AGENDA
IOWA CITY TELECOMMUNICATIONS COMMISSION
CITY CABLE TV OFFICE, 10 S. LINN ST., TOWER PLACE PARKING FACILITY, LEVEL 3A
APRIL 24, 2017, 5:30PM

1. Call to order

2. Approval of March 27, 2017 meeting minutes

3. Announcements of Commissioners

4. Short public announcements

5. REPORTS
   Consumer Issues
   Mediacom Report
   Local Access Reports
   City Cable TV Office Report

6. Municipal broadband feasibility

7. Adjournment

MINUTES
Iowa City Telecommunications Commission
March 27, 2017 – 5:30 P.M.
City of Iowa City Cable TV Office, 10 S. Linn St. - Tower Place, LEVEL 3A

Call to Order: Meeting called to order at 5:35 P.M.

Members Present: Nick Kilburg, Laura Bergus, Paul Gowder

Members Absent: Derek Johnk

Staff Present: Ty Coleman

Others Present: Gerardo Sandoval, Bond Drager

Recommendations to Council : NONE

Approval of Minutes:
Bergus moved and Kilburg seconded a motion to approve the January 23, 2017 minutes as presented. The motion passed unanimously.

Announcements of Commissioners:
None

Short Public Announcements:
None

Consumer Issues:
Coleman noted that he had included complaints from January and February in the meeting packet. Coleman noted that a number of the complaints reported in January were in connection with outages that had taken place.

Kilburg noted one complaint where Lee Grassley had provided information about outage times and found it to be useful. Coleman referred to the report of Mediacom's outages in 2016 and asked if anyone had questions. Coleman said he noticed that for one of the outages, the duration did not seem to match according to the dates listed for it and that he would need to look into it further to understand the data. Coleman said he wasn't certain of the threshold used for the report in terms of the size of the outage, but noted he had asked Lee Grassley for a report of the major outages that occurred in Iowa City in 2016.

Coleman noted that there was only one complaint received in February. Gowder said he wasn't sure what to make of the cluster of remarks about Mediacom's market power and the perceived monopoly. Coleman said that an outage often compels customers to contact the City's Cable TV Office. Coleman also said that there is a greater chance that

those who call his office to file complaints have some awareness that the City has an agreement with the cable company, though many aren't aware that the franchise agreement is non-exclusive.

Coleman reiterated that the cluster of these types of complaints is likely due to the outages.

Mediacom Report:
Coleman said he hadn't recently touched base with Mediacom's Lee Grassley and noted that he hadn't received any information from Grassley to report to the Commission.

Coleman stated that he inquired with the City's Legal Department and the City Clerk's office about whether Mediacom had returned the letter of credit that is required as part of the local franchise and learned that neither office had seen it. Coleman said he asked Grassley to look into the matter.

Local Access Reports:
Sandoval said that he had wondered about what would happen after 2018 with regards to the Commission, the Public Access Television (PATV) channel, and PATV's role, stating that he hoped for PATV to continue its services. Sandoval said PATV is thinking about how to reinvent itself, with the possibility of providing additional media and technology services. Sandoval noted that PATV owns the property in which it resides and said there could be a possibility of partnering with another non-profit organization to create a bigger center and providing other services. Sandoval said he had experience with starting a non-profit in California called Digital NEST (Nurturing Entrepreneurs Through Science and Technology). Sandoval said he feels this kind of service isn't currently accessible to the Iowa City community.

Sandoval said PATV is thinking about fundraisers and other ways to raise money to sustain itself as a non-profit and to continue its public access mission. Sandoval said a beer tasting event had recently taken place at Beadology to support the Iowa Dance Week. Sandoval said the event went well and that local brewers donated their products. Sandoval said PATV's next fundraising event is called "I Drag for PATV," for which people will donate to see participants drag at the event to be held at Studio.

Sandoval reported that PATV staff had been contracted to provide production support for a recent culinary challenge event using three cameras, switching live, and projecting content onto a screen. Sandoval said that PATV was able to use its equipment to support a major production event, larger in scope than other projects PATV had previously taken on, and that the production went well.

Sandoval said that people are learning about television production and are showing up to produce shows at PATV and that things are going well.

Gowder asked if PATV had considered working with the local entrepreneurial incubator

crowd. Sandoval said he had spoken with Mark Nolte of ICAD and the CEO and president of ImOn and noted that they have pointed him towards other business contacts with whom to consider connecting. Sandoval said that he would present more as partnerships develop. Bergus commended Sandoval and PATV for being proactive and positive.

Coleman asked who contracted with PATV for the culinary challenge production work Sandoval had mentioned. Sandoval said it was done for the University and was part of a conference involving an association of university chefs. Sandoval said the culinary challenge portion of the conference featured nine chefs from nine universities and was similar to culinary challenge programs often seen on TV.

Drager said that the Library was not worried about changes that would come with the expiration of the City's franchise with Mediacom in 2018. Drager said some Library staff were not aware of the changing franchise, but said that changes have been expected. Drager said the Library Channel had been developing its online video presence in order to ensure that the Library can continue to get video programs to the public and that Library administration has stated there would continue to have a purpose for video production at the Library.

Coleman clarified that when the local franchise expires and moves to a state-issued franchise, the access channels will continue.

City Cable TV Office Report:

Coleman said that he and two of the Commission members did not end up attending the ImOn luncheon event referred to at a previous meeting, as recommended by Legal staff, to avoid any perception of City representatives being influenced by the business.

Coleman said his office would be sending two of its staff to a regional conference hosted by Wisconsin Community Media and the Alliance for Community Media - Midwest. Coleman said that Jack Brooks and Joel Bouwers would be attending the sessions to learn from presenters. Coleman also said that Brooks had won two Excellence Awards in the Best of the Midwest video contest for work on the *Iowa City Update* and *Iowa City In Focus* program series. Coleman said that these programs have become flagship programs for the City and that Brooks had done a great job of continuing to develop and improve the shows by trying out new ideas since joining the staff last August.

Municipal Broadband Feasibility:

Gowder asked for an update regarding a meeting with City Council. Coleman said a meeting date would be scheduled in the coming months. Bergus said the Commission needs to know what kind of information the Council is looking for, noting that the issue came up as a reaction to a request for funding that appeared not to be fully informed. Bergus said that the Council's discussion included a desire to hear from the volunteer members of the Telecommunications Commission before any decision would be made to spend City money to investigate the topic. Bergus said she vaguely recalled a task force

created in the early 2000's to look at the issue, which included Mediacom, the University of Iowa, the City of Iowa City, SouthSlope, and presumably Coralville and North Liberty. Bergus said she recalled that Steve Fleagle had provided input to the City on the feasibility of a municipal broadband network. Bergus said she recalled learning that Iowa City is different than many communities in that it has a lot of fiber in the ground owned by many entities that is not well coordinated. Bergus recalled learning that municipal broadband would require a citywide build-out or rental of existing facilities from entities who may be better positioned to provide services. Bergus said a lot has likely changed since that time.

Bergus also referred to when Google Fiber was a topic of discussion and believed that the application process was investigated and that reasons were identified for Iowa City not being a good fit for the program, which may have had to do with the University already providing robust services and infrastructure. Gowder asked whether records of these discussions were available for the Commission's review prior to meeting with the City Council.

Bergus asked to find out what the Council wants to know. Gowder said the Commission should also consider what it wants the Council to know about the topic. Bergus said her gut feeling was that at the time of the two mentioned discussions, a municipal broadband system did not make sense for Iowa City. However, Bergus questioned what might have changed since then that would potentially change the analysis of the proposal. Bergus said providing the Council information an example of what the cost might look like, using another community's experience, would be beneficial. Gowder asked if the City could request a basic overview of the creation of the system in Cedar Falls. Coleman agreed that it would make sense to contact the City of Cedar Falls. Coleman also said his office could search for Telecommunications Commission records where the topic was discussed and any records referring to the discussions mentioned by Bergus. Bergus recalled that the discussion involving area stakeholders consisted of a couple of meetings and that efforts did not continue following the meetings.

Kilburg asked about the timeframe for meeting with the City Council about the issue. Coleman said there would be sufficient time to gather information and continue the discussion amongst the Commission before a meeting with Council would take place.

Gowder suggested that the Commission may need to hold a special work session of its own in advance of meeting with the City Council, once commission members have had a chance to review relevant information, in order to agree upon a coordinated set of recommendations. Coleman recalled the document created by a law student that was referred to in the Council's February 7, 2017 work session and meeting packet and suggested that the Commission review it and the Council's discussion about it. Coleman said he would send the related documents to the Commission. Bergus said that commission members may wish to research the topic individually in order to educate themselves.

Adjournment:
Kilburg moved and Bergus seconded a motion to adjourn. The motion passed unanimously. Adjournment was at 6:10 p.m.

April 21, 2017

To: Iowa City Telecommunications Commission
From: Ty Coleman, Media Production Services Coordinator (MPSC)
Re: Consumer Issues Report - March 2017

1.)
Date: 03/17/17
Method of contact: Phone call

Complaint/Comment Summary:
A property owner, who is not a Mediacom customer, reported that Mediacom had installed a power supply box in a lot adjacent to his home that he had purchased over five years ago to use as green space. The property owner wondered if they had the right to put the above-ground equipment in that location. A Mediacom representative told the property owner that the box is in an easement, giving the company the right to put its equipment in it for the purpose of providing services to residents.

Resolution Summary:
MPSC inquired about the location of easements on the property with the City's Engineering Division, who reported that there were, in fact, utility easements adjacent to both of the property owner's lots, giving Mediacom the right to install its equipment, whether underground or above ground. MPSC reported the information to the customer. The customer said he would be checking with Mediacom directly to see if there was anything that could be done to change the situation. No further communication was received by the MPSC from the property owner.

Date of Resolution: 03/17/17

2.)
Date: 03/20/17
Method of contact: Phone call

Complaint/Comment Summary:
A DirectTV customer complained that Mediacom's channel lineup did not include Fox Sports Midwest, which features St. Louis Cardinals baseball games.

Resolution Summary:
This resident had contacted the MPSC in August 2016 with the same comment, saying that he would switch to cable if Mediacom offered coverage of the St. Louis Cardinals. MPSC checked again with Mediacom's Lee Grassley to see if the channel was or would be offered. Grassley reported that the Major League Baseball organization determines what carriers get what team coverage, saying that Iowa City falls into the Chicago Cubs area, and that Mediacom does not have control over it. MPSC reported the information to the resident.

Date of Resolution: 03/21/17

3.)
Date: 03/30/17
Method of contact: Emaill

Complaint/Comment Summary:
Customer in a newly-built townhome reported that the pedestal to which her cable is supposed to be connected was installed between two driveways, on the neighboring lot, rather than her own lot. Customer said she had tried to work with Mediacom directly, as had her builder, and the pedestal was supposed to be moved in July 2016, prior to her move-in date. Customer was concerned because the temporary fix included a cable line being run on the lawn for some distance, becoming a hazard for children and lawn mowers.

Resolution Summary:
MPSC investigated the issue with Mediacom's Tim Eagen, Regional Construction Manager. Eagen reported that the project to move the pedestal had been approved and that it would be complete by April 15, 2017. The customer reported that the pedestal had been moved as of April 13 and she now is waiting for the cable to be buried.

Date of Resolution: 04/13/17

The Library Channel

Report prepared for the Iowa City Telecommunications Commission monthly meeting by Beth Fisher, Program Librarian and Bond Drager, Equipment Specialist. April 2017

April 2017:

April brought an author reading from Thomas Frank, who presented a talk about his newest book, "Listen Liberal". Other adult programming this month includes full coverage of the Mission Creek Art + Life + Technology speaker series, a live podcast recording of The Window featuring Dan Lerner, an Obermann Conversation on the making of Hot Tamale Louie with John Rapson, and a special Poetry Month Event on Memories of the Chicago Barrio and Readings in Latino Poetry.

For children, we are broadcasting several staff storytimes this month plus a program on Animal Adoption and a special presentation from local group 100 Grannies for Earth Day.

Monthly Program Update:

	This month: April 2017	**Next Month: May 2016**
Live Children's Programs	• 5	• 3
Live Adult Programs	• 8	• 9
Programs Cablecast	• 668	•
Programs videotaped by Govt. Channel/CTS	• 2	•

PATV Report to Iowa City Telecommunications Commission April 2017
April has seen a host of interested members of our community who are almost ready to produce new shows from yudo sports show to live musical acts. We received two awards from The Best of the Midwest Media Festival. Award of Excellence for PATV In Your Neighborhood Jazz Fest 2016 and Award of Achievement for Bike Library PSA.

PATV Board Meetings
PATV Board of Directors next meeting May 18th, at 6 pm.

Intro Workshop
Guidelines orientation is the first Thursday of every month, 6 pm at PATV or online @ www.patv.tv
Next Guidelines is Thursday, May. 4th at 6 PM.

Video Workshops Schedule
Studio Training – The second Tuesday of the month from 5 – 7 pm.
HD Camera – The third Thursday of the month from 6 –8 pm.
Digital Editing – The fourth Thursday of the month from 6 - 8 pm.

Current and upcoming staff supported productions
Little Lady President
Nora's House of Dance
Education Exchange
The Joseph Dobrian Show
Hello it's us
Time For Soup
GreenFire
The LyleStyle Show
PATV Presents: Thursday Night Live at Uptown Bills
Tom's Guitar Show
Time for truth

Submitted by Gerardo Sandoval 4/19/17

Date: April 20, 2017
To: The Iowa City Telecommunications Commission
From: Ty Coleman, Media Production Services Coordinator, City of Iowa City Cable TV Office
Re: City of Iowa City Cable TV Office report for the April 2017 meeting

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Media Production Services
Provided by Joel Bouwers, Media Production Asst. and Jack Brooks, Special Projects Asst.

Recent production activities:

- Covered 4 Iowa City Foreign Relations Council lectures discussing topics such as the country Jordan and women's health in poor countries.
- Recorded and cablecast live the Iowa City City Council work sessions and formal meetings of April 4 and 18.
- Recorded the Iowa City City Council's Economic Development Committee meetings of April 5 and 14.
- Covered a lecture by the Geneva Lecture Series titled "Exhausted from Your Insta-Snap-Tweet-texting Life? Sociological & Theological Reflections on Technology."
- Recorded the keynote speaker of Bur Oak Land Trust's 34th annual "Prairie Preview" on the topic of wild bees in Iowa.
- Covered the Community Police Review Board Annual Community Forum.
- Recorded an event held by the Imam Mahdi organization discussing Islam in the Bible.
- Shot and produced three episodes of *Iowa City Update*. Topics included spring hydrant flushing, Washington Street construction, and Mercer Park Renovations.
- Created an April edition of *Iowa City In Focus*. Topics included the Riverfront Crossings District, Compost at the Curb, Free Wheels, and why the streets division uses beet juice on road salt.
- Completed two *Community Highlights* videos on the Polar Plunge and National Bookmobile Day.

Upcoming productions:

- Cover 3 Iowa City Foreign Relations Council lectures discussing topics such as contemporary immigration concerns and exploring the world of 3-D design.
- Record and cablecast live the Iowa City City Council work sessions and formal meetings of May 2 and 16.
- Record the Iowa City Human Rights Commission's Youth Awards Ceremony.
- Continue weekly episodes of *Iowa City Update*. Upcoming topics include the Farmers Market, park construction projects and Building Business Basics workshop.
- *Iowa City In Focus* for May will include the following topics: an officer who has worked 50-years for the ICPD, defensive tactics training, Table to Table, and the Summer of the Arts 2017 lineup.
- Upcoming *Community Highlight* videos will include the Craft Your Environment event and STEAM Fest.

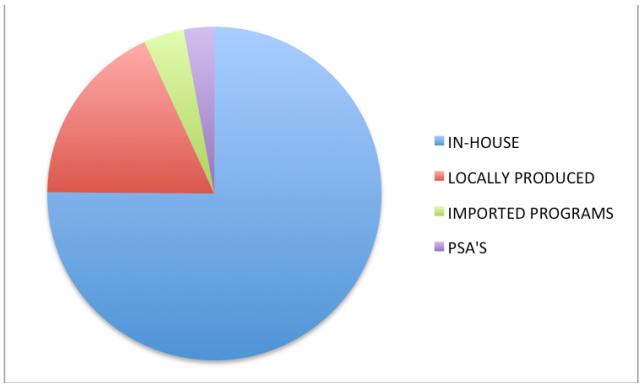
Programming and Interactive Services
Provided by Kevin Crawley, Communications Technician

Recent and upcoming projects:
We're still working on our new voice-driven InfoVision app on channel 5. Changes at Google necessitated a series of software upgrades, and we're still waiting for Apple to come out with new hardware. We are still working on a phone/web app that will allow users to request InfoVision videos without phone calls. I've also made some progress on our next website -- navigation, headers, and footers have all pretty much been worked out, so now it's mostly just a matter of re-encoding the actual content to work within the new framework. It is my idea of a good time, but development time can be hard to fit in with the day to day updates

Website:
In March, we had 2,054 users access 3,896 pages in 3,063 sessions. Our most popular pages were Mediacom's channel lineup, our video page, Mediacom's cable rates, our home page, our program schedule, the One Book Two Book program, and City Council series page.

Our streaming media provider reports 11,673 total hits, which includes 6,195 Events (player window was loaded), 508 Sessions (media was played), and 3,767 OnDemand Hits (media was scrubbed or index point was clicked). 1,094 podcasts were downloaded, and our HQ media was accessed 103 times. Our live stream was accessed 633 times.

On YouTube, we had 3,467 views, accounting for 13,722 minutes of viewing time. Our most-watched programs there were the two most recent episodes of Iowa City In Focus, the University Heights City Council February meeting, the Iowa City Foreign Relations Council program with Doug Jones, an Obermann Conversations program, and the Black Entrepreneurs Roundtable discussion taped in August 2016. Our total subscribers increased by 13 to reach 145.



Programming:
We cablecast 141 programs produced in-house 903 times for 553 hours of programming, 39 locally-produced (DITV, Senior Center, Hoover Library, JC Board of Supervisors, Coralville, North Liberty and University Heights) programs 116 times for 133 hours of programming, and 22 imported programs 71 times for 29 hours of programming. We also showed 98 PSAs 1100 times for 22 hours of programming.

Programs Completed by the Cable TV Office in March 2017

- One Book Two Book Children's Literature Festival 2017
    - Once Upon a Time
    - Write Out Loud!
- Iowa City Foreign Relations Council
    - Health, Wealth, and Waste: Social Entrepreneurship in Global Health and Beyond
    - The Election of 2016: Was It Hacked?
    - Bushido (Samurai Spirit) in Modern Japanese Culture, Sports and Military
    - Jordan: People, Culture, Challenges
- 2017 Preucil School of Music Orchestra Festival
- 2017 NAMIWalks Kickoff Luncheon
- Discussion of Current Events in Our School District
- Iowa City Noon Rotary: Rotarian Action Group for Clubfoot
- Iowa City City Council Formal Meeting
    - March 7
    - March 21
- Iowa City City Council Work Session
    - March 7
    - March 21
- Know Your Rights - Spousal and Partner Abuse Laws and Resources
- Economic Development Committee Meeting of 3/23/17
- City Channel 4 Weekly Highlights
    - Week of March 27
    - Week of April 3
- *Iowa City In Focus* for March 2017
    - Stories included:
        - An in-depth interview with new Police Chief Jody Matherly
        - The City's water purification process
        - Traffic study on disproportionate contact with minorities
        - Late night food truck pilot program
- *Iowa City Update*
    - Spring Street Sweeping
    - Curbside Compost Program
    - Severe Weather Awareness Week
    - Food Truck Pilot Program
- *Community Highlights*
    - One Book Two Book
    - Polar Plunge
- PSA
    - Five-part series called *Composting 101* to educate residents on the process of the new curbside compost program
    - PSA on the Iowa City/Johnson County weather alert system to educate the public about the different weather events that cause the sirens to sound
    - PSA on the Spring Art Expose
    - PSA promoting the Garden as Your Classroom event

I.P

Late Handouts Distributed

2/6/17

(Date)

To: Council
From: Rockne Cole
Re: Budget Request for Municipal Broadband Feasibility Study
Date: February 3, 2017

Councilor Botchway and I would like to seek authorization for a feasibility study for municipal broadband. We have been receiving multiple complaints about quality and cost the level of service currently being provided, and believe now is the time to evaluate whether municipal broadband could provide the solution that we need. This should not be construed as a comment on any particular provider. Some provide great service at a high cost. Others provide great service at reasonable cost. Others provide bad service at high cost. We understand that there is a healthy debate as to whether a municipal service is the solution, or whether we should continue on with the current path. We do not believe that is possible to resolve that debate without a study to evaluate the feasibility of municipal broadband; its potential cost, and as well as its potential benefits. If the study ultimately determines that municipal broadband as not feasible, perhaps that could also lead to a constructive discussion about the way to improve service and cost of providing the service in the private sector.

I am attaching a research paper by students at the University of Iowa Legal Clinic in abridged form. The full 10 page paper is available upon request. It contains a compelling case for municipal broadband as well as a candid discussion about the potential drawbacks. We would both like to thank the University of Iowa Legal Clinic, and its students Deanna Steinbach and Sebastian Rouanet for this well researched paper. I have also attached a summary of costs and services provided by Paul Betke, a local Iowa City resident who prepared a research paper on this topic. I also would like to thank Mr. Betke for letting us use part of his research paper.

Following our January Budget Session, I asked Geoff Fruin for his initial thoughts about this, and he gave me this Reply.

> "No study has been completed. I believe there is sufficient private completion building in the market that will improve service levels, cost and ultimately customer choice. If Council wants to proceed with a study you will need to be clear in the scope of the study you are seeking. The council should also be cognizant of the impact that a

study might have on those companies improving their network or planning to expand their network in the near future. I would guess you will need $50-100k for a study and you should expect a required city investment to build such a network in the tens of millions if not $100 million plus. I believe any study should project out how technology is changing as I think there is a good chance this industry will be significantly disrupted by new technology in the next decade."

We understand that this may be a subject worthy of a full separate work session, but wanted to raise this during budget review process to ensure adequate funding for the feasibility study if we obtain final authorization for the study.

I. Overview of Broadband Technologies

Before jumping into the positive aspects of municipal networks we will address some of the common terms used in discussing broadband internet. Broadband is delivered in three primary ways: DSL, Cable and Fiber. "DSL" refers to a network utilizing pre-existing copper telephone wires to transmit data.[1] "Cable" refers to using the "coaxial cables" also used to transmit cable programming.[2] "Fiber" is the newest and most advanced method, which uses light to transmit data, usually faster than the previous two methods.[3] Many newer broadband projects "Fiber to the Premises" networks, which is fiber optic cable to that transmits the data to individual consumers.[4]

II. Benefits

A municipal broadband network can provide many important benefits for Iowa City. Municipal broadband networks have provided positive economic benefits to other communities through consumer cost savings, job creation and business relocation. Municipal broadband projects have also benefitted schools through cost savings and providing high-speed broadband connectivity, which has the potential to improve the educational tools available to schools. Iowa City has the potential to achieve these benefits through a municipal broadband network.

Consumer and Community Savings

The costs of broadband internet access are often a barrier for lower-income persons.[5] In 2010, 36% of households without home broadband connection "pointed to expense as the major barrier."[6] When a municipality implements a successful broadband network the community benefits, through customer and community savings.[7]

One way for municipal broadband networks to lower consumer costs is to stimulate market competition among internet service providers (ISPs).[8] For example, municipalities can invest in building network infrastructure in order to lower costs for alternative ISPs to enter the market or for local governments to provide their own broadband internet services.[9] This means that the government can take an active role in creating consumer savings by helping to create the conditions for fair competition among broadband providers.[10] In this option Iowa City would use its capital to help build infrastructure that would make the market more accessible to a new private provider.

Another way that municipal broadband networks have lowered consumer broadband costs is through publically owned networks competing with private broadband providers. For example, Lafayette, LA was able to offer prices twenty percent below that of their private competitor by creating a fiber optic network run as a wholly public utility under a retail model.[11] This also drove down the cost charged by the main private provider in the area and saved the customers of the private provider about $4 million.[12] The decrease in the price of municipal broadband likely increased availability of high-speed internet, which would have allowed lower-income households greater access to the internet.[13] An additional benefit that comes from competitiveness in the market is that it incentivizes private companies to increase the quality of

their product.[14] This was the case in Lafayette when its private competitor, Cox, decided that this competitive community should be the first to receive 50Mbps speed from the private provider.[15] The increase market competition created by the introduction of a municipal network can drive both public and private prices for the services down and increase the availability of this vital resource to low-income households.

Benefits to Schools

Schools benefit from municipal broadband networks in several ways. Municipal networks have lowered internet costs for schools in other communities. There is also evidence showing that high-speed broadband access for schools can improve educational experiences for students. Through a municipal network, Iowa City could improve its school system by providing better quality internet at faster speeds, and increasing educational outcomes all while saving money.

Municipal broadband lowers prices for individual customers in addition to lowering internet costs for schools.[16] Both Lafayette and Santa Monica experienced these benefits because of their implementation of a municipal broadband network and they are not the only cities.[17] Some two additional examples are Martinsville and The City of Greenacres.[18]

Santa Monica, Martinsville, and The City of Greenacres all experienced savings while securing high-speed internet for their schools through their implementation of municipal networks.[19] Santa Monica, CA operates a public-private model whereby they operate the network that serves their municipal buildings in conjunction with the local school district and college.[20] By providing for their own broadband needs "instead of purchasing commercial services, within a few years of operation the three local partners were saving a combined $500,000 annually on their telecommunication service budgets."[21] Additionally, "Martinsville, VA saves approximately $140,000 on telephone services alone by self-provisioning services."[22] Lastly, the City of Greenacres, FL, "saves over $24,000 a year," while increasing speeds six times by switching to their own county-owned broadband network.[23]

Just as a municipal network can help to lower costs and increase accessibility for low-income individuals, municipal networks can also act to help connect low-income and underserved schools through offering lower prices.[24] Increasing this access is important for a student's education because children without access to internet at home and at school will not learn essential computer skills and fall behind in technological and computer literacy compared to their more wealthy counterparts.[25]

Municipal broadband networks can also help provide better educational tools for schools. Broadband connectivity for schools has the potential to develop more interactive tools to engage students as well as provide for more individualized learning experiences.[26] Specifically, municipal broadband networks have given students these benefits. Cedar Falls' fiber municipal network is wired to its school districts giving schools high-speed broadband internet access.[27] Iowa City could increase the quality of internet their schools receive and cease relying on private providers to provide for their students' education.

Economic Benefits and Growth

Municipal broadband projects have resulted in several types of economic benefits. One type of community benefit is the potential for added community jobs, through construction and customer service jobs, as well as infrastructure maintenance and repair.[28] The community also benefits because the money that they are paying for their internet service stays in the community to pay for local jobs and is not paid to a private provider which generally has a lesser number of local employees.[29] Iowa City could be missing out on these economic opportunities by not exploring the option of a municipal broadband network.

Bristol, Virginia, a city of over 17,000 people, experienced many of these benefits after creating their broadband network. Bristol began planning a fiber optic ring in 1999, and began connecting municipal buildings such as schools in 2000 and the infrastructure to connect businesses and homes in 2002.[30] Implementing a public utility structured as a retail entity saved their community an estimated total of $2 million on the cost of internet and a total savings across cable, phone, and internet services of "just under $10 million."[31] Additionally, a 2007 report stated that at that time the Bristol Virginia Utility's (BVU) investments had created 1,220 jobs, which BVU later updated to over 2,000 jobs in following years.[32]

Additionally, in 2001, Lake County, Florida began offering private businesses access to its municipal broadband network, which had fiber connections to hospitals, schools, and other businesses.[33] An econometric study of Lake County's municipal broadband system found that economic growth in Lake County doubled in relation to peer counties since offering network access to other entities.[34] These results indicate that opening a publicly owned municipal broadband network to private entities can spur significant economic growth in the community.

There is also evidence showing that municipal broadband networks encourage economic development through attracting businesses to relocate to the local municipality. For example, there is evidence that municipal "Fiber to the Home" (FTTH) systems, which means providing broadband service directly to the home through fiber) attract new businesses. [35]This attraction occurs because these businesses believe that they can do business online more efficiently as well as increasing the ease of employees working from home.[36] Iowa City could save money and generate new businesses and jobs for its community through municipal broadband adoption.

Financial Obstacles

Municipal broadband projects can be expensive to create and manage, and some critics point to specific projects to demonstrate failures in public fiscal responsibility. For example, critics argue that Lafayette's fiber program is 30% short of its revenue projection and $160 million in debt.[37] However, proponents argue that Lafayette's market entry to provide broadband services helped keep private ISP rates stable and create cost savings for consumers.[38] Moreover, significant financial challenges exist when municipalities use the retail model and compete with private providers. In the retail model, market penetration and competition against well-established incumbent private providers (ISP) are significant challenges. [39]

However, there is a wealth of resources, both private and governmental, available for municipalities looking to start broadband projects to use in order to overcome financial hurdles. First, the federal government has many grant programs that fund broadband projects that

accomplish specific policy purposes ranging from increasing rural access to the internet, increasing economic development, and improving school and library facilities.[40] Next, technical assistance such as workshops, guides and publications are available from both the federal government and non-governmental organizations. These resources discuss funding methods, potential challenges and roadblocks, and general strategies for implementing a municipal broadband system.[41] While there will always be financial risks in pursuing municipal broadband projects, there are numerous avenues of support for municipalities looking to overcome this hurdle.

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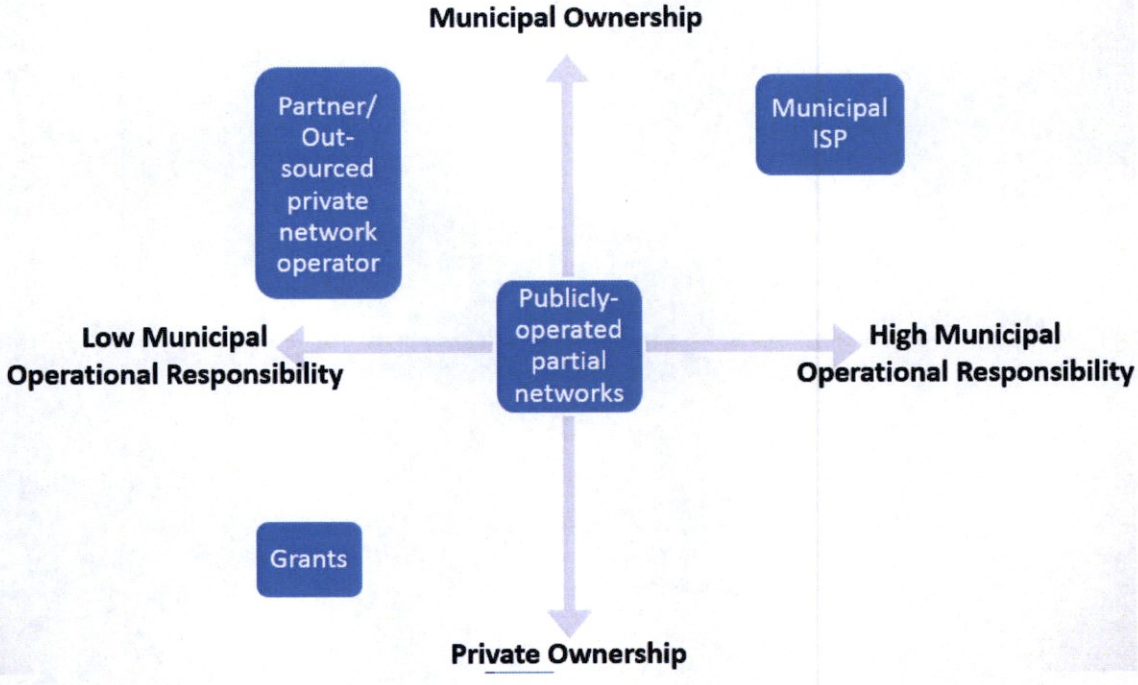
[1] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 15 (2014).
[2] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 16 (2014).
[3] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 18-9 (2014).
[4] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 18-9 (2014).
[5] *See* SPEED MATTERS: BENEFITS OF BROADBAND, COMMUNICATION WORKERS OF AMERICA 5, 10 (2010).
[6] *See* COMMUNITY-BASED BROADBAND SOLUTIONS, *supra* note 1, at 9.
[7] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 11 (2012).
[8] *See* COMMUNITY-BASED BROADBAND SOLUTIONS: THE BENEFITS OF COMPETITION AND CHOICE FOR COMMUNITY DEVELOPMENT AND HIGHSPEED INTERNET ACCESS, THE EXECUTIVE OFFICE OF THE PRESIDENT, 11 (2015).
[9] *See* COMMUNITY-BASED BROADBAND SOLUTIONS, *supra* note 1, at 13.
[10] *See* COMMUNITY-BASED BROADBAND SOLUTIONS: THE BENEFITS OF COMPETITION AND CHOICE FOR COMMUNITY DEVELOPMENT AND HIGHSPEED INTERNET ACCESS, THE EXECUTIVE OFFICE OF THE PRESIDENT, 11 (2015).
[11] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 26-7 (2012).
[12] CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 27 (2012).
[13] SEE CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 27 (2012).
[14] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 29 (2012).
[15] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 29 (2012).
[16] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014).
[17] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014); CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 26-7 (2012).

[18] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014).
[19] *See* THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014).
[20] *See* LAMPLAND AND MITCHELL, *supra* note 23, at 7-8, 15, 17.
[21] THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014).
[22] THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014).
[23] THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 27 (2014).
[24] *See* SPEED MATTERS: BENEFITS OF BROADBAND, COMMUNICATION WORKERS OF AMERICA 5 (2010).
[25] *See* SPEED MATTERS: BENEFITS OF BROADBAND, COMMUNICATION WORKERS OF AMERICA 10 (2010).
[26] *See generally* CHARLES M. DAVIDSON AND MICHAEL J. SANTORELLI, THE IMPACT OF BROADBAND ON EDUCATION, U.S. CHAMBER OF COMMERCE (2010).
[27] *See* DORIS J. KELLEY, A STUDY OF THE ECONOMIC AND COMMUNITY BENEFITS OF CEDAR FALLS, IOWA'S MUNICIPAL TELECOMMUNICATIONS NETWORK (2004).
[28] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 11 (2012).
[29] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 11,12 (2012).
[30] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 2, 3 (2012).
[31] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 11 (2012) (reporting savings across cable, phone, and internet to be almost $10 million.)
[32] *See* CHRISTOPHER MITCHELL, BROADBAND AT THE SPEED OF LIGHT: HOW THREE COMMUNITIES BUILD NEXT-GENERATION NETWORKS 14 (2012).
[33] *See* GEORGE S. FORD & THOMAS M. KOUTSKY, BROADBAND AND ECONOMIC DEVELOPMENT: A MUNICIPAL CASE STUDY FROM FLORIDA (2005).
[34] *See Id.* at 15.
[35] *See* MUNICIPAL FIBER TO THE HOME DEPLOYMENTS: NEXT GENERATION BROADBAND AS A MUNICIPAL UTILITY, FIBER TO THE HOME COUNCIL NORTH AMERICA, (2009) at 3-4.
[36] *See* MUNICIPAL FIBER TO THE HOME DEPLOYMENTS: NEXT GENERATION BROADBAND AS A MUNICIPAL UTILITY, FIBER TO THE HOME COUNCIL NORTH AMERICA, (2009) at 3-4.
[37] STEVEN TITCH, LESSONS IN MUNICIPAL BROADBAND FROM LAFAYETTE, LOUISIANA, REASON FOUNDATION 1-2 (2013).
[38] *See* LEONARD G. KRUGER AND ANGELE A. GILROY, MUNICIPAL BROADBAND: BACKGROUND AND POLICY DEBATE, CONGRESSIONAL RESEARCH SERVICE 3-4 (2015).
[39] THE ART OF THE POSSIBLE: AN OVERVIEW OF PUBLIC BROADBAND OPTIONS, NEW AMERICAN FOUNDATION 26 (2014).
[40] *See generally* BROADBANDUSA: GUIDE TO FEDERAL FUNDING OR BROADBAND PROJECTS (2015).

[41] *See generally* BLAIR LEVIN AND DENISE LINN, THE NEXT GENERATION NETWORK CONNECTIVITY HANDBOOK, GIG.U AND THE BENTON FOUNDATION (2015); Institute for Local Self-Reliance, https://ilsr.org/content-types/resource-archive/?initiative=broadband; BroadbandUSA, National Telecommunications & Information Administration, http://www2.ntia.doc.gov.

DSL CenturyLink	CUSTOMER RATING ★★☆☆☆	AVAILABILITY 94.6%	FASTEST SPEED 100 mbps	PRICING FOR 10 MBPS $34.95
CABLE Mediacom the power to simplify	CUSTOMER RATING ★★½☆☆	AVAILABILITY 94.3%	FASTEST SPEED 150 mbps	PRICING FOR 15 MBPS $34.95
DSL SHARON TELEPHONE CO. High Speed Broadband	CUSTOMER RATING ☆☆☆☆☆	AVAILABILITY 9.0%	FASTEST SPEED 10 mbps	PRICING FOR 10 MBPS $49.99
FIBER SHARON TELEPHONE CO. High Speed Broadband	CUSTOMER RATING ☆☆☆☆☆	AVAILABILITY 9.0%	FASTEST SPEED 10 mbps	PRICING FOR 32 MBPS $57.99
DSL windstream communications	CUSTOMER RATING ★★☆☆☆	AVAILABILITY 6.4%	FASTEST SPEED 7.0 mbps	PRICING FOR 25 MBPS $69.99
FIBER BERNARD TELEPHONE & COMMUNICATIONS CO.	CUSTOMER RATING ☆☆☆☆☆	AVAILABILITY 5.7%	FASTEST SPEED 20 mbps	PRICING FOR 20 MBPS $59.95
DSL FMTC	CUSTOMER RATING ☆☆☆☆☆	AVAILABILITY 5.7%	FASTEST SPEED 10 mbps	PRICING FOR 3.0 MBPS $69.95



promoting bicycling, is there sufficient bicycle parking at Terry Trueblood? Um, but if someone should come in a car, how can we deal with it, without spending $225,000 was where I was coming from.

Throgmorton/ Okay! So....thanks. Why don't we move on to the next topic.

Thomas/ Could I.....could I just say a few things more in general (both talking)

Throgmorton/ Oh, I'm sorry, you wanted.....yeah, sure! (mumbled) Didn't know you wanted to!

Thomas/ Um...yeah, cause I....this is my second round of budget discussion (laughs) and, um, you know, I....I think fortunately it wasn't....didn't seem quite as.....the process wasn't quite as intense. I think partly we....we didn't have the strategic plan to....to develop, you know, simultaneously and so forth. But, you know, some of my observations in looking at this was....what I would call it, you know, we need to have an effort where we look at increasing revenues and reducing expenditures any way we can.

Throgmorton/ Are you talkin' about Trueblood or are you talking about the budget....

Thomas/ I'm just talking about in our practices as it relates to the budget and to our CIP.

Throgmorton/ I'd like for us to get through the, uh, six items first and then come (both talking)

Thomas/ Oh, I thought we did!

Throgmorton/ (both talking) ....some broader question.

Thomas/ I thought we did!

Throgmorton/ No! No, we have two more items (both talking)

Thomas/ ...sorry....

Throgmorton/ ...(both talking) Yeah. So...okay, so the fifth item is municipal broadbon... broadband feasibility study. So....your.....your suggestion, uh, Kingsley and Rockne, uh, includes a....a paragraph or so from, uh, I guess an email from Geoff.

Cole/ Uh huh.

Throgmorton/ About the....the cost of the study, and then the likely cost of the build-out....

Cole/ Uh huh.

Throgmorton/ ....and possible, uh, implications for private....firms that might compete with the existing provider. Uh, so those are all pretty serious concerns. So...I...I, whatda y'all think about, I mean, did you have a chance to read all that?

Mims/ Yeah, I did! I have a quick question.

Botchway/ Go ahead!

Mims/ Did either of you read the, um.....if I can find it now.....

Throgmorton/ (mumbled)

Mims/ No. Um....it was....it was one of the documents that the law students referenced. Did either of you read the 'Broadband at the Speed of Light' article...or book? Okay. That's where you need to start. Okay? If you read that, because they....they referenced it probably 30 times in their article. So I went and looked it up and pulled it up. You get as far as about page six, the Executive Summary. And this was the paragraph that took care of it for me. It said....and what this....what this article or this book actually did is it looked at three cities who have built-out their own municipal broadband. Okay? Um... there's one in Vir....one in Louisiana, and I've got 'em written down here somewhere. Anyways, it said in each of these cases, the local public power utility....they had a public power utility....took the lead in creating the new network. A characteristic of nearly every citywide, publicly owned community fiber network in America. And as I read through more of this – there's 75 pages of it – didn't finish it all, but I read....a good part of it and then read all the summary part of it, it is very clear....that.....the likelihood of being able to do a municipal broadband without already owning a municipal electrical utility is about zero. Because what they do is they sell revenue bonds based on the utility's revenues to finance. They do not put the credit and good faith of the city behind these. They have cost anywhere from $75 to over $100 million to built-out. Some of them have gone through $2.5 million or more in legal fees before they even started, because all the big companies, of course, are trying to sue them and stop them, etc. Um, so when I started looking at this, and looked at the background of these three cities who have been fairly successful in doing it, and some of the other commentary in this article, one of the things that, um....concerned me was in the law students article, they never reference this part of it. They never reference the fact that the success of these three cities, and they went in and they picked out, you know, a lot of the good things – economic development and some of these cities have had great economic development as a result of this. Um...but it was almost a linchpin piece that if you don't have a public electric utility, you virtually can't make it work. So when I look at that, I am not willing...to set aside $100,000 in our budget, or 50 or whatever, to hire consultants and do research on this. If we want to look at it at all, then my recommendation is we send a letter to our Telecama....Telecommunications Commission and maybe set up a joint meeting with them, um, and find out for sure what they have already done for research over the last few years, and why they have not recommended that we look at it more seriously and more in-depth, and then decide from there if we want to do anything more, but based on that, I can't support putting any money into it.

Botchway/ So….no and yes, and I say that because I totally agree with you and I think I….I understood some of the implications regardless of that article, I mean….the article highlighted some of the….the funding pieces, um…..

Mims/ The students' article you mean?

Botchway/ No, that article you just referenced.

Mims/ Yeah.

Botchway/ The funding pieces that, again, weren't necessarily referenced in the article, but….this is a conversation I know that I've had….Simon's not here. Oh, there he is! Um, I know that I had it with Simon and Zach Walls, maybe about a year and a half ago, about what this would take and look like, and then, you know, Rockne did a good job as far as getting some of the law students involved and…..so there's…..there's a lot of pieces. Um….which as...the more and more we talk about some of our….or even my arguments for how we're going down this, um, I would feel would be based more from a strategic planning standpoint. Again, just kind of how we've gone through this particular argument. However, um, also….sorry. However, I do think, to your point, um, I think it's important to….however, I think it's important to highlight the need for this. I...I think that it has huge implications as far as what it could do, um, for our community. Not only from an economic development standpoint, which I mentioned, but also from an...from an equity standpoint and what it could do...I'll be honest with you! We could do for the School District as they talk about one-to-one communication….or one-to-one, um, device ….devices and um, having a deeper understanding and what it could do for our education overall, but….um, I would, again, I didn't…I would be inclined, and I wasn't aware of, um, and...if I was, maybe I was and I missed it, um, of this conversation from a Telecommunication, um, Commission standpoint. I would be interested in a joint meeting, so I'm glad you already mentioned that, to sit with them, one because I don't necessarily think I've done that since I've been on Council, um, and I think it would be interesting to hear from them. I have a lot of respect for some of the people that are a part of that commission, um, to know what their thoughts are in moving forward. I will say this this is one, Susan, kind of as you mentioned before, not necessarily (mumbled) but another topic, that I am….this is something that gets brought up, for me, in the strategic planning conversation this year, or this coming year, and so it's not something that I think I'm going to forget about it at all. Um, so I think that….I do think that I need...I think there's more information that's out there that I would like to have and so from that standpoint, I'd be willing to...bring that back from allocating funding for it, but I would say that I would like to meet with them…..relatively soon, I mean months (several talking in background) with the comintion...commission relatively soon to discuss that so we can have some information moving into the next session.

Cole/ I would (both talking)

Throgmorton/ …..makes good sense to me but (both talking)

Cole/ I would love that, and I....and I think that, I mean, I think the issue here too is, you know, Susan, you bring up the question of whether it's a pure municipal. I think it's...there's a whole range of potential options, and so I think it's....it's an issue that's come up a lot with constituents, um, in terms of service with....with unknown providers. Um...that I won't mention, but I think it is something that we need to evaluate. It is critical infrastructure that we need to identify. So I'd be happy to do a joint meeting, uh, with them to identify this going forward, and maybe we need to look at, if we do make some progress in that meeting, planning ahead possibly to the following year, uh, whether that's something, whether we'd wanna make that...that happen, but I...I'd be happy to do that and withdraw the request so we could have that joint meeting, um, so do we have the support on that?

Throgmorton/ Sounds like a reasonable thing to me (several talking in background) I see a lot of nodding heads.

Cole/ Okay! Great!

Taylor/ I think that'd be great because, uh, before we got the letters today from the commission, I was thinking, well that's a good idea to look into this, but then when...two of 'em wrote to us and said that they've been looking into this and we appoint these folks and we appreciate their knowledge and so I think first step would be to meet with them and see what they have to say.

Throgmorton/ Okay! (several responding) All right. Great. All right, last item – Gilbert Street road diet.

Mims/ My concern with this is....I guess I would like to see us....um....I'd like to see us get a little further down the road with our other road diets and get public reaction to those before we start rushing any others. I guess just....I mean, we've had lots of people talk pro and con about the Mormon Trek. We don't have it in place yet, um....so that would be my preference, to....you know, get something done and give people a little time to get used to it and then....if that still means we can bump this up a year or whatever, then... then fine, but....I...I'm not anxious to rush too many of these right back to back before... people've had a chance to get used to one or two of 'em and....and have some reaction to it.

Dickens/ First Avenue hasn't been converted yet.

Botchway/ (mumbled) Oh, sorry! (several talking)

Throgmorton/ ...striping left, yeah.

Taylor/ The only thing that I think would maybe bump it up a little bit in priority is the fact that the Riverfront Crossings' area and Gilbert Street in particular is...is starting to form and grow, and so I would think it might be important to start looking at the road there.

Summary of Iowa City Telecommunications Commission and City Cable TV Office Staff Discussions and Efforts Regarding Municipal Broadband.

Beginning around Feb. 2012 the Commission began receiving articles and information on municipal broadband projects in their monthly meeting packets as a part of the "articles" section of the packet that included information on cable TV, telecommunication policy and news, broadband, and other issues of interest to the Commission.

Staffed continued to gather information and materials relating to the development of municipal broadband systems and held impromptu, informal discussions with several members of the Commission about possible strategies to promote the idea of investigating a municipal broadband network to the City. Given the possibility of needlessly alienating the current provider of broadband services or creating a misperception in the community, the discussions were limited to members who were most interested and was not brought before the Commission as a whole.

Growing out of this interest, the Commission, working through City Cable TV Office staff, conducted a community survey to measure consumer satisfaction with Internet service, level of knowledge, and network performance. A report was issued in January 2014.

A document created by City Cable TV Office staff was included in the January 2014 Telecommunications Commission meeting packet and offered two main suggestions for possible recommendations resulting from the broadband survey. The first was an exploration of a municipal broadband system. The second was to develop a public awareness and education effort to provide the community with information residents could use to become better-informed consumers.

A public education program was developed and implemented by City Cable TV Office staff by April 2014.

During this period, Cable TV Office staff continued to gather information on municipal broadband projects around the country, including presentations from NATOA (National Association of Telecommunications Officers and Advisors). During this period Google was pursuing communities to partner with to build FTTH (fiber to the home) gigabit networks and made public several documents outlining information communities could gather that would enhance their applications. Much of this information was about existing municipally-owned fiber and access to conduits, public right of way, and build-out conditions. City Cable TV staff pursued information on the existence and location of municipal fiber but was met with disinterest from other City staff. Further effort to gather information was limited.

Q1: Service type

Service type			
	Counts	Percents	Percents 0 100
Cable (over cable line)	401	65.3%	
DSL (over phone line)	191	31.1%	
None	8	1.3%	
Other	8	1.3%	
Mobile hotspot	6	1.0%	
Totals	614	100.0%	
Mean	--		

Q2: Age

Age			
	Counts	Percents	Percents 0 100
41-65	254	41.4%	
26-40	191	31.1%	
66 and above	88	14.3%	
19-25	67	10.9%	
no answer	7	1.1%	
under 14	4	0.7%	
14-18	3	0.5%	
Totals	614	100.0%	
Mean	--		

Q3: Education

Education			
	Counts	Percents	Percents 0 100
masters, Ph.D.	241	39.3%	
bachelors degree	226	36.8%	
some college	115	18.7%	
high school	21	3.4%	
no answer	8	1.3%	

[Continuing table]

Education			
	Counts	Percents	Percents 0 100
less than a high school diploma	3	0.5%	
Totals	614	100.0%	
Mean	--		

Q4: School children

School children			
	Counts	Percents	Percents 0 100
no	393	64.0%	
yes	133	21.7%	
no answer	88	14.3%	
Totals	614	100.0%	
Mean	--		

Q5: Income

Income			
	Counts	Percents	Percents 0 100
$45,000-75,000	143	23.3%	
$100,000 and above	134	21.8%	
$75,000-$100,000	99	16.1%	
no answer	91	14.8%	
less than $20,000	57	9.3%	
$30,000-45,000	55	9.0%	
$20,000-30,000	35	5.7%	
Totals	614	100.0%	
Mean	--		

Q6: Location

Location			
	Counts	Percents	Percents 0 100
81	46	7.5%	
other	42	6.8%	
82	38	6.2%	
84	30	4.9%	
61	28	4.6%	
63	27	4.4%	
83	25	4.1%	
52	22	3.6%	
62	22	3.6%	
102	22	3.6%	
104	22	3.6%	
53	20	3.3%	
51	17	2.8%	
42	16	2.6%	
71	16	2.6%	
Other	221	36.0%	
Totals	614	100.0%	
Mean	--		

Q7: Satisfaction

Satisfaction			
	Counts	Percents	Percents 0 100
somewhat dissatisfied	135	22.0%	
somewhat satisfied	118	19.2%	
very dissatasified	112	18.2%	
satisfied	102	16.6%	
dissatisfied	91	14.8%	
very satisfied	52	8.5%	
no answer	4	0.7%	
Totals	614	100.0%	

[Continuing table]

Satisfaction			
	Counts	Percents	Percents 0 100
Mean	--		

Q8: Least satisfied aspect

Least satisfied aspect			
	Counts	Percents	Percents 0 100
Price	239	38.9%	
Reliability	169	27.5%	
Availability of bandwidth or speed	135	22.0%	
other	71	11.6%	
Totals	614	100.0%	
Mean	--		

Q9: Bundle

Bundle			
	Counts	Percents	Percents 0 100
yes	388	63.2%	
no	209	34.0%	
no answer	17	2.8%	
Totals	614	100.0%	
Mean	--		

Q10: Cost

Cost			
	Counts	Percents	Percents 0 100
$41-50	246	40.1%	
$51-60	123	20.0%	
$61-70	64	10.4%	
no answer	55	9.0%	

[Continuing table]

Cost			
	Counts	Percents	Percents 0 100
$21-30	47	7.7%	
$10-20	24	3.9%	
$71-80	23	3.7%	
$81-99	18	2.9%	
$100 or more	14	2.3%	
$31-40	0	0.0%	
Totals	614	100.0%	
Mean	--		

Q11: Value

Value			
	Counts	Percents	Percents 0 100
Too much for the level of service provided	468	76.2%	
About right for the level of service provided	99	16.1%	
A good deal for the level of service provided	24	3.9%	
no answer	23	3.7%	
Totals	614	100.0%	
Mean	--		

Q12: Advertized download

Advertized download			
	Counts	Percents	Percents 0 100
no answer	215	35.0%	
12-20 megabits	154	25.1%	
4-7 megabits	77	12.5%	
8-11 megabits	62	10.1%	
21-40 megabits	41	6.7%	
1-3 megabits	33	5.4%	

[Continuing table]

Advertized download			
	Counts	Percents	Percents 0 100
41-50 megabits	22	3.6%	
more than 51 megabits	10	1.6%	
Totals	614	100.0%	
Mean	--		

Q13: Advertized upload

Advertized upload			
	Counts	Percents	Percents 0 100
no answer	276	45.0%	
1-2 megabits	100	16.3%	
897-1 megabit	83	13.5%	
2-5 megabits	64	10.4%	
257-896 kilobits	54	8.8%	
5-10 megabits	24	3.9%	
more than 10 megabits	13	2.1%	
256 kilobits or less	0	0.0%	
Totals	614	100.0%	
Mean	--		

Q14: Cap

Cap			
	Counts	Percents	Percents 0 100
no answer	416	67.8%	
no	121	19.7%	
yes	77	12.5%	
Totals	614	100.0%	
Mean	--		

Q15: Typical download

Typical download			
	Counts	Percents	Percents 0 100
no answer	234	38.1%	
4-7 megabits	114	18.6%	
12-20 megabits	87	14.2%	
1-3 megabits	79	12.9%	
8-11 megabits	58	9.4%	
21-40 megabits	24	3.9%	
41-50 megabits	10	1.6%	
more than 51 megabits	8	1.3%	
Totals	614	100.0%	
Mean	--		

Q16: Performance decline

Performance decline			
	Counts	Percents	Percents 0 100
yes	339	55.2%	
no	220	35.8%	
no answer	55	9.0%	
Totals	614	100.0%	
Mean	--		

Q17: Time of decline

Time of decline			
	Counts	Percents	Percents 0 100
no answer	403	65.6%	
5 p.m.-10 p.m.	152	24.8%	
12 p.m.-5 p.m.	28	4.6%	
after 10 p.m.	18	2.9%	
8 a.m.-12 p.m.	13	2.1%	
Totals	614	100.0%	

[Continuing table]

Time of decline			
	Counts	Percents	Percents 0 100
Mean	--		

Q18: Decline download

Decline download			
	Counts	Percents	Percents 0 100
no answer	506	82.4%	
1-3 megabits	36	5.9%	
less than 1 megabit	28	4.6%	
4-7 megabits	21	3.4%	
8-11 megabits	16	2.6%	
12-20 megabits	3	0.5%	
21-40 megabits	3	0.5%	
more than 51 megabits	1	0.2%	
Totals	614	100.0%	
Mean	--		

Q19: Cross street

Cross street			
	Counts	Percents	Percents 0 100
BLANK	412	67.1%	
Windsor Court	5	0.8%	
Windsor Drive	5	0.8%	
Bowery and Van Buren	4	0.7%	
Oakdale Circle, Oakdale Ridge	4	0.7%	
Sandusky Drive	3	0.5%	
Catskill Ct. and Perry Ct.	2	0.3%	
Center St	2	0.3%	
College and Summit	2	0.3%	
Glendale Rd. a 7th Ave.	2	0.3%	
Larch Ln, Rochester Ave	2	0.3%	

[Continuing table]

Cross street	Counts	Percents	Percents 0 100
Taft Ave. Nearest cross streets are Court and Taft.	2	0.3%	
10th St. and 22nd Ave.	1	0.2%	
1540 Aber Ave	1	0.2%	
19th Ave and 5th Street	1	0.2%	
Other	172	28.0%	
Totals	*	*	
Mean	--		

* Note: Multiple answer percentage-count totals not meaningful.

Q20: Check speed

Check speed	Counts	Percents	Percents 0 100
no	347	56.5%	
yes	267	43.5%	
no answer	0	0.0%	
Totals	614	100.0%	
Mean	--		

Q21: Download results

Download results	Counts	Percents	Percents 0 100
no answer	410	66.8%	
12-20 megabits	59	9.6%	
21-40 megabits	43	7.0%	
4-7 megabits	36	5.9%	
1-3 megabits	33	5.4%	
8-11 megabits	27	4.4%	
41-50 megabits	4	0.7%	
more than 51 megabits	2	0.3%	

[Continuing table]

Download results			
	Counts	Percents	Percents 0 100
Totals	614	100.0%	
Mean	--		

Q22: Upload results

Upload results			
	Counts	Percents	Percents 0 100
no answer	408	66.4%	
1-2 megabits	72	11.7%	
2-5 megabits	49	8.0%	
257-896 kilobits	45	7.3%	
897-1 megabit	27	4.4%	
256 kilobits or less	8	1.3%	
more than 10 megabits	3	0.5%	
5-10 megabits	2	0.3%	
Totals	614	100.0%	
Mean	--		

Q23: Test time

Test time			
	Counts	Percents	Percents 0 100
no answer	409	66.6%	
12 p.m.-5 p.m.	71	11.6%	
8 a.m.-12 p.m.	57	9.3%	
5 p.m.-10 p.m.	54	8.8%	
after 10 p.m.	23	3.7%	
Totals	614	100.0%	
Mean	--		

Q24: location verification

location verification			
	Counts	Percents	Percents 0 100
no answer	401	65.3%	
yes	211	34.4%	
no	2	0.3%	
Totals	614	100.0%	
Mean	--		

Q25: Home work

Home work			
	Counts	Percents	Percents 0 100
occasionally	249	40.6%	
no answer	111	18.1%	
part-time	101	16.4%	
never	95	15.5%	
primarily	58	9.4%	
Totals	614	100.0%	
Mean	--		

Q26: Number of users

Number of users			
	Counts	Percents	Percents 0 100
2	385	62.7%	
1	103	16.8%	
4-6	103	16.8%	
3	23	3.7%	
7 or more	0	0.0%	
no answer	0	0.0%	
Totals	614	100.0%	
Mean	--		

Q27: Number of devices

Number of devices			
	Counts	Percents	Percents 0 100
4-6	200	32.6%	
no answer	111	18.1%	
7 or more	99	16.1%	
3	93	15.1%	
2	69	11.2%	
1	42	6.8%	
Totals	614	100.0%	
Mean	--		

Q28: Multiple device use

Multiple device use			
	Counts	Percents	Percents 0 100
3 or more hours per day	251	40.9%	
1-2 hours per day	134	21.8%	
no answer	126	20.5%	
rarely	103	16.8%	
Totals	614	100.0%	
Mean	--		

Q29: application frequency -email

application frequency -email			
	Counts	Percents	Percents 0 100
daily	263	42.8%	
hourly	224	36.4%	
no answer	107	17.4%	
weekly	11	1.8%	
irregularly	7	1.1%	
never	3	0.5%	
Totals	615	100.0%	

[Continuing table]

application frequency -email			
	Counts	Percents	Percents 0 100
Mean	--		

Q30: Application frequency -streaming video

Application frequency -streaming video			
	Counts	Percents	Percents 0 100
daily	205	33.3%	
no answer	111	18.0%	
irregularly	93	15.1%	
never	90	14.6%	
weekly	86	14.0%	
hourly	30	4.9%	
Totals	615	100.0%	
Mean	--		

Q31: Application frequency -gaming

Application frequency -gaming			
	Counts	Percents	Percents 0 100
never	241	39.2%	
no answer	119	19.3%	
irregularly	102	16.6%	
daily	73	11.9%	
weekly	63	10.2%	
hourly	17	2.8%	
Totals	615	100.0%	
Mean	--		

Q32: Application frequency -upload video

Application frequency -upload video			
	Counts	Percents	Percents 0 100
irregularly	195	31.7%	
never	192	31.2%	
no answer	119	19.3%	
daily	54	8.8%	
weekly	51	8.3%	
hourly	4	0.7%	
Totals	615	100.0%	
Mean	--		

Q33: Application frequence -transfer large video files

Application frequence -transfer large video files			
	Counts	Percents	Percents 0 100
irregularly	208	33.8%	
never	189	30.7%	
no answer	120	19.5%	
weekly	66	10.7%	
daily	27	4.4%	
hourly	5	0.8%	
Totals	615	100.0%	
Mean	--		

Q34: Application frequency -transfer files of 10 MB or larger

Application frequency -transfer files of 10 MB or larger			
	Counts	Percents	Percents 0 100
irregularly	240	39.0%	
no answer	133	21.6%	
never	102	16.6%	
weekly	85	13.8%	
daily	48	7.8%	

[Continuing table]

Application frequency -transfer files of 10 MB or larger			
	Counts	Percents	Percents 0 100
hourly	7	1.1%	
Totals	615	100.0%	
Mean	--		

Q35: Application frequency -video conferencing

Application frequency -video conferencing			
	Counts	Percents	Percents 0 100
irregularly	200	32.5%	
never	139	22.6%	
weekly	122	19.8%	
no answer	114	18.5%	
daily	35	5.7%	
hourly	5	0.8%	
Totals	615	100.0%	
Mean	--		

Q36: Application frequency -upload pictues to sharing/social websites?

Application frequency -upload pictues to sharing/social websites?			
	Counts	Percents	Percents 0 100
irregularly	173	28.1%	
weekly	155	25.2%	
no answer	112	18.2%	
never	85	13.8%	
daily	80	13.0%	
hourly	10	1.6%	
Totals	615	100.0%	
Mean	--		

Q37: Application frequency -attachements

Application frequency -attachements			
	Counts	Percents	Percents 0 100
weekly	197	32.0%	
irregularly	144	23.4%	
daily	130	21.1%	
no answer	110	17.9%	
hourly	22	3.6%	
never	12	2.0%	
Totals	615	100.0%	
Mean	--		

Q38: Application frequency -maintain or adminster websites?

Application frequency -maintain or adminster websites?			
	Counts	Percents	Percents 0 100
never	306	49.8%	
no answer	116	18.9%	
irregularly	96	15.6%	
weekly	47	7.6%	
daily	41	6.7%	
hourly	9	1.5%	
Totals	615	100.0%	
Mean	--		

Q39: Application frequency -maintain or administer a server?

Application frequency -maintain or administer a server?			
	Counts	Percents	Percents 0 100
never	376	61.1%	
no answer	124	20.2%	

[Continuing table]

Application frequency -maintain or administer a server?			
	Counts	Percents	Percents 0 100
irregularly	53	8.6%	
weekly	28	4.6%	
daily	22	3.6%	
hourly	12	2.0%	
Totals	615	100.0%	
Mean	--		

Q40: Past use -email?

Past use -email?			
	Counts	Percents	Percents 0 100
yes	499	81.1%	
no	116	18.9%	
Totals	615	100.0%	
Mean	--		

Q41: Past use-streaming video (such as Netflix)?

Past use-streaming video (such as Netflix)?			
	Counts	Percents	Percents 0 100
no	386	62.8%	
yes	229	37.2%	
Totals	615	100.0%	
Mean	--		

Q42: Past use -online gaming?

Past use -online gaming?			
	Counts	Percents	Percents 0 100
no	434	70.6%	
yes	181	29.4%	

[Continuing table]

Past use -online gaming?			
	Counts	Percents	Percents 0 100
Totals	615	100.0%	
Mean	--		

Q43: Past use -upload to video services (such as YouTube)?

Past use -upload to video services (such as YouTube)?			
	Counts	Percents	Percents 0 100
no	481	78.2%	
yes	134	21.8%	
Totals	615	100.0%	
Mean	--		

Q44: Past use -transfer large video files?

Past use -transfer large video files?			
	Counts	Percents	Percents 0 100
no	502	81.6%	
yes	113	18.4%	
Totals	615	100.0%	
Mean	--		

Q45: Past use -transfer file of 10 MB or larger?

Past use -transfer file of 10 MB or larger?			
	Counts	Percents	Percents 0 100
no	419	68.1%	
yes	196	31.9%	
Totals	615	100.0%	
Mean	--		

Q46: Past use -video conferencing

Past use -video conferencing			
	Counts	Percents	Percents 0 100
no	453	73.7%	
yes	162	26.3%	
Totals	615	100.0%	
Mean	--		

Q47: Past use -upload pictures to sharing/social websites

Past use -upload pictures to sharing/social websites			
	Counts	Percents	Percents 0 100
no	343	55.8%	
yes	272	44.2%	
Totals	615	100.0%	
Mean	--		

Q48: Past use-email attachements

Past use-email attachements			
	Counts	Percents	Percents 0 100
yes	416	67.6%	
no	199	32.4%	
Totals	615	100.0%	
Mean	--		

Q49: Past use -maintain or administer websites?

Past use -maintain or administer websites?			
	Counts	Percents	Percents 0 100
no	499	81.1%	
yes	116	18.9%	
Totals	615	100.0%	

[Continuing table]

Past use -maintain or administer websites?			
	Counts	Percents	Percents 0 100
Mean	--		

Q50: Past use -maintain or adminster servers

Past use -maintain or adminster servers			
	Counts	Percents	Percents 0 100
no	548	89.1%	
yes	67	10.9%	
Totals	615	100.0%	
Mean	--		

Q51: Current use -email

Current use -email			
	Counts	Percents	Percents 0 100
yes	498	81.0%	
no	117	19.0%	
Totals	615	100.0%	
Mean	--		

Q52: Current use -streaming video

Current use -streaming video			
	Counts	Percents	Percents 0 100
yes	352	57.2%	
no	263	42.8%	
Totals	615	100.0%	
Mean	--		

Q53: Current use -online gaming?

Current use -online gaming?			
	Counts	Percents	Percents 0 100
no	433	70.4%	
yes	182	29.6%	
Totals	615	100.0%	
Mean	--		

Q54: Current use -upload to video service

Current use -upload to video service			
	Counts	Percents	Percents 0 100
no	429	69.8%	
yes	186	30.2%	
Totals	615	100.0%	
Mean	--		

Q55: Current use-transfer large video files

Current use-transfer large video files			
	Counts	Percents	Percents 0 100
no	468	76.1%	
yes	147	23.9%	
Totals	615	100.0%	
Mean	--		

Q56: Current use- transfer 10 MB files

Current use- transfer 10 MB files			
	Counts	Percents	Percents 0 100
no	386	62.8%	
yes	229	37.2%	
Totals	615	100.0%	

[Continuing table]

Current use- transfer 10 MB files			
	Counts	Percents	Percents 0 100
Mean	--		

Q57: Current use- video conferencing

Current use- video conferencing			
	Counts	Percents	Percents 0 100
no	353	57.4%	
yes	262	42.6%	
Totals	615	100.0%	
Mean	--		

Q58: Current use -upload pictures to sharing/social websites

Current use -upload pictures to sharing/social websites			
	Counts	Percents	Percents 0 100
yes	320	52.0%	
no	295	48.0%	
Totals	615	100.0%	
Mean	--		

Q59: Application frequency-attachements

Application frequency-attachements			
	Counts	Percents	Percents 0 100
yes	421	68.5%	
no	194	31.5%	
Totals	615	100.0%	
Mean	--		

Q60: Current use- maintian or admisniter websites?

Current use- maintian or admisniter websites?			
	Counts	Percents	Percents 0 100
no	483	78.5%	
yes	132	21.5%	
Totals	615	100.0%	
Mean	--		

Q61: Current use -maintain or administer servers

Current use -maintain or administer servers			
	Counts	Percents	Percents 0 100
no	540	87.8%	
yes	75	12.2%	
Totals	615	100.0%	
Mean	--		

Q62: Future use -email

Future use -email			
	Counts	Percents	Percents 0 100
yes	488	79.3%	
no	127	20.7%	
Totals	615	100.0%	
Mean	--		

Q63: Future use -streaming video

Future use -streaming video			
	Counts	Percents	Percents 0 100
yes	420	68.3%	
no	195	31.7%	
Totals	615	100.0%	

[Continuing table]

Future use -streaming video			
	Counts	Percents	Percents 0 100
Mean	--		

Q64: Future use -online gaming

Future use -online gaming			
	Counts	Percents	Percents 0 100
no	389	63.3%	
yes	226	36.7%	
Totals	615	100.0%	
Mean	--		

Q65: Future use-upload to video services

Future use-upload to video services			
	Counts	Percents	Percents 0 100
no	344	55.9%	
yes	271	44.1%	
Totals	615	100.0%	
Mean	--		

Q66: Future use -transfer large video files

Future use -transfer large video files			
	Counts	Percents	Percents 0 100
no	375	61.0%	
yes	240	39.0%	
Totals	615	100.0%	
Mean	--		

Q67: Future use -transfer files of 10 MB or larger

Future use -transfer files of 10 MB or larger			
	Counts	Percents	Percents 0 100
no	317	51.5%	
yes	298	48.5%	
Totals	615	100.0%	
Mean	--		

Q68: Future -video conferencing

Future -video conferencing			
	Counts	Percents	Percents 0 100
yes	375	61.0%	
no	240	39.0%	
Totals	615	100.0%	
Mean	--		

Q69: Future use -upload pictures to sharing /social websites

Future use -upload pictures to sharing /social websites			
	Counts	Percents	Percents 0 100
yes	361	58.7%	
no	254	41.3%	
Totals	615	100.0%	
Mean	--		

Q70: Future use -email attachments

Future use -email attachments			
	Counts	Percents	Percents 0 100
yes	445	72.4%	
no	170	27.6%	
Totals	615	100.0%	

[Continuing table]

Future use -email attachments			
	Counts	Percents	Percents 0 100
Mean	--		

Q71: Future use -maintain or administer websites

Future use -maintain or administer websites			
	Counts	Percents	Percents 0 100
no	439	71.4%	
yes	176	28.6%	
Totals	615	100.0%	
Mean	--		

Q72: Future use -maintain or administer servers

Future use -maintain or administer servers			
	Counts	Percents	Percents 0 100
no	516	83.9%	
yes	99	16.1%	
Totals	615	100.0%	
Mean	--		

Q73: Application performance

Application performance			
	Counts	Percents	Percents 0 100
Adequate	272	44.2%	
Excellent	178	28.9%	
no answer	127	20.7%	
Poor	38	6.2%	
Totals	615	100.0%	
Mean	--		

Q74: Application performance- web browsing

Application performance- web browsing			
	Counts	Percents	Percents 0 100
Adequate	291	47.3%	
no answer	131	21.3%	
Excellent	118	19.2%	
Poor	75	12.2%	
Totals	615	100.0%	
Mean	--		

Q75: Application performance- streaming video (such as Netflix)

Application performance- streaming video (such as Netflix)			
	Counts	Percents	Percents 0 100
no answer	233	37.9%	
Adequate	200	32.5%	
Poor	130	21.1%	
Excellent	52	8.5%	
Totals	615	100.0%	
Mean	--		

Q76: Application perforamce - online gaming

Application perforamce - online gaming			
	Counts	Percents	Percents 0 100
no answer	395	64.2%	
Adequate	121	19.7%	
Poor	62	10.1%	
Excellent	37	6.0%	
Totals	615	100.0%	
Mean	--		

Q77: Application perforamce-upload video

Application perforamce-upload video			
	Counts	Percents	Percents 0 100
no answer	366	59.5%	
Adequate	140	22.8%	
Poor	82	13.3%	
Excellent	27	4.4%	
Totals	615	100.0%	
Mean	--		

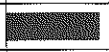
Q78: Application perforamce- transfer large video files

Application perforamce- transfer large video files			
	Counts	Percents	Percents 0 100
no answer	378	61.5%	
Poor	112	18.2%	
Adequate	108	17.6%	
Excellent	17	2.8%	
Totals	615	100.0%	
Mean	--		

Q79: Application perforamce -transfer file of 10 MB or larger

Application perforamce -transfer file of 10 MB or larger			
	Counts	Percents	Percents 0 100
no answer	303	49.3%	
Adequate	157	25.5%	
Poor	120	19.5%	
Excellent	35	5.7%	
Totals	615	100.0%	
Mean	--		

Q80: Application perforamce -video conferencing

Application perforamce -video conferencing			
	Counts	Percents	Percents 0 100
no answer	277	45.0%	
Adequate	188	30.6%	
Poor	109	17.7%	
Excellent	41	6.7%	
Totals	615	100.0%	
Mean	--		

Q81: Application perforamce- upload pictures to sharing/social websites

Application perforamce- upload pictures to sharing/social websites			
	Counts	Percents	Percents 0 100
no answer	252	41.0%	
Adequate	227	36.9%	
Excellent	79	12.8%	
Poor	57	9.3%	
Totals	615	100.0%	
Mean	--		

Q82: Application frequency-attachments

Application frequency-attachments			
	Counts	Percents	Percents 0 100
Adequate	294	47.8%	
no answer	144	23.4%	
Excellent	109	17.7%	
Poor	68	11.1%	
Totals	615	100.0%	
Mean	--		

Q83: Application perforamce -maintain or administer websites

Application perforamce -maintain or administer websites			
	Counts	Percents	Percents 0 100
no answer	447	72.7%	
Adequate	100	16.3%	
Poor	35	5.7%	
Excellent	33	5.4%	
Totals	615	100.0%	
Mean	--		

Q84: Application perforamce- maintain or administer servers

Application perforamce- maintain or administer servers			
	Counts	Percents	Percents 0 100
no answer	510	82.9%	
Adequate	55	8.9%	
Poor	30	4.9%	
Excellent	20	3.3%	
Totals	615	100.0%	
Mean	--		

Q85: Future service level

Future service level			
	Counts	Percents	Percents 0 100
I would like to use more applications than I don now but not if I have to pay more	236	38.4%	
I do not anticipate using more applications in the future than I do now	162	26.3%	
no answer	118	19.2%	

[Continuing table]

Future service level			
	Counts	Percents	Percents 0 100
I anticipate using applications that will require a higher level of service than I currently subscribe and am willing to pay the additional costs	99	16.1%	
Totals	615	100.0%	
Mean	--		

Residential Broadband Survey of Iowa City Area Subscribers

Conducted by the

City of Iowa City Broadband Telecommunications Commission

Hans Hoerschelman, past chair
Laura Bergus
Nick Kilburg
Alexa Homewood
Bram Elias
Matt Butler

January 2014

Contents

Analysis of Results

Purpose

In the spring of 2013, the Iowa City Telecommunications Commission (ICTC)[1] conducted a survey of local residents to gather information on the current state of residential broadband services, community needs, and expectations for the future in the Iowa City area. The goal was to collect data the City of Iowa City, as well as the public at large, could use to determine whether residential broadband services were meeting community needs and expectations, to assist in community planning and development, and to promote economic development.

Surveys conducted by the FCC and others generally did not provide data on pricing or consumer satisfaction, knowledge about broadband services, or anticipated change in their broadband use. The national data certainly did not reflect the realities of the local market.

In order to better understand these realities, the ICTC resolved it should undertake its own survey tailored to the Iowa City area. It hoped the data collected would identify any unmet needs, both in infrastructure and consumer behavior that might be limiting utilization of broadband technologies. Of particular interest were factors that might be limiting adaption, access to service, areas of poorer-performing infrastructure, and any demographic differences in broadband utilization. Specific needs could be identified and strategies to address them formulated.

Methodology

The survey was provided to residents in two forms: as an online, interactive form located at http://iowacitytelecom.com built on the Drupal CMS and as a downloadable PDF. The Internet survey was conducted for a 3-month period. The survey was promoted in a variety of ways to ensure the broadest possible sample and to maximize randomness. An insert was placed in the water bills of over 24,000 households. Press releases generated several news stories. Emails were sent to Iowa City municipal employees. The school district utilized their website and staff emails. Social media sites also were used. IP addresses were checked to ensure respondents completed only one survey.

The survey consisted of 23 questions focusing on consumer information, behavior, demographics, satisfaction, infrastructure performance, and past, present and future usage. A feedback section was also included, allowing for free-form comments. Survey questions are listed in Appendix 3, and comments in Appendix 4.

The survey sampled 614 broadband subscribers in the Iowa City area. This sample size yielded a confidence interval of 3.9% at a 95% confidence level.

Iowa City Area Broadband Landscape

Infrastructure and Access

Three wire line providers currently serve the Iowa City area: Mediacom[2] (cable modem), CenturyLink[3] (DSL), and Southslope[4] (cable modem and fiber to the home (FTTH)) in North Liberty and parts of Coralville. Compared to the rest of the United States, and particularly to Iowa, the Iowa City area has access to relatively robust offerings of broadband service. Mediacom offers up to 105 megabits per second (Mbps) area-wide and CenturyLink up to 40 Mbps, depending on location. CenturyLink's infrastructure, unlike Mediacom's, is unable to provide uniform service. Some areas of Iowa City can receive 40 Mbps, others just 7 Mbps. SouthSlope offers a 200 Mbps service in North Liberty. Cable infrastructure that can support a 100 Mbps service is now common nation-wide, but only 47% of the national population has access to 100 Mbps and only 78% access to 25Mbps.[5] Only 47% of the national population has access to a DSL service of 10 Mbps and 7% access to 25 Mbps.[6] Although CenturyLink has less than half as many broadband subscribers as Mediacom (per this survey), the level of their service is competitive with Mediacom, a fact that few communities can claim.

Additionally, Verizon and ATT offer 4G mobile data service in the Iowa City area.

Cost

According to the National Telecommunications Information Agency, cost, not availability, is the main reason many Americans do not have broadband service.[7] Evaluating the cost of broadband service is problematic. First, the FCC does not collect data on broadband cost, and reliable national data is difficult to obtain. This is due to several factors, including market volatility, the reluctance of broadband providers to make their rates clearly and easily known, and the numerous promotions and contracts offered with and without bundling of other services. Nevertheless, a general picture can be obtained. Stand-alone broadband rates were gathered from Mediacom, CenturyLink and Southslope. This rate included the cost of renting a cable modem, as it is commonly estimated well over 90% of respondents rent their modem rather than own it. The rates utilized in this survey are what a subscriber would expect to pay at the end of any promotional period. When looking at the rate per Mbps, it is important to keep in mind the set cost of providing the service independent of subscriber's service level. Thus, a lower service level should naturally be at a higher rate per Mbps than a higher service level.

The average household spends $44 per month for a stand-alone broadband service between 5 and 15 Mbps.[8] By means of comparison, as of November 2013, a 5 Mbps service from Mediacom would be $48 and CenturyLink would be $52. At the 15 Mbps level, Mediacom would be $66 and CenturyLink $67. (Chart 1.) As a means of comparison, the offerings of two municipal utilities offering a gigabit service are significantly cheaper and provide symmetrical upload and download speeds. A New America Foundation survey[9] compiled a list of the best

broadband service plans worldwide for a relatively modest monthly rate of about $35 per month. The comparisons to Iowa City are dramatic. In New York City, RCN offers a 25 Mbps service for $35 a month, while the same in Iowa City would be in excess of $65. A 100 Mbps service in San Francisco can be purchased for $37.50 a month, but in Iowa City would cost $165.

Survey Results

Subscriber Understanding of Internet Service

Several survey questions addressed the degree of respondents' understanding regarding their Internet service, specifically, the amount of bandwidth advertised in their service plan and the actual bandwidth they receive. This information is necessary for consumers to adequately determine to which level of service they need to subscribe to match their bandwidth needs, determine whether their Internet Service Provider is delivering the bandwidth advertised, and help diagnose technical problems that could impact performance.

Over a third of respondents did not identify the amount of bandwidth for which they had subscribed. (Chart 2.) Nearly half did not know their provisioned upload speed. (Chart 3.) Roughly 38% did not know their typical download speed. (Chart 4.) Over two thirds did not know if their service plan included data caps. (Chart 5.)

Taken together, this data indicates a sizable portion of all respondents lack sufficient understanding to make informed decisions regarding their Internet service. It is likely many do not know they can run a test of their bandwidth and, as a result, have no means to evaluate whether their service delivers the speed they are provisioned or whether their service plan is adequate to reasonably meet their needs. The consequences of this lack of information include subscribing for more bandwidth than needed (and spending more money), dissatisfaction with Internet performance due to inadequate bandwidth for demand, and being unaware of technical problems either with their Internet Service Provider (ISP) or with consumer wiring or equipment. ISPs generally make a good faith effort to guide consumers to a service level that will meet their needs, but as household demand increases or technical problems occur, or performance fluctuates, a lack of understanding of the basic principles of broadband service might result in a lower level of satisfaction.

Consumer Behavior

Nearly all respondents subscribed to either cable modem service (65%) or DSL (31%). (Chart 6.) Of the 614 responses, only 13 accessed the Internet by other means. Of those, one subscribed to a satellite service, four had fiber to the home (FTTH), 6 by mobile hotspot, one by a microwave link, and one by dialup.

Although CenturyLink has a fairly robust DSL network by industry standards, there are areas of Iowa City in which they are not yet able to offer a service level with download speed greater than 7 Mbps. Nevertheless, there was no discernible difference between Mediacom's cable modem service and CenturyLink's DSL service regarding the percentage of respondents subscribing to various service levels as determined by provisioned download (Chart 7), provisioned upload (Chart 8), or cost of service. (Chart 9.)

A majority of respondents (55%) selected a service level that advertises download speeds between 8 and 20 Mbps. About a quarter (27%) chose a service level with less than 8 Mbps. About one in five (19%) had download speeds in excess of 20 Mbps. Three percent subscribed to over 40 Mbps. (Chart 10.) The mean United States actual downstream speed is 8.6 Mbps.[10] Iowa City area consumers have access to faster internet speeds than much of the country, yet the average service tier closely reflects the national average of 15.6 Mbps.[11]

Age (Chart 11), education level (Chart 12), and household income (Chart 13) do not appear to be correlated to selection of a service level.

The majority of respondents' broadband service (65%) is included in a bundled service package that includes television and/or telephone service. The discounts contained in bundled service make cost-based analysis problematic. For example, as of November 2013, an existing Mediacom customer subscribing to a stand-alone 3 Mbps Internet service will pay about $50 a month. A subscriber with a promotional package consisting of a 15 Mbps Internet connection, expanded basic television service, and phone service will pay about $80 for the first year.

A striking number of respondents work from home utilizing an Internet connection. Nearly a third report working "primarily" (12%) or "part-time" (20%) from home. Another 31% work from home "occasionally". (Chart 14.) The service level subscribed to by those who work at home does not differ from the overall population. (Chart 15.)

Most respondents' households (68%) have four or more devices connected to the Internet (Chart 16), and those devices are in use for three or more hours a day for over half of all households. (Chart 17.) Taken together, this suggests many households will have periods that require more bandwidth than they might think necessary if they were following the guidance of their ISP for any one application. For example, if a household is simultaneously streaming a high-definition program, browsing the web, playing an online game and listening to an online radio station, performance would likely be negatively impacted on connections with speeds of less than 7 Mbps. Netflix, a provider of high-definition video, recommends at least a 5 Mbps connection for HD streaming. CenturyLink's website[12] indicates a 7 Mbps connection would be a good choice for streaming video. Mediacom[13] provides no specific recommendation.

Respondents were asked how frequently they use a variety of Internet applications. Email was accessed daily by 96% of respondents. (Chart 18a.) Streaming video was a daily occurrence for 47%. (Chart 18b.) These two online activities far outpaced the other applications contained in Charts 18c-16i. About a third participated in a videoconference once a week. (Chart 18g.) Nearly half uploaded pictures to a social media site once a week or more. (Chart 18h.)

Respondents were asked about their use of selected Internet applications three years ago, their current usage, and what they anticipated using in the future. (Chart 19.) The changes over time were quite pronounced for streaming video: 46% past, 68% current, and 82% future. The use for uploading to a video service (27%, 36%, 53%), video conferencing (32%, 51%, 74%), and transferring large video files (22%, 29%, 47%) also showed dramatic growth. The applications that showed the greatest growth were also those that require larger amounts of bandwidth. Streaming video, in particular, will place an increasing demand on household bandwidth. Without a corresponding increase in the amount of bandwidth provisioned to them, many respondents, particularly those under 8 Mbps, will likely encounter poor performance.

Those respondents who anticipated using more applications in the future and were willing to pay more were more likely than the overall population to already be users of video conferencing applications (59% vs. 20%) and transferring files of 10 Mbps or larger (57% vs. 20%) than the overall population. (Chart 20.) Further, this group expected to utilize these applications significantly more frequently in the future. Video conferencing would increase from a current use of 59% to 85% in the future and large file transfers from a current 57% to 77% in the future. Thus, those willing to pay more were already more robust users and anticipated using more bandwidth-intense applications with greater frequency in the future. Conversely, those who reported they did not expect to use more internet applications in the future were less likely than the overall population to currently be using video conferencing applications than those expecting to use more applications (47% vs. 59% for current use and 47% vs. 85% for future use). (Chart 21.) Those who did not expect to use more Internet applications were also slightly less likely than the overall population to currently be uploading videos (27% vs. 30%). (Chart 22.)

Streaming video has become commonplace for about 64% of respondents. (Chart 18b.) Only 18% "never" stream video. High-definition video streaming requires more bandwidth than was provided by the service level of 27% of respondents. (Chart 2.) HD video also consumes a large amount of data: about 2.8 GB per hour.[14] Mediacom began enforcing data caps for all customers in August of 2013, with data caps of 150 GB for the 3 Mbps service tier, 250 GB for the 12 Mbps tier, and 350 GB for the 20 Mbps.[15] CenturyLink has a 250 GB data cap.[16] Thus, a 150 GB cap would be exhausted if a user streamed HD video for about an hour and forty-five minutes per day. A 250 GB cap will allow 2 hours per day, and a 350 GB cap a little over 4 hours per day. Three factors taken together—1) 68% of respondents were unaware if they were subject to caps (Chart 5), 2) 41% of respondents report streaming video on a daily basis (Chart 18b), and 3) the dramatic increase in the number of respondents expecting to stream video in the future (Chart 19)—suggest that in the near future many consumers' performance expectations will fall short of what they now experience. Unless ISPs increase their data caps or consumers subscribe to higher service levels, the long-term trend will likely negatively impact consumers with a service level less than 12 Mbps. The need for consumers to be knowledgeable of the existence (and consequences of exceeding) data caps and the level of bandwidth consumed by applications like HD video streaming will become even more important as demand for bandwidth increases in the future via both more bandwidth-intensive applications and more simultaneous connections.

Consumer Attitudes and Perspectives

Overall, respondents were not satisfied with their broadband service. On a six-point scale ranging from "very satisfied" to "very dissatisfied", 55% fell into the dissatisfied grouping and 45% in the satisfied grouping. About 9% were "very satisfied", and twice that number were "very dissatisfied". There was no difference in the level of satisfaction between DSL and cable respondents. (Chart 23.)

Asked the element of service with which they were least satisfied, a significant plurality (39%) of respondents identified the cost of service. (Chart 24.) Reliability (28%) and availability of bandwidth or speed (22%) were significantly behind. About 12% cited other reasons, most commonly poor customer service. A striking 79% responded the cost of service was too high

for the level of service provided. (Chart 25.) Only 4% thought broadband service was a good value. There was no difference between cable and DSL in the perception of value. Generally, the likelihood of a respondent falling into the dissatisfied grouping increased with the cost of service. (Chart 26.) The aspect of service with which respondents were least satisfied varied only slightly between those who bundled services (and presumably pay less) and those who did not (38% vs. 42%). (Chart 27.)

Those respondents "very dissatisfied" were much more likely than the overall population to cite reliability as the aspect of service with which they were most dissatisfied (48% vs. 28%). (Chart 28.) "Very dissatisfied" respondents knowledgeable of their typical download speeds were more likely to subscribe to a service level of 3 Mbps than the overall population. (Chart 29.) Conversely, as service level speeds increased, those knowledgeable of their download speeds were less likely to be "very dissatisfied" than the overall population.

Most cable respondents (57%) reported experiencing a decline in performance during some periods of the day and, unsurprisingly, reported a lower level of satisfaction than those who do not. (Chart 30.) Congestion typically associated with a decline in cable network performance was not found to be more common in certain areas, nor were satisfaction levels associated with any particular locations.

The level of satisfaction seems related to the level of service to which a respondent subscribes. Respondents with speeds below 8 Mbps were more likely to fall into the dissatisfied grouping than those with greater provisioned download speeds. Overall, 44% fell into the satisfied grouping. By provisioned download, the satisfied groupings ranged from 32% to 90%. Each successively faster service level gained a higher percentage in the satisfied grouping. (Chart 31.) The large satisfaction difference between the 4-7 Mbps and the 8-11 Mbps service levels (34% vs. 51%) suggests consumers need a service level of at least 8 Mbps for them to be more likely to be satisfied than dissatisfied with their broadband performance.

Contrary to what might be expected, three factors that could impact household bandwidth requirements—the number of users in the household, the number of devices connected to the Internet, and the frequency of multiple devices in simultaneous use—were not correlated with respondent satisfaction. (Charts 32-34.)

Respondents were asked to rate the performance of various Internet applications as poor, adequate, or excellent. (Chart 35.) As might be expected, those applications requiring more bandwidth had a higher percentage of "poor" ratings. However, even the least demanding application, email, was rated "poor" by 8% of respondents. Those applications that involve uploading files were more likely to be rated as "poor". Of particular note, and previously noted with regard to satisfaction levels, are streaming video and video conferencing. Both were rated "poor" by about a third of respondents. Overall, it appears a number of respondents either were experiencing technical problems that diminished their performance or were not subscribing to a service tier that provided enough bandwidth to meet their expectations.

Most respondents (68%) would like to expand the number of Internet applications they use, but of that group, 71% were unwilling to do so if it cost more. Only 20% of the overall population was willing to pay more to get more. (Chart 36.) This holds true even for those who cited "reliability" as the element with which they were least satisfied. Willingness to pay more for

more service was correlated with the level of overall satisfaction. (Chart 37.) In fact, 54% of those who anticipated using more applications and were willing to pay more were in the "satisfied" grouping compared to 45% overall. 38% of those who reported they would like to use more applications but not if they had to pay more were in the "satisfied" grouping.

Network Performance

Respondents were asked if they knew their provisioned download and upload speeds, and if they did, they were asked if they knew their actual typical speeds. Respondents were also given an opportunity to test their speeds at an online speed test site. As previously noted, 39% did not know their provisioned download speed and 45% did not know their provisioned upload speed. Of those cable respondents that did know their provisioned service level, their perception of their typical speeds and the results from the speed test show they believed their typical download speeds were generally slower than their measured results. Compared to actual speed tests, 20% of respondents were below provisioned speed, 50% the same, and 30% faster. Likewise, only 17% of tests for upload speeds were slower than provisioned. (Chart 38.) The results for DSL respondents were less impressive than for cable modem service. Compared to actual speed tests, 48% of DSL speed tests were slower, 2% faster, and 50% the same as provisioned speed. Those results were nearly identical to the perceived typical speeds of 43% slower, 2% faster, and 55% the same. Tested upload speeds were faster 2% of the time, slower 48%, and the same 50% of the time. (Chart 39.) It appears cable respondents generally misperceived the performance of their broadband service as slower than actually delivered. DSL respondents' perception of performance was closer to that measured, however, that performance often was less than advertised.

Cable broadband is a shared system in which high network traffic at a particular time and/or location (the node) can result in a decline in performance. Among cable respondents, 57% reported experiencing a decline in their download speed during certain times of the day. The vast majority (73%) reported a decline in performance during the time period between 5 p.m. and 10 p.m. (Chart 40.) A decline in performance was reported across all levels of service tiers. (Chart 41.) It appears cable respondents could not overcome peak period network congestion by subscribing to higher speed service tiers. Experiencing a decline in network performance strongly influenced overall satisfaction levels: as previously noted, 45% of all respondents fell into the "satisfied" grouping for overall satisfaction, but among cable respondents who experienced a decline in network performance the rate was only 35%. (Chart 42.)

Summary of Findings

Nearly all respondents subscribed to either cable modem or DSL service.

Despite having access to faster speeds for both cable and DSL services than national averages, respondents select service tiers with speeds in line with the national average broadband subscription of 15.6 Mbps.

Many respondents lacked a level of understanding necessary to make informed consumer decisions about their broadband service or make a determination if their broadband performance was up to the standards for which they were provisioned. Over two thirds did not know if their service contained data caps.

Respondents were generally poorly informed on to which level of service they subscribed, how much bandwidth they received, and how much bandwidth they needed to meet their needs. Awareness of upload speeds was particularly lacking.

Overall, respondents were not satisfied with the broadband offerings in the Iowa City area. There was no difference in the level of satisfaction between DSL and cable subscribers. Cost of service was the most cited factor of consumer dissatisfaction (39%), followed by reliability of service (28%), then availability of specific bandwidth offerings (22%). 12% cited other reasons, poor customer service being chief among them. 79% of respondents believed the cost of service is too high for the level of service provided, while only 4% believed they were getting a good value for their money.

Price was a major factor in respondents' satisfaction level and served as a barrier to subscribing to faster service tiers.

Of the "very dissatisfied" respondents, reliability was the chief complaint. A large majority of cable modem respondents reported experiencing a decline in performance at some periods of the day

Age, education level, and household income did not appear to be factors in respondents' consumer behavior, usage patterns, level of information, or level of satisfaction.

The demand for bandwidth has steadily grown over the past three years and will continue to do so.

A significant increase in anticipated use of video conferencing applications, file transfers larger than 10MB, and uploads to video services (e.g. YouTube) was reported by respondents. Respondents who indicated their intention to use more applications in the future, especially video conferencing, were generally willing to pay more for a higher level of service.

Streaming video usage was reported as commonplace by 64% of respondents.

A significant amount of respondents utilized their broadband connection to work from home, with 32% of respondents reporting 'part-time' to 'primarily' and 31% reporting 'occasionally'.

A majority of households reported 4 or more devices connected to their broadband connection, and those devices are in use for 3 or more hours daily.

Most respondents (67%) reported they would like to expand the number of Internet applications they use but only 20% are willing to pay more to do so.

Conclusions

The Iowa City area is served by a relatively robust broadband infrastructure. In large areas of Iowa City, consumers can choose between competitive providers offering service of 20 Mbps or more. However, current commonly-deployed state of the art broadband infrastructure delivers

up to a gigabit of bandwidth. In fact, the FCC has announced a goal of having at least one community in each state being served by a gigabit service provider by 2015.[17] Cedar Falls (Iowa) Municipal Utilities began offering a gigabit service in 2013. Proponents of advanced broadband infrastructure assert advanced broadband is a strong catalyst for economic development. In fact, the City of Iowa City's Comprehensive Plan lists among its economic development goals and strategies to: "establish strategies to secure next-generation, state-of-the-art broadband and infrastructure".[18] The experience of Kansas City, where Google offers a gigabit service for $70 per month, is an instructive case study of the dramatic impact advanced broadband can have on economic development.

Consumers are generally dissatisfied with their broadband service. Price serves as a barrier to greater utilization of broadband applications and is a major factor in consumers' dissatisfaction with their broadband service. The Iowa City area has not benefitted from broadband competition with regards to price and pays more than many communities across the nation.

Consumers generally lack an understanding of the factors that determine their broadband experience. Many consumers lack sufficient knowledge to make informed market decisions, which likely contributes to dissatisfaction with their broadband experience. Consumers need to be aware of the shortcomings of service levels less than 8 Mbps, particularly with regards to streaming video. The convergence of greater video streaming in the future and relatively low data caps will likely result in greater dissatisfaction with the broadband offerings, particularly for the price, of the two major providers.

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[1] *See:* http://www.iowa-city.org/icgov/apps/boards/members.asp?id=25
[2] *See:* http://www.mediacomcable.com
[3] *See:* http://www.centurylink.com
[4] See: http://www.southslope.com
[5] National Telecommunications and Information Administration. "U.S. Broadband Availability: June 2010-June 2012." May 2013. Accessed November 2013. http://www.ntia.doc.gov/report/2013/us-broadband-availability-june-2010-june-2012
[6] *ibid.*
[7] Reardon, Marguerite. "FCC: Cost a Major Barrier to Broadband Adoption." Cnet.com, February 2010. Accessed November 2013. http://news.cnet.com/8301-30686_3-10457951-266.html
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[12] *See:* http://www.centurylink.com/home/internetonly
[13] *See:* http://mediacomcable.com/site/internet.html

[14] *See:* https://support.netflix.com/en/node/87
[15] ibid.
[16] *See:* http://www.centurylink.com/Pages/AboutUs/Legal/InternetServiceManagement
[17] *See:* http://www.fcc.gov/document/fcc-chairman-genachowski-issues-gigabit-city-challenge
[18] "IC2030: Comprehensive Plan Update." City of Iowa City, May 2013. Accessed November 2013.
http://www.icgov.org/site/CMSv2/file/planning/ic2030/CompPlanUpdate/1013/Section5, EconomicDevelopment1013.pdf

Charts

Chart 1a

Provider	Speed Mbps	Cost	Cost per MB
Mediacom	3	48.00	16.00
	15	66.00	4.40
	30	75.00	2.50
	50	115.00	2.30
	105	165.00	1.58
CenturyLink	1.5	52.00	34.67
	7	52.00	7.43
	25	67.00	2.68
	40	77.00	1.92
SouthSlope	10	41.00	4.10
	20	45.00	2.25
	40	55.00	1.38
	110	100.00	0.91
	220	200.00	0.91

Chart 1b

Municipal Gigabit Systems			
Provider	Speed Mbps	Cost	Cost per MB
Cedar Falls	2	30.00	15.00
	16	43.50	2.72
	30	62.50	2.10
	50	91.50	1.83
	120	137.50	1.15
	1000	267.50	0.27
Chattanooga	50	57.99	1.16
	100	70.00	0.70
	250	140.00	0.56
	1000	300.00	0.30

Chart 1c

New America Foundation's "What Can You Get for $35?"

Provider	Speed Mbps	Cost	Cost per MB
RCN/New York	25	35.00	1.40
RCN/D.C.	25	40.00	1.60
Time Warner/L.A.	10	30.00	3.00
ATT/Chattanooga	6	25.00	4.17
Lafayette, LA	15	35.00	2.33
Webpass/San Francisco	100	37.50	0.48

Chart 2

Provisioned Download

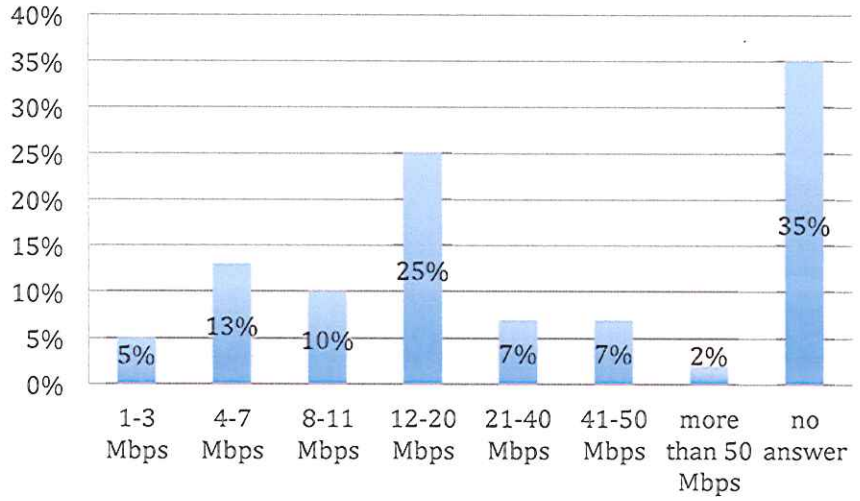


Chart 3

Provisioned Upload

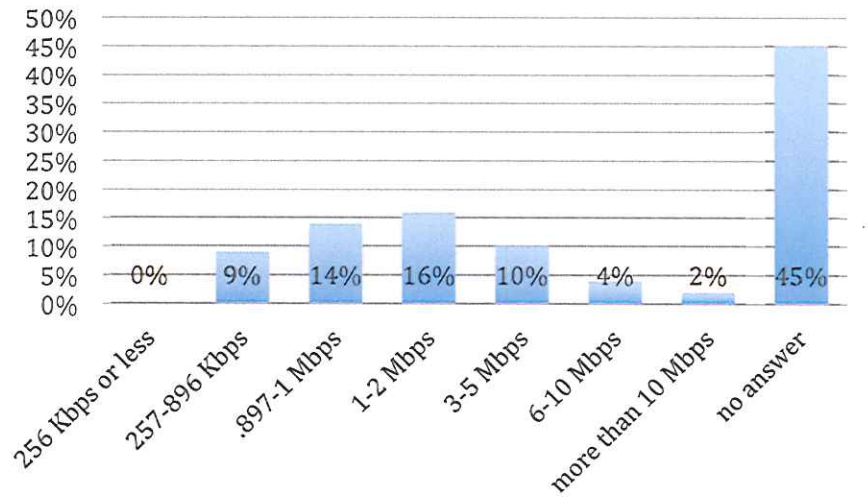


Table 4

Typical Download

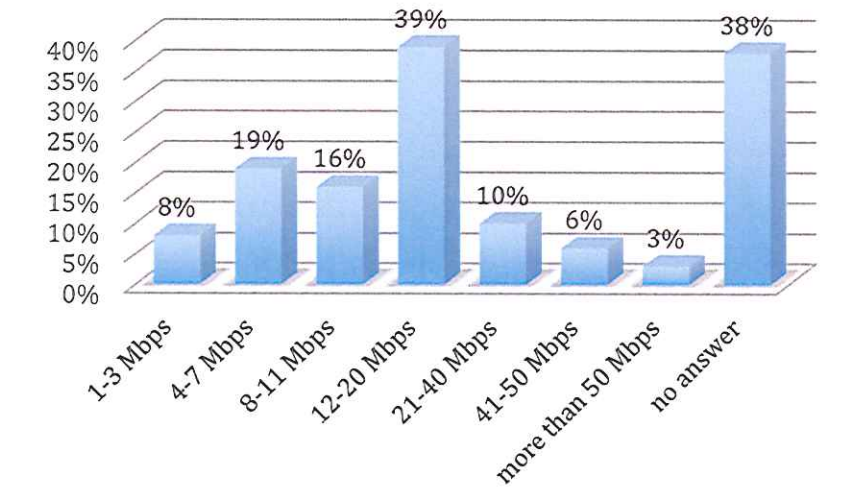


Chart 5

Awareness of Data Cap

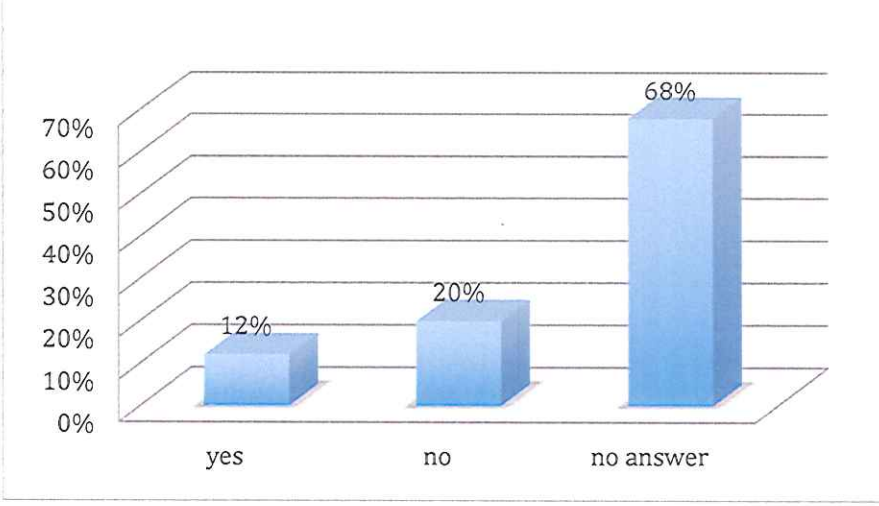


Chart 6
Service Type

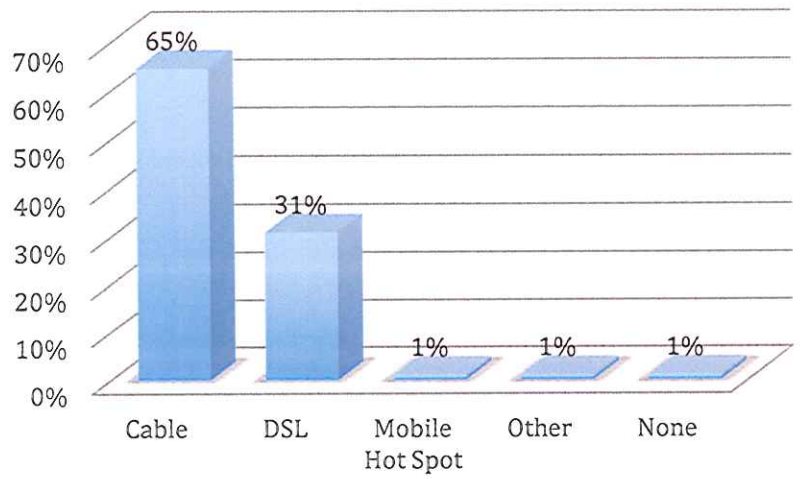


Chart 7
Provisioned Download by Service Type

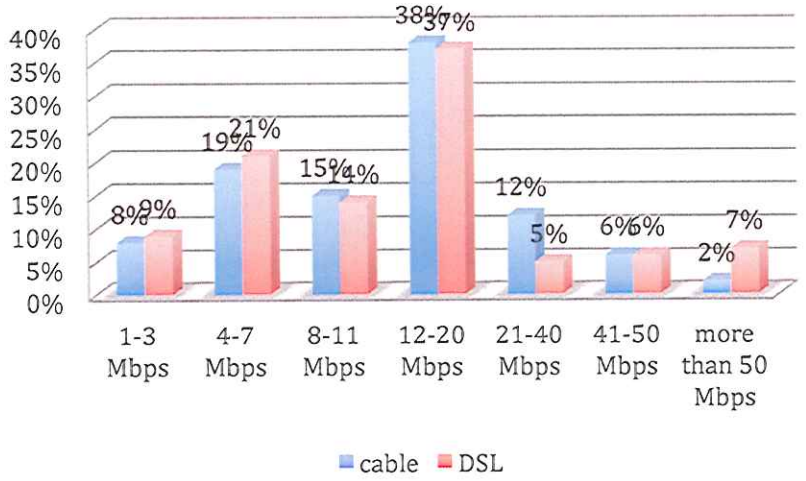


Table 8
Provision Upload by Service Type

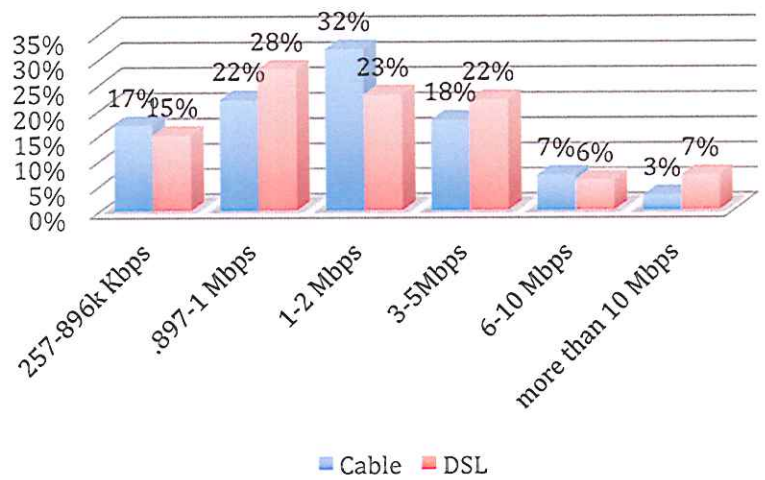


Chart 9
Costs by Servic Type

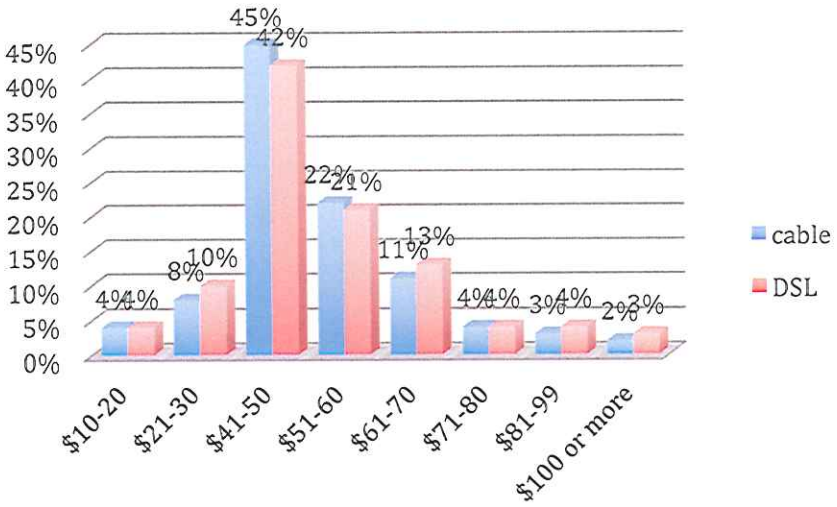


Chart 10

Service Tier Subsribers

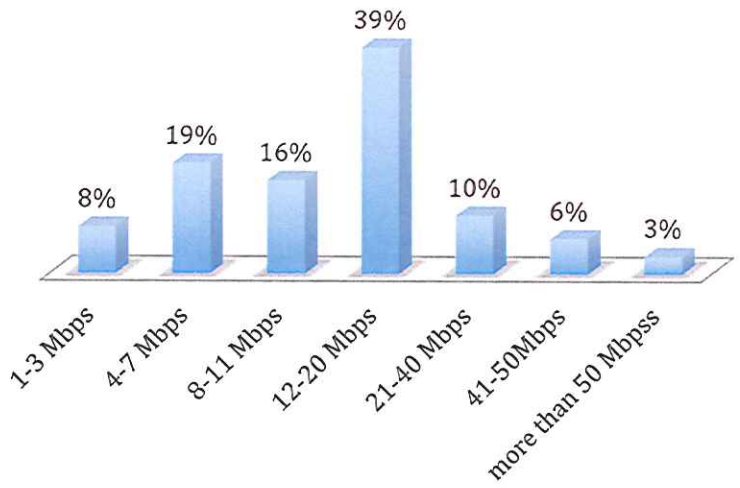


Chart 11

Service Tier by Age

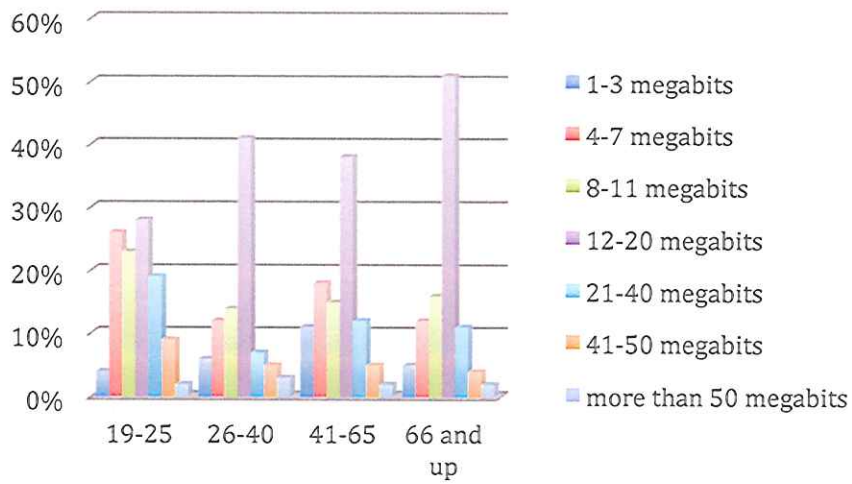


Chart 12

Service Tier by Education Level

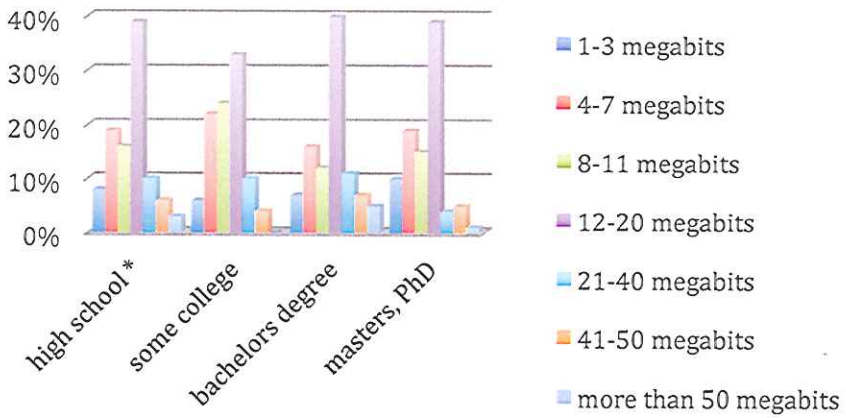
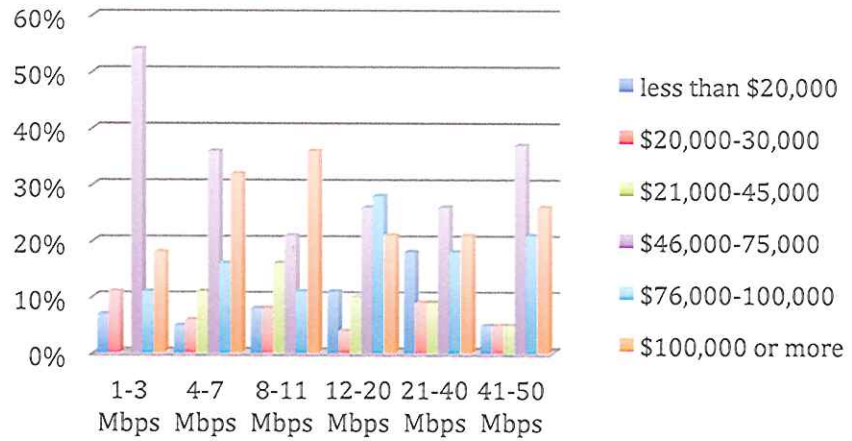


Table 13

Service Level by Household Income



*n=21

Chart 14
Work From Home With Broadband Connection

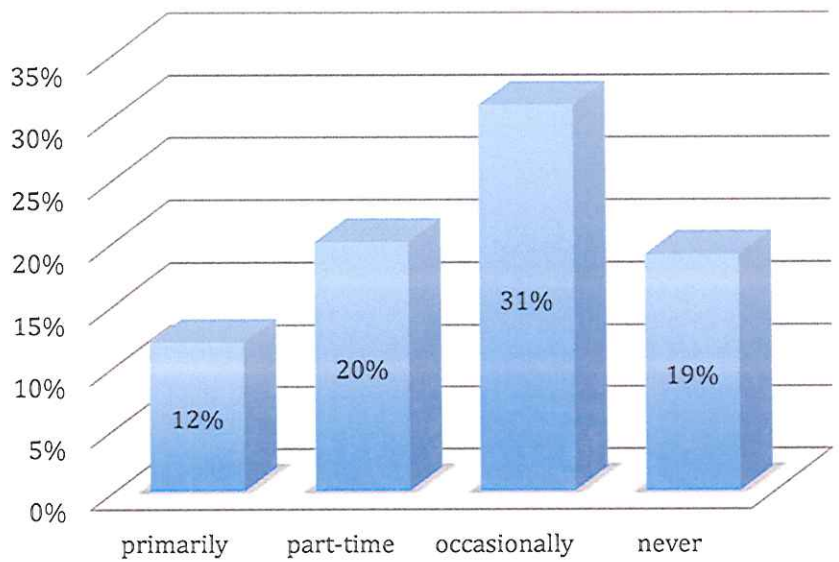


Chart 15
Working at Home by Service Tier

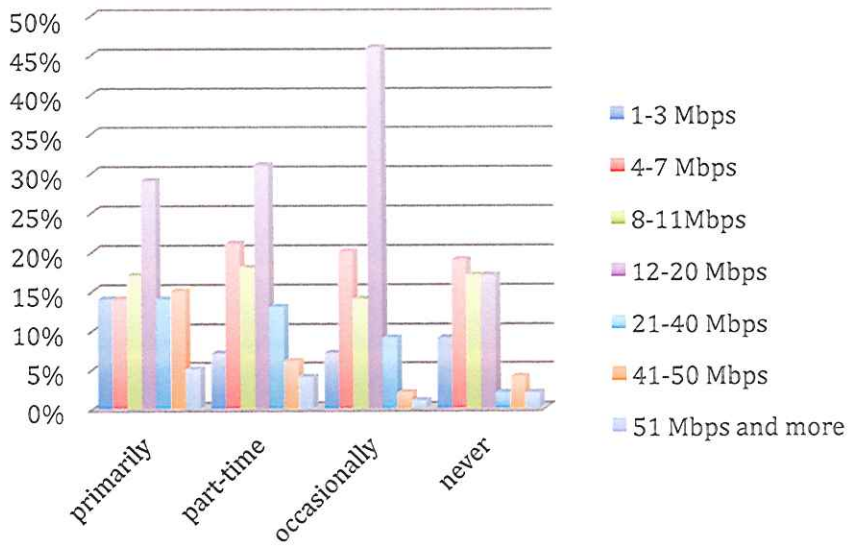


Chart 16
Number of Devices Connected to Internet

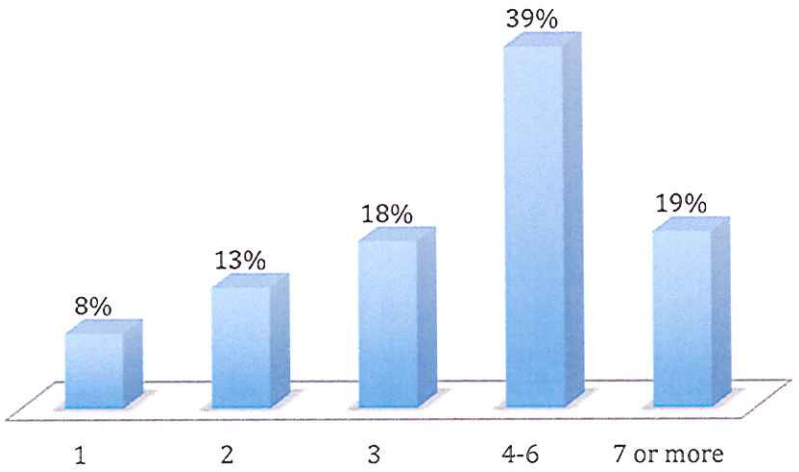


Chart17
Hours Per Day With Multiple Device Usage

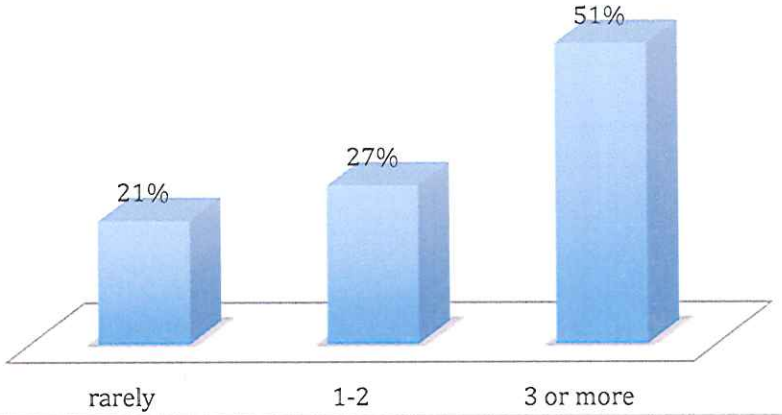


Chart 18a

Frequency of Using Email

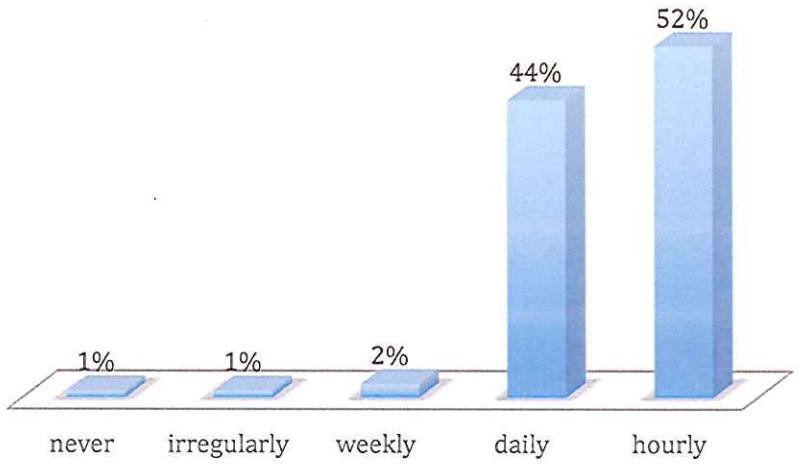


Chart18b

Streaming Video Frequency

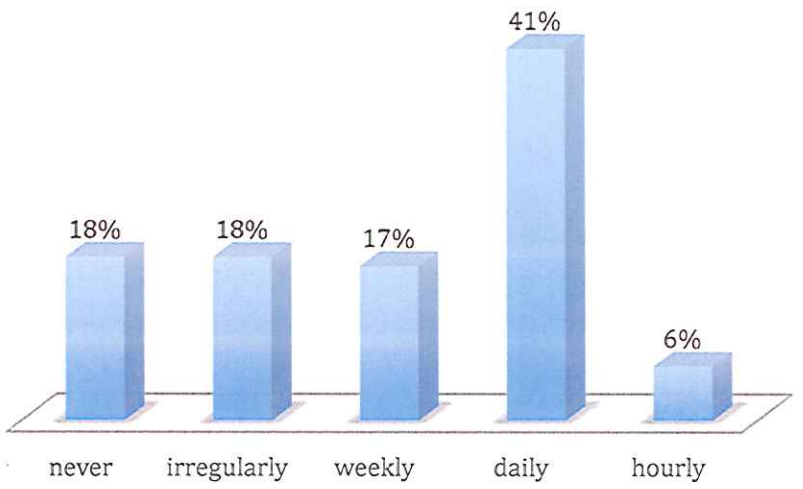


Chart 18c

Frequency of Online Gaming

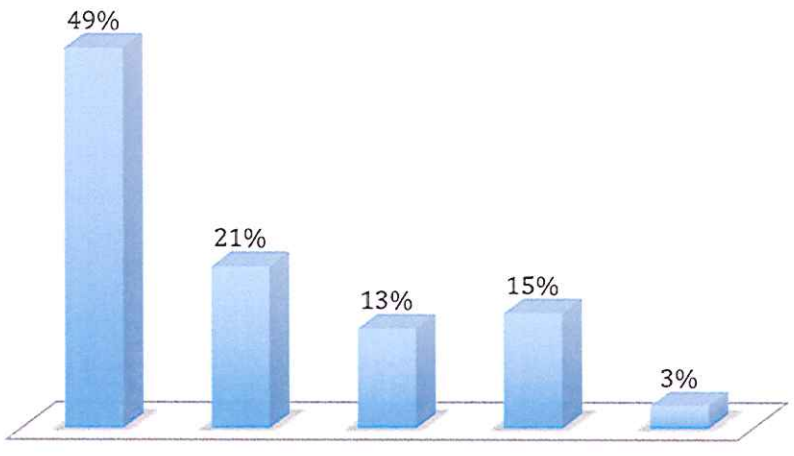


Chart 18d

Frequency of Uploading to a Video Service

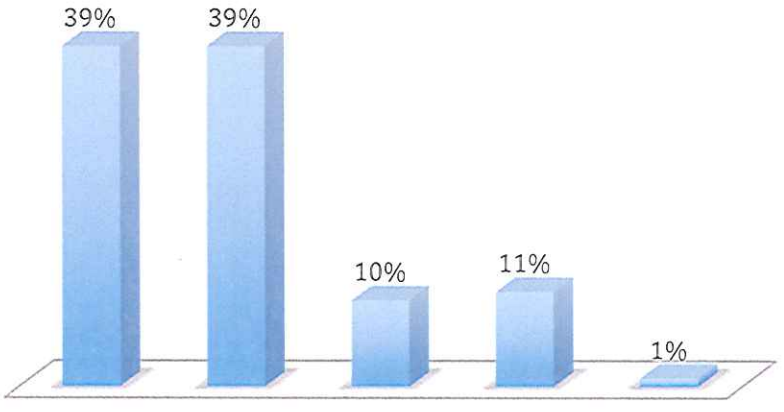


Chart 18e

Frequency of transfering Large Video Files

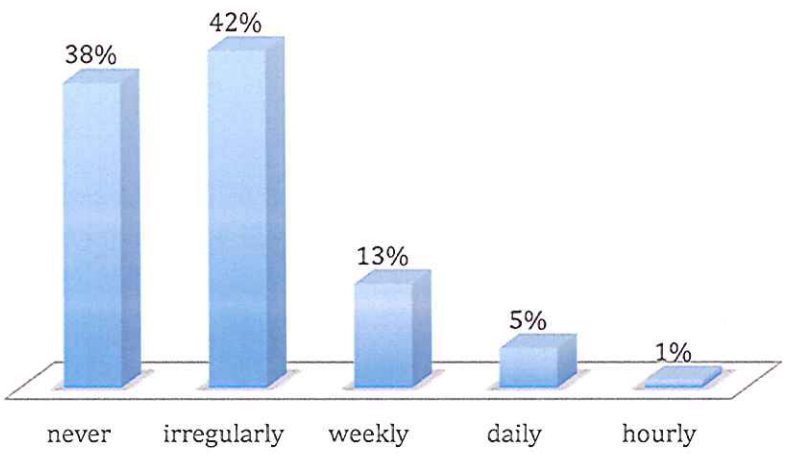


Chart 18f

Frequency of Transfering a 10 MB File

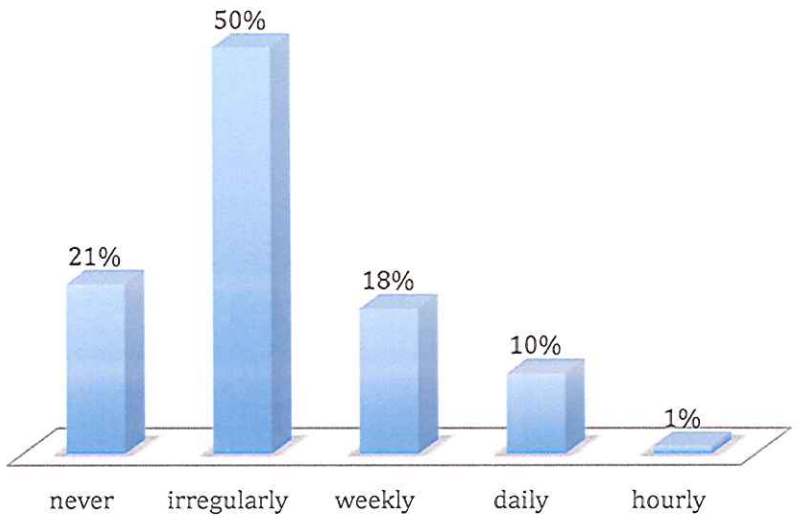


Chart 18g

Frequency of Video Conferencing

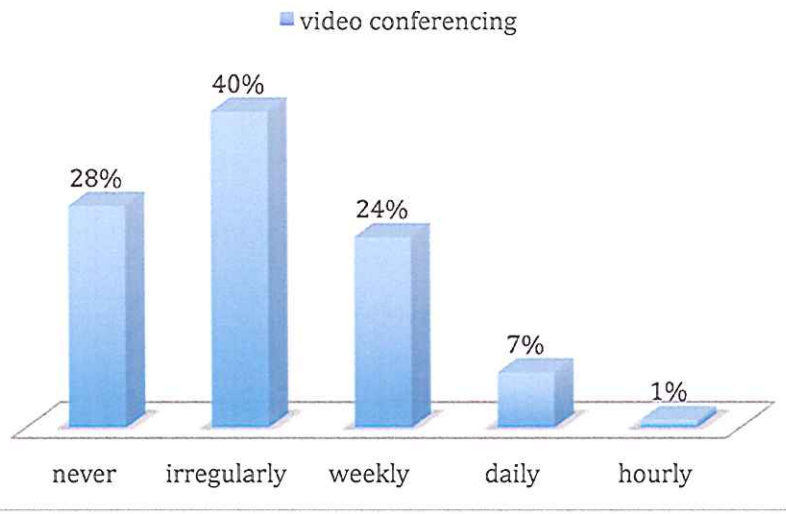


Chart 18h

Frequency of Uploading Pictures to Social Media

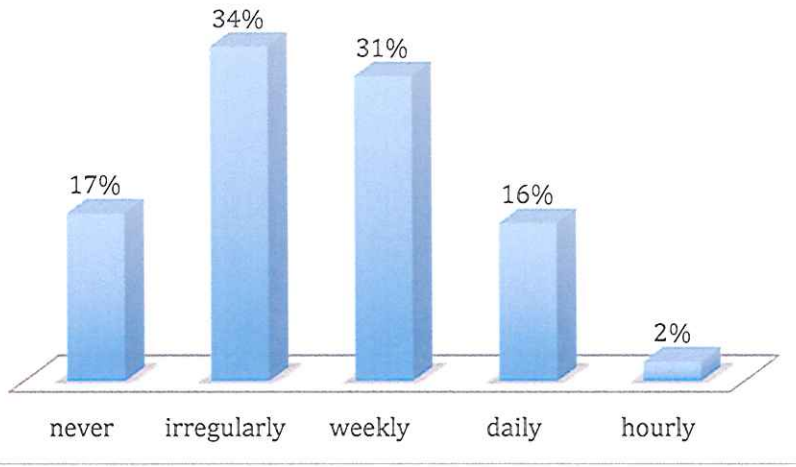


Chart 18i

Frequency of Attachments to Email

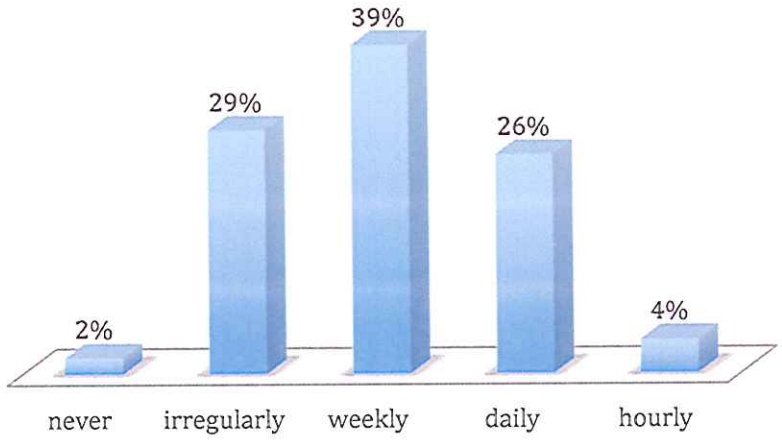


Chart 19

Past, Present, and Future Use by Application

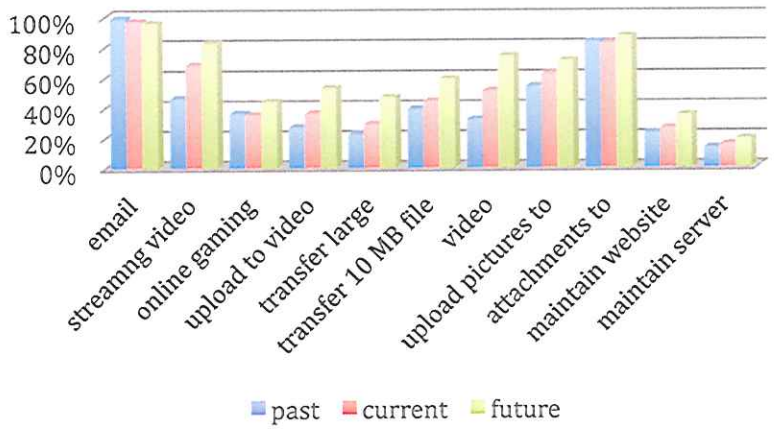


Chart 20

Selected Application Use-Current and Future- Among Those Willing to Pay More

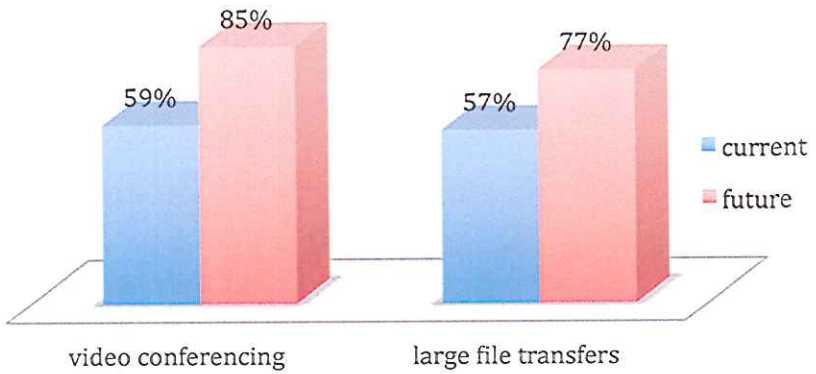


Chart 21

Current and Future Video Conferencing by Future Anticipated Ineternet Use

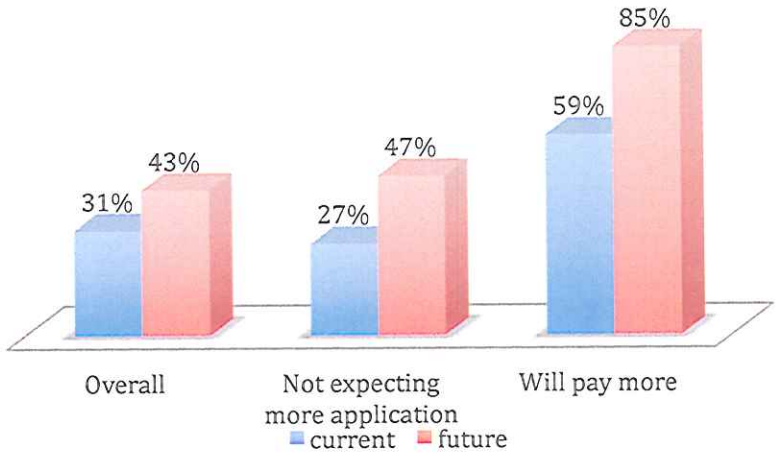


Chart 22
Currently Uploading Video

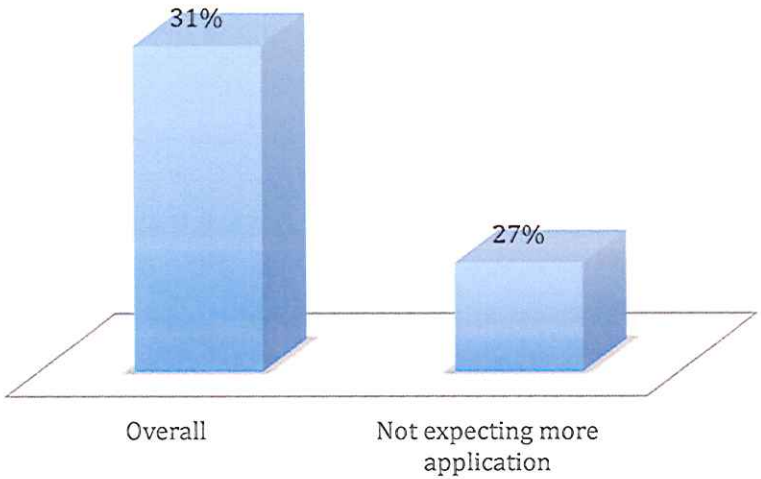


Chart 23
Satisfaction Level

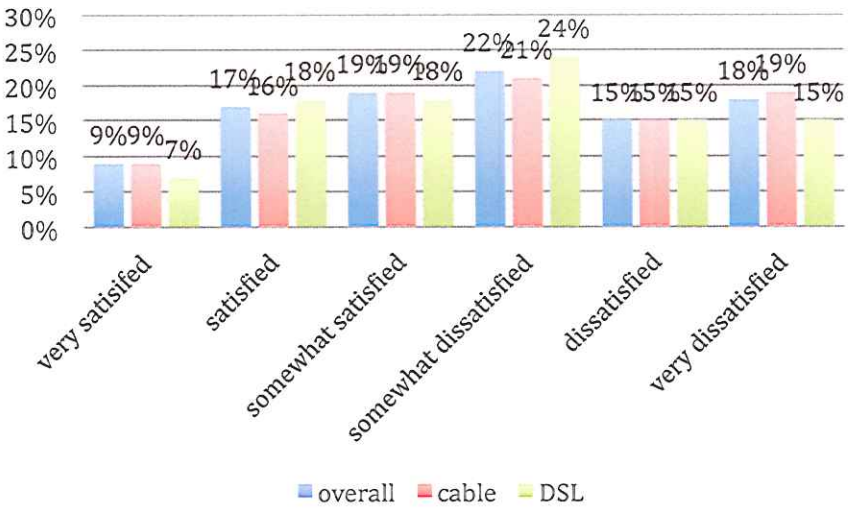


Chart 24
Least Satisfied Aspect of Service

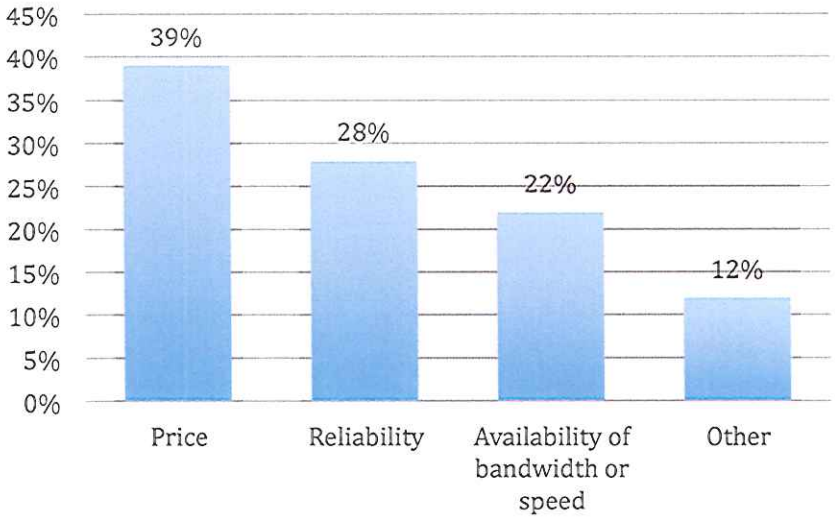


Chart 25
Percieved Value

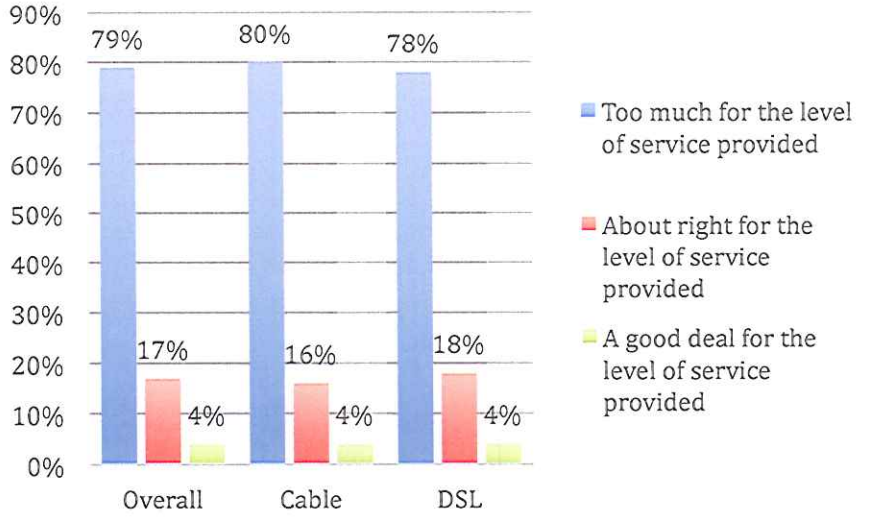


Chart 26

Satisfaction by Cost

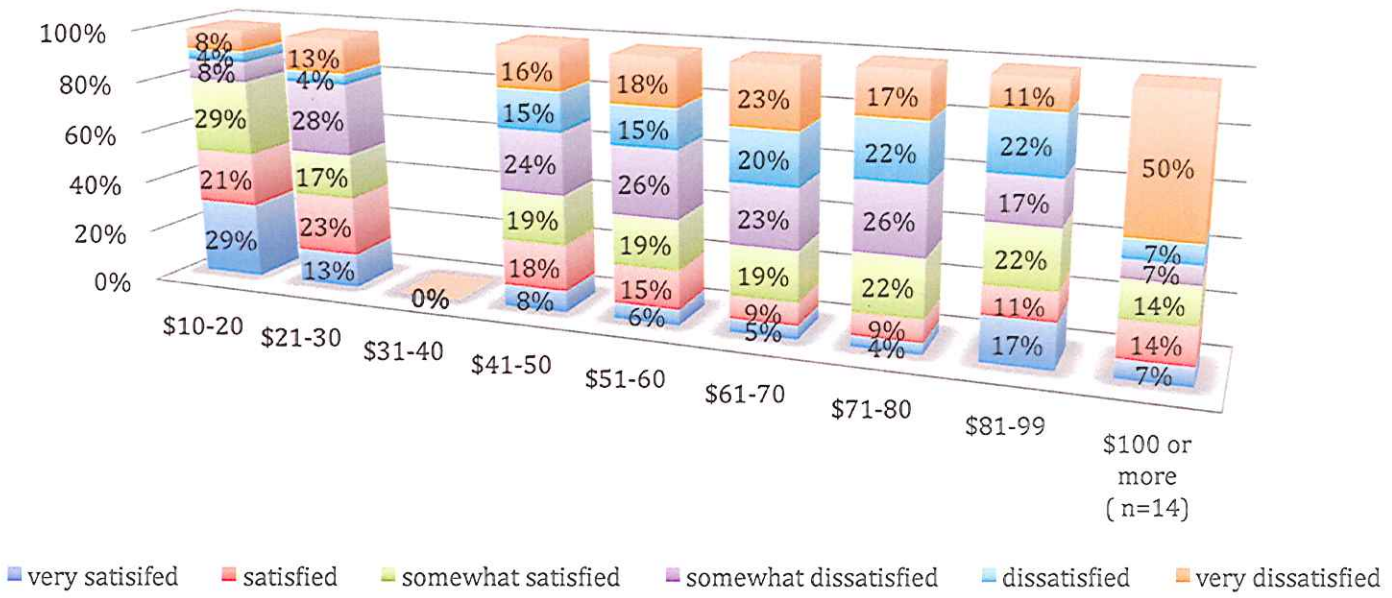


Chart 27

Aspect of Service Least Satisfied by Bundled Service

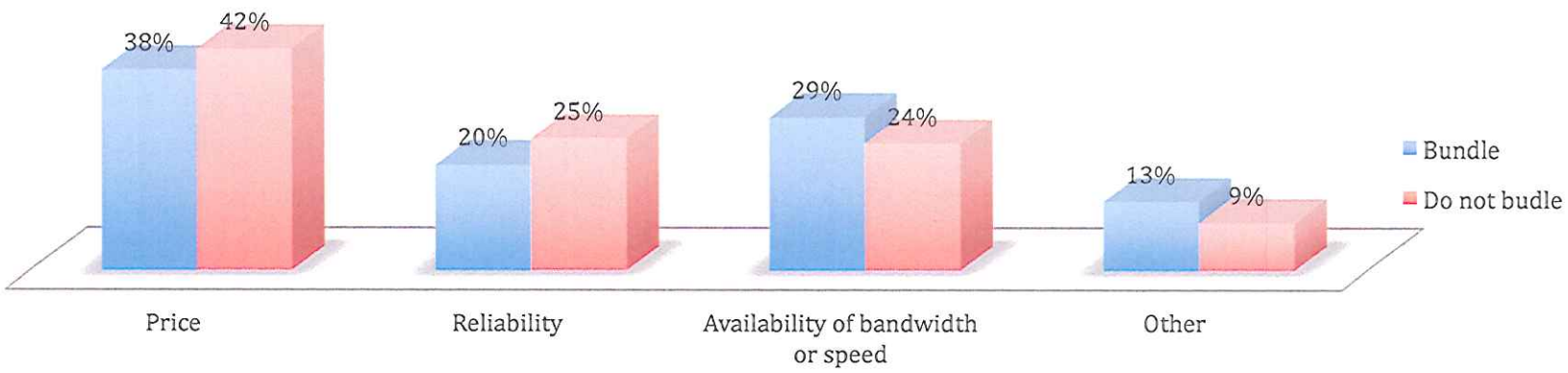


Chart 28

Service Aspect least Satisfied by Those "Very Dissatisfied"

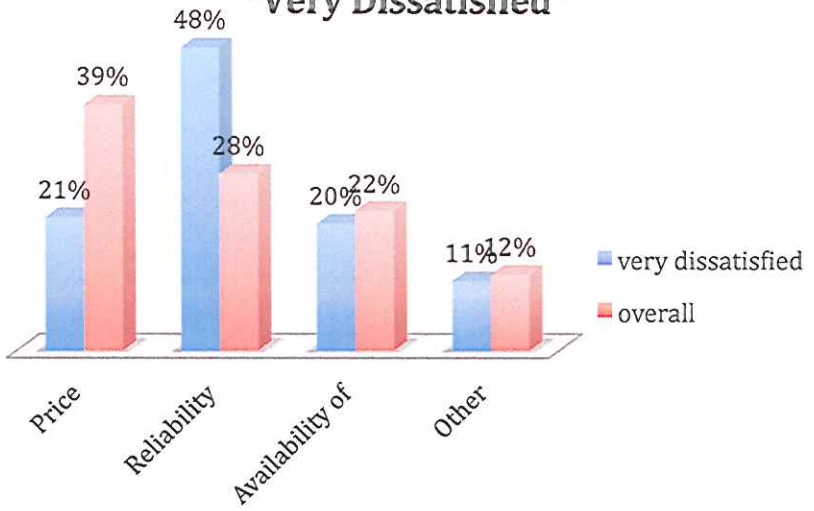


Chart 29

"Very Distisfied" Typical Download

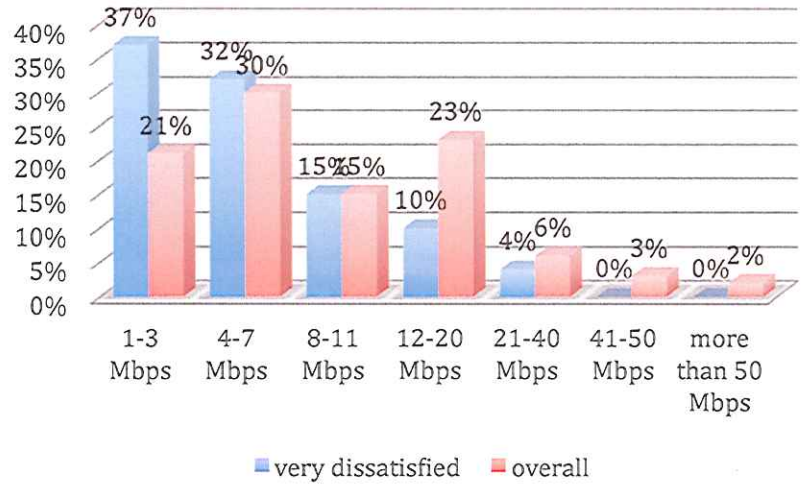


Chart 30

Satisfaction and Performance Decline

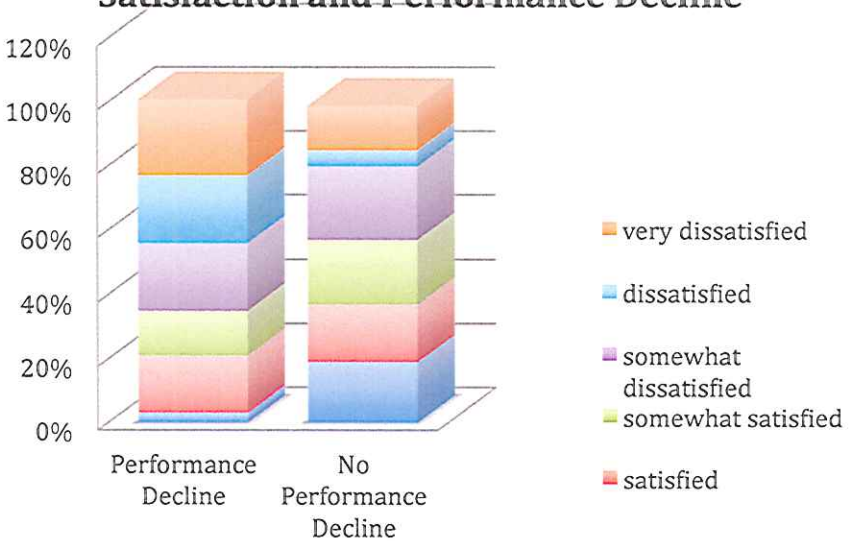


Chart 31

Satisfaction Level by Provision Download

Chart 32

Satisfaction Level by Number of Household Users

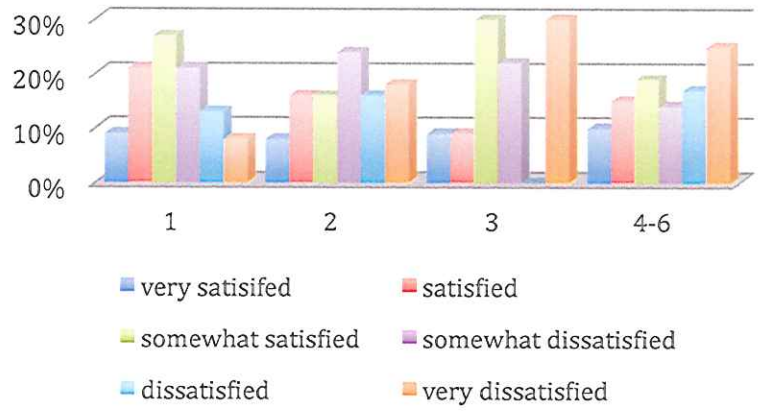


Chart 33

Satisfaction Level by Number of Connected Devices

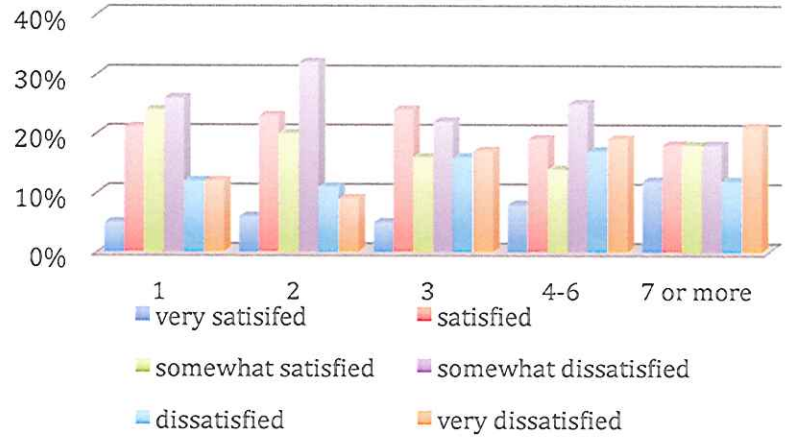


Chart 34

Satisfaction Level by Frequency of Multiple Devices in Simultanious Use

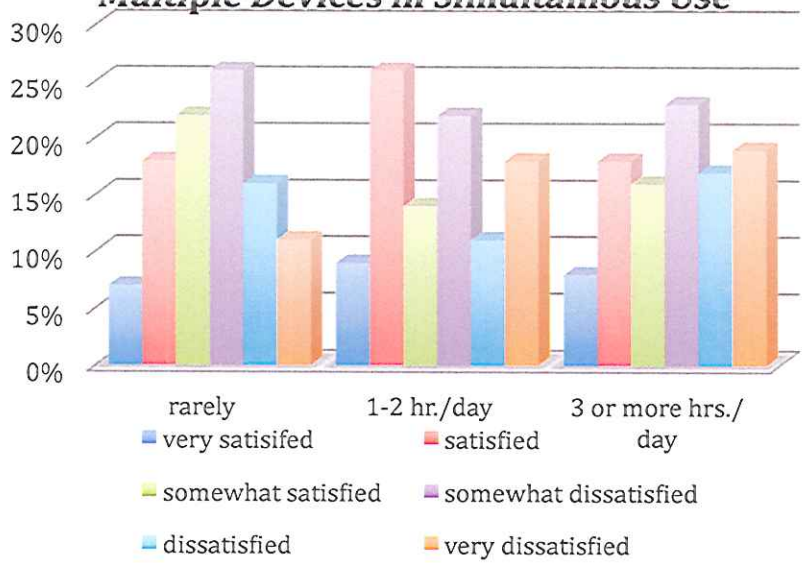


Chart 35

Application Performance

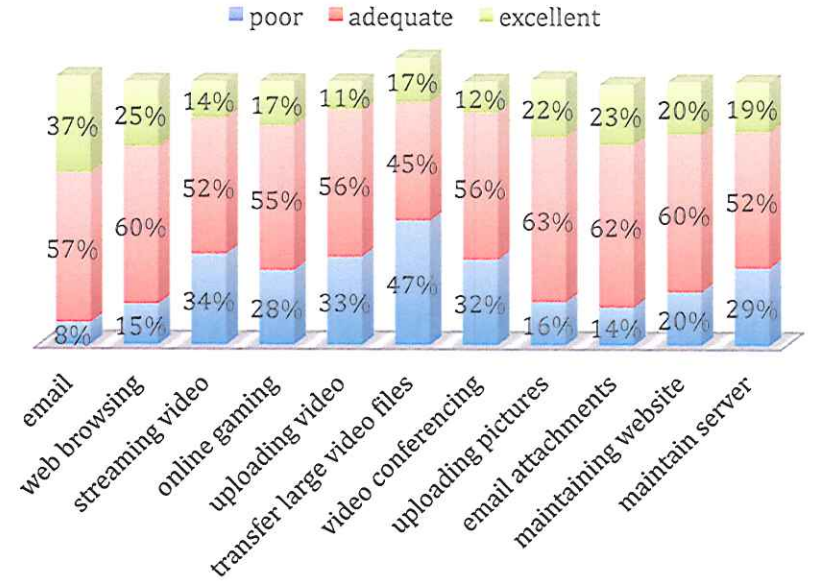


Chart 36

Anticipated Future Use

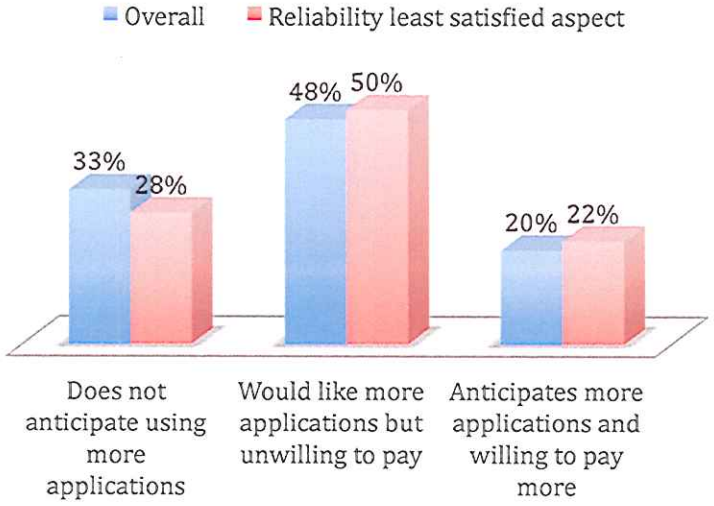


Chart 37

Satisfation Level and Anticipated Future Use

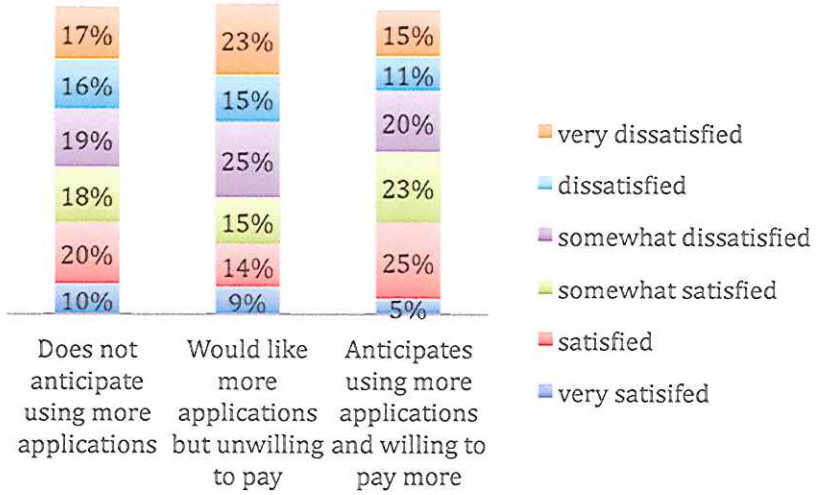


Chart 38

Cable Advertised vs. Perceived Typcial and Actual Speed Test Results

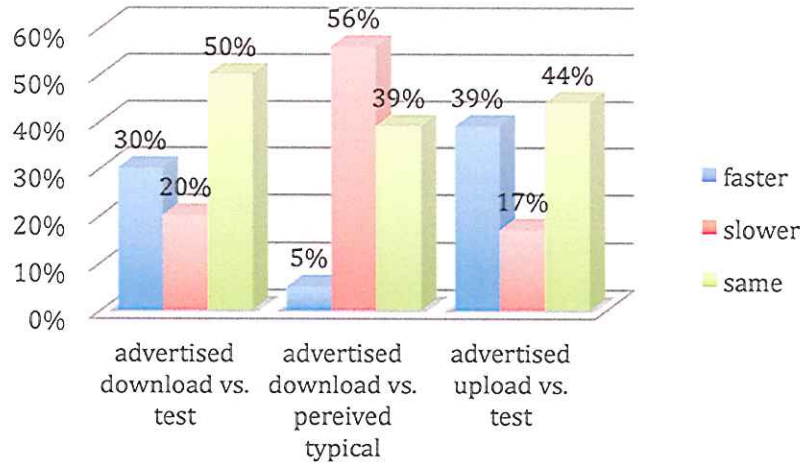


Chart 39

DSL Advertised vs. Perceived Typcial and Speed Test Results

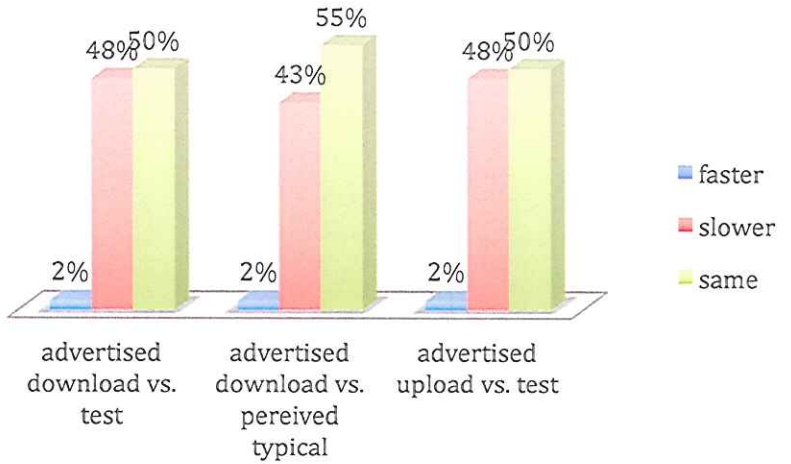


Chart 40

Time of Performance Delcine

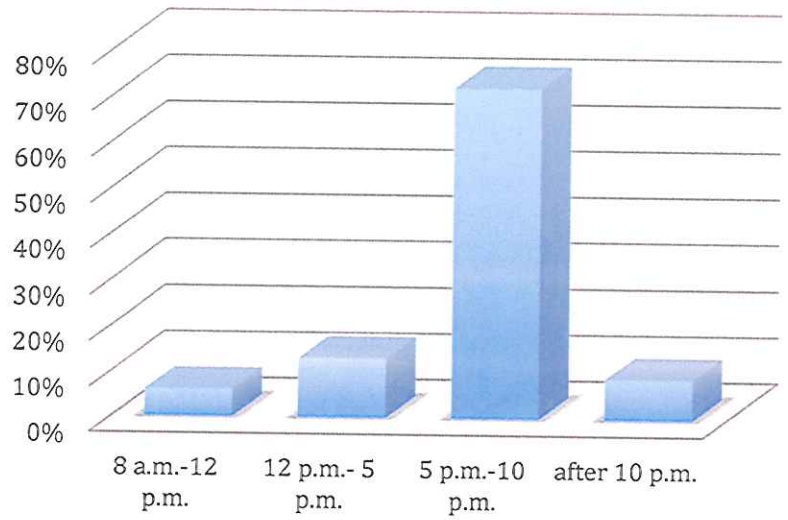


Table 41

Cable Subscrivers Performance Decline by Service Tier

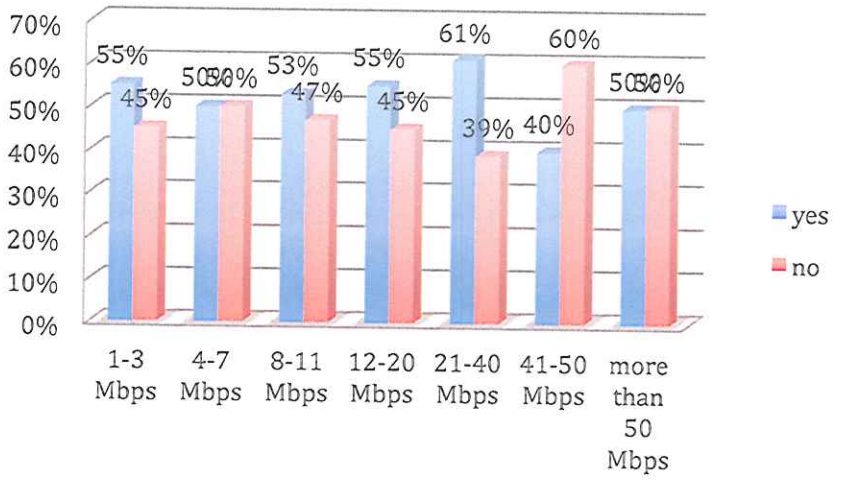
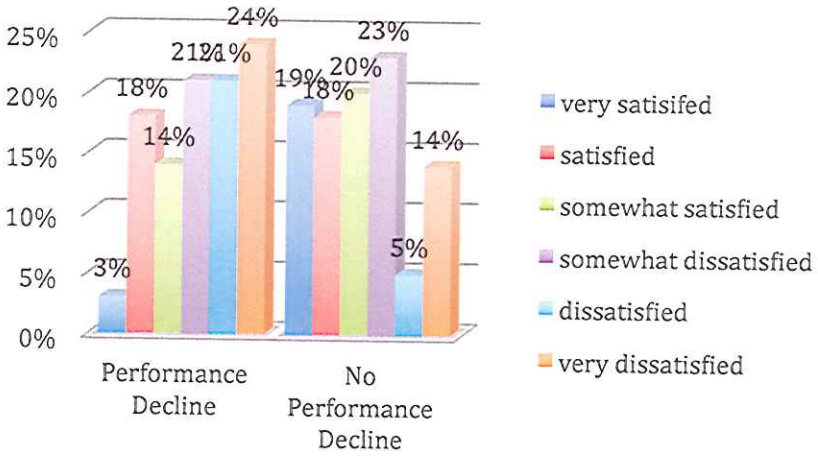


Chart 42

Satisfaction Level and by Performance Decline



Links to articles and resources related to Item 6 - Municipal broadband feasibility

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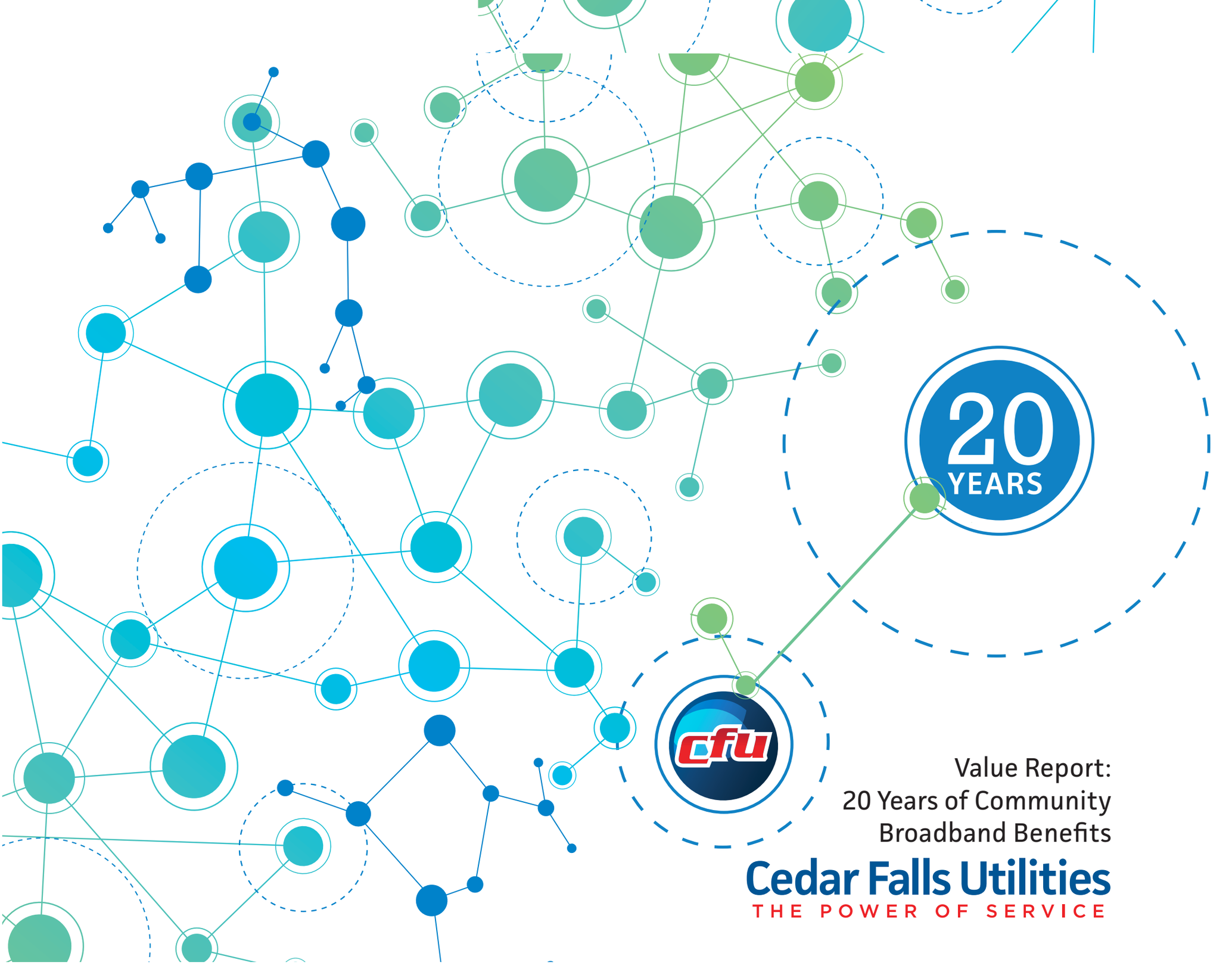
Facts about the Cedar Falls municipal broadband system:
https://www.cfu.net/about-cfu/truth

Municipal Broadband - Not a Walk in the Park:
https://schrier.wordpress.com/2015/01/25/municipal-broadband-not-a-walk-in-the-park/

How Cedar Falls Got Its Gigabit:
http://www.bbpmag.com/MuniPortal/EditorsChoice/0314editorschoice.php

Broadband Communities Magazine - Fiber To The Home (FTTH) Municipal Snapshots:
http://www.bbpmag.com/MuniPortal/snapshots.php

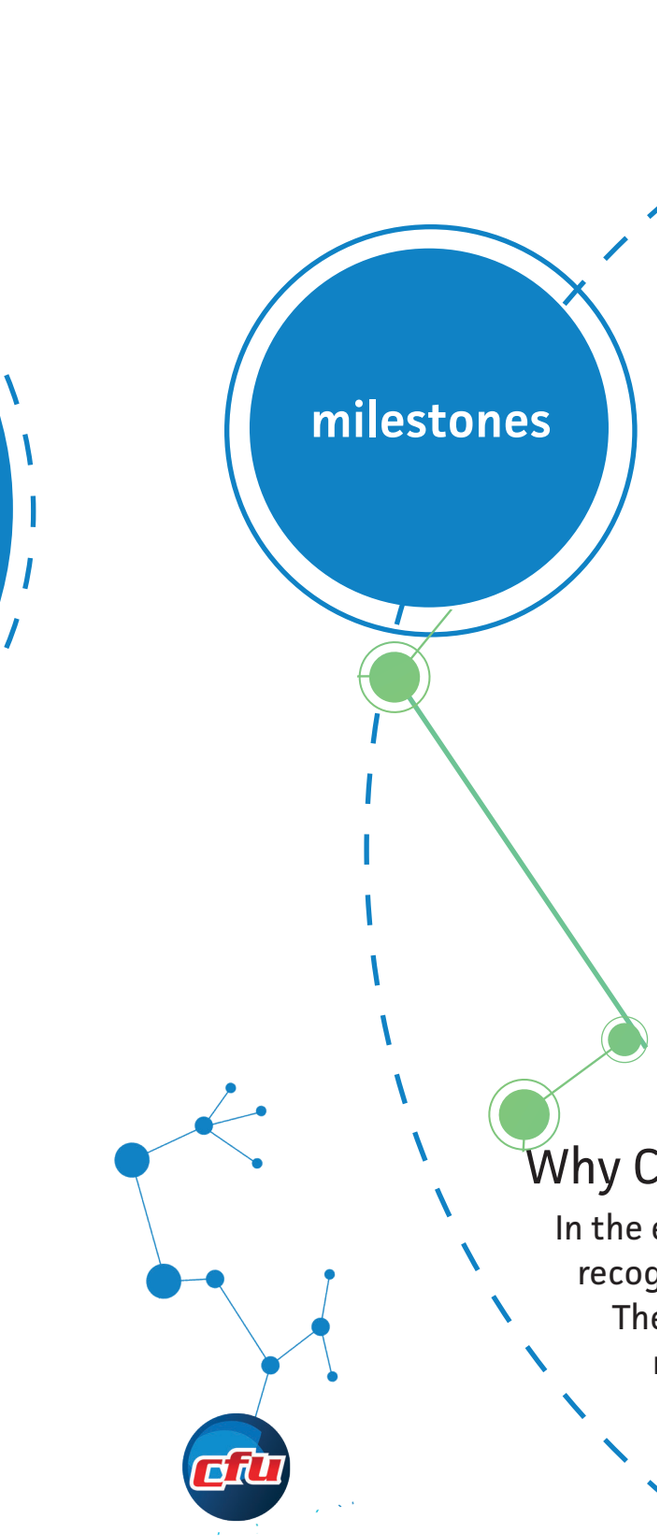
Broadband Communities Magazine - FTTH Financial Analyzers:
http://www.bbcmag.com/FTTHAnalyzer/



Value Report: 20 Years of Community Broadband Benefits

Cedar Falls Utilities

THE POWER OF SERVICE



Community Broadband Milestones

October 1994	Cedar Falls citizens vote to form a Municipal Communications Utility
July 1995	Groundbreaking for network construction
January 1996	First TV customer connected
February 1996	First business internet customer connected
May 1996	City-wide Hybrid Fiber-Coax network complete
January 1997	Cable modem internet service launch
November 2001	Digital TV launch
October 2003	High definition TV launch
August 2010	Fiber-to-the-premises upgrade kick-off
October 2012	Rural broadband expansion kick-off
May 2013	Fiber-to-the-premises upgrade complete city-wide
December 2013	Rural broadband expansion complete
October 2014	Google names Cedar Falls Iowa's top e-commerce city
May 2016	Telephone service launch

Why Cedar Falls built a community-owned network

In the early 1990s, residents wanted competitive choice for cable TV service, and leaders recognized high-speed internet service would soon be essential to the local economy. The telephone and cable companies that served Cedar Falls were not willing to invest in network upgrades. To get the services they wanted, citizens passed a broadband referendum with more than 70% approval, and tasked CFU with building and operating a community-owned network. During 20 years of service, CFU broadband has delivered the benefits promised to the community.

PROMISE
DELIVERED

Early Deployment to Homes, Businesses & Schools

Because of the municipal network, Cedar Falls was one of the first U.S. cities with widely available high-speed internet service.

CFU cable modem service was available city-wide four years before any private provider began offering broadband service.

Community Benefits

ECONOMIC GROWTH Leading edge broadband availability contributed to Cedar Falls' exceptional job growth. The city's Industrial and Technology Parks are now home to more than 7,000 jobs, up from about 1,200 in 1996.

HIGH ADOPTION RATES Early availability of affordable broadband lead to high adoption rates. In a city with about 15,500 households and 1,500 business premises, CFU has more than 14,900 active service locations as of July, 2016.

CUSTOMER SATISFACTION Nine of ten Cedar Falls broadband households choose service from CFU, according to research conducted by the University of Northern Iowa.

PROMISE
DELIVERED

Leading Edge Infrastructure

Broadband subscriber fees are used to fund system upgrades that keep CFU's network reliable and ready to meet growing customer needs.

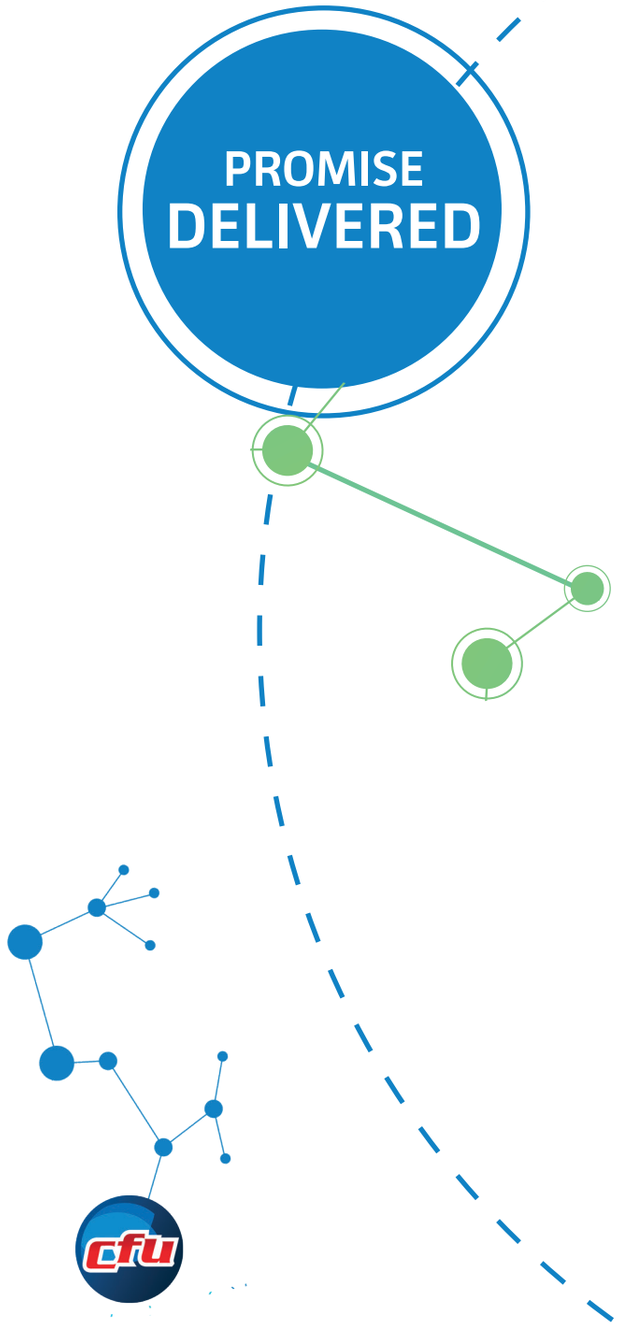
From 2010 to 2013, the entire community-wide network was upgraded to fiber-to-the-premises (FTTP), providing higher capacity and reliability. Diverse multi-path upstream connections were put in place to reduce outage risk.

Community Benefits

BUSINESS CLIMATE ADVANTAGE System upgrades have kept CFU's service ahead of the bandwidth and data transport needs of local businesses, enabling them to innovate, compete and grow.

SAME DAY SPEED UPGRADES CFU has offered gigabit connections in every corner of Cedar Falls since May, 2013. Today, most choose our 100 x 50 or 250 x 125 megabit per second (mbps) services. As their needs change, subscribers can upgrade anytime to gigabit service with no waiting, no appointment and no build out fee. Services faster than 1 gbps are readily available as custom solutions.

SUPERIOR RELIABILITY Redundancy and diversity in our external network means seamless service to our customers, even if an upstream provider is down.



Competitive, Economical Service Rates

As a community owned, not-for-profit service, CFU sets service rates as low as possible, but high enough to fully fund operating costs, capital expenditures and debt service.

Community Benefits

RATE SAVINGS Twice a year we compare CFU broadband and TV service rates to a group of 20 peer cities in Iowa. The most recent comparison shows that CFU subscribers save more than $4 million a year on these services, compared with the average peer-city rates.

COST BASED PRICING CFU's rates are lower than competing providers for similar service plans. Rather than charging as much as the market will bear to maximize shareholder profits, CFU's local Board of Trustees sets the lowest responsible rates, based upon operating and capital expenditure costs.

SERVICE PLANS DRIVEN BY CUSTOMER NEEDS Rather than push customers into higher-cost service plans, CFU offers a full menu of services from budget to premium. Our mission is meeting the full range of customer needs.

Self-Supporting Fee for Service Business Model

The Municipal Communications Utility is community-owned but not tax supported. Citizens who don't subscribe to CFU broadband services pay nothing to support the Communications Utility. The money subscribers pay for internet, TV and telephone services covers operating costs, capital expenditures and debt repayment.

Community Benefits

NO LOCAL OR STATE TAX SUPPORT Contrary to false information you may have seen elsewhere, there is no cost "to the public" for community broadband. The network is supported by user fees, not taxes. By supporting business growth, the Utility has helped bolster the community's tax base.

NO SUBSIDY FROM THE ELECTRIC, GAS OR WATER UTILITIES Contrary to false information published by groups that oppose municipal broadband, CFU's Communications Utility is not subsidized by the Electric, Gas or Water Utilities. The other utilities do not borrow money on behalf of the Communications Utility or guarantee or repay its bond debt.

LOCAL CONTROL OF SERVICE RATES A Board of Trustees composed of local citizens sets rates for all of CFU's services. They keep service rates as low as possible, while raising enough subscriber revenue to fully fund the Utility.

Prompt and Responsive Local Service

While competing service providers may take several days to connect services or fix problems, CFU's local crews are on call 24/7/365 to connect customers and keep them in service.

Community Benefits

SAME DAY SERVICE Internet service can be activated at nearly any Cedar Falls residence or business location with just a phone call on any business day.

FREE LOCAL TECH SUPPORT Customer support is provided seven days a week by our local Help Desk associates. In the rare event of a service outage, local crews are dispatched day or night, any day of the week.

CUSTOM BUSINESS SOLUTIONS CFU's network engineers work directly with local businesses to design internet access, networking and data transport solutions.

PROMISE DELIVERED

New Services to Meet Community Needs

During 20 years as a broadband provider, CFU has continuously expanded bandwidth capacity to stay in front of community-wide demand, which has often doubled from one year to the next.

Competing providers sometimes decline to extend service to new developments and neglect needed plant maintenance. CFU continues serving the entire community to put reliable, high capacity service within the reach of every home and business.

Community Benefits

TELEPHONE LAUNCH Because of customer demand, particularly from the business community, CFU launched phone service in May 2016.

RURAL EXPANSION In 2009, the federal government made funding available to broadband providers for rural service expansion. CFU received a one-time grant of $843,641 from the Department of Agriculture. This covered about 40% of the cost of extending fiber services to previously unserved areas outside the city limits. (Most federal broadband grants under this $7.2 billion program were received by private, for-profit phone and cable companies.)

SYNERGY WITH THE MUNICIPAL ELECTRIC UTILITY CFU's electric utility is able to connect through the broadband plant to smart meters and remote switching gear that save meter reading costs and help minimize outage time.

LEARN MORE

What is the cost to local taxpayers?

The Cedar Falls broadband utility is community-owned, but not tax supported. It is operated on a fee for service basis, and fully self-sustaining through subscriber revenue.

In a city with approximately 15,500 dwellings and 1,500 business premises, CFU currently serves more than 14,900 dwellings and businesses with high-speed internet, telephone and/or TV services. Subscriber revenues fund operating and equipment costs, as well as principal and interest payments on money borrowed to finance major capital projects. A chart of the broadband utility's profitability over the past 10 years is below.

How was the fiber optic upgrade financed?

From 2010 to 2013, Cedar Falls Utilities (CFU) upgraded its broadband infrastructure throughout the city, replacing hybrid fiber coax (HFC) with fiber to the premises (FTTP). The upgrade was funded with accumulated internal cash flow (set aside over several years in anticipation of this project) and borrowing that included $15.04 million of proceeds from Communications Utility Revenue Bonds. These bonds pledge Communications Utility revenue as the sole repayment source. The bonds are not guaranteed or backed by the city-owned electric, gas or water utilities, or by the taxpayers. CFU is on target to repay these bonds early, at their first call dates.

How does the broadband utility pay back its debt?

The Utility's local Board of Trustees sets service rates as low as possible, while generating the cashflow needed to fund operating expenses, capital expenditures and debt service. Principal and interest payments are made from operating income. The most recent 10-year financial summary is at the end of this report.

Did the city's electric, gas and water utilities take on debt to build the fiber optic plant?

No. The Communications Utility used accumulated operating cashflow and issued revenue bonds to fund the upgrade. The bonds are not backed by the city's taxing authority or by CFU's electric, gas or water utilities. More information appears above under the section titled "How was the Fiber Optic Upgrade Financed?"

Why is CFU's gigabit internet priced higher than Google's?

CFU's most popular business and consumer broadband plans are priced below **competing local providers.** Compared with the average cost in peer communities across the state, Cedar Falls residents save more than $4 million a year on internet and TV services.

Based upon publicly available information,* Google fiber services are priced below cost and subsidized by the company's other business enterprises. In summer 2016 Google announced a moratorium on additional fiber build-outs, and said it's exploring wireless rather than fiber connections going forward.

Unlike Google, CFU's fiber network is a self-supporting, fee for service business. To sustain leading edge fiber services in Cedar Falls for the long term, CFU sets prices as low as possible while covering the costs of providing service.

*As reported in the Wall Street Journal **here**.

Ten Year Financial Summary Cedar Falls Municipal Communications Utility

Year ended 12/31…	2007	2008	2009	2010	2011
Operating Revenue	$9,721,949	$10,995,281	$11,296,749	$12,198,451	$12,603,274
Operating Expenses	$7,529,287	$8,617,364	$8,924,913	$9,249,195	$11,917,381
Operating Expenses	$2,192,662	$2,377,917	$2,371,836	$2,949,256	$685,893
NonOperating Revenue (expense)**	$48,774	$29,456	$185,912	($187,046)	($226,359)
Net Income	$2,241,436	$2,407,374	$2,557,748	$2,762,210	$459,534

Year ended 12/31…	2012	2013	2014	2015	2016
Operating Revenue	$14,309,713	$15,725,113	$16,724,758	$17,575,519	$18,702,855
Operating Expenses	$13,199,728	$14,908,652	$13,508,999	$14,165,744	$14,564,143
Net Operating Income	$1,109,985	$816,461	$3,215,759	$3,409,775	$4,138,712
Non Operating Revenue (expense)**	$283,472	($122,895)	$127,761	$439,079	($55,561)
Net Income	$1,393,457	$693,566	$3,343,520	$3,848,854	$4,083,151

* Source: Audited annual income statements for the Municipal Communications Utility of the City of Cedar Falls, IA. 2016 numbers are pre-audit and will be updated if needed when audit is complete.

** Non-operating revenues include contributions in aid of construction, intergovernmental payments, interest income and miscellaneous items. Non-operating expenses are primarily interest on term debt.

JUNE 2014

From

UNDERSTANDING THE DEBATE OVER GOVERNMENT-OWNED BROADBAND NETWORKS:

Context, Lessons Learned, and a Way Forward for Policy Makers

Cedar Falls Case Study

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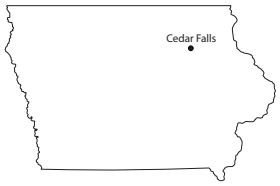
Cedar Falls, Iowa

The municipal broadband network in Cedar Falls, Iowa, is one of the oldest in the country. First deployed in the mid-1990s, this GON evolved from a traditional cable broadband system, built atop a hybrid fiber/coaxial infrastructure, to one that is transitioning to all fiber-optic.

Though it has survived for several decades, the Cedar Falls model may be difficult for other localities to replicate. In its push to modernize and join the ranks of other "gig cities," Cedar Falls assumed a significant amount of debt with limited evidence that consumers wanted ultra-fast Internet connections. As a result, the system has experienced some financial volatility, which has led to a credit downgrade. It remains to be seen whether the benefits of this network will justify the significant costs associated with this municipality's ambitious expansion plans.

Cedar Falls, Iowa At-A-Glance



City Population: 39,993 (2012)

Year of Network Launch: Mid-1990s

Current Status: Partially Built

Number of subscribers: 17,000

Revenues: $14.3 million

Operating Expenses: $13.2 million

Note: Additional information on the Cedar Falls network is contained in Table 1 and in Appendix I.

Background

Cedar Falls Utilities (CFU) began to explore the feasibility of building a municipal communications network in the early 1990s.[1] After two years of study, the Cedar Falls City Council established a Municipal Communications Utility and transferred authority to the CFU Board of Trustees.[2] The project began in earnest after the issue was put before voters in 1994.[3] Seventy-one percent voted in favor of deploying a GON that would be managed and controlled by the CFU Board of Trustees.[4] Voters also approved a $3 million bond issuance to finance the project.[5]

At first, the network offered only cable service,[6] but by 1997, the utility began to offer Internet service via CyberNet, a 10 Mbps citywide Ethernet network.[7] At that point, the network was composed of hybrid fiber/coaxial (HFC).[8] In 2010, CFU began to replace the coaxial portion of its network with fiber and started to extend the fiber directly to homes and businesses.[9] This upgrade eventually allowed CFU to offer 1 Gbps speeds to customers.[10]

Cost and Financing

Deployment of the initial HFC network was funded by a $3 million bond issued in 1995 (it matured in 2008).[11] The upgrade to fiber and expansion of the network were slated to cost $17 million.[12] In 2009, Cedar Falls began to borrow funding for these purposes by issuing a general obligation bond for $2,320,000.[13] The bond matures in 2024 and has a rising interest rate that begins at .075 percent and increases throughout the bond's life to 3.80 percent in the final year.[14]

Cedar Falls can repay this general obligation bond through any mechanism, including its taxing powers.[15] In 2010, Cedar Falls assumed additional debt to further fund the project when it borrowed $13,130,000 using communications utility revenue capital loan notes,[16] which carry an interest rate of three percent and mature in 2024.[17] This debt was secured by a first lien on revenue from the communications

utility.[18] The GON also benefited from loans from the electric utility, totaling over $2 million by the end of 2011,[19] and grants from the federal government, totaling $877,433, in support of network expansion to previously unserved areas.[20] As of the end of 2012, the total annual cost of operating the GON was $13,199,726, up from $8,924,912 in 2009.[21] Maintenance and system operation cost $8,009,105 and sales, customer service, and corporate operations totaled $2,999,629.[22]

The Network

CFU's FTTH network is 95 percent complete.[23] The new gigabit system was switched on in May 2013.[24] This GON offers only broadband Internet access and television services, not telephone. Customers also have access to CFU's wireless hotspots, which are available in parts of downtown Cedar Falls.[25] In terms of specific offerings, services include a stand-alone asymmetrical 2 Mbps connection for $29.95 a month ($34.95 for rural customers), a 30 Mbps asymmetrical connection for $64.50 per month ($69.50 for rural customers), and a 1 Gbps asymmetrical connection for $265 a month ($270 for rural customers).[26] Prices for business consumers are substantially higher (e.g., $950.00 per month for 1 Gbps in the city, $990 per month in rural areas).[27] CFU also makes available lit or dark dedicated fiber connections between customer-owned facilities, and wholesale bandwidth for other ISPs.[28]

Over the last decade, the financial viability of the GON in Cedar Falls has fluctuated. The system rarely generated revenues to cover its total costs in the years before its upgrade,[29] and over the last few years, while total operating revenues exceeded total operating expenses, operating expenses continue to grow at a fast pace.[30]

Community Impact

There are a number of positive impacts that have resulted from the GON in Cedar Falls which are often cited by CFU proponents and GON supporters.[31] The utility estimates its customers pay about $200 less each year for their Internet service than residents in neighboring "peer communities" in Iowa do.[32] As of May 2013, CFU accrued about 11,600 total subscribers,[33] but without knowing the types of connections these customers purchased, it is difficult to determine whether the significant costs associated with upgrading its network to all-fiber are delivering value to customers—and the city generally—in excess of these reported savings. With anecdotal evidence suggesting very few customers opt for CFU's fastest speed tiers, it can be argued that the costs of building this GON outweigh the benefits that may stem from it.[34]

Evidence that the GON spurred economic development and job creation is limited. A study from the early 2000s found that, while the presence of the GON appeared to play some role in influencing several firms to relocate to Cedar Falls, it was just one of many, arguably more important factors, making it difficult, if not impossible, to "verify that these developments [were] the direct result of the City's broadband delivery system."[35]

CFU supporters and GONs advocates argue that the city's investment in its fiber upgrade has had positive impacts on its credit rating.[36] However, Moody's recently downgraded its bond rating from A1 to A3.[37] Moody's reasoned that CFU's debt is becoming increasingly illiquid, the network is highly leveraged (due mostly to its fiber expansion), and the network lost several major customers to competitors in recent years.[38] These challenges will be difficult to overcome as incumbents begin to leverage their nimbleness and compete more vigorously with CFU, especially on the price for higher-speed tiers.[39]

Assessment

The huge cost and long-term debt associated with the municipal fiber system in Cedar Falls raise questions about opportunity costs and whether such substantial resources have been invested wisely. Such uncertainty gains additional primacy when viewed in light of other priorities competing for funding at the local level.

Recent debate over the town budget for fiscal year 2014 highlighted several of these.[40] Much to the dismay of many residents, the local government approved a property tax increase for the coming year.[41] Some of these revenues might have been used to pay for a new highway interchange,[42] highlighting another important trade-off that policy makers make when they elect to deploy a GON.[43]

Infrastructure Needs in Iowa

Public infrastructure throughout the state requires significant attention—nearly half of the roads in the state are of poor or mediocre quality; more than a quarter of its bridges are structurally deficient or functionally obsolete; and nearly $15 billion is needed to meet school, drinking water, and wastewater infrastructure needs.

Endnotes

1 *See* Doris J. Kelley, *A Study of the Economic and Community Benefits of Cedar Falls, Iowa's Municipal Telecommunications Network*, 2, Oct. 2. 2003, Cedar Falls Utilities, *available at* http://www.lus.org/uploads/AStoryofTwoCities.pdf ("*Study of the Economic and Community Benefits*").
2 *Id.*
3 *See City of Cedar Falls, Iowa $3,000,000 General Obligation Bonds, Series 1995B*, at p. 6, Electronic Municipal Market Access, Municipal Securities Rulemaking Board (June 9, 1995), *available at* http://emma.msrb.org/MS111001-MS86309-MD167913.pdf ("*Cedar Falls $3,000,000 General Obligation Bonds, Series 1995B*").
4 *Id.*
5 *Id.*
6 *Study of the Economic and Community Benefits* at p. 2.
7 *Id*. at p. 3.
8 *Id*.
9 *See* John Molseed, *CFU Adds Fiber Optic Links to All Customers*, June 13, 2010, WCF Courier, *available at* http://wcfcourier.com/news/local/article_4cccdbd5-1341-594a-bb4c-701305cd218b.html?mode=story ("*CFU Adds Fiber Optic Links*").
10 *See, e.g.,* Jon Ericson, *Cedar Falls Joints Elite 'Gigabit City' List*, May 8, 2013, WCF Courier, *available at* http://wcfcourier.com/business/local/cedar-falls-joins-elite-gigabit-city-list/article_588684f4-4750-54c9-8c49-48fd5b891ba1.html.
11 *Cedar Falls $3,000,000 General Obligation Bonds, Series 1995B* at p. 6.
12 *CFU Adds Fiber Optic Links.*
13 *See City of Cedar Falls, Iowa, $2,320,000 General Obligation Capital Loan Notes, Series 2009B*, Electronic Municipal Market Access, Municipal Securities Rulemaking Board (Nov. 30, 2009), *available at* http://emma.msrb.org/EP357783-EP282175-EP677366.pdf.
14 *Id*. at p. 13.
15 *Id.* at p. 2.
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17 *Id*. at p. 19.
18 *Id*. at p. 1.
19 *See Financial Statements of the Municipal Electric, Gas, Water, and Communications Utilities of the City of Cedar Falls, Iowa, For the Year Ending Dec 31, 2011*, at p. 28, Cedar Falls Utility (March 2012), *available at* http://auditor.iowa.gov/reports/1223-0046-C000.pdf ("*Financial Statements For the Year Ending Dec 31, 2011*").
20 *See Advancing Broadband: A Foundation for Strong Rural Communities*, at p. 29, Rural Utilities Service, U.S. Dept. of Agriculture (Jan. 2011), *available at* http://www.rurdev.usda.gov/supportdocuments/RBB_report_whole-v4ForWeb.pdf.
21 See *Financial Statements of the Municipal Communications Utility of the City of Cedar Falls, Iowa*, *Including Independent Auditor's Report, For the Years Ended Dec. 31, 2012 and 2011*, at p. 3, Cedar Falls Utility (April 4, 2013), *available at* http://emma.msrb.org/EP760639-EP589987-EP991542.pdf ("*CFU Auditor Report, For the Years 2011 and 2012*"). *See also Financial Statements For the Year Ending Dec 31, 2011* at p. 3.
22 *See CFU Auditor Report, For the Years 2011 and 2012* at p. 3.
23 *See* CFU, Internet, http://www.cfu.net/cybernet/default.aspx.
24 *See CFU Launches Gigabit Internet Service*, May 28, 2013, Cedar Falls Times, *available at* http://www.communitynewspapergroup.com/cedar_falls_times/news/article_09479d64-c7ca-11e2-80e2-0019bb2963f4.html ("*CFU Launches Gigabit Internet Service*").
25 *See* CFU, Free Wi-Fi Zones, http://www.cfu.net/cybernet/wifi.aspx.
26 *See* CFU, Internet—Residential Services, http://www.cfu.net/cybernet/residential-service.aspx.
27 *See* CFU, Internet—Business Services, http://www.cfu.net/cybernet/business-service.aspx.
28 *See* CFU, Internet and Fiber Services, http://www.cfu.net/customer-service/commercial-services/fiber-services.aspx.
29 *See, e.g.,* Ronald Rizzuto, *Iowa Communications Systems: The Financial Track Record,* Heartland Institute (Sept. 2005), a*vailable at* http://heartland.org/sites/all/modules/custom/heartland_migration/files/pdfs/17724.pdf.
30 *CFU Auditor Report, For the Years 2011 and 2012* at p. 6.
31 *See* CFU, Community Benefits, http://www.cfu.net/about/community-benefits.aspx.
32 *See CFU Residential Report Card for the Period of June 2012—May 2013,* CFU, *available at* http://www.cfu.net/webres/File/RPT_card.pdf.
33 *CFU Launches Gigabit Internet Service.*
34 *See, e.g., id.* (noting that these speeds will be attractive mostly to business customers in the short term). *See also* Steve Donohue, *Iowa City Charging $275 Monthly for 1-Gig Broadband Service*, May 29, 2013, Fierce Cable, *available at* http://www.fiercecable.com/story/iowa-city-charging-275-monthly-1-gig-broadband-service/2013-05-29 (noting that there is little demand for the 1 Gbps service at this point in time).
35 *See* Doris Kelley, *A Study of the Economic and Community Benefits of Cedar Falls, Iowa's Municipal Telecommunications Network*, at p. 12, Iowa Association of Municipal Utilities (July 2004), *available at* http://www.baller.com/pdfs/cedarfalls_white_paper.pdf.
36 *See,e.g.,* Christopher Mitchell, *Cedar Falls Utility Gets High Bond Rating from Moody's*, March 19, 2013, Community Broadband Networks, Institute for Local Self-Reliance, *available at* http://www.muninetworks.org/content/cedar-falls-utility-gets-high-bond-rating-moodys.
37 *See* Soo Yun Chung, *A3 Rating Applies to Approximately $13 Million Senior-Lien Revenue Debt Outstanding*, March 8, 2013, Moody's Investor Services, *available at* http://www.moodys.com/research/Moodys-downgrades-to-A3-from-A1-the-rating-on-Cedar--PR_268153 ("*A3 Rating Applies to Approximately $13 Million Senior-Lien Revenue Debt Outstanding*").
38 *Id.*
39 *See, e.g.,* Jeff Baumgartner, *Mediacom Faces 1 Gig Pressure in Iowa*, May 30, 2013, Multichannel News, *available at* http://www.multichannel.com/distribution/mediacom-faces-1-gig-pressure-iowa/143570.

40 *See* Tina Hinz, *Cedar Falls Budget Hearing Set for Feb. 25*, Feb. 18, 2013, WCF Courier, *available at* http://wcfcourier.com/news/local/cedar-falls-budget-hearing-set-feb/article_7771e49b-33a6-568c-b35f-b08c11339daa.html.

41 *See* Tina Hinz, *Cedar Falls Council Oks Budget; Tax Hike Irks Residents*, Feb. 26, 2013, WCF Courier, *available at* http://wcfcourier.com/news/local/govt-and-politics/cedar-falls-council-oks-budget-tax-hike-irks-residents/article_6cd83257-6fe2-5894-8cf1-eacaa93581ff.html.

42 *Id.*

43 *See* ASCE Infrastructure Report Card 2013, States—Iowa, http://www.infrastructurereportcard.org/a/#p/state-facts/iowa.

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About The Advanced Communications Law & Policy Institute

The Advanced Communications Law & Policy Institute (ACLP) at New York Law School is an interdisciplinary public policy program that focuses on identifying and analyzing key legal, regulatory, and public policy issues facing stakeholders throughout the advanced communications sector. ACLP's mission is to promote data-driven and solution-focused dialogues amongst local, state and federal policy makers, academe, consumers, service providers, and the financial community concerning changes to the regulatory regimes governing wireline, wireless, broadband, and IP platforms. Recent research has focused on modernizing communications regulations at the federal, state, and local levels, identifying barriers to more robust broadband adoption in key demographics and sectors, and public policy strategies to spur innovation and investment in broadband.

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BROADBAND FEASIBILITY ANALYSIS UPDATE

Brieana Reed-Harmel, Broadband Project Manager

John Honker, Magellan Advisors

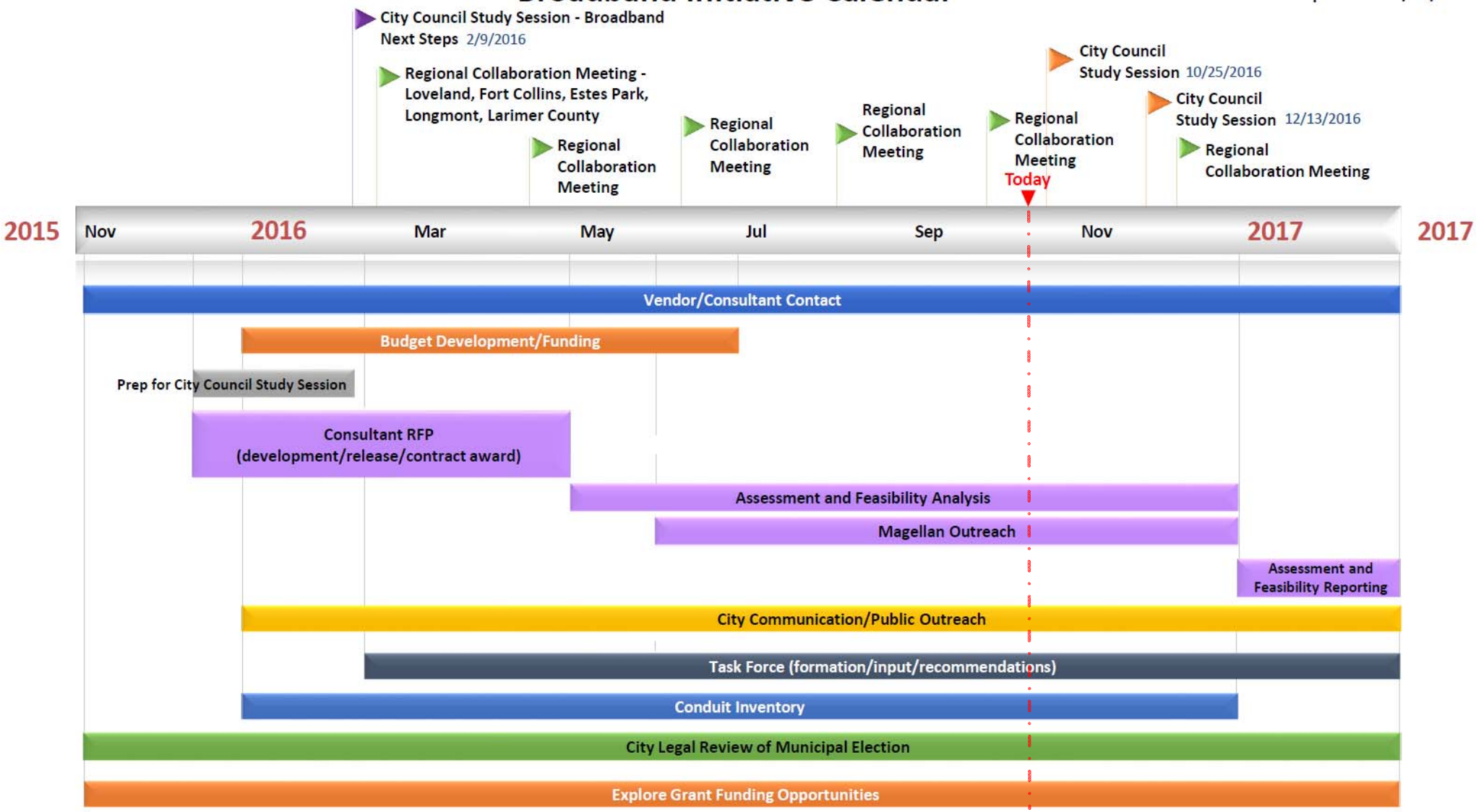
October 25, 2016

Magellan ADVISORS

City of Loveland

Broadband Initiative Calendar

Updated: 10/18/2016



LEARNING OBJECTIVES

1. Types of broadband services available in Loveland currently
2. How Loveland is currently served
3. Broadband issues reported by the community
   - Residential, small & medium commercial, large commercial, community anchors
4. Broadband needs of community interest groups
   - City, Utilities, Economic Development, Fire & Rescue, Police
5. Root causes of broadband issues
6. Community sentiment regarding a City-provided broadband service
7. Municipal business models used to improve the broadband environment

COMMUNITY ANCHOR ORGANIZATIONS

Organization Type	Broadband Needs
Schools	Adequate connectivity but growth requires upgrades and more redundancy
Healthcare	Need more affordable options
Fire & Rescue	Additional redundancy to support self-sufficiency and emergency preparedness
Police	Wireless needs across City to support proactive monitoring of incidents and faster connectivity for field operations
Parks & Recreation	Redundancy and connectivity at outlying locations

INITIAL SURVEY RESULTS

Residential Surveys: 886 households responded online – Non-adopter paper survey is being collected currently

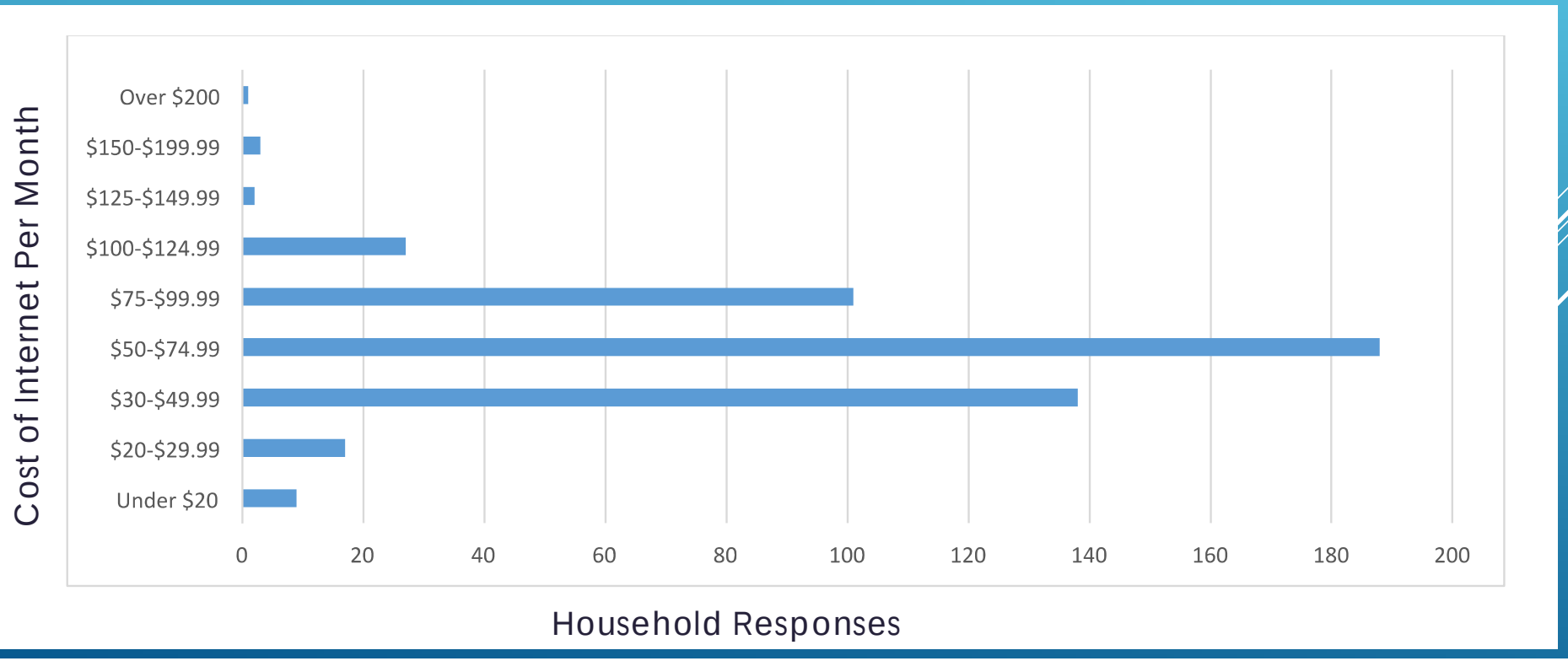
- 98.8% Have internet service at home
- 61.2% Subscribe to cable
- 23.3% Subscribe to mobile or fixed wireless
- 26% Subscribe to DSL
- 0% Subscribe to fiber

Business Surveys: 172 businesses responded – Phone campaign is being performed to solicit more business response

- 97.2% Have internet service at their business
- 60% Subscribe to cable
- 26.8% Subscribe to mobile or fixed wireless
- 22.5% Subscribe to DSL
- 5.6% Subscribe to fiber

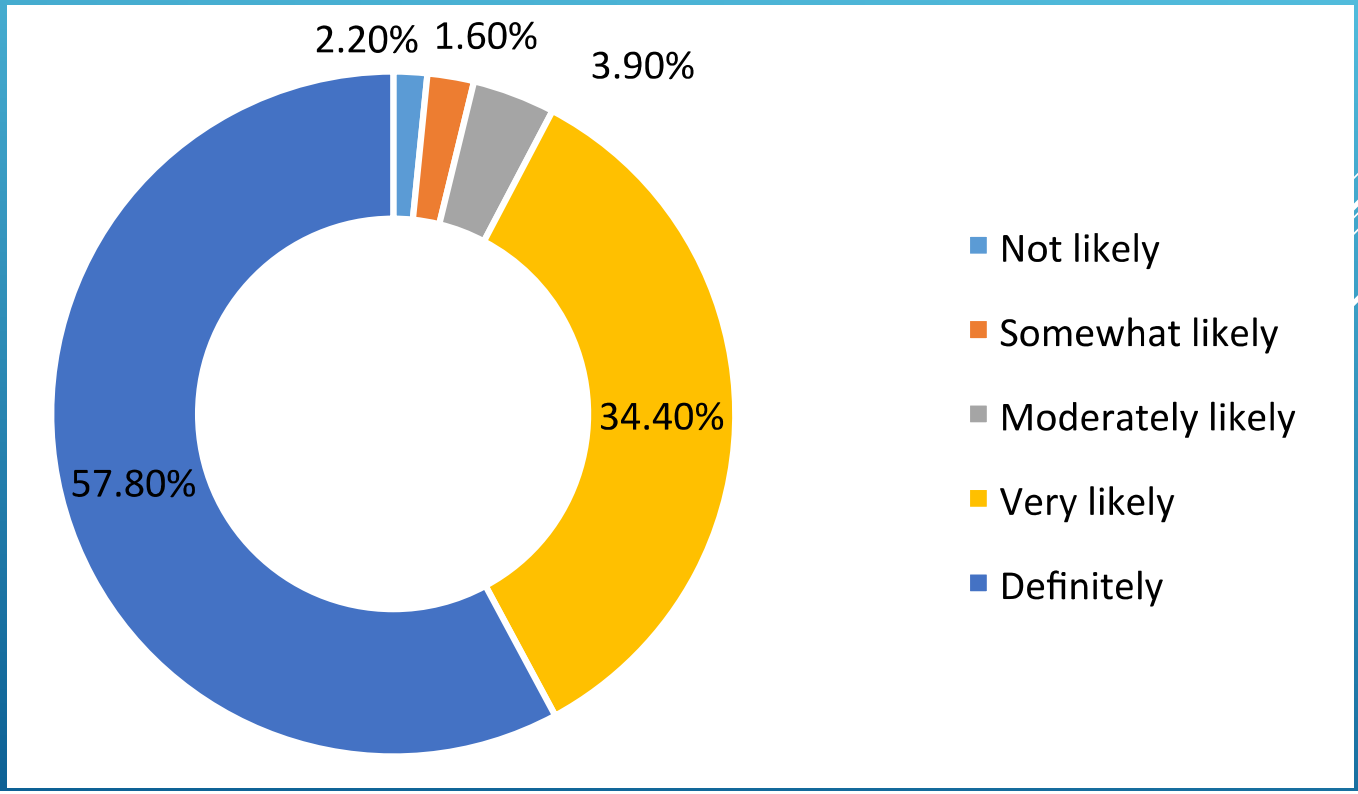
RESIDENTIAL INTERNET SERVICES

1. **About 75% of Loveland households pay between $50 - $100 per month**
2. **For that cost, they receive on average of 60 Meg download**
3. **Actual downloads average around 44 Meg**



RESIDENTIAL INTERNET SERVICES

1. **On a scale of 1-10, 96.1% of households ranked the importance of Internet as an 8 or higher**
2. **92.2% of households would definitely or very likely subscribe to a City-provided Internet service**



BUSINESS INTERNET SERVICES

1. **56.5% of households say needs are not currently met**

2. **Of these, 77.8% said prices were too high, 56.1% said speeds were not fast enough**

3. **58.1% said current services were reliable**

Household Internet Satisfaction Levels

	Not Satisfied ---------- Completely Satisfied						
	1	2	3	4	5	6	Trend
Price	19.6%	23.5%	24.9%	21.1%	8.2%	2.5%	

COMMON BROADBAND THEMES IN LOVELAND

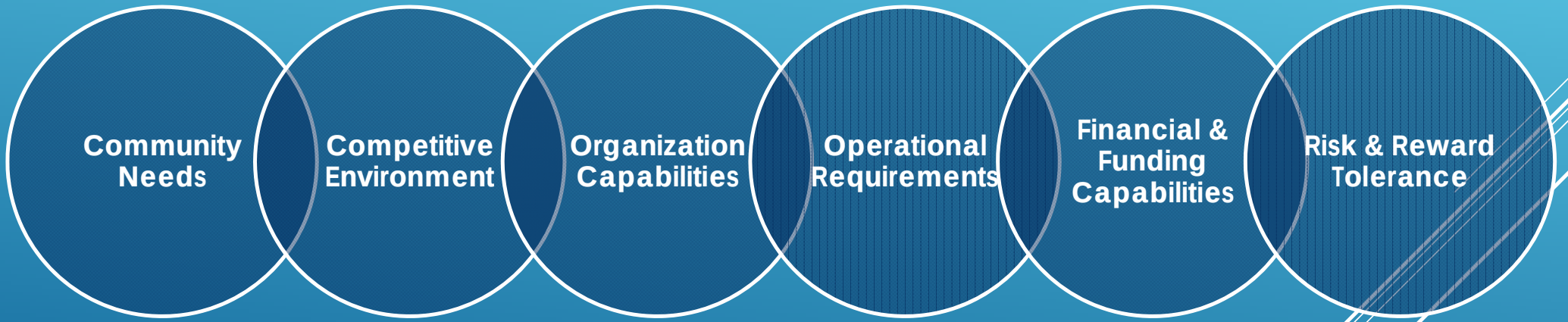
Consumer Perceptions

- Cost too high for services received
- Few providers = lack of choice
- Lack of redundancy for business users
- Uncertainty: Will future needs be met?

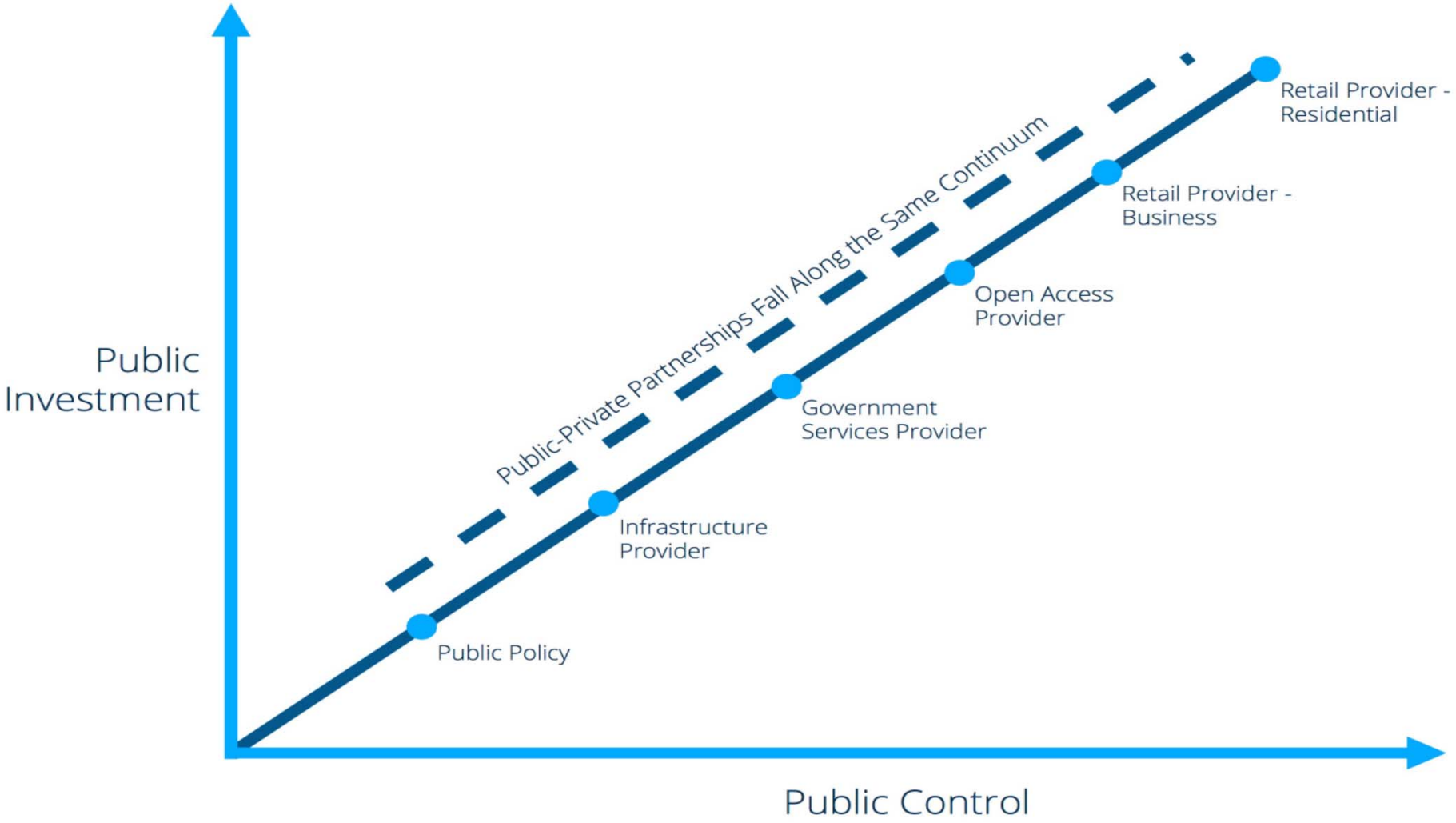
Influence on Feasibility Study

- Loveland should focus on driving value, especially for the prime small/medium business market
- Third provider would introduce additional choice to City's broadband environment
- Market exists for network that provides redundancy to businesses, institutional users in key areas.
- Should the City play a role in ensuring that future stakeholders' needs are met?

INPUTS TO SELECTING THE RIGHT BROADBAND BUSINESS MODEL



CHOOSING THE RIGHT MIX OF RISK, REWARD AND CONTROL



BROADBAND BUSINESS MODELS EMPLOYED BY MUNICIPALITIES

Business Model	Description	Examples	Summary
Public Policy Only	• City uses policy tools and standards to streamline construction and reduce the cost of building infrastructure.	• Santa Cruz County, CA • Knoxville, TN	• Low risk/reward option to support incentives to accelerate broadband investment but no "quick wins" to improve services
Public Services	• City financed or shared financing with other public organizations • Dark fiber or data services to community organizations • Sometimes retail services provided by the city to these organizations	• Seminole County, FL • Leesburg, FL • Columbia County, GA	• Improves the cost, access and collaboration among public organizations without forcing the city to compete with private broadband providers
Open Access	• City financed and operated • Wholesale services only to retail broadband providers • Retail providers deliver Internet, telephone, and other services	• Palm Coast, FL • Danville, VA • Provo, UT	• Enables more competition and choice but difficult to incentivize broadband providers to use municipal infrastructure

BROADBAND BUSINESS MODELS EMPLOYED BY MUNICIPALITIES

Business Model	Description	Examples	Summary
Infrastructure	• City provides conduit and/or dark fiber to businesses, broadband providers, and other public organizations • City does not provide retail services	• Santa Monica, CA • Palo Alto, CA • Lakeland, FL	• Improves the cost and availability of fiber infrastructure to providers, businesses, and community organizations, not generally used for residential
Municipal Retail – Business Only	• City financed and operated • Fiber services • Internet and often telephone and data services to businesses	• Fort Pierce, FL • Hudson, OH	• Enables the city to directly improve services to businesses but requires the city to compete with broadband providers and operate the network.
Municipal Retail – Residential	• City financed and operated • Fiber and sometimes cable services • Internet and often television and telephone to residents and businesses	• Bristol, VA • Morristown, TN • Ashland, OR	• Enables the city to provide major improvements to residential services but requires significant investment and operational capabilities.

LEARNING OBJECTIVES CONCLUSION

1. Types of broadband services available in Loveland currently
2. How Loveland is currently served
3. Broadband issues reported by the community
   a. Residential, small & medium commercial, large commercial, community anchors
4. Broadband needs of community interest groups
   a. City, Utilities, Economic Development, Fire & Rescue, Police
5. Root causes of broadband issues
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7. Municipal business models used to improve the broadband environment

QUESTIONS?

Magellan ADVISORS

City of Loveland