

# **Preliminary Report on the Feasibility of Municipal Broadband Internet Service for the City of Albany, NY**

**Presented by**

**The Albany Municipal Internet Commission**

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**Note: The members of the commission would also like to thank Jessica Smith for her work as project manager working with the commission, Luke Gucker for his active participation, insights and logistical assistance, Commissioner of Administrative Services Rachel McEneny for her input and assistance with obtaining critical research materials, and Council-Member Owusu Anane for his input and assistance as a Common Council Liaison.**

## I. Introduction

Since the turn of the century, the internet has more and more become a necessity for commerce and our daily lives. We rely on the internet for financial transactions, record keeping, ordering goods and services, and information retrieval among many other uses. The way we learn, create, retail, and interact with our neighbors has been changed by cell phones, email, and computers.

The digital revolution has placed an emphasis on connectivity and the need for quality, high speed internet service. This reality has been exacerbated by the COVID-19 pandemic and the hybrid/work from home schedules and acceleration of e-commerce. Adoption of home broadband has increased since the turn of the century, but it has not been uniform. While just over of three quarters of Americans have broadband in their home, racial minorities, lower income individuals and those without a high school degree have adopted at lower rates than the national average.

At the state level, New Yorkers have adopted broadband at a higher rate than the national average. However, adoption lags throughout the state in urban and rural areas. Because the FCC identifies areas served if broadband is available (cite), this high adoption rate is not representative of the reality of broadband service and adoption, specifically in urban areas. In fact, this data does not represent the number of households with access to what is considered high speed internet.

In response to these existing inequalities, the Federal government and State of New York have dedicated appropriations to expand coverage and affordability throughout the country and State, respectively.

Over the last two years, the federal government has created a program to provide discounts to households with income at or below 200% of the federal poverty guidelines and meet a list of eligibility requirements. 2021's infrastructure Investment and Jobs Act allocated \$42.5 billion for a number of programs to create the Broadband Equity, Access, and Deployment Program, enable middle mile broadband infrastructure, create Digital Equity Act Competitive Grant Programs, and increase broadband affordability.

New York State has also stepped up with additional funding. Governor Kathy Hochul and the State Legislature allocated \$300 million through a new program called ConnectALL. This program draws on funding from the Infrastructure Investment and Jobs Act as well as the American Rescue Plan to make \$1.4 billion available to New Yorkers to increase access to broadband, increase affordability, and grants for new construction projects to lay fiber optic cables. In order to encourage these construction projects, Governor Hochul also took the step of suspending the PERM 75 permitting program, which imposed a fiber optic fee on fiber installations in the state's right of way.

During this time, local governments throughout the country have stepped up to fill these service gaps. In 2021, the City of Albany created the Municipal Internet Commission,

charged with identifying the feasibility of establishing a city-owned internet service. The Commission was charged with identifying ideal service models, cost, and partnerships among other areas to advise the Mayor and Common Council on potential next steps to establishing this service.

Throughout our research, we have identified several options the City of Albany may consider for municipal internet service. This preliminary report will continue to be refined as we solicit feedback from the public, Mayor's office, and Common Council. We believe with support from federal, state, city, and community partners, the City of Albany has the opportunity to become a leader in New York State and the Northeast in providing this essential service at an affordable price.

## **II. Executive Summary**

The members of the City of Albany Municipal Internet Commission are pleased to share this preliminary report of our research to date. This report is intended to provide an introductory overview of the work to fulfill the commission's central charge – to determine the feasibility of creating a municipal broadband network for the city of Albany to achieve the following goals:

- To improve (and eventually achieve) digital equity for all those who live and work in our community regardless of race, creed, gender, or economic status by providing internet access to all.
- To encourage innovation, entrepreneurship, and economic development including new job creation through the provision of affordable, reliable, high-speed broadband services.
- To enable both increased transparency in government operations and improved access to city services through the use of the municipal broadband network.
- To identify the most reliable and cost-efficient model for the creation of a municipal broadband network for the city of Albany and identify potential funding sources and strategic partnerships to assure the success of the project and its maintenance moving forward.

### **Basic Configuration Terminology**

There are primarily two types of network configurations employed by municipalities with municipal broadband networks:

- “Hub and Spoke” – similar to what is commonly found in coffee shops and small businesses. One radio (the “Hub”) sends and receives data for several users (the “spokes”). The wireless router has a physical connection to the internet (wired) and the data from multiple users is transmitted through the wire. The disadvantage of this model

is that if one of the wireless routers connected to the network goes down, there may not be another present nearby capable of maintaining service to that area of the community.

- “Mesh Network” – most municipal wireless networks employ a “mesh” rather than a “hub and spoke” configuration to avoid the shortcomings of that model. It employs a series (mesh) of radio transmitters, and each is capable of communicating with at least two others essentially creating a cloud of radio signals through the city. Signals travel from router to router through this cloud. This option is also considered to be more cost efficient as it requires fewer wires, its faster to build, and should one or more nodes fail, others in the mesh can compensate for them until they are repaired.

### **Preliminary Recommendations**

- Based on our analysis to date, it is feasible to undertake the creation of a municipal broadband network for the City of Albany. The commission will continue to research the specific costs associated with doing so and potential sources of funding and support to do so in a way which minimizes the impact on city taxpayers and maximizes potential economic benefits (reduced costs, additional revenue, job creation) to the city of Albany.
- The preferred network configuration (given the population density and size of the city) would be a “mesh network” configuration rather than a “Hub and Spoke” model. The commission is currently researching the potential leveraging of the city’s recent decision/investment to purchase the streetlight poles throughout the city and equip them with “smart” light technology so that they could be monitored/maintained by data transmitted to and from the poles when a light needs to be replaced, duration modified, etc. The poles could be used to place the nodes necessary to create the density needed for a “mesh network” for high-speed internet city-wide.
- The City of Albany should actively pursue all grant opportunities identified to minimize the costs of construction of the municipal broadband network to city taxpayers and businesses.
- The Mayor and Common Council should consider the creation of a separate quasi-governmental “Albany Municipal Internet Authority” to oversee the development, construction, and management of the municipal broadband network (similar to the Albany Water Authority) as it would appear to be the most efficient public management model. The authority would have the ability to issue bonds, develop and maintain fee structures for services, and acquire staff with the technical expertise required to maintain and improve the network moving forward.
  - If the Mayor and Common Council agree or reasonably expect that the City of Albany may wish to pursue the creation of a new authority to oversee municipal broadband, it is recommended that the Common Council initiate legislation requesting that the State legislature grant the city such legal authority to do so and enlist the aid of the city’s State legislative delegation to draft and submit legislation to do so without further delay so that work on the project can proceed

without further delay once the commission's final report is submitted and approved.

### **III. Review of Comparable Broadband Projects/Initiatives**

One of the challenges encountered by the benchmarking subcommittee was that the majority of community/municipal broadband initiatives underway were for communities substantially smaller than the city of Albany, making them less than ideal choices for a basis of comparison. For example, two communities in Maine who have undertaken successful municipal broadband initiatives are typical of the communities identified and are noted below.

#### **Georgetown, Maine**

Georgetown is a coastal community in Maine with a population of 1,058 (as of the 2020 census) which has undertaken to build a multi-million-dollar, full fiber to the premises (FTTP) municipal broadband network. Inspired to do so by a lack of reliable service provided by their incumbent internet service provider (ISP) and the connectivity issues brought on by the COVID-19 pandemic, the town broadband committee enlisted outside assistance to finance the construction.

Georgetown opted to pursue an FTTP network despite the high-cost relative to other solutions. The initial cost was identified as \$3,712,043.00, but the community devised a funding strategy that made the project feasible. Through partnering with a different ISP, Axiom, and a mix of grants and community funding, and a grant from Connect Maine of \$858,365.00 they were able to cover the costs. It is expected that the project construction will begin in Summer 2022.

#### **Roque Bluffs, Maine**

The town of Roque Bluffs has a population of approximately 300 people and made the decision to pursue a community-driven broadband project. The town was already partially served by an internet service provider (ISP) and the project was complicated by the rural nature and low population density of the community. Through the active engagement of the community and the aid of the Island Institute, the broadband committee was able to devise an optimal solution for their community and resolve their connectivity issues. The community received a grant from the USDA for \$893,170 to build out a fiber network for 166 homes, 22 farms, and 16 businesses.

## Suitable Communities for Comparison

For this reason, in this preliminary report the benchmarking subcommittee has chosen to focus on three communities which are suitable comparisons for the city of Albany based on population size, density, and basic demographics. They are as follows: Chattanooga, Tennessee, Chicopee, Massachusetts (though not a match on population size), and Longmont Colorado.

### Chattanooga, Tennessee

Chattanooga was one of the first U.S. cities to pursue the creation of a city-wide municipal broadband network. A city with a population nearly twice that of the City of Albany (171,000 as of the last census), they began creation of their fiber networks in 2009. According to an independent study completed by Dr. Bento Lobo of the University of Tennessee, over the past 12 years, the broadband utility (EPB Fiber) **has returned nearly \$2.7 billion** on an original investment of \$220 million to build, expand, and maintain the network. This also includes the creation of over 9,000 new jobs during the same period.<sup>1</sup>

**Demographics:** While the population of Chattanooga is double that of Albany, other features of both make them a suitable comparison for potential returns on investment in municipal broadband. Both are:

- 1) Centers of government activity.
- 2) Have a large number of private and public universities both within and adjacent to the cities.
- 3) Are centers for technology development and innovation
- 4) Have a large aging and growing minority population.

**Network:** The network was installed and established by the Electric Power Board (EPB), a Chattanooga public utility corporation. Construction was financed by a combination of loans and grants totaling approximately \$220 million over a 10-year period. The Fiber Network is a “**Full Service**” Network as opposed to a “**Dark Fiber**” network used in other municipalities and employs “mesh networking” (relaying radio signals throughout the whole city via a series of access points or radio transmitters, each of which is connected to at least two other transmitters) as opposed to the “hub and spoke” hard-wired models which are more costly and less reliable in cities.

Mesh networks provide reliable user connections and are also faster to build and less expensive to run than the hub and spoke configurations. Internet connections can also be secured through the addition of a wireless router to an existing wired connection – a convenient method for internet access provision in small, centralized areas (for example public housing, apartment complexes/towers).

Program Options: EPB offers both residential and commercial service plans to individuals and local businesses.

### **Rates/Service packages**

Currently there are three levels of service offered:

- 300MBPS – for both download and upload. Current Rate is \$57.99/Month
- “Gig” Package – 1000 MBPS for both download and upload. Current Rate is \$67.99/month
- 10 Gig Package – 10,000 MBPS for both download and upload. Current Rate is \$299.99/month

**Additional Items of Note:** The city of Chattanooga also combined their efforts to provide municipal broadband with the creation a “smart” power-grid for the city which allowed them to leverage the framework created for the power grid to support the broadband infrastructure as well.

EPB made a conscious decision not to offer their services at a lower rate than competing internet providers in order to promote economic peace, instead focusing on providing higher-quality services and speeds at the same rates.

Here is a link to the report of the study conducted by Dr. Bento Lobo of the University of Tennessee at Chattanooga which provides a detailed analysis of the costs and economic benefits derived from the creation of municipal broadband in the city of Chattanooga:

Ten Years of Fiber Optic and SmartGrid Infrastructure in Hamilton County, Tennessee

### **Works Cited**

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## **Chicopee, MA**

Population: 55,560 (2020 Census). Albany, NY is 98,860 (2020 Census).

Although the population difference between Chicopee, MA and Albany, NY at first glance seems to paint these cities as being in different spheres, diving deeper shows they have many similarities in terms of their influence in their respective regions.

**Demographics:** Both are older Northeastern cities with former industrial bases and have transformed themselves in the 20th century; Albany to a focus in state government and education and Chicopee to manufacturing and as a military center, as it the largest Air Force Reserve base in the United States. Both cities are also important population centers to their respective states; Chicopee is the 2nd largest city in Western MA (behind Springfield, MA) and Albany is the center of New York State's Capital Region and the largest population center in Eastern New York State north of New York City.

Like Albany is doing now, Chicopee commissioned a committee to determine the feasibility of a municipal internet service starting in 2012. The study was concluded in 2018 and determined that this would be a worthwhile option for the citizens of Chicopee.

**Network:** Chicopee has chosen to have the municipal internet service be run by Chicopee Electric and Light (CEL), which “ was established as a municipal utility in 1896 by community leaders who wished to free the community from the grip of a private utility company”, much in the same vein as what we are attempting to accomplish today for internet. They spun off a separate entity under CEL to run and manage the internet portion, known as Crossroads Fiber ([www.crossroadsfiber.net](http://www.crossroadsfiber.net)).

They have taken an approach of building out their network using Fiber Internet, and doing so in stages, working neighborhood by neighborhood based on demand. Initially available only to business customers, they have expanded to residential opportunities after the first year. As of the end of 2020, capacity was projected to be at 5500 households, with a goal of full buildout to all available households by the end of 2027.

**Rates/Service packages:** Current pricing and service tiers vary between consumer and business accounts. Business plans are available at two distinct tiers, Crossroads Business Standard and Crossroads Enterprise.

Crossroads Business Standard provides business customers with ‘best effort’ bandwidth and availability, with plans ranging from \$99.95 for 250 Mbps up to \$249.95 for 1Gbps tier. Crossroads Enterprise provides dedicated services with tiers ranging from \$395.95 for 100 Mbps upto \$1895.95 for a 1 Gbps plan. Contract options are either 1 or 2 years. 1 year contracts are charged an install fee of \$99.95, while 2 year contracts waive the installation fees.

Residential tiers are \$59.95 for 250 Mbps or a 1 Gbps plan for \$69.95 monthly. Residential plans are not charged an installation fee. Speeds on residential plans are listed as ‘best effort’ and ‘up-to’ the speeds listed per tier, but not guaranteed.



Again, Chicopee may have a smaller overall population than Albany, but it looks to be an example for how to effectively and efficiently build out a municipal internet network that can benefit its citizens and quite a varying array of businesses, and that can scale over time to continue to meet those needs.

Sources:

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<https://medium.com/@JoelforChicopee/its-time-to-stop-preventing-progress-in-chicopee-it-s-time-for-municipal-internet-74b8f4328177>

<https://muninetworks.org/communitymap>

### **Longmont, Colorado**

Another community that could serve as an excellent comparison community and model for Albany's municipal internet service is Longmont, Colorado. Longmont is very similar in size to Albany.

**Demographics:** As of the 2020 Decennial Census, the City of Albany has a population of 99,224 and 48,031 households and Longmont has a population of 98,885 and 41,680 households. Being so close in both overall population and households makes Longmont an ideal comparison community, with lessons to be learned on cost, service tiers, types of networks, and more.

**Network:** Longmont has a citywide gigabit fiber network which is much faster and more reliable than a traditional cable internet system. The city's municipal service is frequently rated amongst the fastest internet services in the nation, being ranked highly every year since 2018. Longmont's municipal internet service was installed and established by the Longmont Power and Communications (LPC) and is managed by NextLight. LPC is a public power organization that has worked to provide affordable electricity and other services to residents of Longmont for over 100 years. LPC was established to manage the municipal internet service in 2014. NextLight also provides landline phone service to residents who want it.

**Rates and Service Packages:** NextLight provides both residential and commercial service to residents and businesses.

For residential customers, there are three plans available. The first and most expensive plan is the internet and phone plan. This plan provides 1000 mbps and includes landline phone service. This plan costs \$94.95 a month. The next plan, the 1 Gig Internet plan,

also offers 1000 mbps internet speeds but does not include the landline phone. This plan costs \$69.95 a month. The last plan offers 100 mbps internet speeds for smaller households or households with fewer devices. This plan costs \$39.95 a month. All three plans have no data caps and no lock-in contracts.

NextLight's business options are mainly geared towards small businesses but can accommodate businesses who need a faster internet speed. Similar to the residential options, businesses have three plans to choose from. NextLight offers plans that provide 25, 50, and 100 mbps download speed. These plans come at a monthly price of \$59.95, \$119.95, and \$199.95 respectively. These speeds cover the needs of most small businesses, whether they have just one or two computers or are frequently on video calls and downloading large files. Custom options are available if a business requires a faster download speed.

## **IV. Ideal Model for Municipal Internet Service in Albany**

### **Introduction**

The development of building and deploying a broadband communication network is technically complex. There is no single solution. Acting as a Commission, our decisions are dependent upon multiple factors such as the mission, goals, initial capital expenditure and objectives of sponsoring entities. As well as other considerations including capabilities of the existing in-place Albany infrastructure, network security and performance requirements. An "ideal model" network is the design and planning of deciding geographical layout; quantity and what type of equipment stations (nodes) and where this network infrastructure stations should be located in Albany city limits for populated neighborhood areas. Albany broadband should aim to facilitate a broadband network layout to provide inclusive coverage with minimal infrastructure cost. This is the art of network design. In the early phases of the design process, our goal is to determine the cause or motivation for change. Network planning is one of the most important aspects of Albany's broadband service.

### **Albany Broadband Network Analysis**

Traditionally, the cable television companies known as called multiple service offerers (MSOs), have dominated the telecommunication industry in providing broadband services. Albany deserves more accessible options, better high-speed and lower costs. Sophisticated technological advancements, the amazing increase in network capacity, the multiplicity of computer applications, demands to improve the quality and reliability of Internet services underscore the importance of developing and implementing valuable broadband networking solutions. Currently, Albany's options are Charter Communications/Spectrum, Verizon Communications and Hughes Network Systems. There are logical reasons that legacy broadband last-mile technologies like DSL, cable, cellular and satellite are lacking to meet these tasks. For legacy broadband, great care must be taken about segment length, selection of cable type, and other technical specifications.

Today there are various networking configurations in use, individually with unique performance characteristics, advantages and limitations. The Federal Communication Commission requires that broadband services have a minimum speed of 25 Mbps for downloads, and 5 Mbps for uploads. There are two desirable aspects to internet connection: fast transmission rates and seamless, constant connectivity. Fast transmission rates require wide frequency bandwidths, as well as high bandwidth utilization efficiency.

Technology helps to ensure that a coverage as large as possible is reached with a fixed number of network equipment. Emerging technologies are defined by terms of generations, which implies the evolutionary process. 1G represents analog transmission of voice; 2G represents digital transmission of voice; 2.5G represents digital transmission of voice and narrow bandwidth data; 3G, 4G and 5G now represents digital transmission of multimedia for broadband speeds (voice, video, and data).

A newer Internet technology is fiber optics. Fiber also offers this new access technology further business and management freedoms from the tyrannies imposed upon by 19<sup>th</sup> century copper and circuit-switched technology and its regulatory fallacies. Fiber to the home is the ideal choice whenever possible. We recommend and trust fiber can revolutionize Albany. Fiber to the home (FTTH) is a fiber optic transmission delivery form where the fiber spreads from a central office to the boundary of a residential home or business office. Fiber to the home is a configuration that involves installing optical fiber at a central office or location before running fiber optic cables to its destination. After deployment installation, the fiber last mile, seldom need any reengineering for a time. Fiber optic cables use strands of glass to transmit light. To use a fiber-optic cable, equipment must convert an electrical signal into light. The light pulses are converted to electronic signals via optical network terminals and distributed throughout as Internet. These light pulses transport electronic data up to 900 megabits per second. That speed is more than 100 times quicker than traditional coaxial cable, like Spectrum. It's important for the initial optical fiber to be put in a position that will allow it to deliver the benefits of fiber optics to as many people as it possibly can. The flexibility of fiber-based systems and above all their lower lifetime costs, should accelerate the penetration of broadband across to the underserved residents of the digital divide.

### **Albany Broadband Network Design & Planning**

During this stage, our primary objective is to study as much about the proposed broadband network needs to identify and uncover the problem or opportunity that occurs. A network topology, which is the physical layout of the components of the network - can conceptualize this information. As a result, we'll want to understand electro-mechanical applications and technical processes that the proposed broadband network should be supporting. Our broadband network assessment strategy may consist of several fundamental phases: preliminary investigation, analysis, preliminary design, detailed design, implementation, and documentation.

## **The planning phase**

- involves collecting thorough statistics and noting initial suggestions about the broadband network design. This plan consists of performing research about the needs of potential Albany residential and business customers, which produces documents outlining service gaps, risk analysis and competitive practices.

## **The architecture phase**

- entails capturing the results of the planning phase and pairing them with our broadband servicing goals. The architecture is a sophisticated conceptual design. At the end of the architecture phase, an Albany land topology, physical design and operating prototype should be documented.

## **The design phase**

- renders the architecture reality. It identifies precise details necessary to execute the new broadband network design. Providing information necessary to create the broadband network, in the arrangement of a detailed topology, physical design, operations design and maintenance plan.

## **Albany Broadband Network Architecture and Requirements**

The effectiveness of an Albany broadband network will depend on the geographical layout of the physical network components in relation to the locations where service is required. Traffic engineering is an important technology in network design. Once the FTTH central office location(s) has been established and the appropriate designs for it are in place, a vendor company that specializes in fiber optics must use the correct materials to put the location together. A contracted vendor (most likely chosen through an RFP bid) can then run fiber optic cables from the central location to buildings in the surrounding area. Albany's residents and businesses span over more than 10 distinct neighborhoods. After the Albany broadband network is deployed and service is introduced, the network itself must be maintained. Generally, each network node can serve a finite number of users and process a certain amount of offered broadband traffic. It needs to be regularly tested to ensure that a consistent quality of service is sustained. As the Albany customer base increases, the Albany broadband should improve the service, revise its network plan, insert more network nodes and modify the network. Consequently, the number of network nodes required over a coverage area is a function of the expected number of users and traffic, which is itself a function of total population.

The reach and coverage of Albany's fiber-based broadband network is a crucial enterprise decision to be evaluated. Fortunately, demographic data is a powerful source of information about where Albany people work and live. Demographic data consist of particular geographic locations consisting of several attributes - some of which include attributes suitable for determining broadband network traffic distribution. It also presents economic and age distribution data helpful to estimate the probability that they will subscribe to a broadband service. Demographic data for residences typically include

simple statistics of the population in different age groups and the number of housing units. The United States Census provides categorical data for basic and summary geographical areas: the most basic smallest region is called a 'block'. These categorical data statistics are geographically classified by assigning them as elements to a block 'centroid' set in terms of latitude and longitude. Albany's broadband network coverage could possibly be projected by incorporating the housing unit density data for a coverage area - the total number of housing units that are potentially served by a network node. The initial expense of a full-coverage network deployment can be costly. These costs can be classified as variable since they depend to a great degree on the size of the customer base. Additionally, it may be logistically unfeasible to roll out a full network. We believe Albany's broadband network should be built in incremental phases. With zero initial subscribers, there can be a high risk for high initial capital expenditure. For a successful service, the penetration rate will increase over time, so a multiyear projection of the penetration rate will provide future objectives for the total traffic the broadband network system must handle.

## **Conclusion**

As a commission, our research warrants sufficient consideration relative to the hardware, software and architecture infrastructure aspects of the broadband network design. Modeling the traffic that our fiber-based internet service will transport is an essential task in designing a successful Albany broadband system. Modeling network coverage areas and traffic requires that the geographic location of network nodes be determined along with the magnitude and the statistics of the traffic originating from and destined for each traffic source. Deploying telecommunication resources has always been by cables stretched between utility poles, however, FTTH deployment can be aerial or underground. Yet, our research is still in progress because of undiscovered logistical details needed to further our project: GIS imaging of Albany utility and rail line rights-of-way. At the time of this submission, the Commission has been communicating with the City of Albany Planning Department and their GIS consultant Timmons Group to request supplemental data needed to advance our network design.

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## **V. Fiscal Issues and Concerns**

It is an obligation of the Commission on Municipal Internet Service to “review all available options that would minimize the financial cost of creating such infrastructure”. Any budget developed for this aims to include estimates of operating and capital expenditures, in addition to providing a road map for managing a prospective Albany Municipal Internet Service that can withstand both short and long-term economic changes.

### **Grant Funding Sources**

The City of Albany should pursue and obtain eligible funding. A significant component is the creation of grant funding expanded by recently passed legislation. In this instance, a grant is funding provided by a government agency to another government entity that enables it to perform specified ventures for the common good, without having to resort to financing or placing a burden on the overall city budget. The prospective channels are:

#### **Federal Funding - *The Broadband Equity, Access & Deployment Program (BEAD)***

“All states will receive a minimum of \$100 million as part of the Broadband Equity Access and Deployment Program (BEAD). The remaining BEAD dollars are allocated based on formulas detailed in the Infrastructure Investment and Jobs Act (IIJA). States will also receive money from the State Digital Equity Capacity Grant Program based on formulas detailed in the IIJA. Notably, states must apply for both of these programs in order to receive funds.”<sup>[1]</sup>

#### **State Funding - *ConnectALL Initiative***

“To support local efforts to expand broadband, the *ConnectALL* initiative will establish three grant programs to provide funding to local municipalities and other entities to plan, engineer, and construct accessible broadband infrastructure. The State will coordinate with municipalities in every corner of New York to ensure funding is directed where it's most needed and that every community has the support and resources to effectively participate. The grant programs are focused on three primary efforts: Local Connectivity Planning and 21st Century Municipal Infrastructure: This program takes a pioneering approach by providing grants to municipalities, nonprofits and other entities to construct open and accessible public broadband infrastructure.”<sup>[2]</sup>

### **Grant Funding Procurement**

Any grant proposal submitted on behalf of the municipal internet service should include a narrative description of the work that an Albany Municipal Internet Service plans to undertake to fulfill both its own and grant administrator goals. The proposal includes, at

minimum, a description of the problem to be addressed, a detailed plan for addressing the problem, what it will cost, and what results the grant administrator can expect from the proposed project. After the proposal is accepted by the grant administrator and a grant award is made, the grant proposal forms the basis for a legally binding contract between grant administrator and grant recipient. By signing the contract, the city of Albany as a grantee agrees to perform mutually agreed-on plans of work and to report its progress toward fulfilling the terms of the grant and achieving the goals set forth in its grant proposal. A critical, but often neglected part of planning a project is sustainability. Is it critical, the city of Albany incorporates into the project the means that it will keep the Municipal Internet Service project going after the grant is exhausted.

### **Grant Funding Budget Audit**

Since the Albany Municipal Internet Service capital requirements are based on budgets, the need for precise budget forecasting and aggressive ongoing management of the budget is critical. Poor execution and noncompletion of technology projects are a material waste of corporate resources - vast majority of technology projects have missed deadlines and overrun budgets, as publicized in the news media. IT project failure can be at best a hindrance and, at times, fatal to a company. In every case, working on the right projects ineffectively or working on the wrong projects is a drain on precious grant funding resources. Recognition of these shortcomings enables the proposed Albany Municipal Internet Service to analyze scenarios and ask questions, which either validate the need for the IT expenditure or uncover other alternatives.

### **Financing Options**

While grants and other forms of funding from the Federal and State government are crucial to funding a large project such as this one, they may not cover the entire cost and can be competitive to secure. The city of Albany has several options it can undertake to raise funds itself to either close funding gaps or to fully pay for the project without assistance. These examples provide a general overview of each funding type and real-life examples from other cities and municipalities across the country that have used them to help establish their internet service.

### **Revenue Bonds**

The city of Albany can issue bonds to fund the initial setup and establishment of the broadband service. Bonds are then paid back with the revenues from the service. Revenue bonds are typically issued to private investors and then, once the service is established and running, the municipality can begin to pay back those bonds with revenues. The bonds typically are issued with an interest rate and are usually repaid over many years. This is one of the most common forms of fundraising and can potentially generate a lot of capital for a project quickly. Bonds are considered a safe form of investment and can be useful to large investment firms or even regular citizens who are looking for a low-risk investment.

This is a popular financial strategy used to fund part of or all a municipal internet project. Examples of municipalities using revenue bonds can be found all over the country, including Lafayette, Louisiana, Cedar Falls, Iowa, and Chattanooga, Tennessee.<sup>[3]</sup>

## **Loans**

Another option for the city is to take out a loan and use the revenues from the service to pay it back over time. Loans can be taken out from a bank or a federal agency. Certain Federal agencies, such as the United States Department of Agriculture, have specific loan programs that are designed to increase broadband access. The ReConnect Loan and Grant Program from the USDA provides 100% loans that will cover the entire cost of a project, as long as the project meets certain requirements. These loan programs also typically have low, fixed interest rates. For example, the USDA loan has an interest rate of 2%. Federal loan programs seem to have diminished over the past few years, but with the new recently passed IIJA, more loan programs along with other funding opportunities could become available again.

## **Internal Loan**

Another loan option for the city is to use an internal loan. Instead of taking out a loan from a bank, an Internal Loan allows one department to take out a loan from another department within the same municipal government. The advantage of this type of loan is that it can be taken out at a much lower interest rate than a loan from a bank would be taken out for.<sup>[4]</sup>

One notable example of an internal loan can be found in the development of Chattanooga Tennessee's municipal internet services, one of the most successful in the country. The Electric Power Board (EPB), which is in charge of Chattanooga's municipal internet service, also has an energy division that supplies internet to homes in the city. To finance some of the initial project, the Electric Division supplied a [\\$50 million loan to the Fiber Optic Division](#). The purpose of this loan was "to finance the costs of adapting the broadband network to provide telecommunications services to its customers". The Fiber Optic Division established a repayment schedule to repay this loan and as of December 2012, was on track to repay the loan ahead of schedule. While only a portion of the project was funded utilizing an internal loan, it provided a seamless and low costs loan to accomplish a crucial part of the process.<sup>[5]</sup>

## **Avoided Cost**

Another helpful tool cities have used is an avoided cost. An avoided cost comes into play for networks that are built incrementally over time. As the municipality installs and establishes the infrastructure for the broadband system, the city can redirect existing funds used to lease connections from providers to build and operate its network. For example, adding one section of a city or all municipally owned buildings into a municipal internet service can generate savings that can be used to further establish the network.<sup>[6]</sup>



The city of Santa Monica in California was able to use avoided cost to help save hundreds of thousands of dollars and redirect that funding towards establishing and improving their municipal internet service. The city began laying the groundwork in 1998 for their service and initially connected municipal buildings, the local school district, and the local college into a community-owned internet service. The city saw savings of around \$400,000 in the first year of establishing this network and was able to reinvest those savings into helping further establish the city-owned internet service to the rest of the city.<sup>[7]</sup>

## **Tax Increment Funding**

Tax Increment Funding (TIF) is another strategy the city could use to fund the project. While TIF funding has historically been used for more traditional projects such as land acquisition or construction, it could be useful to keep in mind as a funding option for the city. The idea behind TIF is to pay for a project or investment upfront that is expected to increase tax values or increase the tax base, and then use those increases to pay back initial costs. TIF financing has two different methods the city could use; Bond Financing and “Pay As You Go.”

In TIF Bond Financing, bonds that are issued are guaranteed to be paid back with increased tax collection that is generated from the investment. In this case, bonds would be issued to fund the implementation and set up of the municipal internet system. Once the system was set up, increased tax collections from increased property values, new businesses establishing in the city, or from other benefits would be utilized to pay back those bonds.<sup>[8]</sup>

The second option for TF financing, “Pay As You Go,” entails partnering with a private developer or contractor. With a private contractor doing the work of setting up the municipal internet system, the city would be able to incrementally pay for the services as additional tax revenue is collected by the city. Both of these options include a risk to the city and in the case of “Pay As You Go,” to the developer as well. However, this method of funding does allow for a potentially faster starting time for the project.

## **Operating Costs**

The city of Ammon, Idaho – population 13,860<sup>[9]</sup> – has operated a municipal internet service since at least 2016 in response to many residents and businesses believing that they were not being adequately served by existing cable and telecommunications providers.<sup>[10]</sup> While the city of Ammon is smaller compared to the city of Albany, in reviewing multiple cities that provide municipal internet, they were the only one to provide information that broke down the per household cost of connecting to fiber-optic service since the cost of connection is borne solely by the property owner.

The system that the Ammon built is a fiber-to-the-home model, in which homes were directly connected to high-speed fiber-optic internet service with up-to on gigabit speeds at a cost of \$64 per month. The city of Ammon’s website provides a breakdown of the per household monthly cost of operating their municipal internet service:

- \$22.50 is the monthly cost of installing the fiber line to the property (residents and businesses can choose to pay the upfront cost of \$3,200 to \$3,600 or pay this over 15 years).
- \$16.50 to pay for the maintenance and operation of the municipal internet service.
- \$25.00 to pay for the service of one gigabit internet speeds depending on the Internet Service provider.

Given that one the purposes of developing a municipal internet service is to ensure that residents are provided affordable access to the internet, it may not be ideal for Albany to give residents the choice to either pay the upfront cost of installation or a monthly fee over several years as it may deter participation - even from households who may be able to easily afford it. However, the estimate of the overall installation cost does provide a window as to how much it could potentially cost to have each household and business connected to a fiber-optic internet service.

Not included in these monthly costs are that of equipment costs like routers or modems – as residents and businesses are expected to pay for these items – unlike what is expected of current cable providers in which equipment is an additional monthly fee. Purchasing a Wi-Fi router directly leads to long-term savings compared to paying a monthly fee. However, the initial cost of a router can range from \$90 - \$700 per a list of common routers listed on CNET.com<sup>(11)</sup>, may be a barrier for low-income households to acquire. A solution to address this would be for the city to bulk purchase routers to reduce the individual cost for them and give potential customers the choice to lease or purchase them.

Also, worth noting is that the city of Ammon’s municipal internet service does not provide access to the internet directly. Instead, the city allows for various internet service providers to offer internet access using the city’s fiber internet infrastructure for a fee that is around \$25 per month.

The city of Ammon’s municipal internet website did not go into much detail as for as how they broke down the operating costs of their internet service, however, a similar sized city - Anacortes, Washington (population 17,637)<sup>(12)</sup> lists on their website members of their fiber-optic municipal internet service department:

- o A Department Director.
- o 4 Fiber Technicians, often with landscaping and construction experience, or having worked in other municipal departments similar to that of the city of Albany’s Department of General Services.
- o An Outside Plan Technician in charge of coordinating the expansion of the fiber optic network.

- o A Network Technician to assist with helping connect homes and properties to the internet as well as monitor, maintain, and control the system's network electronics.
- o A Fiber Manager, someone brought in to assist with the development of the fiber optic network.
- o A Business Operations manager to assist with processing customer orders, address customer inquiries, and execute community outreach initiatives.<sup>[13]</sup>

For a city the size of Albany which is five to seven times larger in terms of population than Ammon and Anacortes, there will likely need to be an increased number of operating staff to account for the larger customer base. Nevertheless, the list of positions that the city of Anacortes has is useful in that it provides a framework of the type of staff who will likely be needed to operate such a service.

The salary levels for staff working for municipal internet services often mirror the salary levels of positions of those in comparable city positions – for example technicians may make the similar salaries of those who may work in traffic engineering or the general services. However, in order to successfully fill these positions, they must be competitive with, if not exceed the salaries of similar positions in the private sector.

### **Operating Revenues**

The average cost of broadband internet service is over \$60 a month in New York State.<sup>[14]</sup> If municipal internet is to succeed in Albany, it must be able to compete with the existing broadband providers. The best way to ensure this success is that the city must be able to provide a better-quality service and provide that service at a cost that meets or is lower than what the current broadband provider offers. For that reason, it is imperative that the cost of city-run internet service does not exceed the \$60 price mark or whatever the average cost of internet service is determined to be within the city of Albany once development of this service commences.

However, for individuals and families in Albany who already cannot afford internet access, ensuring municipal internet costs stay around the \$60 a month level will not do anything to expand access as the cost barrier will remain. To resolve this issue, the city should take advantage of existing federal and state programs to increase affordability. Since 2021, the Federal Communications Commission has been promoting their Affordable Connectivity Program which provides a \$30 subsidy for eligible low-income households to help offset the cost of internet service.<sup>[15]</sup> If the municipal internet service cost stays at the \$60 per month level, the subsidy could effectively halve the cost of quality high speed internet service – allowing more families access to the internet. At the same time, this could provide Albany's municipal internet service with a reliable stream of revenue to address a substantial portion of the operating costs.

Additionally, the Governor of New York announced a \$1 billion "ConnectALL" initiative to expand broadband internet access throughout the state via a series of grants to

localities. As of this writing, there are limited details regarding how this funding can be accessed – however, this state resource should be kept in mind should the effort to develop municipal internet in Albany continue to move forward.<sup>[16]</sup>

Another potential revenue source to support a municipal internet service could come from the leasing of space on the city's newly owned streetlights to private telecommunications providers to host 5G antennas and other equipment. In June 2019, the city of Albany through a partnership with the New York Power Authority, began the process of purchasing the streetlights in the city from National Grid and converting them to LEDs.<sup>[17]</sup> One of the benefits touted by city and state leaders at the time was the potential to install additional equipment on the lights to facilitate 5G cellular service in the city.<sup>[18]</sup> New York City allows cell phone providers to install antennas on its streetlights and has been doing so for 15 years, and in 2020 it announced 10 franchise agreements with several companies to install 5G equipment on street lights and some traffic light poles.<sup>[19]</sup>

The cities of Syracuse and Rochester are both pursuing the leasing of its infrastructure to telecom companies to generate revenue for their cities. However, they are taking different approaches. Following a 2018 FCC rule change that limits the fees on what municipalities can charge telecommunications companies to install 5G antennas, the city of Syracuse worked out a deal with Verizon that will provide the city with \$162,000 in annual fees on top of \$300,000 in application fees. In contrast, the city of Rochester passed an ordinance in 2019 that allows them to charge \$1,500 for each streetlight or other utility equipment used to host 5G equipment, which runs counter to the FCC rule change which limits that amount to \$270. As a result of this ordinance, Verizon has sued the city of Rochester claiming it effectively prohibits the company from doing business in the city.<sup>[20]</sup>

Should the city of Albany decide to lease its streetlights to telecommunications providers, the city could use the revenues generated to support the municipal internet service in two ways.

- 1) Re-invest the revenues back into the operation to support the costs of maintaining this service. This is one way that costs could be kept low for potential customers, and to ensure the service remains competitive in relation to other internet providers.
- 2) Using the revenues generated to further subsidize the cost of low-income households. Depending on how much the city generates from telecom providers, potentially thousands of households could have effectively free access to high quality internet service, furthering the goal of reducing the digital divide in the city.

## **Conclusion**

A city-wide municipal internet service may appear to be a large expense to maintain and operate successfully, when broken down the costs can be manageable for a municipality the size of Albany. And by taking advantage of available grants, advantageous financing opportunities, and revenue opportunities, it is possible for Albany to develop a municipal internet service that can be financially self-sufficient operation and expand internet service in a way that ensures every household has access to the internet regardless of their ability to pay.

## **End-Notes**

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## **VI. Identification of Potential Strategic Partnerships in implementing Municipal Broadband in Albany**

Partnerships are critical for the success and validity of the City of Albany's Municipal Internet Services. Funding from state and local governments, as well as support via legislative changes, will ensure the City's service is a feasible and affordable alternative to current internet providers.

Partnerships with local institutions and private businesses can also bridge gaps in funding, outreach, and technical assistance that can make Albany's municipal internet a model service for municipalities throughout New York State and the country.

The Commission on Municipal Internet Service recommends the following stakeholders be engaged as the City acts upon the Commission's report. These are suggestions with broad groupings to inform outreach, but the Commission recommends further applicable stakeholders be engaged as appropriate.

- United States Federal Government
  - Support from our Federal government and elected officials will be critical for appropriations that will make the build out of the municipal internet system economically feasible for city government.
    - United States Senate Majority Leader Chuck Schumer
    - United States Senator Kirsten Gillibrand
    - United States Representative Paul Tonko
- New York State Government
  - Support from our State government and elected officials is critical. Depending on what type of service decided upon by city government, enacting legislation at the state level may be necessary. Additionally, financial assistance will be required for successful implementation of the service.
    - New York State Governor Kathy Hochul
    - New York State Senator Neil Breslin
    - New York State Assemblymember Pat Fahy
    - New York State Assemblymember John McDonald
- Albany County Government
  - Albany County has shown a commitment to expanding internet service to municipalities across the county. Cooperation with city government and a potential internet service can realize the mutual goal of providing affordable and high-quality high-speed internet.
    - Albany County Executive Dan McCoy
    - Albany County Legislature
- City of Albany Government
  - Mayor Kathy Sheehan, and the Albany Common Council, specifically Councilman Owusu Anane, have shown leadership by passing legislation creating this commission. We thank them for their confidence in our



mission. We anticipate further support as the report is finalized and service options are considered and implemented.

- City of Albany Mayor Kathy Sheehan
- City of Albany Common Council
- Educational Institutions
  - Educational institutions are important community anchors. We recommend engaging these institutions for support in research including data gathering, making connections with their sister institutions and providing support where appropriate. The City of Albany School District is in the unique position of having connections to families across the city who will need access to this service. They will be critical to identifying high need areas and individuals.
    - City of Albany School District
    - City of Albany Public Library System
    - University at Albany
    - University at Albany Center for Technology in Government
    - College of St. Rose
    - Maria College
    - Albany Law School
    - Albany Pharmacy School
    - Sage College
- Local Community Groups
  - We are fortunate in the City of Albany to have a strong fabric of active and informed community groups. These groups will be critical for gathering feedback on the Commission's report, the implementation of the service, and the effectiveness of the service.
    - City of Albany Neighborhood Associations
    - City of Albany BIDS
    - United Way of the Greater Capital Region
    - AVillage
    - Arbor Hill Development Corporation
- Local businesses
  - Time and time again, our local businesses have stepped up to help our community. We anticipate calling on these partners as we move through this process in hope of providing their expertise and financial support when available. A successful city-owned internet service will act as a catalyst for attracting, retraining, and training the workforce.
    - CDTA
    - SEFCU
    - Business for Good
    - Redburn Development/Massive Mesh
    - Rosenblum Co.
    - Omni Development
    - Cass Hill Development
    - CDPHP
    - Equinox

- Albany Med
- St. Peters
- Commerce Hub
- Co-working spaces such as the Bull Moose Club, CapCity Coworks, Beahive Albany
- National Grid

## VII. Conclusion

As we have previously noted, there has been a steadily increasing demand, and need, from the public for high-speed internet access.

The reality of broadband as an area of critical infrastructure became even more apparent since the advent of the COVID-19 pandemic and the shift to remote delivery and access to the full array of both private and public services at all levels of government. Coupled with recognition that a lack of digital equity creates barriers to access services particularly amongst vulnerable populations such as minorities, lower income individuals and families, the disabled, and senior citizens. Coupled with demands for increased transparency in government (which internet access can help address), the need for a city-wide broadband solution is both clear and immediate.

Given the considerable efforts at both the Federal and State level to make funding available for municipal broadband initiatives, the commission believes that such an investment of time and resources by the city of Albany is both structurally and fiscally feasible and necessary

The commission will continue to research and refine the findings and recommendations included in this preliminary report and solicit public feedback on potential models and proposals so that the Mayor and Common Council can make the best-informed decision possible for the benefit of the city of Albany and its residents.

Finally, we re-iterate one of the key pieces of information from our analysis of the publicly run broadband network developed by the city of Chattanooga. In the 10 years since Chattanooga invested \$220 million dollars (a mix of grants and bond revenue), **the return on investment (ROI) has been \$2.7 billion dollars and the creation of nearly 10,000 new jobs for its residents.** That success, or close to it, would be life-changing for our community and position the City of Albany as a national leader in innovation alongside Chattanooga.