Trillion Connected Sensors by 2030

Global Internet Traffic	
1992	100 GB per DAY
1997	100 GB per HOUR
2002	100 GB per SECOND
2007	2,000 GB per SECOND
2016	26,600 GB per SECOND
2021	105,800 GB per SECOND

NEO CONNECT

Pg.5

Why are Municipalities Investing in Broadband?

- Local Control of an Economic Development Driver
- Net Neutrality Laws Overturned
- Smart Home Applications
- Convergence of Smart City Applications, Cellular Backhaul, Internet Consumption

NEO CONNECT

Pg.6

In the Report

Section 1 –Introduction and Recommendations

- Initial Recommendations for Implementation Now
- Next steps for evaluating Gigabit strategies

Section 2 – WHY

- Why is this important?
- Why are Municipalities Investing in Broadband and what are the benefits?
- Current Assessment and Survey Reponses, Why is the current infrastructure in Greeley and Windsor not sufficient?

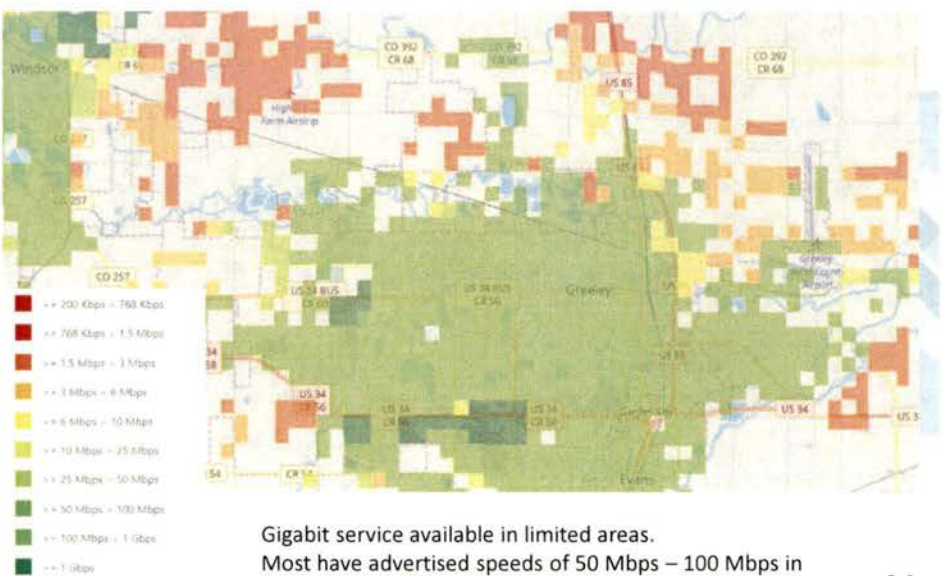
Section 3 – WHAT

- What policies can be implemented now?
- What level of investment can be done now, regardless of the ultimate broadband strategy for Gigabit services?
- What will each level of investment cost?
- What models and best practices have been implemented by other municipalities?

Pg.7

CURRENT ASSESSMENT

CURRENT SERVICE AVAILABLE GATHERED BY STATE OF COLORADO PROVIDED BY ISP



Gigabit service available in limited areas.
Most have advertised speeds of 50 Mbps – 100 Mbps in Download Speeds

Pg.8

Survey Summary

82%	• Stated that the download and upload speeds are too slow
54%	• Telecommute
66%	• Support a small monthly utility fee to pay for broadband infrastructure build out.
21%	• Would probably move if broadband wasn't adequate (5% said definitely)
73%	• Support a model similar to Longmont.

Data based on opt-in public survey of 600+ responses between 10/2017 – 1/2018

Pg.9

Level of Investment

1) Implement Broadband Friendly Policies and Ordinances and Smart Conduit Construction to Gain Assets and Attract Partners

2) Connect City Government and Smart City Applications

3) Connect other Key Community Anchor Institutions

4) Connect Homes and Businesses with Fiber through a Public-Private Partnership or through offering Broadband as a Service

5) Further Evaluate Working with Existing Providers to Improve their Services (Comcast, CenturyLink)

Pg.10

Level 1 – Implement Broadband Friendly Policies and Ordinances

- Dig Once/Shadow Conduit
- Joint Trench/Shared Costs
- GIS As-builts and Funding Set Aside
- One Touch Make Ready
- Land Use Policies, Conduit Placement

NEO CONNECT

Pg.11

Dig Once/Shadow Conduit Policies

- Incremental Cost To Install Shadow Conduit Is $2 - $7 Per Foot.
- Cost To Install New Conduit As A Standalone Project Is $25 - $35 Per Foot.
- Typically, Shadow Conduit Represents 1-2% Of A Road Improvement's Total Project Budget.
- Cost Savings
- Gain Assets
- Attract Partners
- Use in Construction for Network connecting Government, Anchor Institutions
- Possible Use in PPP or ISP venture

Pg.12

LEVELS 2 & 3 – CITY AND ANCHOR INSTITUTIONS

With the Use of Existing Fiber

Description	Eng. & Construction Management	Labor	Materials	Project Total
Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City"	$ 270,043	$ 1,161,935	$ 260,223	$ 1,692,201
Water Meter Locations outside City Limits	$ 41,358	$ 183,964	$ 50,488	$ 275,810
Adding on All Other Anchor Institutions	$ 230,184	$ 1,166,545	$ 351,754	$ 1,748,483
Total	**$ 541,585**	**$ 2,512,444**	**$ 662,465**	**$ 3,716,493**

As a New Build

Description	Eng. & Construction Management	Labor	Materials	Project Total
Traffic Lights, Public Safety, Water Meters, Parking Meters - "Smart City"	$ 624,146	$ 3,260,450	$ 758,316	$ 4,642,912
Water Meter Locations outside City Limits	$ 41,358	$ 183,964	$ 50,488	$ 275,810
Adding on All Other Anchor Institutions	$ 473,049	$ 2,095,045	$ 516,856	$ 3,084,950
Total	**$ 1,138,553**	**$ 5,539,459**	**$ 1,325,660**	**$ 8,003,673**

- Connect City Government Applications, Public Safety, Water Meters, Traffic Lights, Parking Meters
- Connect Key Anchor Institutions (Schools, Universities, Hospitals)
- Further Investigation into use of Existing Fiber

Pg.13

WHAT OTHER CITIES ARE DOING

BEST PRACTICES

ANALYZING INVESTMENT LEVELS 4 AND 5

- NOCO Cities include Longmont, Loveland, Ft. Collins, Estes Park
- Symmetrical gigabit services
- $60 to $100 pricing for residential customers and
- $500 to $750 pricing for business customers are being offered in cities and towns across the country Options to enter into PPP, variety of models
- Models are driven mostly to mitigate debt coverage risk – driven by take rate – driven by pricing
- City involvement, capital, and ownership are negotiable

NEO CONNECT

Pg.14

Models to Consider

Analyzing Investment Levels 4 and 5

Work with phone/cable company

- City may or may not invest capital to incent the providers
- Low financial risk, and no control
- Shadow Conduit, Joint Builds
- Examples: Arvada, Westminster

Public Private Partnership

- # of Financing Options
- Share in Capital Costs
- Share in the Revenue
- Examples: Centennial, Boulder

City as the ISP

- City invests in Fiber to the Premise
- Provides Internet Services Directly
- Examples: Longmont, Loveland and Ft. Collins

Financial, operational and political risk increases with each "step up"
Control also increases with each "step up"

Pg.15

When evaluating Public Private Partnerships, the Tension between Control, Risk and Reward must be weighed against the City's Goals.

- Control is required to ensure end results
- Ownership is required to ensure Control
- Risk increases as ownership increases

Pg.16

Financial Model, Fiber to the Premise, What Works?

City as an ISP

- Residential rates of $80-$100 per month for 1 GB
- Take rate percentage of 30%
- Starting in Year 4
  - Annual of $11 Million
  - Net Income of $5-6 Million
- $50 per month with 50% take rate produces similar results

City as an ISP, Utility Fee

- $5 - $7 Monthly fee to Homes passed
- $50 - $80 per month
- Produces similar results

Public Private Partnership

- Share in the capital costs
- Revenue share would cover City's debt service
- Sensitivity analysis with take rates and pricing

Pg.17

Level of Investment

- ✓ 1) Implement Broadband Friendly Policies and Ordinances and Smart Conduit Construction to Gain Assets and Attract Partners
- ✓ 2) Connect City Government and Smart City Applications
- ✓ 3) Connect other Key Community Anchor Institutions
-  4) Connect Homes and Businesses with Fiber through a Public-Private Partnership or through offering Broadband as a Service
-  5) Further Evaluate Working with Existing Providers to Improve their Services (Comcast, CenturyLink)

Pg.18

Next Steps

- Staff Recommendations
  - Recommend Broadband Friendly Policies and Ordinances
  - Connect Remaining City Assets
  - Begin Discussions with Community Anchor Institutions
  - Create a Forum for Public Engagement

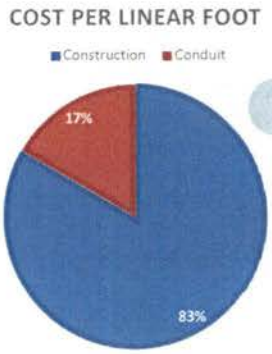
NEO CONNECT

Dig Once Policy

NEO CONNECT

Dig Once Policy

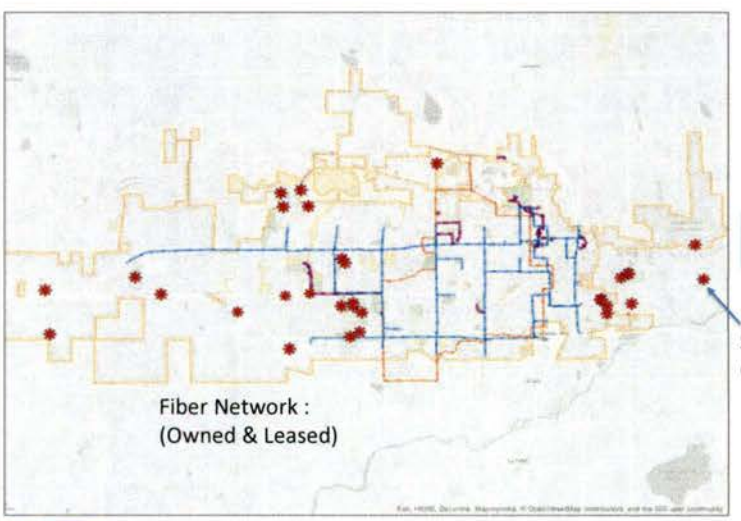
- Examples of others that have or will adopt:
  - Arvada
  - Grand Junction
  - Centennial
  - Federal Projects
  - Colorado State Projects
- Est. Funding
  - $120k – $200k per yr
  - Recommendations in budget process
  - City of Renton, WA - $250k per yr



NEO CONNECT

Pg.21

Connect Remaining City Assets



NEO CONNECT

Pg.22

Community Anchor Institution Engagement

School District 6

University of Northern Colorado

WELD County

Aims Community College

highplains Library District

NEO CONNECT

Pg. 23

Form Citizen Engagement Group

- Participation to help evaluate solutions for Greeley
- Explore Various Models
  - Work with the Local Providers
  - Public Private Partnerships
  - City as the ISP
- Regional NOCO collaboration

NEO CONNECT

Pg. 24

NEO CONNECT

QUESTIONS?

THANK YOU

Worksession Agenda Summary

May 22, 2018 (6:00 – 6:30 p.m.)
Agenda Item Number 2
Key Staff Contact: Name, Title, and Phone Number: Victoria Runkle, Assistant City Manager, 970-350-9730

Title:
Citizens' Capital and Operating 20 Year Plan

Background
Since January 2018 a group of citizens have been meeting to review the capital and operating needs associated with implementation of the 2060 Comprehensive Plan.

The Chair, Rod Esch, will report on the Committee's progress and considerations to date.

Council Direction Requested
None; informational only.

Attachments
None.

Worksession Agenda Summary

May 22, 2018 (6:30 – 7:15 p.m.)
Agenda Item Number 3
Key Staff Contact: Victoria Runkle, Assistant City Manager, 970-350-9730

Title:
Nuts and Bolts: Budget

Background
The City adopts a biennial budget beginning in every "odd-numbered" years. This process requires the Council to spend a significant amount of time the year prior to the adoption of the budget.

The operating budget process has multiple steps prior to getting to the City Council's consideration.

1. Begins with staff developing a prioritization of all departments' programs as measured against the City's Comprehensive Plan elements.

2. Departments begin to analyze their performance metrics against both the Comp Plan elements and growth requirements.

3. Departments then take the information from team prioritization, performance metrics, and external growth issues to develop both their base budget and "supplemental" requests. Departments must review lower priorities to determine if there are different ways of providing higher priority services. They are to provide all performance measures and alternatives to any new requests.

4. The Finance Department reviews all the supplemental requests for performance measures. If the measures are not well defined, the Finance Department may not forward the request to the City Manager. Simultaneously, the Finance Department estimates the increase to wages and benefits. This is the first "increase to the budget."

5. From that work, and all revenue estimating, the Finance Department informs the City Manager of the expected revenue growth.

6. The City Manager then reviews the departments' requests with the department and generates a Proposed Budget for Council consideration.

7. The City Manager must present a Proposed Budget to the City Council by September 15th. The goal is to provide the budget to the Council prior to Labor Day.

8. The City Council reviews the Proposed Budget through a series of work sessions and, in the first year, a workshop. It is a considerable amount of information. The important issue is to ensure the Council's priorities are established.

9. The Council must adopt a budget by December 15th each year as defined in the City Code. The Council must also have two public hearings regarding the budget.

In addition to this process, the Council also reviews and adopts the City's Capital spending plan through the Five Year Capital Improvements Plan. While this document illustrates the capital sending for the next five years, the Council adopts only the annual spending plan.

Finally, the City also adopts the utility spending plans. The Water and Sewer budget process begins in April of each year with the Water Board and then the Council reviewing the overall direction of the utilities' spending plans. Capital spending is particularly expensive in the utilities. These types of costs strongly affect the necessary rate structure for multiple years. Beginning the dialogue early with the utilities is important to ensure a full understanding of the rate influences for our citizens.

Staff will review the budget process with the Council.

Council Direction Requested
None; informational only.

Attachments
None.

Worksession Agenda Summary

May 22, 2018 (7:15 – 7:30 p.m.)
Agenda Item Number 4
Key Staff Contact: Victoria A. Runkle, Assistant City Manager, 350-9730

Title
Monthly Financial Report

Background
Attached is the report for the month ended April 30, 2018

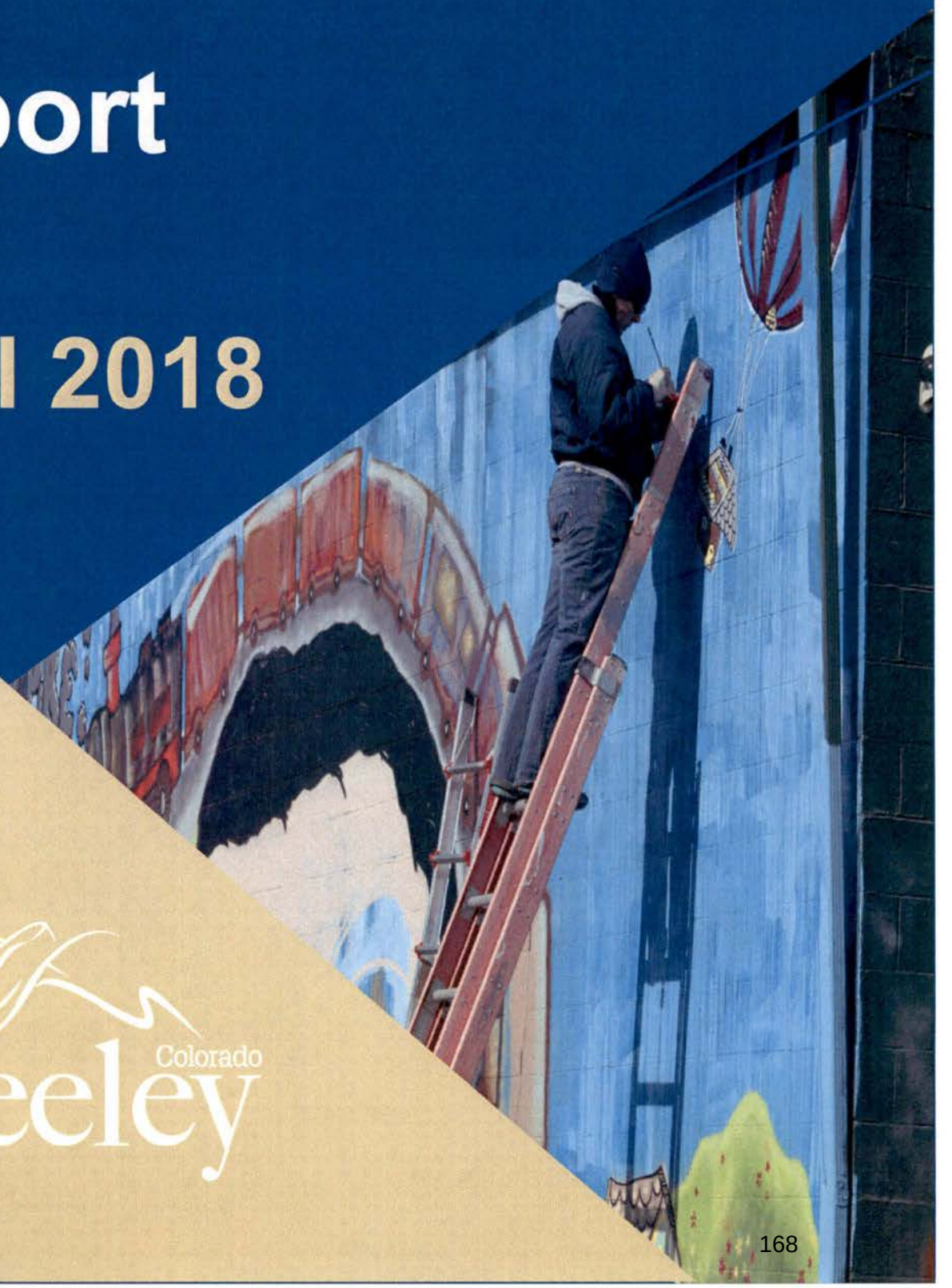
Council Direction Requested
None; informational only.

Decision Options
None; informational only.

Attachments
April Monthly Financial Report
PowerPoint Presentation

Monthly Financial Report

April 2018



City of Greeley Colorado

Table of Contents

Cover photos provided by City of Greeley Flickr account.

www.flickr.com/photos/greeleygov

April Financial Summary

Governmental accounting can at times be difficult to interpret because most (but not all) revenue is received one month after it is generated, while all expenses are recorded in the month which they were incurred. The following report outlines Greeley's major revenue funds and details 2018 collections to date.

General Fund

The General Fund has a total revenue budget of $94,228,753 and an expenditure budget of $107,525,930 in 2018. The monthly financial report examines the Fund's major revenue sources, expenditures, and overall trends; the report also utilizes historical data and future projections. The proceeding section provides summarized financial information, while detailed data is found in the sections beginning on page 5.

Sales Tax

Sales tax revenues comprise 44% of the General Fund's total revenues. The General Fund's 2018 share of sales tax revenues total $10,630,050 (24.6%) of a 2018 budget estimate of $43,174,285 through three months of sales tax payments. 2018 budgeted sales tax revenue is 2.2% less than 2017 actuals. Sales tax revenue designated for the general fund has increased 7.0% ($696,858) from 2017.

Use Taxes

Use taxes comprise 7.0% ($6,639,756) of the General Fund revenue budget in 2018.

Through three months, general use tax revenue has increased 12.1% ($45,274) as compared to 2017.

The City levies a building use tax upon issuing a new building permit. Building use tax revenue has increased 76.5% ($398,638) from 2017.

Auto use tax revenue has decreased 0.1% (-$511) from 2017 through three months of collections.

Building Permits

New construction permits and filing fee revenues are direct indicators of municipal growth. Building permit revenue has increased 37.5% ($154,241) from 2017 to 2018. 154 new construction permits ($51.4 million valuation) have been issued in 2018, as compared to 68 ($21.4 million valuation) during the same period in 2017, resulting in a 126% increase in permits issued and a 140% increase in permit valuation to date. The number of single family permits issued in 2018 (123) has already exceed the total for all of 2017 (111).

2018 single-family permits to date: 123 issued, $27.7 million total valuation.

2017 single-family permits to date: 40 issued, $9.7 million total valuation.

2018 multi-family permits to date: 23 issued, $3.6 million total valuation.

2017 multi-family permits to date: 18 issued, $1.9 million total valuation.

2018 commercial permits to date: 8 issued, $20.0 million total valuation.*

2017 commercial permits to date: 10 issued, $9.7 million total valuation.

*Construction of a new addition to the Union Colony Prepatory School (2000 Clubhouse Drive) accounts for $6.3 million of the total 2018 valuation.

Special Fund Revenues & Economic Indicators

Lodging Tax

The Convention and Visitors Fund is supported by the City's 3.0% lodging tax and is utilized to support convention and visitors activities. Through April, lodging tax revenue has increased 18.8% ($21,768) from 2017, and the City has collected 25.3% of the 2018 budget estimate of $545,000. According to the March Rocky Mountain Lodging Report, Greeley's year-to-date occupancy rate is currently 65.7% as compared to 68.4% in 2017; The 2018 statewide occupancy rate is currently 63.4%

Food Tax

Greeley's food tax finances a capital maintenance program for the repair of streets, buildings, parks, and other capital assets. Through three months, food tax revenue has increased 6.9% ($120,857), and the City has collected $1,876,105 (26.5%) of the 2018 budget estimate of $7,074,449.

Economic Indicators

The price of Colorado/Nebraska DJ Basin Crude Oil at the end of April (4/30/2018) was $64.00, an 44.6% increase from 2017. Total sales tax revenue from April retail sales grew 6.5% from 2018. Several business categories have grown in 2018, including dining out, general merchandise stores, motor vehicle and parts dealers, utilities, furniture stores, gasoline stations, health and personal care stores, and clothing stores.

Summary

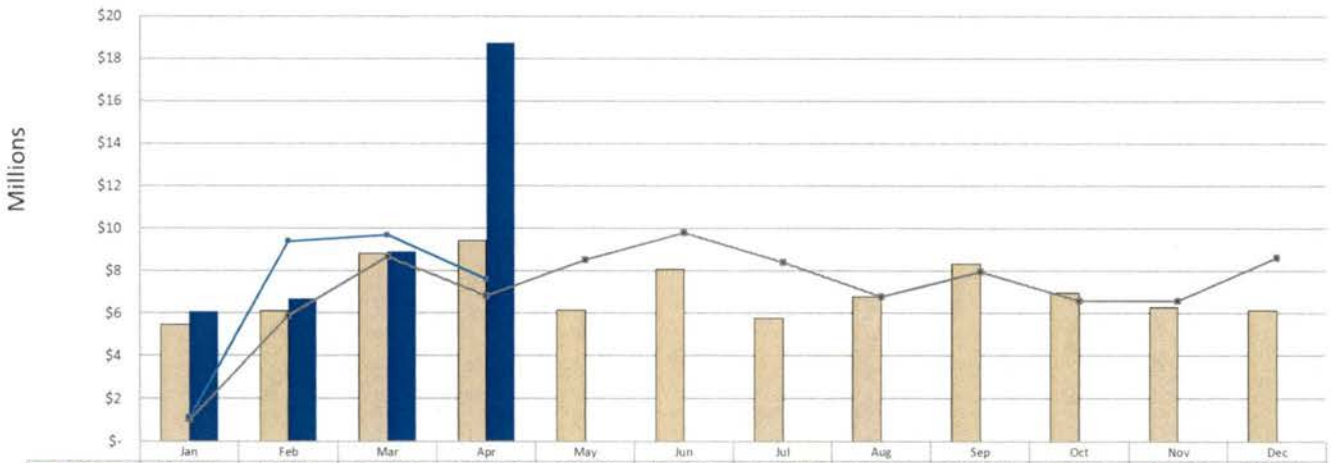
The following sections outline Greeley's major operating funds. After a strong 2017, the local economic conditions in early 2018 continue to be positive, as evidenced by the continued growth in sales tax revenue, property tax, and use taxes.

General Fund

Overview:

Major sources of revenue in the General Fund include sales, property, and use tax; county, state, and federal intergovernmental funds; franchise fees; transfers from other funds; fines, forfeits, and service charges; licenses and permits; and miscellaneous sources.

The following graph compares 2018 expenditures and revenues with the same data from 2017. The first three months of 2018 revenues and expenditures are following historic trends. The City received $3.4 million in one-time oil royalty payments in February 2018. March 2018 revenues are higher due to an increase in property tax collections from last year. City Council appropriated a one-time carryover of 2017 funds in April, contributing $11.6 million to the month's expenses.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017 Expense	$5,466,396	$6,118,369	$8,808,910	$9,424,569	$6,155,996	$8,047,103	$5,778,378	$6,799,102	$8,325,951	$6,966,660	$6,275,198	$6,156,846
2018 Expense	$6,093,069	$6,702,933	$8,914,816	$18,737,710								
2017 Revenue	$1,035,434	$5,874,520	$8,668,522	$6,831,305	$8,501,383	$9,777,809	$8,398,084	$6,767,288	$7,937,994	$6,611,407	$6,610,706	$8,638,952
2018 Revenue	$1,099,762	$9,390,091	$9,679,283	$7,601,212								

The table below compares 2018 actual and budgeted revenue and expenditures as of April 30, 2018.

2018 General Fund Overview				
	2018 Actual	2018 Revised Budget	Variance	% of 2018 Budget
Use of Fund Balance	$ 12,678,180	$ 13,297,177	$ (618,997)	95.3%
Revenue	$ 27,770,348	$ 94,228,753	$ 66,458,405	29.5%
Expenditures	$ 40,448,528	$ 107,525,930	$ 67,077,402	37.6%

Revenues:

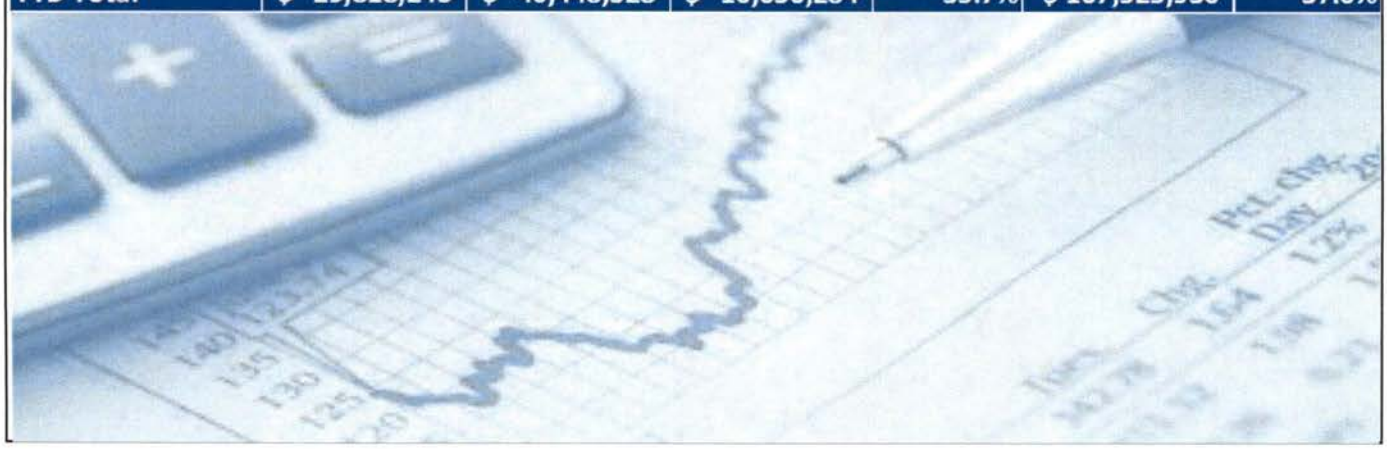
Three months of payments have been received from the following revenue sources in 2018: franchise fees, sales tax, general use tax, lodging tax, and property tax. Four months of payments have been received for the following: building and planning permit fees; building use tax; and charges for interfund services. The City received $3.4 million in one-time oil royalty payments in February 2018. March 2018 revenues are higher due to an increase in property tax collections from last year. The city received increased revenue from building permits, royalties, and sales tax in April. Total received revenues are currently 29.5% of the 2018 budget and are 23.9% above 2017 to date.

General Fund Revenue Comparisons						
	2017	2018	Variance	% Change 2017 - 2018	2018 Revised Budget	% of 2018 Budget
1st Quarter	$ 15,578,476	$ 20,169,136	$ 4,590,660	29.5%	-	-
April	$ 6,831,305	$ 7,601,212	$ 769,907	11.3%	-	-
YTD Total	$ 22,409,780	$ 27,770,348	$ 5,360,568	23.9%	$ 94,228,753	29.5%

Expenditures:

The General Fund is used to provide basic municipal services such as police, fire, parks, culture, recreation, public works, community development, and general administration. Below is a summary of expenditures through April 30, 2018. The increased expenditures in 2018 are due to a one-time $500,000 charge that was refunded in March and the appropriation and transfer of $11.6 million of 2017 carryover funds in April.

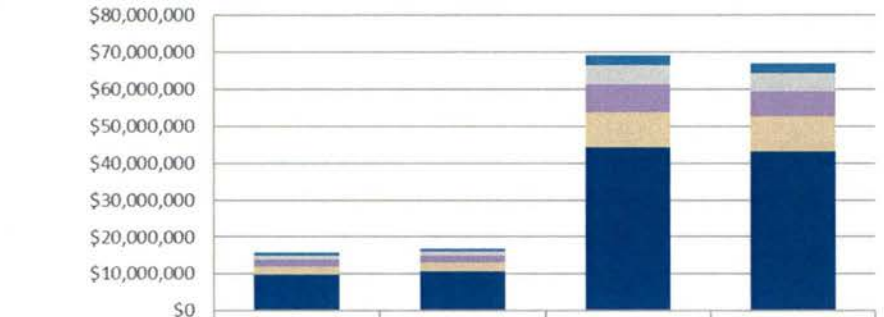
2018 General Fund Expenditure Comparisons						
	2017	2018	Variance	% Change 2017 - 2018	2018 Revised Budget	% of 2018 Budget
1st Quarter	$ 20,393,676	$ 21,710,819	$ 1,317,143	6.5%	-	-
April	$ 9,424,569	$ 18,737,710	$ 9,313,141	98.8%	-	-
YTD Total	$ 29,818,245	$ 40,448,528	$ 10,630,284	35.7%	$ 107,525,930	37.6%



Revenue Sources

The City collects sales tax on the retail sale of various goods and commodities at a rate of 4.11%; the state's sales tax rate is 2.9%. City sales tax revenue is distributed to the Public Safety Fund (0.16%), Quality of Life Fund (0.30%), General Fund (3.0%) and Keep Greeley Moving (0.65%). In 2015, the citizens of Greeley re-approved the 3.46% tax on food for home consumption – the Food Tax Fund.

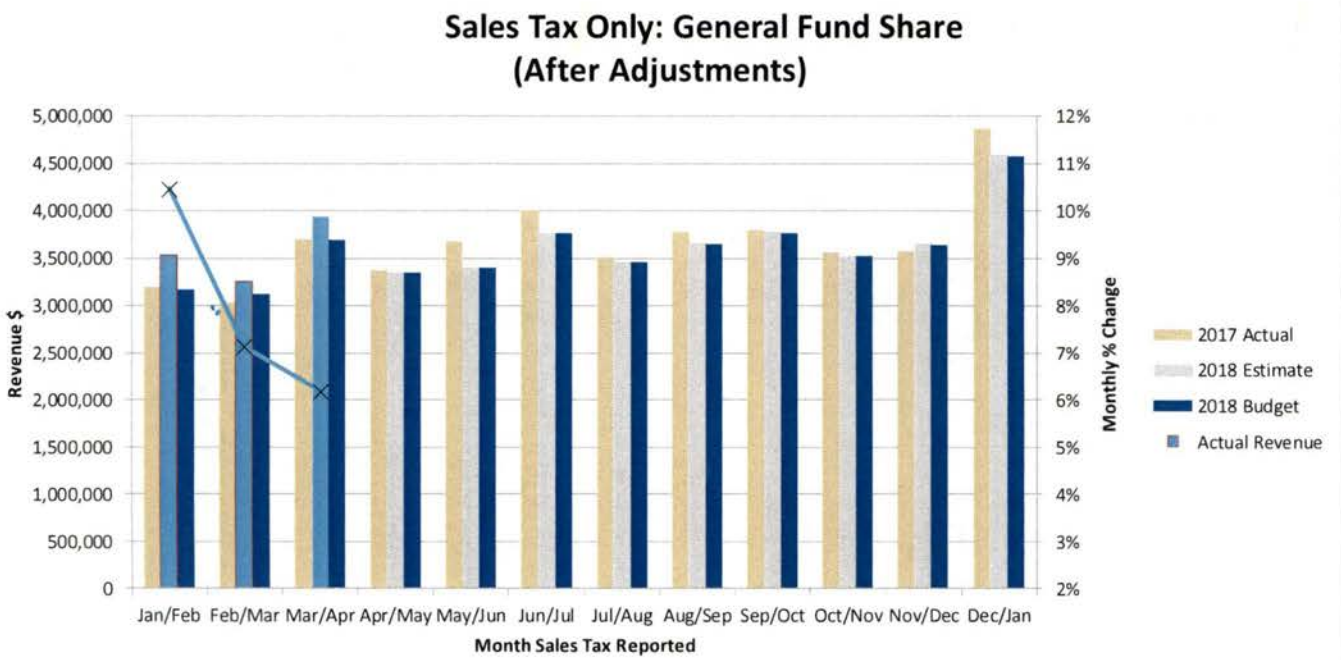
The graph below illustrates the sales tax revenue distribution to five different funds before debt payments: General, Public Safety, Quality of Life, Food, and Keep Greeley Moving. Intergovernmental agreements with Evans and Windsor also affect the fund distribution.



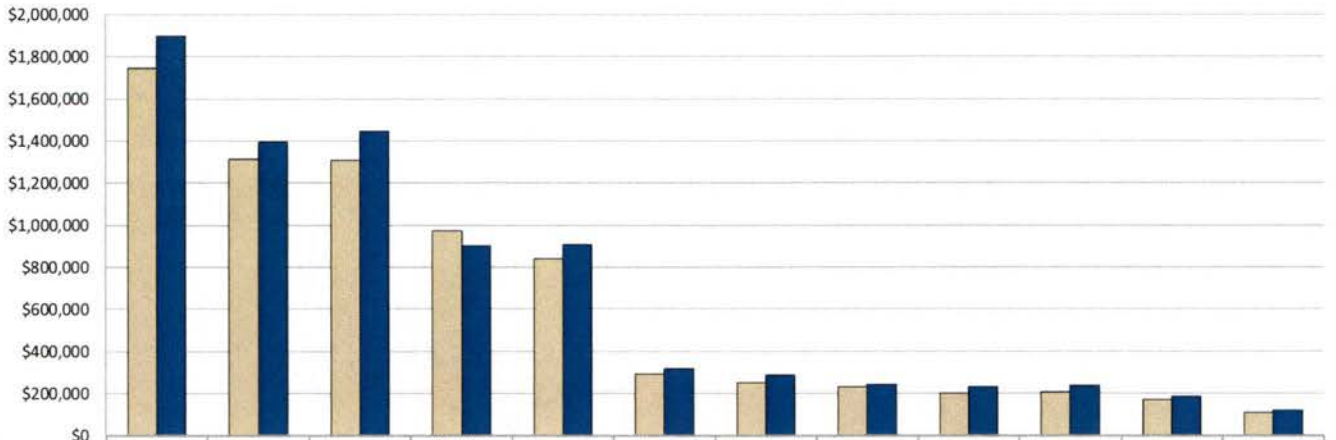
	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$623,383	$666,995	$2,754,920	$2,607,571
Quality of Life	$1,168,844	$1,250,616	$5,165,474	$4,889,197
Food	$1,755,248	$1,876,105	$7,490,314	$6,935,735
Keep Greeley Moving	$2,176,345	$2,330,328	$9,680,773	$9,427,169
General Fund	$9,933,192	$10,630,050	$44,164,431	$43,174,285

Sales tax revenues have been collected for three months in 2018. General sales tax revenue is budgeted at 2.2% below 2017 revenue. The General Fund's sales tax revenues have increased 7.0% as compared to 2017.

The graph below is a summary of the General Fund share of sales tax by month and includes three months of 2018 actuals and a nine-month 2018 forecast.

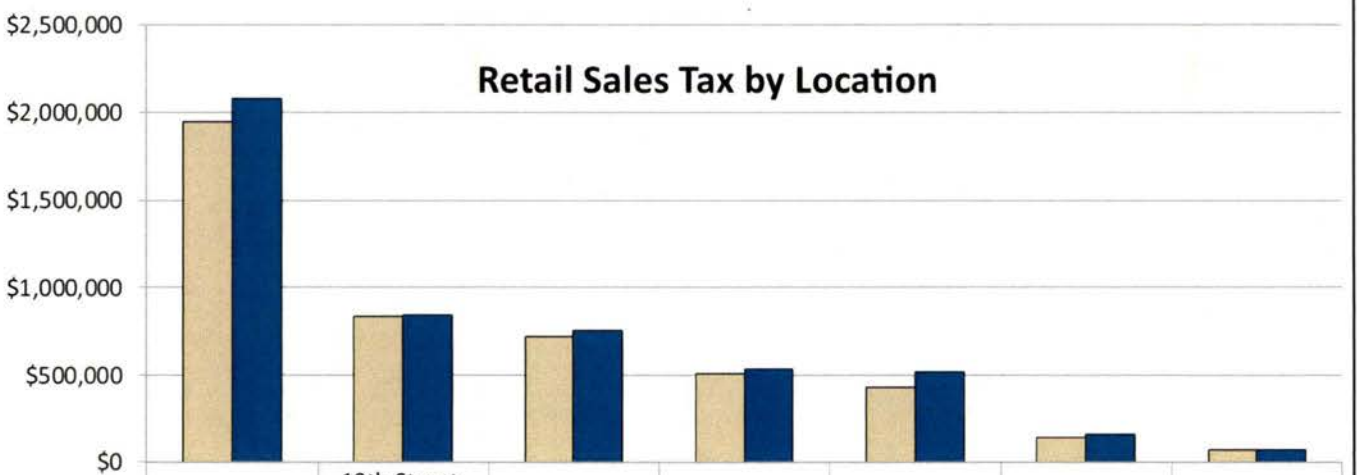


The North American Industry Classification System (NAICS) is used to categorize sales tax revenue by industry. The graph below compares sales tax revenue by select industries for 2017 and 2018. Adjustments have been made below to account for late payments. Online Shopping experienced the largest percentage increase of 16.36% above 2017 totals, while Dining Out had the largest dollar increase of $150,134.



	Dining Out	General Merchandise Stores	Motor Vehicle and Parts Dealers	Building Material and Garden Equipment and Supplies Dealers	Utilities	Electronics and Appliance Stores	Clothing and Clothing Accessories Stores	Health and Personal Care Stores	Sporting Goods, Hobby, Book, and Music Stores	Online Shopping	Furniture and Home Furnishings Stores	Gasoline Stations
2017 YTD	$1,746,131	$1,311,911	$1,306,217	$974,578	$838,268	$289,180	$247,800	$232,475	$200,806	$203,057	$169,043	$110,193
2018 YTD	$1,896,266	$1,396,574	$1,445,348	$901,273	$905,548	$316,103	$283,847	$239,227	$231,285	$236,276	$184,903	$119,298
% Change	8.60%	6.45%	10.65%	-7.52%	8.03%	9.31%	14.55%	2.90%	15.18%	16.36%	9.38%	8.26%
$ Change	$150,134	$84,664	$139,131	$(73,305)	$67,281	$26,924	$36,047	$6,751	$30,479	$33,219	$15,860	$9,105

The graph below outlines retail sales by identified locations for three months, omitting grocery stores and auto dealers. All locations have increased sales from 2017 to 2018 with Centerplace showing the largest dollar increase of $131,614 and Downtown showing a 20.87% increase. The graph has been modified to account for late payments and adjustments to prior periods.



	Centerplace Area	10th Street-23rd Ave - 59th Ave	Greeley Mall Area	University District	Downtown Development	Northgate Village	St. Michaels
2017	1,945,481	837,854	719,014	512,209	431,654	140,022	63,858
2018	2,077,095	841,210	758,224	535,956	521,729	158,942	64,956
% Change	6.77%	0.40%	5.45%	4.64%	20.87%	13.51%	1.72%
$ Change	$131,614	$3,355	$39,210	$23,747	$90,076	$18,920	$1,098

Property Tax

The City levies property tax based on Weld County's biennial property value appraisal. The mill levy is currently set at 11.274 mills. Property tax revenue has increased 16.5% ($605,453) from 2017 to 2018 through three months of collection.

Property Tax						
	2017	2018	Variance	% Change 2017 - 2018	2018 Budget	% of 2018 Budget
1st Quarter	$ 2,966,893	$ 3,628,120	$ 661,227	22.3%	-	-
April	$ 692,980	$ 637,206	$ (55,774)	-8.0%	-	-
YTD Total	**$ 3,659,873**	**$ 4,265,326**	**$ 605,453**	**16.5%**	**$ 10,230,784**	**41.7%**

2018 Property Tax Sources from County Accessor

Source	%	Amount
Residential	43.8%	$ 5,449,646
Commercial	33.8%	$ 4,206,186
Industrial	11.8%	$ 1,466,737
Mineral, Oil & Gas	4.0%	$ 498,687
Other	6.6%	$ 824,864
Total	100%	$ 11,341,187

Franchise Fees

Electricity, natural gas utilities, and cable television providers pay franchise fees to the City for the use of public right-of-way property. Telephone providers pay an occupation tax.

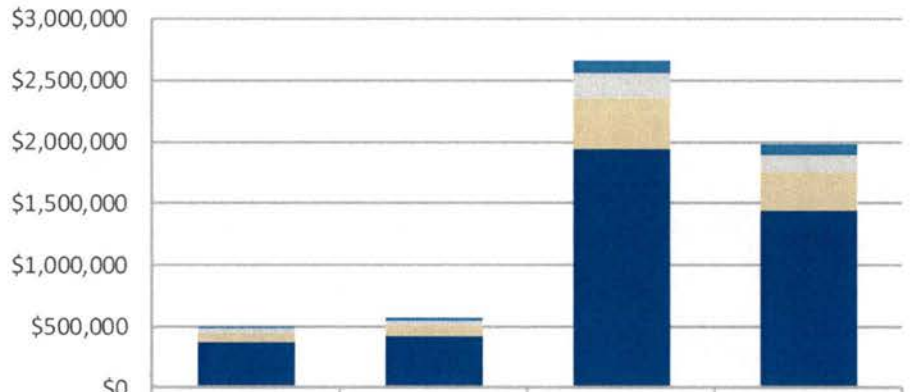
Franchise fees have increased over the first four months of 2018.

Franchise Fees & Telephone Tax						
	2017 YTD	2018 YTD	Variance	% Change 2017 - 2018	2018 Budget	% of 2018 Budget
Cable	$ -	$ -	$ -	-	$ 1,070,244	0.0%
Electric	$ 410,341	$ 404,385	$ (5,956)	-1.5%	$ 2,651,578	15.3%
Natural Gas	$ 432,733	$ 584,645	$ 151,912	35.1%	$ 1,452,218	40.3%
Telephone	$ 36,615	$ 25,179	$ (11,437)	-31.2%	$ 100,000	25.2%
YTD Total	**$ 879,690**	**$ 1,014,209**	**$ 134,519**	**15.3%**	**$ 5,274,040**	**19.2%**

Use Taxes

Use taxes are levied upon individuals using, storing, or consuming tangible personal property that has not been subject to sales tax. Three types of use taxes (general, automobile, and building) provide revenue to the Public Safety Fund, Quality of Life Fund, Keep Greeley Moving, and General Fund.

General Use Tax

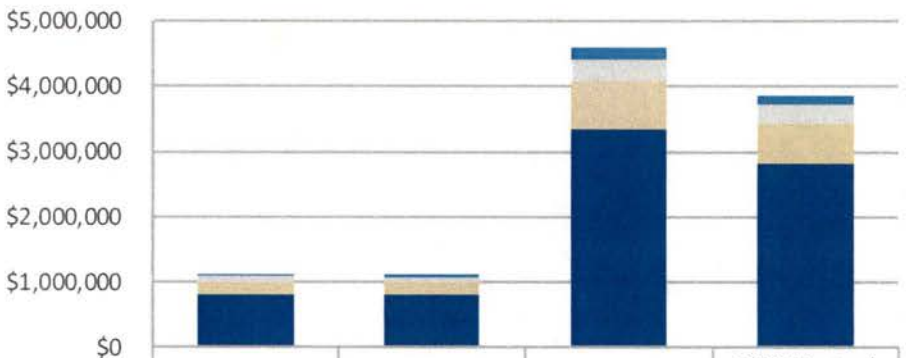


	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$19,909	$22,324	$103,841	$76,942
Quality of Life	$37,330	$41,858	$194,703	$144,266
Keep Greeley Moving	$69,540	$92,634	$419,103	$312,501
General Fund	$373,303	$418,577	$1,947,025	$1,442,664

The General Fund share of general use tax revenue has increased 12.1% from 2017 to 2018.

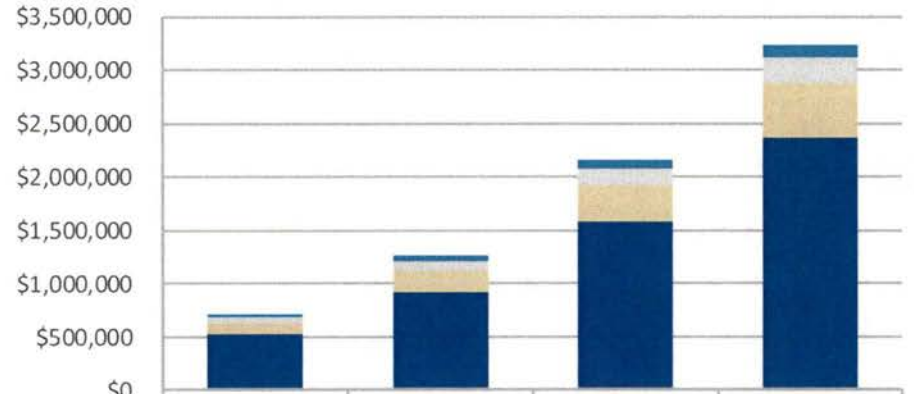
Auto Use Tax

Auto use tax revenue has decreased 0.1% from 2017 to 2018.



	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$44,034	$44,007	$178,917	$151,038
Quality of Life	$82,565	$82,514	$335,470	$283,196
Keep Greeley Moving	$178,890	$178,779	$726,852	$613,442
General Fund	$825,647	$825,135	$3,354,703	$2,831,959

Building Use Tax



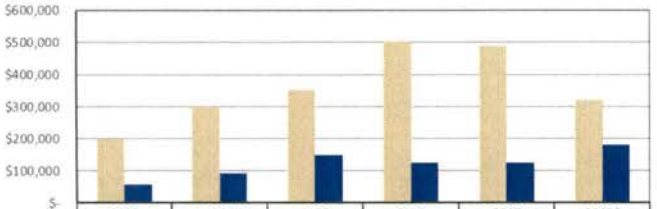
	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$27,795	$49,056	$84,173	$126,140
Quality of Life	$52,115	$91,979	$157,825	$236,513
Keep Greeley Moving	$112,789	$197,172	$341,564	$512,321
General Fund	$521,154	$919,792	$1,578,247	$2,365,134

Through four months of collections, building use tax revenue has increased 76.5% from 2017 to 2018.

Building & Planning Permit Fees

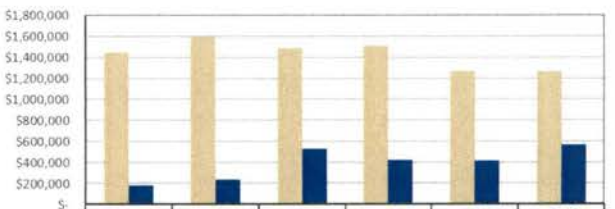
Building and planning permit fees are collected on new commercial, industrial, and residential renovation and construction. Through four months of 2018, plan filing and check fee revenues have increased 44.5% ($56,006) from 2017 to 2018 and building permit fees increased 37.5% ($154,241).

Plan & Filing Fees



	2013	2014	2015	2016	2017	2018*
Actuals/Budget*	$196,181	$300,106	$352,917	$505,050	$489,979	$320,000
YTD Actuals	$58,250	$92,981	$148,330	$125,671	$125,767	$181,774

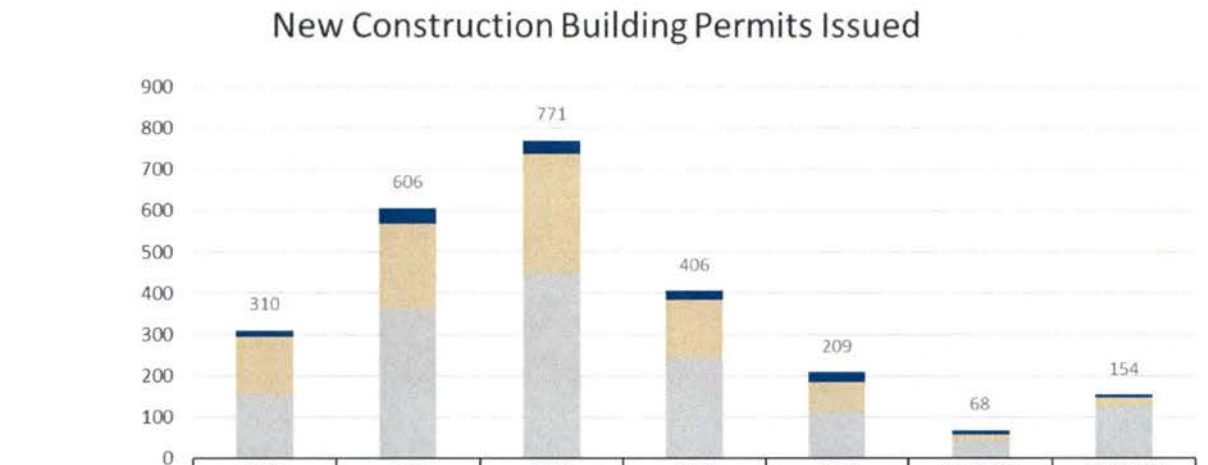
Building Permit Revenue



	2013	2014	2015	2016	2017	2018*
Actuals/Budget*	$1,444,774	$1,595,310	$1,483,715	$1,507,978	$1,273,000	$1,273,000
YTD Actuals	$181,179	$238,057	$529,760	$422,330	$411,063	$565,304

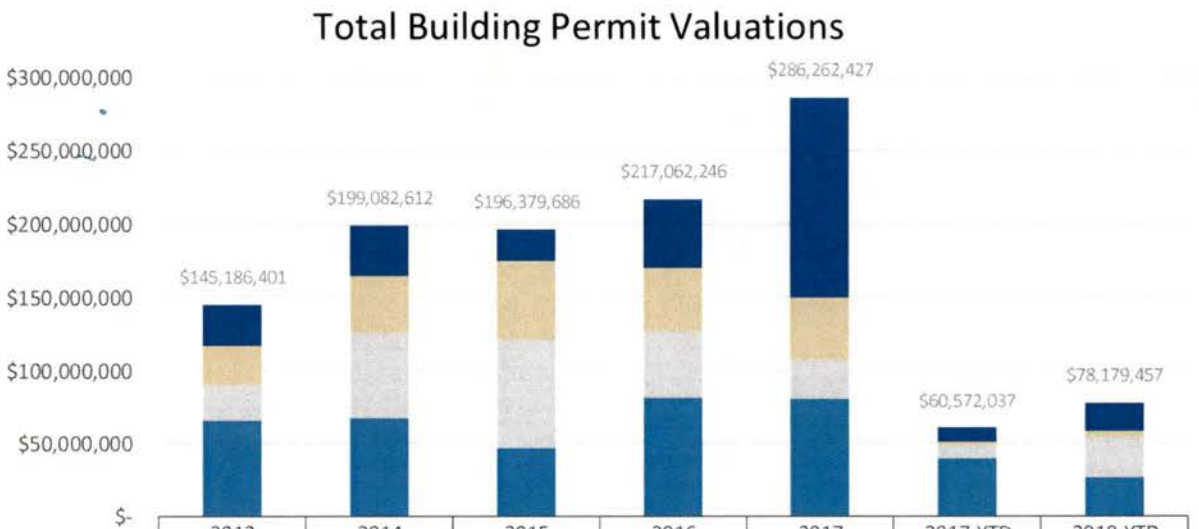
Building Permits Issued

The number of new building permits issued each month is a direct indicator of construction growth in Greeley. The following graph illustrates the number of permits issued for new commercial, single, and multi-family developments. After a sharp increase in permits issue in March, 2018 permits are currently ahead of the pace set in 2017. The number of single family permits issued in 2018 (123) has already exceed the total for all of 2017 (111).



	2013	2014	2015	2016	2017	2017 YTD	2018 YTD
New Commercial	15	37	32	23	26	10	8
New Multi-Family	140	208	290	139	72	18	23
New Single-Family	155	361	449	244	111	40	123
Total	310	606	771	406	209	68	154

Building Permit Valuations



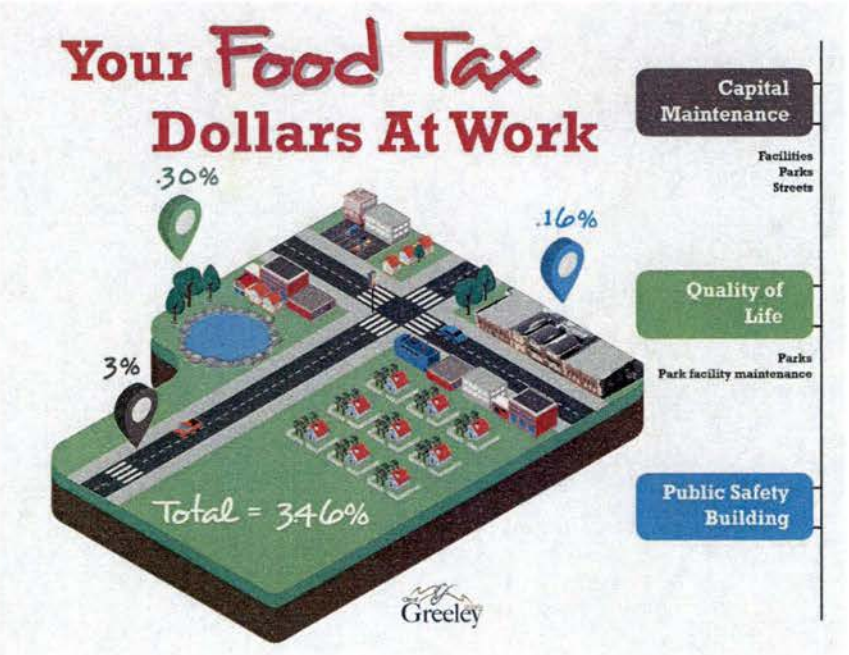
	2013	2014	2015	2016	2017	2017 YTD	2018 YTD
New Commercial	$28,107,903	$34,692,350	$21,622,922	$46,620,945	$136,394,23	$9,731,105	$20,048,555
New Multi-Family	$26,207,094	$38,421,203	$53,335,909	$43,402,782	$42,009,358	$1,911,830	$3,593,365
New Single-Family	$25,332,659	$58,891,310	$74,046,922	$45,308,198	$27,142,816	$9,723,902	$27,735,393
Other Permits	$65,538,745	$67,077,749	$47,373,933	$81,730,321	$80,716,016	$39,205,200	$26,802,144
Total	$145,186,40	$199,082,61	$196,379,68	$217,062,24	$286,262,42	$60,572,037	$78,179,457

Food Tax Fund

Greeley's food tax finances a capital maintenance program for the repair of streets, buildings, parks, and other capital assets. The revenue cannot be used for other governmental purposes. The tax rate is currently 3.46% and 3% of the tax is applied to capital maintenance. The remaining balance is distributed to the Quality of Life and Public Safety Funds (0.30% and 0.16%) as approved by voters in 2002 and 2004.

Three months of 2018 food tax collection for the Food Tax Fund totaled $1,876,105 (6.9%) of the budgeted $7,074,449.

Food Tax Fund Overview						
	YTD 2017 Actual	YTD 2018 Actual	% Change	2018 Encumbrances	2018 Revised Budget	% of 2018 Budget
Sales Tax on Food	$ 1,755,248	$ 1,876,105	6.9%	-	$ 7,074,449	26.5%
Transfer from Designated Revenue	$ 13,889	$ 9,754	-30%	-	$ 98,000	10.0%
Other	$ 61,962	$ 98,896	60%	-	$ 603,819	16.4%
Total Revenue	**$ 1,831,099**	**$ 1,984,755**	**8.4%**	**-**	**$ 7,776,268**	**25.5%**
Capital Projects	$ 1,018,732	$ 1,702,641	67%	$ 2,076,431	$ 10,460,220	36.1%
Total Expenditures	**$ 1,018,732**	**$ 1,702,641**	**67%**	**$ 2,076,431**	**$ 10,460,220**	**36.1%**
Use of Fund Balance	$ (812,366)	$ (282,114)			$ 2,683,952	



Quality of Life

The .30% sales and use tax, grant funds, and park development impact fees are utilized to complete various projects.

Description	YTD 2018 Actual	2018 Revised Budget	% of Budget
Beginning Fund Balance	**$ 5,801,408**	**$ 5,801,408**	
Revenue			
Sales and Use Tax	$ 1,472,176	$ 5,696,799	25.84%
From Parks Development	$ 1,323,182	$ 964,194	137.23%
Other	$ 72,783	$ 824,676	8.83%
Total Revenue	**$ 2,868,141**	**$ 7,485,669**	**38.32%**
Expenditures			
Projects	$ 224,443	$ 8,896,298	2.52%
Maintenance	$ 275,160	$ 825,481	33.33%
Debt Service	$ 617,938	$ 2,471,750	25.00%
Total Expenditures	**$ 1,117,541**	**$ 12,193,529**	**9.17%**
Committed Fund Balance	**$ 1,689,561**		
Ending Fund Balance	**$ 5,862,447**	**$ 1,093,548**	

Public Safety

The table below highlights funds dedicated to the police facility, debt, equipment, and maintenance generated from the 0.16% tax.

Description	YTD 2018 Actual	2018 Revised Budget	% of Budget
Beginning Fund Balance	**$ 3,243,602**	**$ 3,243,602**	
Revenue			
Sales and Use Tax	$ 785,161	$ 3,038,293	25.84%
Total Revenue	**$ 785,161**	**$ 3,038,293**	**25.84%**
Expenditures			
Maintenance	$ 153,983	$ 512,474	30.05%
Debt Service	$ 434,063	$ 1,736,250	25.00%
Total Expenditures	**$ 588,046**	**$ 2,248,724**	**26.15%**
Ending Fund Balance	**$ 3,440,717**	**$ 4,033,171**	

Keep Greeley Moving Fund

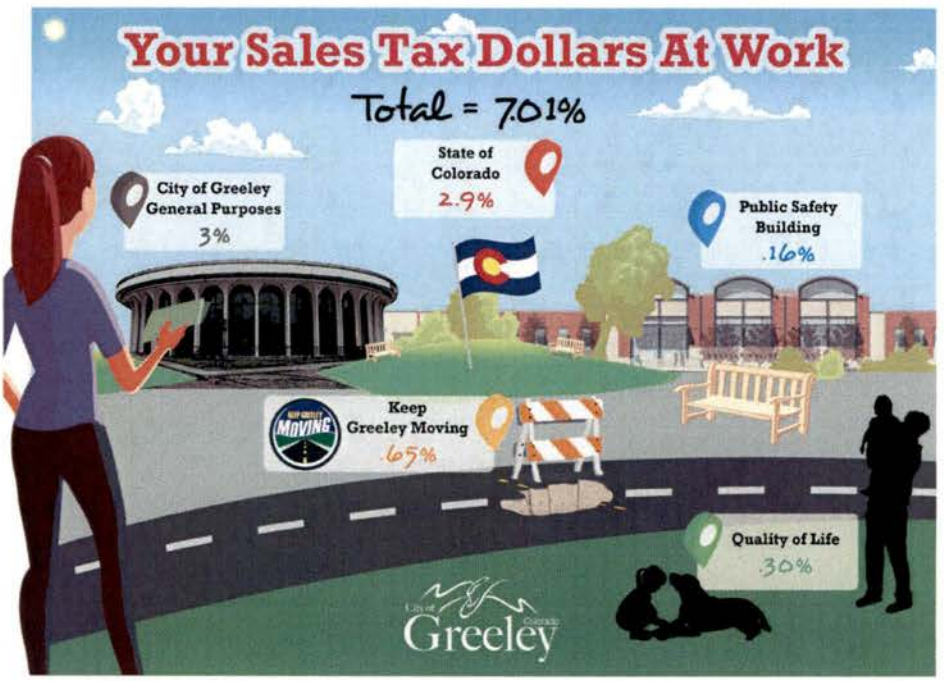
An additional sales tax of 0.65% was approved by voters during the last quarter of 2015 to fund street maintenance and improvements for seven years. The City is responsible for public concrete sidewalk and gutter repairs through the seven-year life of the program. It will additionally make major improvements to ten arterial and collector roads, repave eight neighborhoods, and complete three street capacity projects.

2018 projects include:

- $11.2 million for pavement overlay, seal coat, patching, and striping.
- $2.0 million for the construction of handicap ramps and sidewalk access points at various locations throughout the city, concrete repair and cross-pan replacement program, and the neighborhood concrete program.

Keep Greeley Moving sales and use tax revenue is currently 10.3% above 2017's year-to-date total.

Keep Greeley Moving						
	YTD 2017 Actual	YTD 2018 Actual	% Change	2018 Encumbrances	2018 Revised Budget	% of 2018 Budget
Sales & Use Tax	$ 2,537,564	$ 2,798,913	10.3%	$ -	$ 10,865,433	25.8%
Transfer from Food Tax Fund	$ 666,667	$ 933,333	40.0%	$ -	$ 2,800,000	33.3%
Other Revenues	$ 5,475	$ 22,192	305.3%	$ -	$ -	-
Total Revenue	**$ 3,209,705**	**$ 3,754,438**	**17.0%**	**-**	**$ 13,665,433**	**27.5%**
Projects	$ 450,366	$ 427,371	-5.1%	$ 10,376,918	$ 13,233,683	81.6%
Road Development Fund Projects	$ 1,200,000	$ 1,200,000	0.0%	$ -	$ 3,600,000	33.3%
Total Expenditures	**$ 1,650,366**	**$ 1,627,371**	**-1.4%**	**$ 10,376,918**	**$ 16,833,683**	**71.3%**
Use of Fund Balance	$ (1,559,339)	$ (2,127,067)			$ 3,168,250	

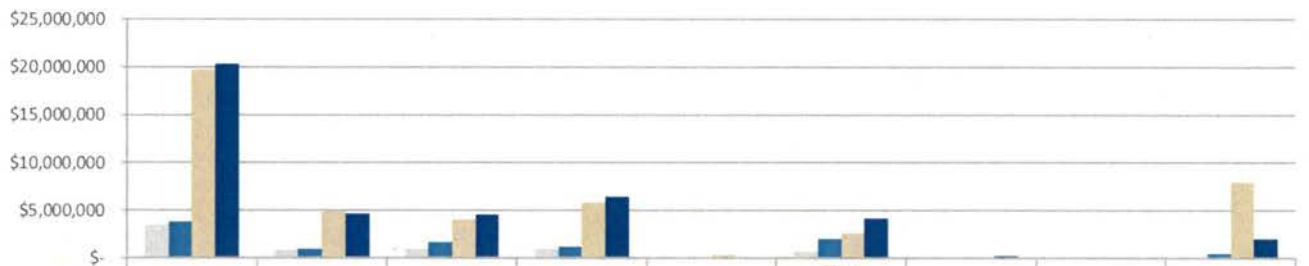


Water Funds

The Water Department provides clean water to the citizens and industries of Greeley. The department is responsible for 476 miles of distribution lines and 69.75 million gallons of treated water storage reservoirs. Below is a summary table of water revenues and expenditures. Bond proceeds of $71.8 million are budgeted in 2018 to fund capital projects. The department will use fund balance to cover the $20.1 million difference between budgeted expenditures and revenue in 2018.

Water Overview							
	YTD 2017 Actual	YTD 2018 Actual	YTD % Change	2018 Encumbrances	2017 Actuals	2018 Revised Budget	% of 2018 Budget
Total Revenue	**$ 6,819,677**	**$ 10,090,217**	**48.0%**	**-**	**$ 45,461,551**	**$ 114,239,036**	**8.8%**
Operating	$ 6,858,288	$ 7,267,008	6.0%	$ 1,841,852	$ 25,698,962	$ 28,467,713	32.0%
Water Rights Acquisition	$ 985,155	$ 435,851	-55.8%	$ 626,418	$ 9,773,310	$ 8,735,574	12.2%
Capital	$ 5,407,788	$ 7,280,070	34.6%	$ 35,840,805	$ 27,019,442	$ 97,125,708	44.4%
Total Expenditures	**$ 13,251,231**	**$ 14,982,929**	**13.1%**	**$ 38,309,075**	**$ 62,491,714**	**$ 134,328,995**	**39.7%**
Use of Fund Balance	$ 6,431,554	$ 4,892,712			$ 17,030,163	$ 20,089,959	

Water Revenues by Source



	Residential Rates	Commercial Rates	Industrial Rates	Other Rates	Raw Water Sales	Plant Investment Fees	Water Shares	Cash In Lieu	Other
YTD 2017 Actual	$3,449,293	$790,836	$957,192	$903,886	$-	$693,500	$-	$-	$24,970
YTD 2018 Actual	$3,877,444	$935,909	$1,652,929	$1,184,706	$-	$1,996,477	$-	$-	$442,752
2017 Actuals	$19,762,484	$4,905,890	$4,083,024	$5,819,589	$365,496	$2,563,125	$1,460	$-	$7,960,483
2018 Budget	$20,364,863	$4,665,000	$4,578,728	$6,396,412	$125,000	$4,211,507	$172,770	$-	$1,974,756
YTD % Change	12.4%	18.3%	72.7%	31.1%	0.0%	187.9%	0.0%	0.0%	1673.14%
% of 2018 Budget	19.0%	20.1%	36.1%	18.5%	0.0%	47.4%	0.0%	0.0%	22.4%

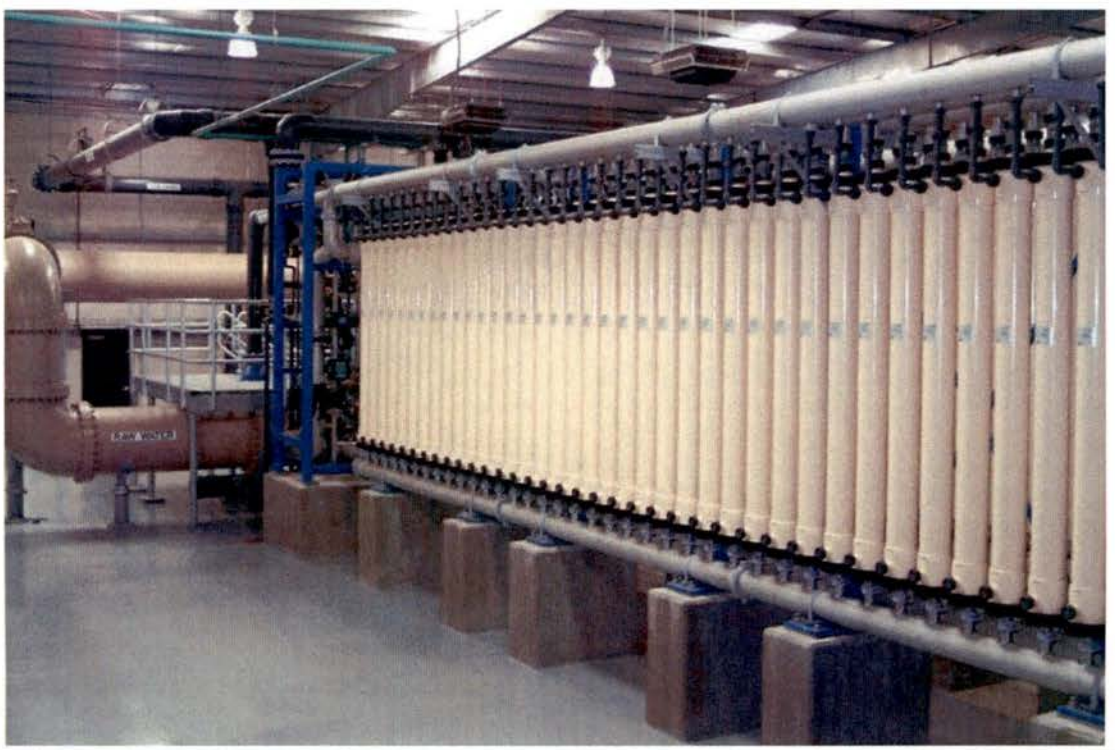
2018 revenues for residential, commercial, and industrial rates have moved 12.4%, 18.3%, and 72.7%, respectively, from 2017. To date, total rate revenue has increased 25.4% from 2017. The total rate revenue is budgeted to increase 3.0% in 2018. Due to the timing of utility payment schedules, rate revenues will fluctuate during the first few months of 2018.

Water Funds

As mentioned earlier, water expenditures are expected to exceed revenues as fund balance is used to fund capital projects. Budgeted capital expenditures for 2018 include:

- $38.3 million for Windy Gap Firming.
- $33.9 million for capital replacement projects.
- $8.8 million for water rights acquisition.
- $8.2 million for Milton Seaman Permitting and Projects.
- $2.9 million for Disinfection Outreach and Verification.

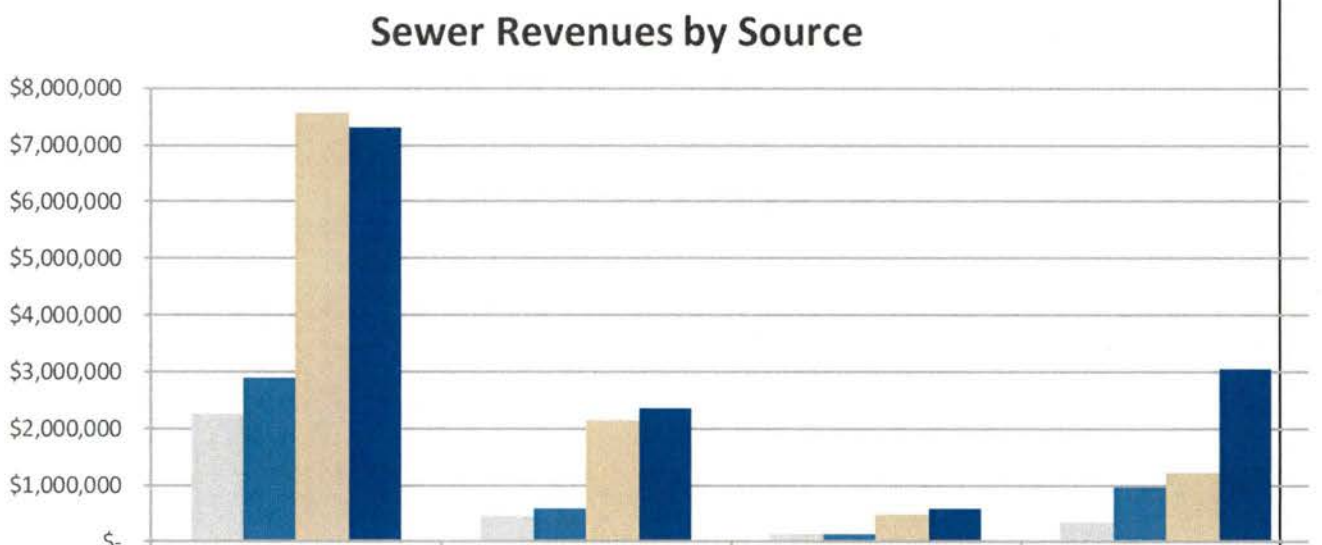
Water Projects over $1 million in 2018					
Quarter	Beginning Allocated Funds	Budget	Actual Expenditures	Variance from Budget	Ending Allocated Funds
Q1	$ 89,792,223	$ 3,887,019	$ 3,404,669	$ (482,350)	
Q2		$ 4,360,000	$ 1,547,307	$ (2,812,693)	
Q3		$ 8,485,726	$ -	$ -	
Q4		$ 10,150,000	$ -	$ -	$ 62,909,478
Total		**$ 26,882,745**	**$ 4,951,976**	**$ (3,295,043)**	
Project Savings		$ 4,410,171			
Planned Next Year Expenditures		$ 58,540,549			



Sewer Funds

The Sewer Department collects and treats wastewater from Greeley's residences and businesses. 359 miles of line and 10 sewage pumping stations are operated and maintained by the department in order to perform these critical services.

Residential, commercial, and industrial sewer revenues have moved 28.9%, 27.7%, and 8.8%, respectively, from 2017 to 2018. To date, total sewer rate revenue in 2018 has increased 21.7% as compared to 2017. Total rate revenue was budgeted to decrease 0.3% this year. Due to the timing of utility payment schedules, rate revenues will fluctuate during the first few months of 2018.



	Residential Rates	Commercial Rates	Industrial Rates	Plant Investment Fees
YTD 2017 Actual	$2,245,211	$460,128	$132,115	$348,275
YTD 2018 Actual	$2,893,349	$587,652	$143,732	$970,100
2017 Actuals	$7,580,288	$2,144,791	$483,376	$1,234,693
2018 Budget	$7,321,560	$2,360,820	$586,099	$3,044,609
YTD % Change	28.9%	27.7%	8.8%	178.5%
% of 2018 Budget	39.5%	24.9%	24.5%	31.9%

Sewer Funds

Bond proceeds are budgeted at $12 million for 2018 to fund capital projects.

2018 projects include:

- $2.4 million for Ashcroft Draw Sewer Phase II.
- $2.5 million for North Greeley Sewer Phase 2A.
- $2.3 million for Water Pollution Control Facility Blower Replacement Project.
- $2.1 million for Water Pollution Control Facility Solids Processing Improvements.
- $1.9 million for Nitrification Project Phase II.
- $605,000 for Sanitary Sewer Master Plan update.
- $387,500 for general rehabilitation projects.

Sewer Overview							
	YTD 2017 Actual	YTD 2018 Actual	YTD % Change	2018 Encumbrances	2017 Actuals	2018 Revised Budget	% of 2018 Budget
Total Revenue	**$ 3,185,728**	**$ 4,594,832**	**44.2%**	**-**	**$ 11,443,148**	**$ 25,313,088**	**18.2%**
Operating	$ 1,969,370	$ 2,236,151	13.5%	$ 441,551	$ 6,470,170	$ 7,208,322	37.1%
Capital	$ 2,775,483	$ 681,707	-75.4%	$ 3,990,004	$ 10,944,962	$ 15,874,249	29.4%
Total Expenditures	**$ 4,744,853**	**$ 2,917,858**	**-38.5%**	**$ 4,431,555**	**$ 17,415,132**	**$ 23,082,571**	**31.8%**
Use of Fund Balance	$ 1,559,125	$ (1,676,974)			$ 5,971,984	$ (2,230,517)	

Sewer Projects over $1 million in 2017					
Quarter	Beginning Allocated Funds	Budget	Actual Expenditures	Variance from Budget	Ending Allocated Funds
Q1	$ 11,219,617	$ 865,500	$ 52,023	$ (813,477)	
Q2		$ 985,000	$ 319,186	$ (665,814)	
Q3		$ 1,401,609	$ -	$ -	
Q4		$ 1,525,000	$ -	$ -	$ 6,442,508
Total		**$ 4,777,109**	**$ 371,209**	**$ (1,479,291)**	
Project Savings		$ 813,410			
Planned Next Year Expenditures		$ 5,629,098			

Caustic Metering Pumps at the Water Pollution Control Facility

Stormwater Funds

The Stormwater division is responsible for:

- Developing a Capital Improvement Program for Stormwater facilities.
- Monitoring and creating maintenance plans for the existing system.
- Developing City drainage standards.
- Reviewing flood impact issues.
- Regulating illicit discharges.
- Managing the City's Stormwater National Pollution Discharge Elimination System (NPDES) permit.

Capital projects in 2018 include:

- $8.9 million for 27th Avenue storm drain improvements 17th to the Poudre River.
- $695,324 for 12th Street Outfall preliminary design.
- $680,000 for drainage system repairs to system mains, inlets and culverts.

A brief summary of Stormwater revenue and expenditures is shown below. Revenues are up 32.6% from 2017 to 2018. Stormwater revenue for 2018 was budgeted at 12.5% over 2017 actual revenues. 2018 expenditures are budgeted to exceed revenues by $1.2 million as Stormwater fund balance is used. To date, 32.9% of the expenditure budget has been spent (including encumbered expenses). The 2018 capital expenditure budget will increase as 2017 encumbered projects move into 2018. Due to the timing of utility payment schedules, rate revenues will fluctuate during the first few months of 2018.

Stormwater Overview							
	YTD 2017 Actual	YTD 2018 Actual	YTD % Change	2018 Encumbrances	2017 Actuals	2018 Revised Budget	% of 2018 Budget
Rates	$ 1,552,437	$ 1,964,996	26.6%	-	$ 5,625,663	$ 6,153,323	31.9%
Impact Fees	$ 78,518	$ 135,403	72.4%	-	$ 164,996	$ 291,394	46.5%
Total Revenue	**$ 1,630,954**	**$ 2,100,398**	**28.8%**	**-**	**$ 5,790,659**	**$ 6,444,717**	**32.6%**
Operating	$ 1,045,999	$ 991,655	-5.2%	2,158	$ 3,066,006	$ 3,383,059	29.4%
Capital	$ 652,020	$ 1,814,044	178.2%	$ 2,278,216	$ 3,931,169	$ 12,057,326	33.9%
Total Expenditures	**$ 1,698,019**	**$ 2,805,699**	**65.2%**	**$ 2,280,374**	**$ 6,997,175**	**$ 15,440,385**	**32.9%**
Use of Fund Balance	$ 67,065	$ 705,301			$ 1,206,516	$ 8,995,668	

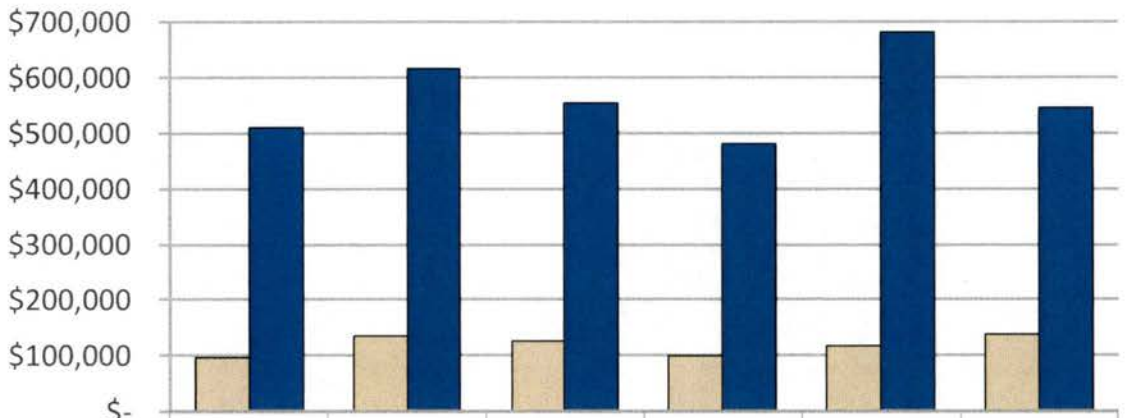
Stormwater Projects over $1 million in 2018

Quarter	Beginning Allocated Funds	Budget	Actual Expenditures	Variance From Budget	Ending Allocated Funds
Q1	$ 8,876,887	$ 100,000	$ 71,878	$ (28,122)	
Q2		$ 750,000	$ 751,284	$ 1,284	
Q3		$ 1,000,000	$ -	$ -	
Q4		$ 1,500,000	$ -	$ -	$ 5,526,887
Total		**$ 3,350,000**	**$ 823,162**	**$ (26,838)**	
Project Savings		$ -			
Planned Next Year Expenditures		$ 5,526,887			

Lodging Tax

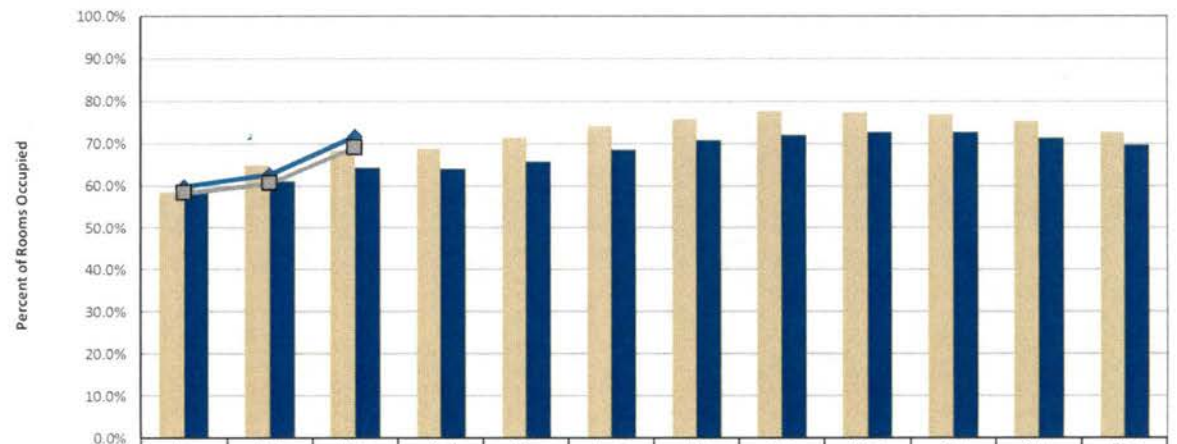
The Convention and Visitors Fund is supported by a 3% lodging tax and is utilized to support convention and visitor activities. For rooms rented through March, revenues increased 18.8% from 2017. According to the March Rocky Mountain Lodging Report, Greeley's year-to-date occupancy rate is currently 65.7% as compared to 68.4% in 2017.

Lodging Tax Revenue



	2013	2014	2015	2016	2017	2018*
YTD Receipts	$96,226	$134,404	$126,462	$99,290	$116,097	$137,865
Actual/Budget*	$510,863	$616,765	$554,650	$480,766	$682,478	$545,000

Greeley vs. Colorado Lodging Occupancy Rates

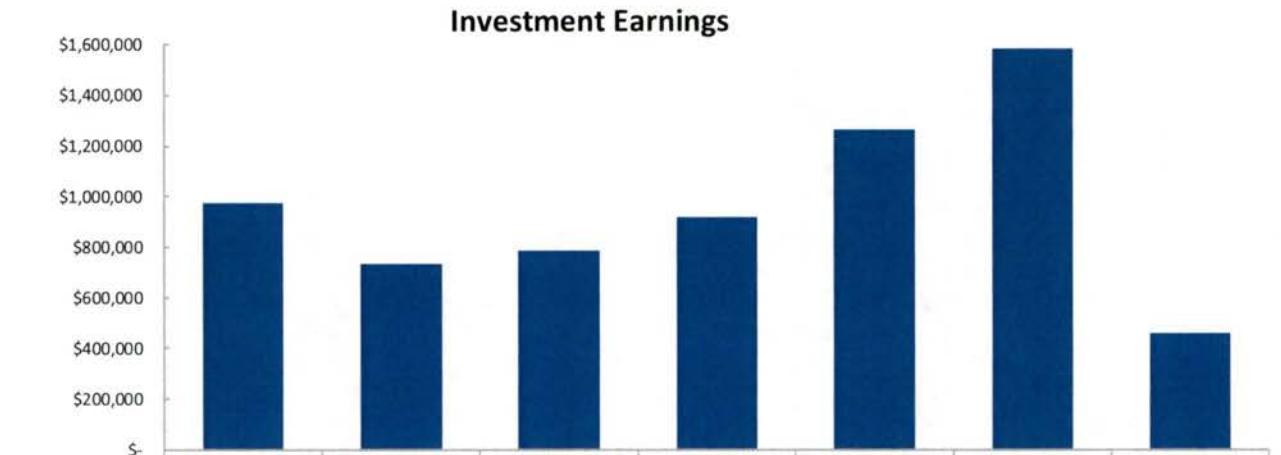


	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2017 Greeley YTD Occupancy Rate	58.6%	64.7%	68.4%	68.7%	71.3%	74.2%	75.7%	77.5%	77.3%	76.8%	75.3%	72.8%
2017 Colorado YTD Occupancy Rate	59.0%	60.9%	64.1%	64.0%	65.6%	68.4%	70.7%	72.0%	72.7%	72.5%	71.2%	69.6%
2018 Greeley YTD Occupancy Rate	59.7%	62.5%	71.6%									
2018 Colorado YTD Occupancy Rate	58.2%	60.5%	69.0%									

Investments

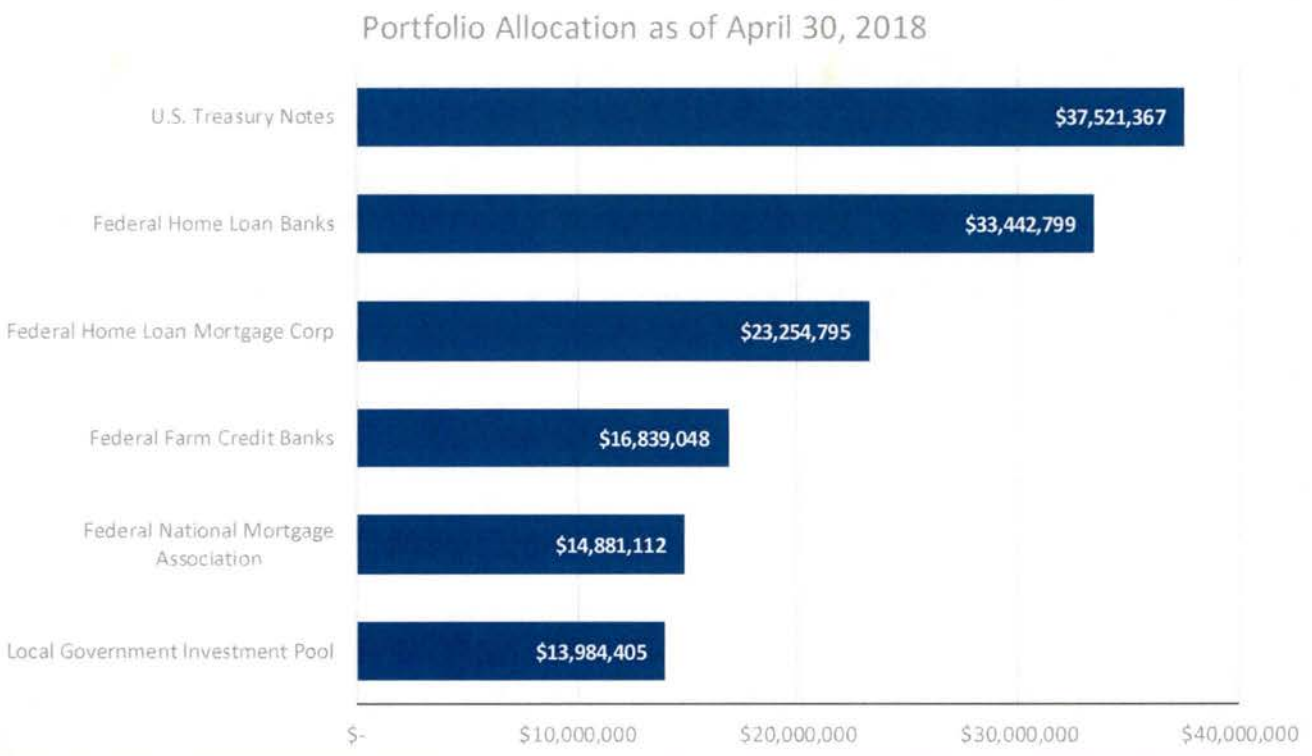
The City of Greeley's investment objectives include:

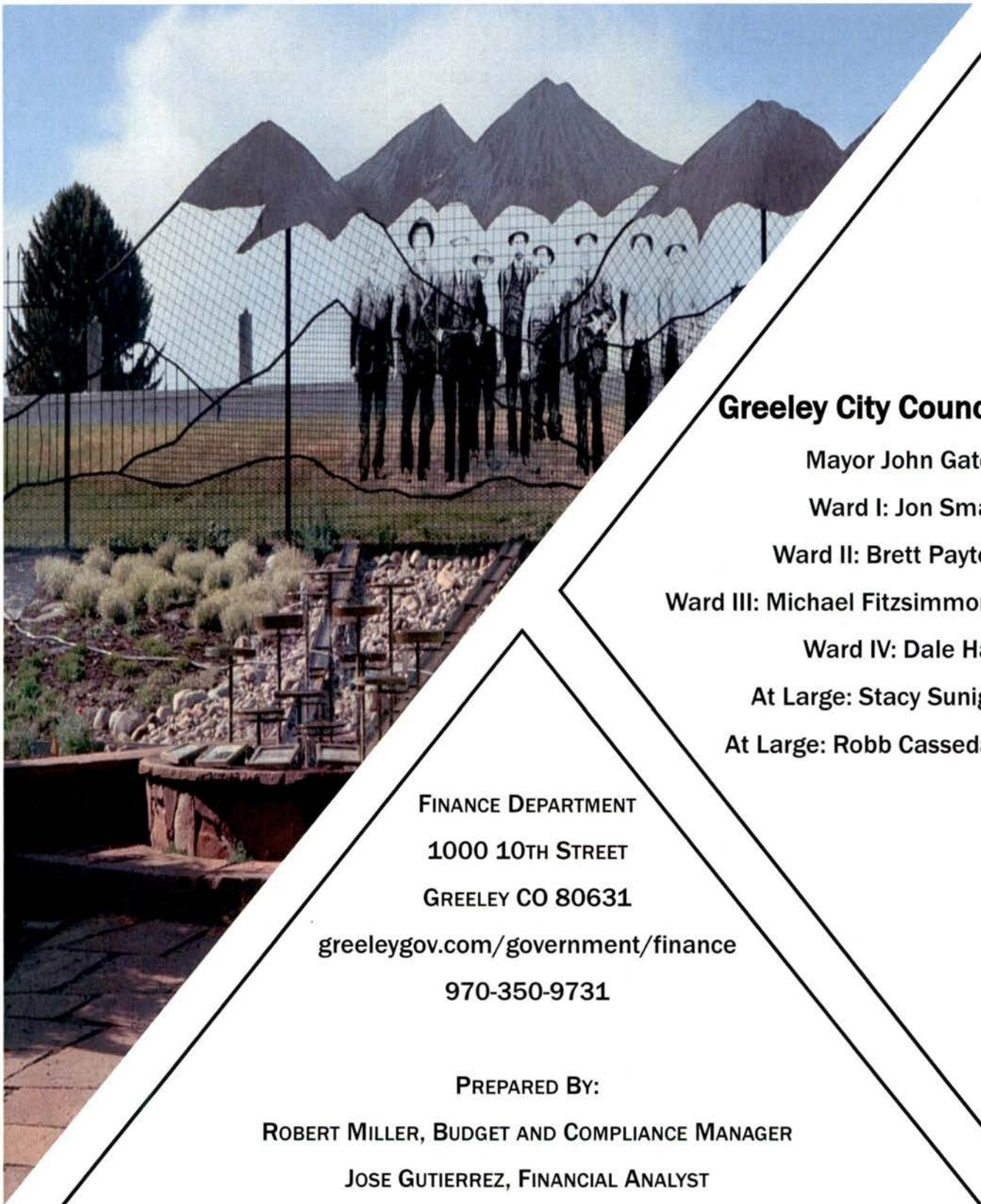
- The preservation of capital and protection of investment principal.
- Maintaining sufficient liquidity to meet immediate and short-term obligations.
- Achieving a market value rate of return.
- Minimizing risk through asset diversification.



	2012	2013	2014	2015	2016	2017	2018
Investment Earnings	$974,476	$734,787	$786,786	$919,544	$1,262,722	$1,584,714	$459,369

The City's portfolio performance benchmark is the one-year U.S. Treasury rate. As of April 30, 2018 the weighted average maturity was 1.10 years, book yield was 1.42% and the one-year treasury rate was 2.24%.





Greeley City Council

Mayor John Gates

Ward I: Jon Smail

Ward II: Brett Payton

Ward III: Michael Fitzsimmons

Ward IV: Dale Hall

At Large: Stacy Suniga

At Large: Robb Casseday

FINANCE DEPARTMENT

1000 10TH STREET

GREELEY CO 80631

greeleygov.com/government/finance

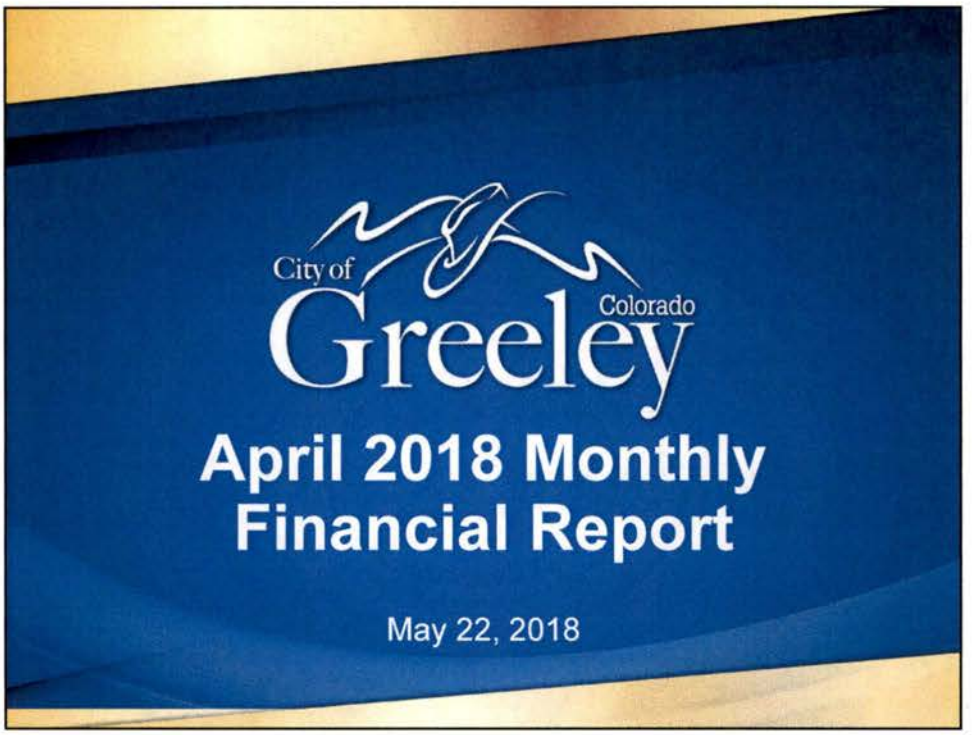
970-350-9731

PREPARED BY:

ROBERT MILLER, BUDGET AND COMPLIANCE MANAGER

JOSE GUTIERREZ, FINANCIAL ANALYST

City of Greeley Colorado



Tonight's Presentation

- General Fund
- Enterprise Funds
- Lodging Tax

CITY OF GREELEY

General Fund Summary

	2018 Actual	2018 Revised Budget	Variance	% of 2018 Budget
Use of Fund Balance	$ 12,678,180	$ 13,297,177	$ (618,997)	95.3%
Revenue	$ 27,770,348	$ 94,228,753	$ 66,458,405	29.5%
Expenditures	$ 40,448,528	$ 107,525,930	$ 67,077,402	37.6%

CITY OF GREELEY

General Fund Revenue

	2017	2018	Variance	% Change 2017 - 2018	2018 Revised Budget	% of 2018 Budget
1st Quarter	$ 15,578,476	$ 20,169,136	$ 4,590,660	29.5%	-	-
April	$ 6,831,305	$ 7,601,212	$ 769,907	11.3%	-	-
YTD Total	$ 22,409,780	$ 27,770,348	$ 5,360,568	23.9%	$ 94,228,753	29.5%

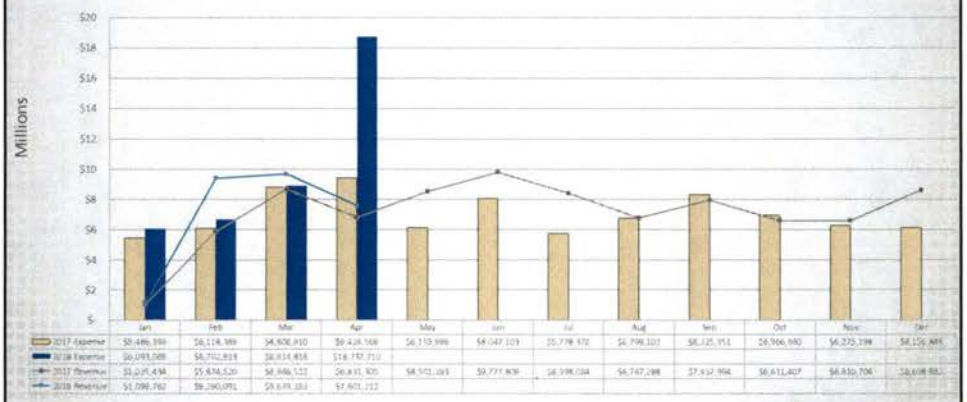
CITY OF GREELEY

General Fund Expenditures

	2017	2018	Variance	% Change 2017 - 2018	2018 Revised Budget	% of 2018 Budget
1st Quarter	$ 20,393,676	$ 21,710,819	$ 1,317,143	6.5%	-	-
April	$ 9,424,569	$ 18,737,710	$ 9,313,141	98.8%	-	-
YTD Total	$ 29,818,245	$ 40,448,528	$ 10,630,284	35.7%	$ 107,525,930	37.6%

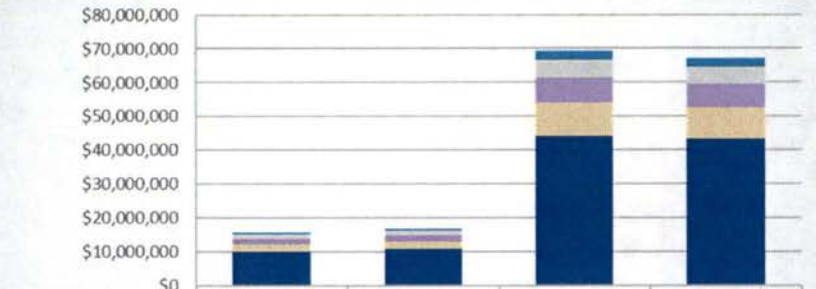
CITY OF GREELEY

General Fund Revenue and Expenditure Overview



CITY OF GREELEY

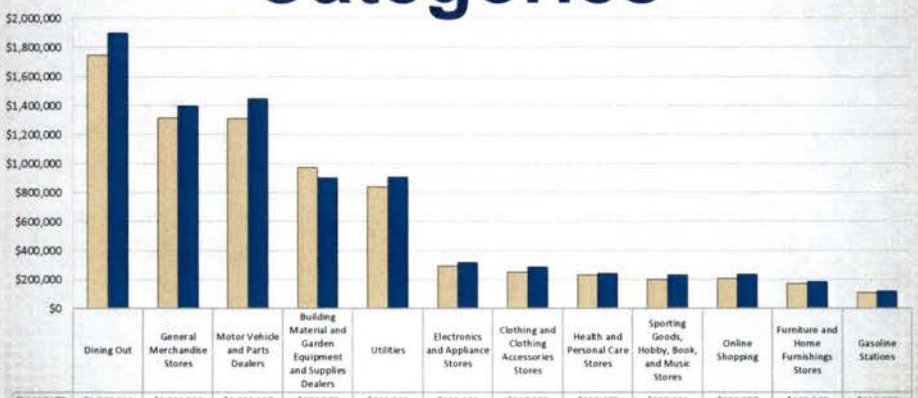
Sales Tax Distribution



	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$623,383	$666,995	$2,754,920	$2,607,571
Quality of Life	$1,168,844	$1,250,616	$5,165,474	$4,889,197
Food	$1,755,248	$1,876,105	$7,490,314	$6,935,735
Keep Greeley Moving	$2,176,345	$2,330,328	$9,680,773	$9,427,169
General Fund	$9,933,192	$10,630,050	$44,164,431	$43,174,285

CITY OF GREELEY

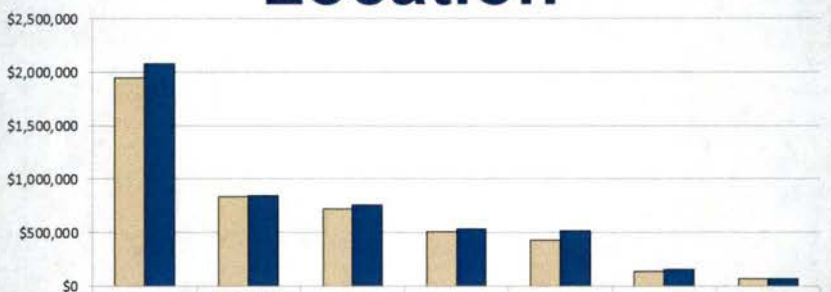
Sales Tax by Major Categories



	Dining Out	General Merchandise Stores	Motor Vehicle and Parts Dealers	Building Material and Garden Equipment and Supplies Dealers	Utilities	Electronics and Appliance Stores	Clothing and Clothing Accessories Stores	Health and Personal Care Stores	Sporting Goods, Hobby, Book, and Music Stores	Online Shopping	Furniture and Home Furnishings Stores	Gasoline Stations
2017 YTD	$1,746,131	$1,311,911	$1,306,217	$974,578	$838,268	$289,180	$247,800	$232,475	$200,806	$203,057	$169,043	$110,193
2018 YTD	$1,896,266	$1,396,574	$1,445,348	$901,273	$905,548	$316,103	$283,847	$239,227	$231,285	$236,276	$184,903	$119,298
% Change	8.60%	6.45%	10.65%	-7.52%	8.03%	9.31%	14.55%	2.90%	15.18%	16.36%	9.38%	8.26%
$ Change	$150,134	$84,664	$139,131	$(73,305)	$67,281	$26,924	$36,047	$6,751	$30,479	$33,219	$15,860	$9,105

CITY OF GREELEY

Retail Sales Tax by Location*



	Centerplace Area	10th Street-23rd Ave - 59th Ave	Greeley Mall Area	University District	Downtown Development	Northgate Village	St. Michaels
2017	1,945,481	837,854	719,014	512,209	431,654	140,022	63,858
2018	2,077,095	841,210	758,224	535,956	521,729	158,942	64,956
% Change	6.77%	0.40%	5.45%	4.64%	20.87%	13.51%	1.72%
$ Change	$131,614	$3,355	$39,210	$23,747	$90,076	$18,920	$1,098

*Excludes businesses selling groceries and auto dealers.

CITY OF GREELEY

Property Tax

	2017	2018	Variance	% Change 2017 - 2018	2018 Budget	% of 2018 Budget
1st Quarter	$ 2,966,893	$ 3,628,120	$ 661,227	22.3%	-	-
April	$ 692,980	$ 637,206	$ (55,774)	-8.0%	-	-
YTD Total	$ 3,659,873	$ 4,265,326	$ 605,453	16.5%	$ 10,230,784	41.7%

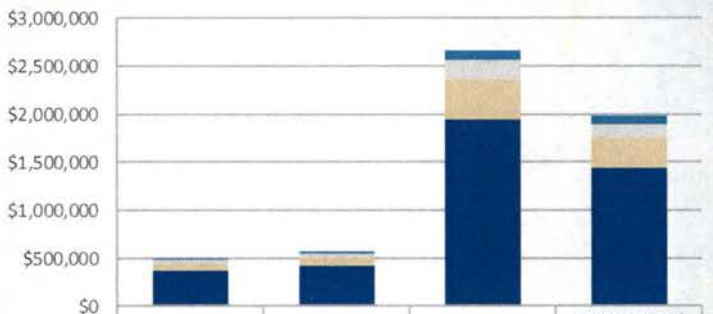
CITY OF GREELEY

General Fund: Franchise Fees

	2017 YTD	2018 YTD	Variance	% Change 2017 - 2018	2018 Budget	% of 2018 Budget
Cable	$ -	$ -	$ -	-	$ 1,070,244	0.0%
Electric	$ 410,341	$ 404,385	$ (5,956)	-1.5%	$ 2,651,578	15.3%
Natural Gas	$ 432,733	$ 584,645	$ 151,912	35.1%	$ 1,452,218	40.3%
Telephone	$ 36,615	$ 25,179	$ (11,437)	-31.2%	$ 100,000	25.2%
YTD Total	$ 879,690	$ 1,014,209	$ 134,519	15.3%	$ 5,274,040	19.2%

CITY OF GREELEY

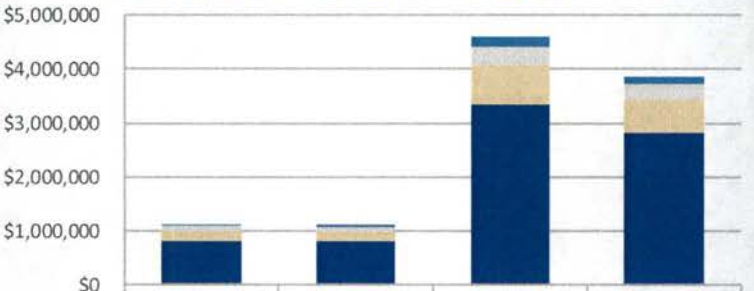
General Use Tax



	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$19,909	$22,324	$103,841	$76,942
Quality of Life	$37,330	$41,858	$194,703	$144,266
Keep Greeley Moving	$69,540	$92,634	$419,103	$312,501
General Fund	$373,303	$418,577	$1,947,025	$1,442,664

CITY OF GREELEY

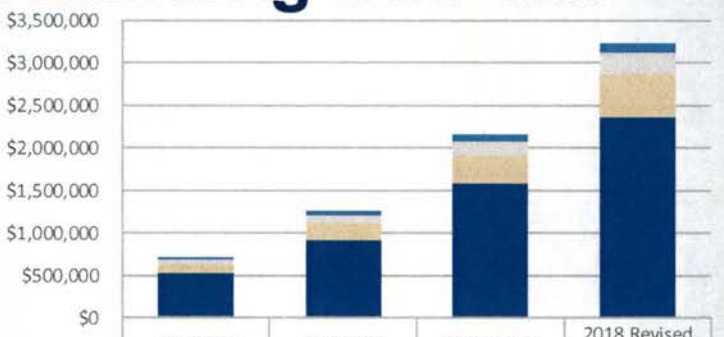
Auto Use Tax



	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$44,034	$44,007	$178,917	$151,038
Quality of Life	$82,565	$82,514	$335,470	$283,196
Keep Greeley Moving	$178,890	$178,779	$726,852	$613,442
General Fund	$825,647	$825,135	$3,354,703	$2,831,959

CITY OF GREELEY

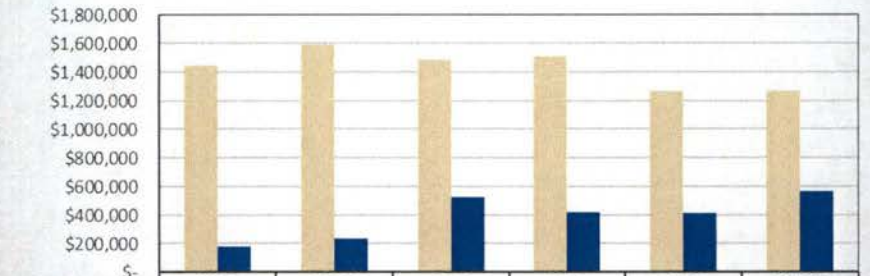
Building Use Tax



	2017 YTD	2018 YTD	2017 Actual	2018 Revised Budget
Public Safety Bonds	$27,795	$49,056	$84,173	$126,140
Quality of Life	$52,115	$91,979	$157,825	$236,513
Keep Greeley Moving	$112,789	$197,172	$341,564	$512,321
General Fund	$521,154	$919,792	$1,578,247	$2,365,134

CITY OF GREELEY

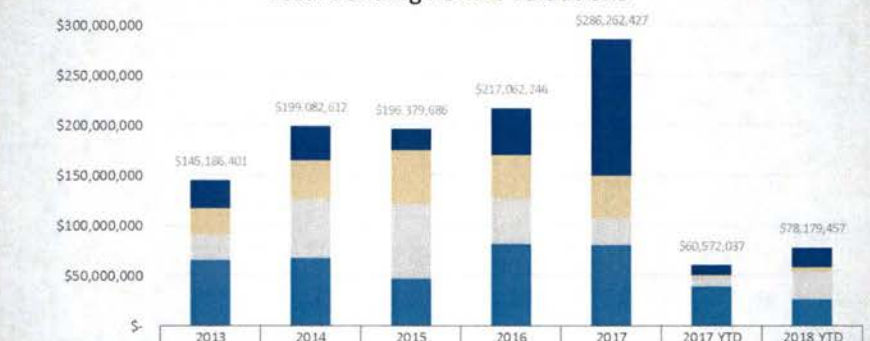
Building Permit Revenue



	2013	2014	2015	2016	2017	2018*
Actuals/Budget*	$1,444,774	$1,595,310	$1,483,715	$1,507,978	$1,273,000	$1,273,000
YTD Actuals	$181,179	$238,057	$529,760	$422,330	$411,063	$565,304

CITY OF GREELEY

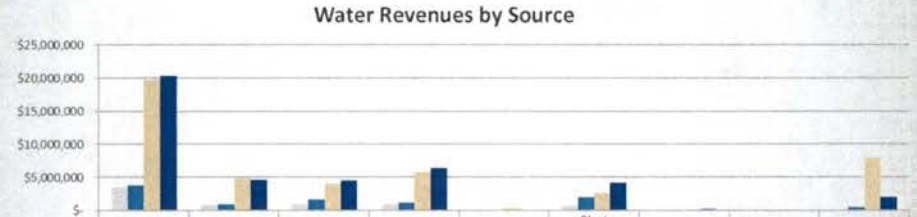
Building Permit Valuations



	2013	2014	2015	2016	2017	2017 YTD	2018 YTD
New Commercial	$28,107,903	$34,692,350	$21,622,922	$46,620,945	$136,394,23	$9,731,105	$20,048,555
New Multi-Family	$26,207,094	$38,421,203	$53,335,909	$43,402,782	$42,009,358	$1,911,830	$3,593,365
New Single-Family	$25,332,659	$58,891,310	$74,046,922	$45,308,198	$27,142,816	$9,723,902	$27,735,393
Other Permits	$65,538,745	$67,077,749	$47,373,933	$81,730,321	$80,716,016	$39,205,200	$26,802,144
Total	$145,186,40	$199,082,61	$196,379,68	$217,062,24	$286,262,42	$60,572,037	$78,179,457

CITY OF GREELEY

Water Funds



	Residential Rates	Commercial Rates	Industrial Rates	Other Rates	Raw Water Sales	Plant Investment Fees	Water Shares	Cash In Lieu	Other
YTD 2017 Actual	$3,449,293	$790,836	$957,192	$903,886	$-	$693,500	$-	$-	$24,970
YTD 2018 Actual	$3,877,444	$935,909	$1,652,929	$1,184,706	$-	$1,996,477	$-	$-	$442,752
2017 Actuals	$19,762,484	$4,905,890	$4,083,024	$5,819,589	$365,496	$2,563,125	$1,460	$-	$7,960,483
2018 Budget	$20,364,863	$4,665,000	$4,578,728	$6,396,412	$125,000	$4,211,507	$172,770	$-	$1,974,756
YTD % Change	12.4%	18.3%	72.7%	31.1%	0.0%	187.9%	0.0%	0.0%	1673.14%
% of 2018 Budget	19.0%	20.1%	36.1%	18.5%	0.0%	47.4%	0.0%	0.0%	22.4%

CITY OF GREELEY

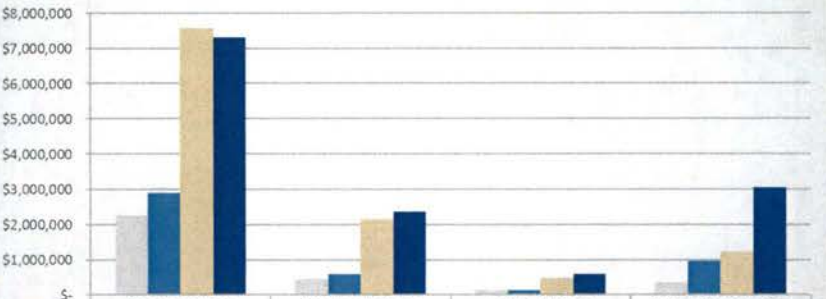
Water Funds

	YTD 2017 Actual	YTD 2018 Actual	YTD % Change	2018 Encumbrances	2017 Actuals	2018 Revised Budget	% of 2018 Budget
Total Revenue	$ 6,819,677	$ 10,090,217	48.0%	-	$ 45,461,551	$ 114,239,036	8.8%
Operating	$ 6,858,288	$ 7,267,008	6.0%	$ 1,841,852	$ 25,698,962	$ 28,467,713	32.0%
Water Rights Acquisition	$ 985,155	$ 435,851	-55.8%	$ 626,418	$ 9,773,310	$ 8,735,574	12.2%
Capital	$ 5,407,788	$ 7,280,070	34.6%	$ 35,840,805	$ 27,019,442	$ 97,125,708	44.4%
Total Expenditures	$ 13,251,231	$ 14,982,929	13.1%	$ 38,309,075	$ 62,491,714	$ 134,328,995	39.7%
Use of Fund Balance	$ 6,431,554	$ 4,892,712			$ 17,030,163	$ 20,089,959	

CITY OF GREELEY

Sewer Funds

Sewer Revenues by Source



	Residential Rates	Commercial Rates	Industrial Rates	Plant Investment Fees
YTD 2017 Actual	$2,245,211	$460,128	$132,115	$348,275
YTD 2018 Actual	$2,893,349	$587,652	$143,732	$970,100
2017 Actuals	$7,580,288	$2,144,791	$483,376	$1,234,693
2018 Budget	$7,321,560	$2,360,820	$586,099	$3,044,609
YTD % Change	28.9%	27.7%	8.8%	178.5%
% of 2018 Budget	39.5%	24.9%	24.5%	31.9%

CITY OF GREELEY

Sewer Funds

	YTD 2017 Actual	YTD 2018 Actual	YTD % Change	2018 Encumbrances	2017 Actuals	2018 Revised Budget	% of 2018 Budget
Total Revenue	**$ 3,185,728**	**$ 4,594,832**	**44.2%**	**-**	**$ 11,443,148**	**$ 25,313,088**	**18.2%**
Operating	$ 1,969,370	$ 2,236,151	13.5%	$ 441,551	$ 6,470,170	$ 7,208,322	37.1%
Capital	$ 2,775,483	$ 681,707	-75.4%	$ 3,990,004	$ 10,944,962	$ 15,874,249	29.4%
Total Expenditures	**$ 4,744,853**	**$ 2,917,858**	**-38.5%**	**$ 4,431,555**	**$ 17,415,132**	**$ 23,082,571**	**31.8%**
Use of Fund Balance	$ 1,559,125	$ (1,676,974)			$ 5,971,984	$ (2,230,517)	

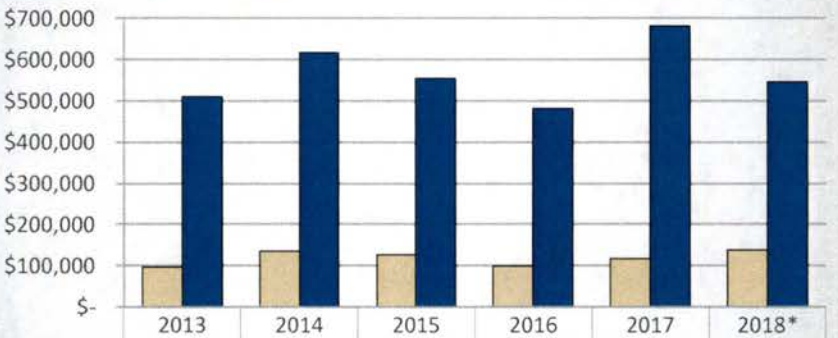
CITY OF GREELEY

Stormwater Funds

	YTD 2017 Actual	YTD 2018 Actual	YTD % Change	2018 Encumbrances	2017 Actuals	2018 Revised Budget	% of 2018 Budget
Rates	$ 1,552,437	$ 1,964,996	26.6%	-	$ 5,625,663	$ 6,153,323	31.9%
Impact Fees	$ 78,518	$ 135,403	72.4%	-	$ 164,996	$ 291,394	46.5%
Total Revenue	**$ 1,630,954**	**$ 2,100,398**	**28.8%**	**-**	**$ 5,790,659**	**$ 6,444,717**	**32.6%**
Operating	$ 1,045,999	$ 991,655	-5.2%	2,158	$ 3,066,006	$ 3,383,059	29.4%
Capital	$ 652,020	$ 1,814,044	178.2%	$ 2,278,216	$ 3,931,169	$ 12,057,326	33.9%
Total Expenditures	**$ 1,698,019**	**$ 2,805,699**	**65.2%**	**$ 2,280,374**	**$ 6,997,175**	**$ 15,440,385**	**32.9%**
Use of Fund Balance	$ 67,065	$ 705,301			$ 1,206,516	$ 8,995,668	

CITY OF GREELEY

Lodging Tax Revenues



	2013	2014	2015	2016	2017	2018*
YTD Receipts	$96,226	$134,404	$126,462	$99,290	$116,097	$137,865
Actual/Budget*	$510,863	$616,765	$554,650	$480,766	$682,478	$545,000

CITY OF GREELEY

April Financial Summary

2018 Revenues as compared to budget

- ↑Lodging Tax
- ↑Building Permit Revenue
- ↑General Use
- ↑Sales Tax
- ↑Property Tax

City of Greeley Colorado

Worksession Agenda Summary

May 22, 2018
Agenda Item Number 5
Contact: Roy Otto, City Manager

Title
Scheduling of Meetings, Other Events

Summary
During this portion of the meeting the City Manager or City Council may review the attached Council Calendar or Worksession Schedule regarding any upcoming meetings or events.

**There is a need to have a discussion about the July 3, 2018 Council meeting given there is only one item scheduled for that evening, the Fourth of July Holiday, and ongoing Greeley Stampede events. Would Council prefer to start this meeting at an earlier time, cancel this meeting, or proceed as planned?

Attachments
Council Meetings/Other Events Calendar
Council Meeting/Worksession Schedule
Status Report of Council Petitions and Related Information

May 2018 - June 2018

May 2018

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

June 2018

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
May 20	21	22 5:00pm City Council Worksession (1025 9th Ave)	23 11:00am Public Works Week Cookout (Island Grover 4-H Building, 527 N. 15th Avenue) - Council Master 5:00pm US 34 PEL Public Meeting (Riverside Library & Cultural Center Banquet	24 10:00am RSVP Required: CML Spring Outreach Meeting (Windsor Town Hall, 301 Walnut Street, Council Chambers) - Council Master Calendar	25	26
27	28 9:00am 2018 Memorial Day Program (Linn Grove Cemetery, 1700 Cedar 11:30am Greeley Chamber of Commerce (Gates) 6:00pm Youth Commission (Smail)	29	30 7:00am Upstate Colorado Economic Development (Gates/Hall) 5:30pm 2018 Greeley Unexpected VIP Launch Party (Gourmet Grub, 2118 35th Avenue, Westlake	31 3:00pm Chief Garner's Retirement Celebration (Greeley Rec Center, Room 101) - Council Master Calendar	Jun 1	2
3	4	5 6:30pm City Council Meeting (1025 9th Ave)	6	7 7:00am Poudre River Trail (Hall) 3:30pm IG Adv. Board (Smail) 6:00pm MPO (Gates/Casseday)	8	9 10:00am Coffee with Councilmember Fitzsimmons (Continuum Coffee, 6560 W. 29th 10:00am Front Range Fire Consortium Graduation (Northridge High School,
10	11	12 5:00pm City Council Worksession (1025 9th Ave)	13	14	15	16 10:00am City Chat with Councilmember Suniga (TBD)
17	18	19 96th Colorado Municipal League Annual Conference (Vail, Colorado) - Jessica Diagana 6:30pm City Council Meeting (1025 9th Ave)	20 7:30am Visit Greeley (Fitzsimmons) 2:00pm Water & Sewer Board (Gates) (School District Six Facility)	21 7:30am DDA (Casseday/Smail) 3:30pm Airport Authority (Casseday/Payton)	22	23

City Council Meeting Schedule

Date	Description	Staff Contact	
June 5, 2018 Council Meeting	Proclamation - Alzheimer's Awareness	Betsy Holder	Recognitions
	Resolution - Fiscal Agent Transfer	Victoria Runkle	Consent
	Ordinance - Intro - Amendments to Chapter 9.44 - Banning Smoking in Place of Assembly	Andy McRoberts	Consent
	Board & Commissions Planning Commission Interviews & Appointments	Betsy Holder	Regular
June 12, 2018 Worksession	CIP/Facilities/Parks & Open Space Tour		2.50
June 19, 2018 Council Meeting	**CANCELLED AS OF 4/17/2018**		
June 26, 2018 Worksession	Nuts and Bolts Water 101 (regular and executive session Water Board Included)	Burt Knight	1.50
	Comprehensive Annual Financial Report	Victoria Runkle	0.50
July 3, 2018 Council Meeting	Ordinance - Final - Amendments to Chapter 9.44 - Banning Smoking in Place of Assembly	Andy McRoberts	Regular
July 10, 2018 Worksession	Economic Development Tour		2.00
July 17, 2018 Council Meeting			
	Board & Commissions Appointments	Betsy Holder	Regular
July 24, 2018 Worksession	Citizens Recommendations on 20 Year Capital and Operating Needs with Funding Recommendations	Victoria Runkle	1.00
	Nuts and Bolts Economic Health and Housing		
	Monthly Financial Report	Victoria Runkle	0.50
August 7, 2018 Council Meeting			
August 14, 2018 Worksession			
August 21, 2018 Council Meeting			
	Board & Commissions Appointments	Betsy Holder	Regular
August 28, 2018 Worksession			
	Monthly Financial Report	Victoria Runkle	0.50
September 4, 2018 Council Meeting			
September 11, 2018 Worksession			
September 18, 2018 Council Meeting			
	Board & Commissions Appointments	Betsy Holder	Regular
September 25, 2018 Worksession	2019 CDBG	Becky Safarik	0.50
	Monthly Financial Report	Victoria Runkle	0.50
October 2, 2018 Council Meeting			
	2019 CDBG Public Hearing	Becky Safarik	Regular
October 9, 2018 Worksession			
October 16, 2018 Council Meeting			
	Board & Commissions Appointments	Betsy Holder	Regular
October 23, 2018 Worksession			
	Monthly Financial Report	Victoria Runkle	0.50
November 6, 2018 Council Meeting			
November 13, 2018 Worksession			
November 20, 2018 Council Meeting			
	Board & Commissions Appointments	Betsy Holder	Regular
November 27, 2018 Worksession			
	Monthly Financial Report	Victoria Runkle	0.50

Greeley City Council

Status Report of Council Petitions

	Council Request	**Council Meeting, Worksession, or Committee Meeting Date Requested**	**Status or Disposition** (After completion, item is shown one time as completed and then removed.)	**Assigned to:**
	None pending.			