

**CITY OF NEWARK
DELAWARE
COUNCIL WORKSHOP MEETING MINUTES
October 7, 2015**

Those present at 7:00 p.m.:

Presiding: Mayor Polly Sierer
District 1, Mark Morehead
District 2, Todd Ruckle
District 3, Rob Gifford
District 4, Margrit Hadden
District 6, A. Stuart Markham

Absent: District 5, Luke Chapman

Staff Members: City Manager Carol Houck
City Secretary Renee Bensley
Community Affairs Officer Ricky Nietubicz
Deputy City Manager Andrew Haines
IT Manager, Joshua Brechbuehl

-
1. An open house on municipal broadband took place from 5:00-7:00 p.m. prior to the start of the workshop. A quorum of Council was not present until shortly before the workshop start at 7:00 p.m.
 2. The Council workshop on municipal broadband began at 7:00 p.m. in the Family Life Building at the Church of the Nazarene.
 3. Ms. Houck welcomed everybody to the Municipal Broadband Feasibility Study Workshop and introduced Mayor and Council. She noted this was the start of the City's education on municipal broadband and that several residents, Len Schwartz and Ralph Begleiter, had brought the topic to the forefront. This meeting was likely to be the first of many on the topic. Mr. Brechbuehl completed the City's initial research and met with residents. With the support of Mayor and Council, those efforts led to this meeting where possibilities would be presented and questions would be answered with the goal of determining the City's initial direction. She noted that while many were eager to explore municipal broadband options, it was important to fully grasp the undertaking and learn from the experience of other communities with an eye towards making future decisions based on what was best for Newark. Ms. Houck then outlined the format for the evening's meeting and noted where copies of the presentation could be found.

Ms. Houck introduced the consultant, Mr. Andrew Afflerbach, Ph.D., P.E., CEO and Director of Engineering at CTC Technology and Energy. Mr. Afflerbach specialized in planning, design, and the implementation of communication, infrastructure and networks. His expertise included emerging fiber and wireless technologies and state-of-the-art networking applications including his oversight and implementation of a wide variety of government and public safety networks. He was considered nationally to be one of the United States' foremost municipal broadband experts.

Mr. Afflerbach thanked all for the opportunity to discuss broadband in Newark. He stated he has had some good conversations already with a number of the people in the public and the elected officials. He gave an overview of the evening's presentation and reported that he has worked with hundreds of city and state governments and that no one is quite the same. He noted there would be some examples and comparisons offered of cities similar to Newark.

Mr. Afflerbach stated his company, CTC Technology had been in the business arena for 30 years. They started working with cities, what was then cable TV franchising, then moved into the broadband service. The company had been involved in public safety

communications and in projects that had been involved in getting broadband to underserved areas at a fair cost.

He stated his partner, Joanne Hovis, is somebody who was very prominent in the policy and business planning space. He was the lead in the technical area.

He stated he had a list of some cities and projects that were relevant to what was proposed in Newark. San Francisco was a city where about seven years ago they looked at serving fiber to the home. They were in an environment where Comcast did not invest in much and the phone company was not going to go anywhere as far as fiber. They looked at what would be a city driven approach to being a city provider. This was the largest city where his company had done this kind of work.

Seattle is similar but, like Newark, they were a city utility. This was important to consider, the good amount of benefit that Newark would have both in terms of cost and capabilities being a city utility.

His company has been working with DELDOT for approximately twenty years. They did their initial buildout of a fiber optic backbone. Also, with other departments in the state where they were basically the keystone infrastructure provider to other state agencies that then operated the electronics and systems over the top of that.

There were university cities like Newark: Madison, Boulder, and Santa Cruz. They were different size communities with different considerations. In Madison, it was a larger city and a larger university. It was also a city that was relatively far from Milwaukee and Chicago, the large metro areas. They had gotten distinctly less service from the cable companies and phone companies.

Santa Cruz had some similarities because of its smaller size relative to Madison. It was a bit more comparable to the City of Newark. Also the scale of the University relative to the city was relatively similar. In Santa Cruz, CTC was involved in a process where the City was negotiating with a private partner to do a public-private partnership and fiber build over the entire city.

The City of Boulder was a little bit better served by the cable company and the phone company. However, they were doing something quite interesting. They were not a public power utility right now, but they were looking at municipal power. That was going to potentially provide opportunities for them to provide broadband services. CTC was working with them on business planning.

He asked how many present were Comcast and Verizon subscribers. The audience indicated there were many of each. Mr. Afflerbach indicated the proposed service was not being considered as cost based, or for performance, and just not the offerings that were there were not exactly what residents wanted. He indicated there was some sort of service available. If residents were entirely happy with the service they currently were getting, they probably would not be at this workshop.

In terms of technologies, Mr. Afflerbach showed a chart with the wireline and wireless technology speeds available in Newark. He was not certain what terminology the audience was familiar with, but noted that dial-up was 1/50 of a megabit and speeds increased from there.

Mr. Afflerbach stated from his presentation (copy entered into the record) that there were many different speed capabilities. In Newark, if a resident had Comcast wired service, they had the capability of going up to a 200MB service although, for cost and other reasons, most people are a little bit toward the middle of that.

Fiber service was not something that was everywhere. The City was fortunate to have fiber to the home here as an option at all as most of the country did not have it.

Verizon FiOS offered limited speeds. It would not be difficult for them to offer 1GB or faster. They did offer faster speed in select cases if the customer wanted to pay for upgraded service. It was not something they marketed and generally made available.

Mr. Afflerbach stated he understood there was city provided Wi-Fi with speeds up to 500MB, which was the kind of speed a resident would get if they had Wi-Fi within their house where they owned the access box and connected. To get this kind of speed on a citywide basis, a whole lot more fiber would need to be added to the current City Wi-Fi. Wi-Fi, to really work had to be connected back to fiber. Fiber made wireless work.

LTE was the technology that AT&T, Verizon, Sprint and T-Mobile use. It had a lot of capability. They would have "new generations" that took users to a higher speed. He predicted many more wireless towers and antennas in the future and noted that was something else to consider in the City.

He stated he had spoken with a few residents that were using their phones as their primary internet. As most were aware, there was a cap on the amount of data a customer could use per month which limited a lot of what people could do even if they got the sufficient speed from the wireless.

Mr. Afflerbach stated that was a brief overview of the technology. In a nutshell, fiber was really where the speed was, and was the ticket to getting into gig.

Comcast was going to be developing this 3.1 technology. They were going to amp it up to high speeds, a speed that many would be completely satisfied with. The way that Comcast was going to get this speed, was in part by building more and more fiber. Just like in the wireless case, the way to get to these higher speeds was by somehow putting more and more fiber in the network.

An example of what could be done with more and more speed would be a 5GB file, which was about the size of a movie in HD format all the way through. He noted with the advent of telemedicine and online education, those who may not need that capability now, could need it or something similar in the future. Other examples were uploading photos or movies from a vacation, cloud backup, etc.

With a garden variety network connection, such as the Comcast connection most people had, it took ten minutes to download the movie and over an hour to upload that size file. That would be state-of-the-art for a wired connection. However, with a Google fiber subscriber all that could happen in seconds. That was a drastic difference, going from ten minutes or over an hour to seconds. Again, a lot of people might not really need that kind of speed but it was something that was definitely coming down the road. It gave a sense of what one was able to do not just in labs but in regular places in the country.

Economic development benefits were also front and center with many people. Currently municipal broadband was just at the beginning. Anyone who worked in economics knows that there needed to be a pretty long baseline to get something considered to be a good result.

This was preliminary information. One survey in the materials looked at fiber to the premises communities. In other words, Newark was already here. It was not 1GB here. 1GB would be potentially more. In a fiber to the premises community, the value on a \$300,000 house is \$5000 more. That was based on surveys of various types of homebuyers and what the preference was. As cities went to 1GB, values could be potentially higher than that, but there was much shorter history with 1GB.

Mr. Afflerbach noted potential benefits in terms of bond ratings of cities. Kansas City, Kansas was not a poor city but was not considered affluent. Most recently, their bond rating was now AA and A+, which was not as high as Newark. Part of why that the rating agency was rating them at that level was cited as the Google fiber network. Most of the information right now was anecdotal but was all pointing in the right direction as fiber being one of the many reasons people and businesses were attracted to cities.

Mr. Afflerbach suggested looking at this incrementally because very few cities want to jump in all the way initially and he generally did not recommend that. A lot of cities that CTC worked with, particularly those with municipal power, had a lot of reasons to go into the fiber realm, get familiar with it and go from there. The goal could be to look at the current landscape and improve it a bit taking cost and performance into account. A certain level of fiber build might be enough to do certain things and then could be a catalyst for other things.

The first step would be to look at the backbone of fiber optics that would connect city facilities and business parks back to someplace such as the information interstate which essentially would be Level III. There were already backbone providers that went out of the city the same way that the rail lines and I-95 did. A limited fiber build with limited investment could be one possibility which would get some of these expensive services improved by the cost and performance.

The next step for many cities was to look at bigger customers that had very data intensive needs, were paying very high costs and were highly critical, such as hospitals, schools and libraries, which had been identified by the administration and the FCC as a core need with funding available from the federal government to support that buildout.

Another alternative was to work with a private provider to leverage ways that the E-rate rules worked or the City could build the fiber and lease it to private providers, making the city a wholesaler. The outcome was that there would be some revenue for the city, some improvement to the competition for core subscribers, and the private sector was still in the game.

Another approach was to look at target areas and do a citywide buildout to some of those areas through the City's knowledge or through canvassing of the economic need. Fiber could be installed for wholesale type service and a private partner could serve the City and/or those location through an RFP process.

Mr. Afflerbach worked in a city in Tennessee that was a public power utility. They had to hook up their substations, which was critical for security for operations of their power system. The substations were evenly distributed throughout the city. They had to build rings because there could not be a failure or cut to take down the system. This city did this, but put in enough fiber count so that they or some sort of private partner in the future would be able to, without rebuilding anything, add fiber or do anything else. All that fiber would be there. Most of the cost of building fiber was not the materials, but the labor, engineering, design and disruption involved in cutting the streets. It was an area where the City would want to put extra capacity in due to the nominal cost of putting in 144 count fiber, which was a healthy size, versus 24 count, which was what was probably done a decade ago and was not much.

Mr. Afflerbach stated one important benefit of the electric utility was the provided expertise of people who were on the poles, which meant the work did not need to be contracted out. The City had buildings that could be cores of connectivity to the fiber and individuals who were skilled and could be trained relatively quickly to do fiber work in addition to the electrical work that they do.

In Newark the poles were pretty crowded, which did not leave a lot of room for a regular private-sector provider to come in and overbuild and provide competition. As the power utility, the City had a certain privilege to put its fiber optic communications in an electrical space which was not traditionally allowed to entities not specifically skilled to be up there for safety reasons.

What many cities had done, like in the Tennessee Valley area, was take advantage of the fact that there was that extra space and that they did not have to go through the process of negotiating and moving existing things on the poles or replacing the poles. There was a ready-made space, which cuts prices from something like \$10-\$15 per foot to closer to \$5 a foot, which was an important thing to keep in mind.

As a municipal power utility, the City would also have increased the ability to borrow relative to a city without a power utility, which meant better rates and better terms.

One of the main reasons that a power utility puts fiber up there in the first place was that it was important for improving the operations of the present security of the City's power system. It also added more capacity for other things, which was not very expensive after that initial step.

Mr. Afflerbach detailed some case studies. Culver City, California was near Los Angeles Airport and had underutilized warehouse areas. They wanted to get more value out of areas that were not providing revenues or jobs. Culver City took stock of what they had which was the space, ability to work with the owners of the property easily, and at low cost, get fiber in and out and do some construction work. They also had the ability to partner with the city of Los Angeles which had its own power utility and connect to them. Once that was done, there were number of different places in Los Angeles where Internet was free, such as Wilshire Avenue. This represented this information highway interstate.

Culver City was initially looking options like the City of Newark, such as building fiber to the home and/or becoming a service for part of the businesses. They found their comfort zone and borrowed and spent their money in a very limited way, working in partnership with the local businesses in the development. They got more life into that area by connecting it to the outside.

Mesa, Arizona was partially a public power city and partially a commercial power city. It was a fast-growing city with a lot of roads that were going to be built new or reconstructed. They planned to use every single opportunity to put a communications conduit in alongside the roads everywhere they reconstructed. Pipes would go along the roads for city use and be leased out private companies. They were not going to go in the fiber business. They were going to provide piping so one could always get from point A to point B in the city in conjunction with other projects. There was so much more construction over the period of five years on roads then they had anticipated that they had fairly clear cuts along all the major arterials with this conduit. They were able to do this in an abandoned military space and now have an Apple silicon manufacturing lab, which the city attributes to providing the conduit. There were not any city services. The city was not selling anything other than the conduit; but they were wholesaling the conduit to private communications providers and to Apple.

Very few cities were going this alone right now and many were entering public-private partnerships. There was the model Google was using where they were demanding quite a bit of cities where they went in, such as a fast lane for permitting and a process where the city streamlines all the processes with the power company with the incumbents.

Another example was Macquarie, an Australian/Canadian bank. They had started a model where they took stock of all the various fees that the cities and the states were paying for various sorts of services. They aggregated the fees and then they went to the lending market. They also took responsibility for billing it in exchange for a twenty year commitment of various sorts of revenues. It was a turnkey arrangement. Mr. Afflerbach felt Newark should consider this type of public-private partnership.

Westminster, Maryland was a town about forty miles west of Baltimore. They had Comcast cable service, but were not one of its prime markets. The investment was not great. Verizon decided not to build FiOS there so they just had DSL. The city government, which was more conservative, decided they were going to treat broadband like roads and they were going to build fiber only after doing a short amount of pilot projects to test the feasibility. They were going to build fiber and then they were going to have the private sector come in and operate that fiber and sell services. They were going to look at the long view. They were going to own that fiber and wholesale it to private providers.

They put out an RFP. There was a process where his company was involved and they were sourcing many potential companies. The project was going to build eighty miles of fiber over the next few years. This was not a rapid build, but one which would get neighborhood by neighborhood going. Eighty miles is about the street mileage of Newark.

The company they worked with was called Ting Internet. There an NBNO wireless provider similar to Virgin Mobile in the U.S. They do not have their own spectrum. It is a company that was focused on customer service and reselling wireless, wanted to get in the fiber space and get involved in the U.S. It was the right size project.

The agreement was high level and could be provided to the City of Newark in more depth if the City wanted to review it more closely. Essentially, it was a ten-year lease agreement. The company would agree to more, but the city wanted to limit it to just ten years with a two-year exclusivity at the beginning. This meant for two years there would not be other providers on the network. Ting could recoup its investment in this. Ting was going to pay \$6 for every home passed where fiber was available for sale. Every location where service was activated, Ting paid \$17 per home.

The meaning behind this was that Ting had some risk in the game and had to go to market. They could not decide they were content with 100 subscribers. They would be losing big money if they did not go out and try to market. The other requirement was that they had to offer services comparable to other fiber at the premises, i.e. they had to provide 1GB like what Google was doing.

Mr. Afflerbach believed the service pricing was \$17 per subscriber for 5MB service and \$45 per subscriber for 1GB service. Ting would lose money on the 5MB subscribers and had a big incentive to upsell to 1GB. The other point was that it was unheard of being in a small town in rural Maryland and the customer was getting 1GB for less than \$50/month. It was data only and did not include video or phone. Ting did offer links to providers of video services to subscribe through them to other providers for third-party video services. There was no fine print and no obligation for one-year service. Ting had to respond to customer sensitive things that subscribers in Westminster felt they were not getting from the incumbents.

There were other models that were quite good, but Mr. Afflerbach recommended looking at what works for Newark and if they want to go down this fiber to the home route.

Metronet was a company in business primarily in the Midwest and were private and equity funded. In Indiana there was a state program that allowed them to get property tax rebates from the city, which was their incentive to get involved. They fund it all themselves and find where they want to go and operate. Other than the property tax rebate, the city does not have as much skin in the game here. However, because it was Metronet's money and Metronet's fiber, Metronet decided where to build. They did not necessarily go and reach underserved areas or areas that were less profitable or multi-dwelling buildings that were harder to get into. It was less risk for the city but a lower possibility of reaching the city's policy goals.

ITV was another example which spun out of the former Family Video. They were based in Urbana-Champaign, which was a University City. The city received funding from the federal government and the stimulus area to build out a backbone and serve underserved areas. They decided, as a city that they no longer wanted to be in the business of providing Internet to the public. They looked for a private partner to spin off the existing fiber and build out the rest of the city. They were working with ITV to do this. They had a long-term lease to the city backbone fiber and as condition of what they were doing, ITV had to provide service to the whole city.

Port Angeles, Washington had a wireless network not too different from the wireless network that the city of Newark had already built, but they upped the game a bit and built fiber optics out. Because they were a city utility they could do it quick and easy. They built fiber optics out to most of their wireless points so it ran at very high speed. It served public safety at very high speed and was the primary service system to public safety mobile users. They serve CCTV. The spec stated they had to provide the same functionality in a vehicle as what would be in a command center.

The service that they provided to the public was pretty good for wireless. It had to be as good as DSL. It is essentially in the 20MB range. Homes and businesses had it. People who visit from Canada could buy a day pass. Port Angeles provided an example

of how without going the fiber route, the City could step up its internal wireless services, turn them public facing and provide capability for the public and city services.

CTC had some discussions recently with the city agencies about what they were doing with communications and what kinds of needs that they would anticipate. One of the things that was a very big driver for any of those models was the large amount cities tended to pay for phone lines and connections to their buildings, schools, libraries, etc., which added up to a lot of money.

CTC spent some time looking at what some of the City's options were. There are a few. One is the current lease services. Remain with the fund company and pay month by month for what the City currently had. It did not increase the City's risk but the City would still pay quite a bit and might not have the capacity that it needs.

Another suggestion was to take the fiber the city had, which was a few miles, add on to the existing fiber, connect all the city buildings and the substations and take care of the core needs. The third suggestion was a long-term fiber lease. The city was talking to other private-sector companies about the idea of a private sector company coming in and instead of leasing phone circuits month by month, doing a ten-year lease of fiber which would provide a better value. The question was, which of these three was the best value for the city over the long term. All the costs, operations, staffing, etc. needed to be included. It was a question that the city really had not addressed but it probably should before it made a decision on a ten-year lease or a long-term renewal of those things.

If the City had its own fiber as an example, it would have the capability of going up to really high speeds and not having to pay a high metered cost for that as they go. There would potentially be efficiencies because the City had public utility staff and IT staff already able to do this by implementing a little of what they were already doing.

There was also the capability available of doing a lot of things with smart city technology such as advanced parking meters, advanced cameras, road sensors, etc. Many times the barrier for a city doing that was not the cost of the cameras, computers, equipment or the cloud. It was the connectivity in the city that impeded the use. Part of the calculation was to project ten years down the road.

CTC looked at some of the needs that the city had right now which was based on the information they had. There was SCADA monitoring technology, which was a critical power system control for the water, sewer and electric utilities. There were CCTV monitoring cameras in parking lots and substations for security. As a future smart city, there was the need for internet. As a lot of the city technologies go on the cloud, the City of Newark had to have good Internet capability to make that happen.

GIS was essentially mapping. Everything that used to be in tables and charts was now geographic. Geographic on maps meant that everything was in three dimensions. To get really good value from the kinds of software and systems that cities and others were using right now, it was necessary to have mapping capability just about everywhere.

There were a number of mobile applications, such as work order and code enforcement. The City could increase the capabilities of staff people if they were able to go by video back to their supervisors and say where they were with code at the location. It created a more efficient work flow. The biggest budget item for any city and any business was staff, so staff efficiency was very important.

He noted the mobile command unit for public safety. In an emergency or any point where the City had to deploy that, they needed to have capability of connecting to it. A city with fiber did not have to do wireless or satellite.

Public safety in particular was one area that was really important because the cost of it not working could be enormous. There were a lot of applications that required a lot of bandwidth. If the City was going to utilize bodycams at some point, it would be better to have bandwidth to make that happen. There were also traditional radios that connected back to each other. There was also CCTV and interconnection with state and federal.

Delaware DIVCOM was the state agency that ran public safety communications. Good connectivity back to the state was needed to make all of that work.

In terms of education, although the school system was jurisdictionally outside the city government, working with the schools was going to be important as the City determined how to get the big picture working. Schools were growing exponentially as they went to Common Core testing, digital textbooks, and the expectation that kids were learning from home just like they were learning at school. The connectivity at school and for the student at home was part of the picture, as well as in-service training being built into an already busy workday and the capability for the students and administrators to get the training they needed. Libraries were also critically important. In addition to the regular use of libraries, they were increasingly becoming the place for members of the public who could not get internet anywhere else to get it. Both of these went together as part of the funding discussion, including the E-rate which was one of the main ways the federal government was able to subsidize and support broadband to schools and libraries.

Holly Springs, North Carolina had been working with Time Warner Metro Ethernet for a long time. CTC did a cost analysis for them. The key point was when services were leased, they were year by year and there would be an increase in services needed. A certain amount of costs per month were paid and as time passed, services got cheaper.

If the City owned its own infrastructure and it was not a ten-year build, but a ten-year financing of a build, it would get to a certain point where operations costs were much lower than the costs of providing the services. That point was reached relatively quickly where there was a very large gap relative to the traditional renting versus owning. It had to be done differently for every city. All operational costs, staffing costs, etc. needed to be incorporated.

Mr. Afflerbach stated the matter of revenues should be covered. Fiber was not a money maker. The focus should be on getting better capabilities and making the city of Newark the way it needed to be. A lot of fiber could be built. Building a lot of fiber more or less cost the same as building a little fiber. The City could build enough to lease a conduit. Some providers were going to want to have that and if looking at roads, the City did not want to have to cut roads multiple times. Some locations were very expensive to build. The City may want to install conduit, not just for revenue, but to eliminate the need to cut and build again.

Public institutions could recoup the cost already spent on various services through subsidies from E-rate which was the school and library federal program and Health Care Connect which was the new E-rate for health care providers or health care institutions.

There was also the potential for bonding to fund networks. Because the City was an electrical utility, it had the ability to get funding, both in terms of capital build and from the rates for ongoing operation and maintenance which could be applied to the improvement of the power system out of the electrical rates to get that going.

The ability to do that was different on a state by state basis. Part of the feasibility analysis would be to look at the Delaware specific situation as far as what latitudes are available and funding something like this through borrowing for the electrical system or in terms of the electric rates subsidizing.

E-rate, was looking at \$2.25 billion per year. The important thing to note about E-rate was that in the past, there was a system where schools would get services from the phone company and based on the percentage of poor families measured, the institution would get a subsidy back of a certain percent. In some cases, it was a very healthy percent. He was not certain where Newark fell, but it appeared, even with a relatively low proportion of students that received subsidized school lunch, they could get upwards of at least fifty percent reimbursement.

The schools had been going through this process and getting reimbursement for about half of their costs for libraries as well. The construction costs and capital costs for new builds were now covered to some extent as well. What this meant was that instead

of going to the phone company and getting a 10MB service for the bare minimum that was needed, the City could look at what would it be to get fiber to schools. What would it be in Newark if fiber was built from the cities back to the schools to connect them and then be reimbursed for that build and have fiber. Again, own versus lease versus the reimbursement on a month-by-month basis.

Health Care Connect was a program that was analogous to the schools and libraries program with E-rate. Health Care Connect was designed to support the growing needs of hospitals and clinics to connect to each other and to connect to health care exchanges, electronic medical records, remote surgeries and consultation.

There was an important component to note where this was funded through consortia. If Newark were to get involved, if its health care institutions wanted to get involved, the health care institutions would have to be in the consortium with rural health care providers, potentially in other parts of the state. In that consortium application, all these institutions would apply together. The idea would be that the hospital would be able to connect to clinics, both within Newark and this area, but would also connect to rural clinics in Sussex County and Kent County.

He believed it was important in the feasibility analysis to make contact with local health care institutions to find out what their needs were and to find out if they had been talking with others as part of a consortium. That could be a possible funding source.

The last item Mr. Afflerbach discussed was the next step recommended, which would be a feasibility analysis to find out what city costs were and run some numbers to determine when going forward whether or not certain approaches would be feasible.

From the technical point of view, this would involve figuring out what the technical architecture would be – wireless or fiber. To get there, the City would have to find out what would be connected and why. The City's needs would determine the model.

The capital costs tended to be only a portion. Over the long term, the operational costs were more and more important, such as staffing, training, replacement equipment and the availability of poles and rights-of-way. The City of Newark was a city with a power utility, which gave the City a leg up, but the amount of space available needed to be determined on the poles and underground. Code compliance also needed consideration.

Financially, the City would do the technical model first and then determine the financial piece of how to pay for and sustain the project. CTC recommended developing a full business Performa in compliance with generally accepted accounting standards. CTC recommended sensitivity analyses. There were some things that would not be apparent, such as how many people would sign up, the various network costs over time and staffing levels whether in-house or outsourced. The outcome in the Performa would be operating and cash flow, net present value, so the full business planning and income statements, etc. would take all important factors into account.

Part of it was going back to City staff and looking at the City, City utilities and public safety as well as potentially schools and health care as being anchor institutions. Since they would be core users, the City needed an analysis of needs to put into the technical piece of what did they need and the business piece of what were they willing to pay. Potential existing long-term contracts for these institutions with private providers would be something the City would want to know up front before committing to anything.

In terms of where things might end up, something a little Newark-specific would be to look at its wireless, but have a wireless system that was for some uses and some people free, for others a premium wireless service that provided some level of competition with the wired services. But it was never the same thing as a wired service. So, a student on a limited budget or someone who wanted an alternative to a service that already existed at a reasonable cost could sign up for something like this.

When it came to offering fiber service, Newark was not a large city and it was never far from fiber even now. Even with a build out to all city buildings, government buildings,

power locations, etc., there could be a situation where somebody who was really requesting having a lot of bandwidth, the scenario could be, "I know it is going to cost me \$5000 for you to pull the fiber to my house, but I am going to look at that as an own versus lease kind of thing. It is going to get me 1GB and I will pay for that cost in exchange for getting a good service at a reasonable price in the long term."

So the City could end up becoming a provider that covered a lot of bases: wireless, and then a certain subset, such as economic development areas, specific types of locations that had this need, people who have the wherewithal to pay for it, the university and its extension/off-campus locations, etc., got the fiber type service. The university may come in and say, "We have a desire to upgrade this entire part of the city with wireless, and want certain fiber here," and become a partner, putting money into this.

There were a whole set of possibilities. Mr. Afflerbach thought it was important not to be extremely focused on what other cities were doing and to make sure this was something that made sense long term for Newark and filled the gaps it had as a city.

The last discussion item was areas of risk. There was substantial penetration from Comcast and Verizon right now. Even if those services were not exactly what the City wanted, it would not take very much for one of those providers to upgrade to higher speeds and to offer, for limited or longer periods of time, more competitive pricing.

In the city of Atlanta, Comcast was offering 1GB service. They were expanding that service to a lot of other places. It was not exactly the 1GB service one would get from a fiber service but it was a substantial upgrade to what was currently offered in the city right now. There was reason to expect over time that service would improve and there would be upgrades. The City should be aware of the fact that it almost never failed that if a city where there was other competition in place, one could expect a very rapid and strong reaction from the incumbents in pricing and performance. Some cities, just to preempt a discussion like this, the incumbent providers stepped up and said, "Okay, tomorrow we're going to upgrade." Maybe that would happen, but that was not certain.

It was also important to keep in mind that not only was there fiber to the home from these two providers, but also in the most lucrative and key corridors of the city. Even if the city went into this business, CTC encouraged that this city partner with some of these providers to have a full, turn-key arrangement. While CTC believed that the City had a lot of capabilities, a lot of this could be done cheaply and the benefits of the City as a public power entity, there was still risk. That went back to the feasibility analysis, which would determine the likelihood of competition, the gaps the City was trying to fill and the coverage of the risks of whatever would be borrowed and spent adequately.

4. Mr. Brechbuehl stated the presentation provided a lot of good information. He stated it was second time he had seen this presentation. Additionally, they had gone through it several times, beginning to end, and he was finding new information he did not catch the first few times. He advised all in attendance to make sure they took a copy with them and reviewed it again. He invited audience members to reach out to him or their Council members.

Mr. Brechbuehl recognized Ralph Begleiter, who was unable to attend the workshop, and Len Schwartz as the two members of the public who raised the issue of municipal broadband. Mr. Begleiter submitted a letter of support, which Mr. Brechbuehl read, which outlined Mr. Begleiter's support for the proposed feasibility study, the importance of reliable broadband internet, the many ways broadband was used by residents of all ages and locations in Newark as well as the City government itself, the contribution that municipal broadband would provide to the City's public service mission instead of private companies' for-profit interests, suggestions for a two or three tiered service level system, and the potential of municipal broadband as an economic development tool in attracting major businesses and new residents.

Mr. Brechbuehl outlined the format for the Q&A segment and Mr. Haines provided the microphone for individuals in the audience.

5. Len Schwartz, District 3, stated he was a professor at the university and seconded Mr. Begleiter's comments. He added that he strongly supported the feasibility study. He thought the City needed to consider that the university had a vested interest in seeing this happen, and he believed the university would be very supportive. He thought the fact that Newark had the opportunity to partner with the university could be very beneficial. He asked that if the City proceeded with the study, that it work with the university and make them part of the plan because he thought the City shared interests with them in this area and it would be helpful to explore such a partnership.

Keith Bart thanked everyone for the presentation and asked how many other vendors were considered before selecting CTC for this particular investigation. He expressed concern regarding the comment about the university being a partner as he felt they were already set up for this and may not be as invested in getting the City up to speed as residents or business owners may be. He felt there may be a significant portion of the City's population that did not need access to this particular service. Mr. Brechbuehl could not respond to whether or not students would use municipal broadband if they were off campus, but that could be looked at if the City moved forward with the feasibility study. He noted that the City reached out to three different organizations, prior to selecting CTC. The other two organizations that were contacted recommended CTC. Mr. Afflerbach impressed staff enough in a phone interview that they felt confident that he could come to Newark and speak intelligently about the topic.

Ed Gliwa asked what the approximate cost of the feasibility study was. Mr. Brechbuehl stated the quote was provided and it was approximately \$43,000 as a total cost for the deep-level feasibility study.

Alan Silverman, Fairfield Crest, asked that the City not forget the volunteer fire company in Newark. The fire company was using Verizon, which was very expensive for dedicated lines, so he thought that would definitely be a benefit to the community as well as the public safety first responder effort. He also noted that the City was permitted to offer services to territories within a 3 mile area beyond the City's corporate limits, which could be considered in the long term. Mr. Brechbuehl was not aware of the 3 mile limit, but Ms. Houck indicated she was aware. Mr. Brechbuehl stated this may be something the City could investigate as they went through the process.

Jim Neg stated he thought a significant investment for this project may be from federal or state grants. He wanted to know if it was possible for Newark to get the same grants as other cities given the fact that the City had very good internet service already. Mr. Afflerbach reported, the bad news in terms of outright grants was that many were during the 2009 stimulus, so that had come and gone. He thought where Newark was well situated was grants that would be potentially be for schools, libraries and health care. He stated he was not familiar with the state grant environment, if there were capital development grants or anything similar that bear looking into. CTC would look at that as part of the feasibility analysis.

Mr. Schwartz wanted to add that Mr. Afflerbach mentioned that the start-up process was such that it might be a little bumpy because, for example, a hospital may be in the process of signing a long term contract with a private company. He thought it was to the City's advantage for the media to know that Newark was considering this and it should be announced. He did not find it worrisome that it may make Verizon or Comcast mad. He thought the worst thing that could happen was that they might decide to lower their prices to fend this off.

Brian Reed, Country Hills, stated he did not have broadband and that the United States was so far behind the rest of the world in broadband technology. He thought the telecommunication companies were only interested in increased profits. He personally would not pay the prices. If the City of Newark reduced their prices, fine, but he would prefer to give his money to the city and not to a commercial company.

6. Ms. Sierer opened the floor to comments from Council.

Ms. Hadden stated she did not have much more to add as she had a conversation earlier with Mr. Afflerbach. Many of her questions were addressed. With the governor's recent approval of telehealth, it had brought individuals and the medical community to the realization that the internet need was going to continue to grow. Also, as someone in the city who was always looking for fiscally responsible new sources of revenue, this had the potential to provide that in a creative way.

She would like to see a feasibility study but she would also like to see if the City and the university could work together on getting funding and sharing the cost, because UD would benefit from it. Even though they had their own infrastructure, it would benefit them in some of their not centrally located offices to campus. So having said that, and hearing that grant monies are basically going to be contained to educational and health purposes, she did not think the City should walk away from this yet, but she would like to start a conversation with the university to see if they would assist the City with the monies for the feasibility study. She was willing to meet with staff and happy to set up that meeting if they would like that to happen.

Mr. Gifford stated after seeing the presentation, he wanted to know what the City's current arrangement for internet service was right now and the cost. Mr. Brechbuehl stated the City primarily used a virtual LAN connection granted from the University of Delaware as its main internet connection, which was a 100MB by 100MB fiber connection. There was a secondary fail over emergency connection through Comcast Small Business which was a 100MB by 25MB service in the main building. There was another metro Ethernet connection used for the phone system via a fiber connection from Comcast. The police department had its own system, which was a Comcast fiber connection that connected them directly to the state through a VPN system. Each of the other City locations had a Comcast Small Business connection, which meant there were about 11 connections the City paid for each month. That connected the South Well Field, the maintenance facility and yard, George Wilson Center, etc. There were no Verizon FIOS connections with the City. The current City Wi-Fi system was not designed for public consumption or for City staff to use. In some areas, it worked fine, but not in most areas. The police attempted to use it, but it would drop in bad spots and it had to be switched to 25 Verizon wireless connections, one in each police car, and an additional one in the mobile command unit. There were also several other employees who used Verizon hotspots. The Electric Department and Code Enforcement Division had 6 Verizon 4G cards to be able to work in the field. Mr. Gifford asked what the costs were. Mr. Brechbuehl stated that the University did not charge the City for the connection they provided. The Comcast Small Business modems were \$75-\$95 each per month and the Verizon wireless connections were \$40-\$45 each per month, including the police cars.

Mr. Gifford asked if any other communities had raised privacy issues with the municipal government owning the internet infrastructure. Mr. Afflerbach stated it did come up. He thought it has been relatively minimal level of conversation relative to the privacy issues posed by some of the devices that are at the end of the network such as CCTV cameras, police cams, etc. In terms of intercepting streams of communication on the way in, it had been raised but the kinds of precautions they took were pretty much the same precautions and safeguards that private sector service providers did. All of them were subject to the federal requirements as far as CALEA and law enforcement intercepts. Mr. Gifford confirmed they generally ran the same way as a private provider. Mr. Afflerbach stated as a private provider, it was important, especially in California there was a lot of consciousness on privacy. A lot of communities had actually shut down Smart Grid type programs for that sort of reason. It was something that if the city ever did go into the stage of being a service provider; it would be a discussion that would be held then. There were models for technology and for rules that would protect that.

Mr. Gifford stated he thought he might have the slowest internet connection in the room. He had a DSL connection and was bumping up against the capability of that connection for the devices that he used. He felt one could get away with very little speed to do a lot of things. He did City Council work, used VPN connections to work, did web conferences and watched Netflix (not in HD), and 1MB was enough to provide that basic level of service. He thought that was something to consider as to what level was the City trying to achieve. If there was something simple to make sure the City was able to provide

internet to the members of the community that was one thing. Trying to entertain the city was another consideration. He was hesitant to support a feasibility study but he may like to see the proposal and consider it. He thanked everyone for the presentation. He believed he learned a little bit and thought it was good to know what the City had and then consider what the City wanted to do moving forward.

Mr. Markham asked how long it would take to do a feasibility study. Mr. Afflerbach stated it would take about four months. Mr. Markham asked what the City would see from that. Mr. Afflerbach stated the City would end up with a report that would include the full financial proforma, a system level technical design with a full bill of materials for what would be included in that, an analysis of the areas of risk that the project would have, based on sensitivity analysis of things like adoption rates and the costs for various source of inputs and whether the City would go in-house and out of house for various sorts of services, and a quantified description of some of your areas of risk, which would make up a comprehensive report. Copies of studies done for other cities could be provided if that would be useful. Mr. Markham stated he would like to see that.

Mr. Markham asked how CTC would gather the financial information to determine the path for feasibility. Mr. Afflerbach stated in terms of internal usage and costs, CTC would mostly get that from staff. Mr. Markham asked how CTC would branch out into the community. Mr. Afflerbach stated the cost would be known from industry standards and CTC's experience. As far as taking a look at what some of large anchor customers outside the city might get, the hospital or the university, CTC and the City would have a number of meetings that CTC would set up with stakeholders that would be participants outside of the city. They would talk with them about current utilization, cost sensitivity and interest to the project. Mr. Markham stated there were not any hospitals in the City and they would not own utilities to the nearest hospital, so he was uncertain and concerned that was one of the grant possibilities because he thought that was limited. The library was county owned. The City could do an agreement with the county but they were a governmental agency. He was a little concerned about mentioning the grants in those areas.

Mr. Markham asked if the City had other agreements for fiber and if there was one with Gore or had that been transferred to somebody else. Mr. Brechbuehl stated the City was about 9.5 years or so into a 10-year, \$0 dollar lease with Gore before they sold the fiber. PEG now owned it. They were not a local company like Gore, but were a mid-west company trying to move east. The City had no idea what that renewal would look like. They could gift it to the City again, but he would not expect it. As far as the other fiber, the City did have about a mile and a half that it owned. That was all the fiber the City had.

Mr. Markham stated that was the City's current backbone and asked how much coverage that would put in the City. He thought that if the City had pre-existing fiber and could add into it, he would like to know what percentage could be covered with what the City had now. Mr. Brechbuehl did not believe the City was authorized to expand that network as it was not the City's fiber. The City had the right to use that fiber where it currently went, but did not have the ability to expand that fiber. Mr. Markham confirmed the City could not connect to it, but thought if the City ran its own cable to serve a neighborhood, they could use that as a backbone. Mr. Brechbuehl stated they could, however, the concern would be in ten years the City would have to renegotiate that backbone or have to run its own. Mr. Markham stated it was a grace period.

Mr. Markham noted that regarding privacy, if the City started hearing about packet sniffing, or packet sniffing in software, then they should really start to worry because in his opinion, the amount of traffic the City would have on fiber, they have to have something pretty sophisticated to figure out what was going on there.

Mr. Markham stated he would like to see this come forward for consideration to Council. He would like to see the whole proposal not just the financial number. He knew places like SevOne were very interested. They were a high technology company that needed the backbone and that was part of the reason they went in with STAR Campus. They had other connections, being alumni but it seemed if the City wanted technology companies throughout the city, not just on university property, that it needed to have some branching out into other office spaces that could support something like that.

Mr. Morehead said it was his understanding that the City had broadband connectivity and availability to greater than 97% of households. He did not get the sense from the various examples used of cities that they had that much connectivity and was curious about the feasibility that way. Mr. Afflerbach stated other cities in his comparisons were cities that he believed had coverage pretty much everywhere with at least cable service and some of them with cable and DSL. What none of those had was fiber to the home, which was something Newark also had. By comparison, the similarity with what Newark had versus what other cities had was the issue of some combination of customer satisfaction and cost, but not just lack of availability. The difference was that Newark had fiber, which other places did not have. Yet, the Verizon fiber solution was fundamentally different right now from what the city provided and Google provided fiber solutions were because they did not offer 1GB service. They offered a service which was relatively similar to the Comcast service. He thought even though one of them was fiber, they were pretty much slightly different flavors of the same. When looking at it big picture, the card that was not out there that was not the same with the other cities was that potentially Verizon could say, "Well what we want to do is go into this much higher speed game and do something different with the pricing." In that case, without anyone putting a shovel into the ground or putting up another strand of fiber, Newark would be exactly where one of those other cities was, with a private provider doing it, which was an interesting twist.

Mr. Morehead asked if the \$5 per foot estimate for construction included connecting the individual homes or was that just pulling the fiber along the back. Mr. Afflerbach stated that was just going down an aerial pole line in the right of way. It did not include building to buildings and did not include any added cost of underground work.

Mr. Morehead asked what it would cost to connect per residence or per business. Mr. Afflerbach replied if it was aerial, it could lash from the pole to the building and could be approximately \$200-\$250. If there were electronics that had to be put in, that was about \$100. The cost of doing that was very much related to labor costs and having really good processes down. One way Verizon lost a lot of money in the early days of FIOS was that it was still experimental and they had to have a lot of different people go out multiple times to find their way. Cities had tried to control costs and done well. They had done things like scheduling a whole neighborhood at once, getting as high of a penetration in a certain neighborhood and then doing the connections at the same time as the build. For example they looked into micro-trenching technologies where they had to go underground that was less intrusive and damaging to the homes. Electronics have been more conducive to being easily installed, similar to a hook up and instantly connect. They had done their homework as far as understanding what a customer needed in their house before showing up there and finding out they had to drill through the wall. To really control that number upfront, the City had to make sure that whoever was doing the installation had all those pieces under control. That was another place where a city with its own power utility would come out ahead because it had certain skills with coming into buildings and having certain relationships and contacts with the customers.

Mr. Morehead asked to consider that the city had a large number of students living in private landlord situations and they had preferences of who they wanted to get their broadband from. When students leave, those services still were wired or cabled. The next student comes in and they have a new contract and the building or the apartment gets rewired again. So going down the street, people see buildings that have wires all over them for no other reason than they have had multiple tenants. He noted that a solution that could be offered to the students or the landlords might be of great interest.

Mr. Morehead did not know if the state had specific laws regarding becoming a third party or an intermediate provider that way but thought that might be something very interesting that would distinctly affect the city. He was interested in understanding the feasibility study. He was a very light user and approach this from that perspective. He did have a Verizon FIOS connection, but only because they broke his copper connection. He was on DSL as well and it was plenty fast enough for what he used it for. He appreciated that Mr. Afflerbach educated the audience extremely well about the various terminology as it was a very technical discussion and it would have been easy to lose folks.

Mr. Ruckle stated several Council members attended a League of Local Governments meeting with a Homeland Security presentation which reviewed a federal program where EMS, firemen, military and police were going to be on a national network. He asked if it was possible that the public could get on that network and, if there was an emergency, they could be kicked off. They said that they were bouncing that idea around. He would like to know if Mr. Afflerbach knew if that was going to be a possibility as he felt it would save the city a lot of money if they could use that. Mr. Afflerbach stated he believed the network that Mr. Ruckle was referring to was First Net National Public Safety Broadband Network. He was on one of the advisory boards to that, SAFECOM. SAFECOM was a wireless technology, so it was very much like what one would get from Verizon or AT&T except it was focused for public safety first responder providers first. It was called a cover lease agreement. SAFECOM was looking for ways to do that in certain parts of the country, particularly in rural areas where unless there was an emergency, the utilization was probably going to be pretty low. Also in rural areas there was a lot of need for commercial services because those were under-served areas. It might be the first cell connection those areas ever got, so why not make that available to the public. In Newark he thought that what would be found was that there was going to be relatively light excess capacity because the city was in a major corridor and there was going to be pretty heavy usage on a daily basis. He thought they also would find that because it was a wireless service, it was not really big bandwidth. The kinds of things that were being considered for secondary services like telemetry, text, email, kind of overflow from the sole providers. For example Sprint or AT&T might buy this capacity as excess and then it would be available at those times that they were overloaded and that the public safety was not using it. It was a different animal more in the wireless realm with lower bandwidth. He thought it would be very useful in the public safety area but even there the business model for First Net was that the police and firefighters would take the money that they pay right now to a commercial provider and instead pay First Net and get granted a better quality of service. It would be similar to what the City got right now, regular LTE type of service.

Mr. Ruckle asked what the cost of 1GB service through Comcast, Verizon and Google would be. Mr. Afflerbach stated Google was charging approximately \$50-\$60 per month for the service but needed to verify that. Verizon and Comcast did not offer that particular service currently. Comcast was beginning to offer it in some markets but he had not seen the pricing on that. It was currently not an available service in most places. In a few months there may be different information on that. Verizon was not offering a gig over FIOS. To get a gig from Verizon, the customer had to get metro Ethernet service which was a business service. That was getting towards the hundreds of dollars per month range if not more and was market dependent.

Mr. Ruckle asked what the estimated cost to the City would be. He thought he saw \$17 and asked if that was what it would cost the City per month on the average, and then they would charge \$30 a month, which would bring \$13 to the City. Mr. Afflerbach stated that was very specific to Westminster. That was the deal they got with their private partner. Remember that the city had to build out the fiber. The city was putting in a much greater investment, probably something on the order of \$1,000 per home as a one-time thing to do that. Once everything got rolling, then the service provider paid them \$17 per month which was basically a wholesale of the service and they sold it for whatever they sold it for. Mr. Ruckle thanked Mr. Afflerbach. He stated it was a great presentation. He learned a lot and he believes everyone on Council has also learned a lot today.

Ms. Sierer thanked Len Schwartz, Ralph Begleiter and also Dan Grim from UD. She noted that Ms. Hadden initiated this and the City met with them and got the ball rolling. She thought it was a beautiful example of citizens getting involved and bringing something forward to the city and then reaching out to consultants and educating everyone on whether this was a possibility for the community. She did believe it had potential to provide a service to citizens, an opportunity to partner with the University of Delaware, and bring businesses and economic development to the community so she definitely thought it was something the City should be looking at.

Ms. Sierer encouraged staff to bring a feasibility analysis contract to the council. She thought that was something Council should review. She felt the presentation was very educational and appreciated the effort and time staff and CTC had put into it.

Ms. Hadden requested that the feasibility study take into consideration the low income people of the city and either be able to offer this service for free based on income and/or provide some type of pricing chart to accommodate low income individuals who need to have access to this in their homes.

7. Ms. Houck thanked everyone for coming out. She stated it was a long but very worthwhile presentation. She thanked all for their attention and Mayor and Council for their support up to this point. She thought staff got their marching orders. At an upcoming council meeting, staff would have a recommendation to move forward with the feasibility study. She thanked Mr. Afflerbach for the preparation of the presentation. She noted there would be more information soon. She asked all to pay attention to the agendas and come and hear some of the information that might be shared when this came before Council for a vote.

8. **Meeting adjourned at 9:05 p.m.**

Renee K. Bensley
Director of Legislative Services
City Secretary