Executive Summary

Purpose of the Study

Over the past several years and even more recently as communities nationally have had to grapple with the effects of the Covid-19 Pandemic, technology has become essential for businesses, households and residents and is no longer a luxury item, and instead has become a vital need. The City of Buffalo, in supporting diversity, equity and inclusion in past, current and future policy, has recognized that the digital divide is a problem that requires a full analysis of the causes of this inequity, and solutions that will directly respond to and bridge disparities amongst certain residents within the City. This would involve, at a minimum, identification and consideration of socio-economic issues that affect accessibility, physical broadband and digital infrastructure, and affordability to develop immediate, medium-term, and long-term solutions.

In February of 2021, City of Buffalo Urban Renewal Agency (BURA) contracted with ECC Technologies, Inc. (ECC) to provide an assessment of internet connectivity and analysis of broadband availability and adoption to provide BURA and the Buffalo Broadband Committee with the information needed to guide the use of local, state, and federal resources to improve broadband availability, internet connectivity and adoption in the City of Buffalo.

Methodology

To fully address the City's needs, ECC implemented a two phased approach 1) development of a City of Buffalo, Broadband Infrastructure Inventory Study report , 2) Broadband Availability and Adoption Tool (BAAT) Survey Campaign. The inventory report identified physical locations of broadband and infrastructure. The BAAT survey identified adoption issues.

The City of Buffalo, Broadband Infrastructure Inventory Study report included a high-level field inventory of the City's existing broadband infrastructure, namely fiber optic and coaxial cable infrastructure on the main roadways in the city. ECC also identified wireline boundaries, central office locations and communication tower infrastructure. ECC's outside plant (OSP) team drove the main roads in the city and to the extent possible, physically identified and documented the City's existing broadband infrastructure. Major roadways are the critical arteries serving the neighborhoods and these were the focus of the study. In major metropolitan areas such as the City of Buffalo, it has been found that streets branching off served major roadways are likewise served. Therefore, to save cost and reduce the overall length of the project It was agreed that ECC would not drive secondary and neighborhood roads. The ECC team, with the field data gathered, created maps of the City's infrastructure into an ESRI GIS database. Secondary research utilized publicly available databases managed by federal and state agencies and information purchased from telecom industry database research organizations. The findings of the Broadband Infrastructure Inventory Study are contained within the official report.

The Broadband Availability and Adoption Tool (BAAT) Survey targeted the validation of availability as seen from the residents or business, broadband speeds, costs, educational limits, reliability, service offerings, and a host of other key issues as may want to be understood by the City. The BAAT Campaign was

instrumental in identifying the cultural impacts and the foundation for the development of the Community Needs Assessment.

Concurrent with the Inventory Study, ECC conducted a broadband survey campaign within the city limits to determine issues pertaining to broadband adoption and use. ECC's Broadband Availability and Adoption Tool (BAAT) is a web-based application that documented 1) demand for broadband services, with the marketing component, data, and 2) mapped responses all captured within one portal.

ECC worked closely with BURA and the Buffalo Broadband Steering Committee to develop the questionnaire used in the survey. ECC provided suggestions/recommendations to the BURA and City teams pertaining to the implementation of the BAAT program based on other campaigns successfully executed with ECC clients.

During the project, the ECC and BURA teams met at least every other week to review activities and results. Periodically, the meetings would include maps of the city to identify the geographic responses in a graphical format. The BURA team utilized a variety of methods to publicize the BAAT survey including outreach through the city's public relations office, links on the city's website, notifications on property tax bills, and even person to person canvasing in certain neighborhoods.

Recommendations

Issues:

The BAAT Survey responses uncovered several key issues driving the availability and adoption of broadband in the city of Buffalo. These issues include:

- **Lack of choice in broadband provider** - 92% of respondents believe it is important or very important to have a choice of providers.

- **High cost of service** – nearly 50% of respondents are paying $75/month or more for service in the City of Buffalo.

- **High cost to provision broadband service** – while the survey results showed 12% perceived Internet was not available, the inventory data showed that broadband infrastructure is prevalent throughout the City. However, there can be high costs associated with provisioning service to an address which can be prohibitive to adoption.

- **Education on the benefits of and how to use the Internet** - 6% of respondents claimed they lack the skills and knowledge to use the Internet.

- **Availability of affordable equipment** - 6% of respondents cited the lack of a computer or a device prevented access to the Internet

- **Service-related issues** - In the open comment section of the survey 29% of respondents complained of issues with customer service/reliability.

Strategies for Solutions: Below, possible solutions for addressing the City's broadband issues are addressed. These solutions are broken down by actions that can be taken in the short term (over the next 12 months), medium term (1-2 years), and long-term (2+ years).

Short Term Strategies (over the next 12 months):

Affordable Connectivity Program

To immediately address *cost issues*, the city should consider leveraging the Federal Affordable Connectivity Program by marketing the availability of the program, informing residents of the benefits, costs, qualifications, and assistance with processing applications.

The Emergency Broadband Benefit expired on December 31, 2021. However, Congress created the Affordable Connectivity Program, a new, long-term $14 billion program that replaced the Emergency Broadband Benefit Program on January 1, 2022. The program was established for the FCC to help low-income households pay for broadband service and connected internet devices. The outcome of this program is to help ensure that households can afford the broadband they need for work, school, healthcare and more. Communication from the City to the community should be performed to get the public informed of this service. The Affordable Connectivity Program will provide a discount of up to $30 per month for broadband services for eligible consumers. [1] City residents can contact their provider to set up this discount. Greenlight Networks, Spectrum and Verizon all participate in the Affordable Connectivity Program.

Create a fund for hardship cases and low-income households.

To address the high cost of broadband, either installation costs or monthly costs, it is recommended that the city allocate a portion of the franchise fees collected from Spectrum and Verizon into a pool of funds to be used to help reduce these costs for the needy households.

Several cities have used a source of revenue for supporting local telecom for hardship cases and low-income households. This franchise agreement is a negotiated contract between a municipality and a cable TV service provider that grants the provider the right to serve customers in the city's jurisdiction. The contract often specifies the period of service and a fee remitted back to the municipality. In many areas of NYS, the TV franchise fee is roughly 5% of TV revenues. The franchise fees do not apply to revenues from Internet, telephone, or security services. Only TV service revenues are used to calculate the franchise fees paid to the municipality.

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[1] [Consumer FAQ for Emergency Broadband Benefit | Federal Communications Commission (fcc.gov)](https://fcc.gov)

Identify a Broadband Champion and Establish a Broadband Committee

The city should identify and designate a broadband champion. As a first step it is imperative that a person within the city be chosen as a "champion" to oversee and provide the necessary "will" to move the initiative forward. Ideally, the champion will possess political weight in the community, some technical experience and the time needed to devote to such an effort.

The city should create a small broadband committee to drive broadband initiatives forward. The members should include at a minimum City IT, a member from the City Mayors team, City neighborhood and district representatives and the broadband champion. This working group should be chartered with providing strategic planning and setting policy for the development of a city -wide broadband initiatives.

The champion and /or representatives of the broadband committee should meet periodically with all broadband providers offering services in the city to understand their plans and needs and work cooperatively with the providers to expedite expansion. Through this cooperative effort, the city could influence the timing and location of expansion to critical parts of the city that need it the most. This committee could also meet with regional providers not currently providing services to entice expansion into Buffalo. This committee could also be responsible for exploring various grant opportunities to expand broadband. Lastly, the committee could identify and recommend modifications to existing City policies to reduce obstacles in the deployment of broadband services.

Medium Term Strategies (1-2 years):

Provide an environment to embrace ISP expansion.

Having viable *competition in broadband service providers* is essential to drive prices down and improve service quality. ECC recommends that the City consider:

- Adopting a dig once policy, whereby anytime the city or utility uncovers sidewalks or streets to place underground facilities, the city places conduit for city use, and for lease to other carriers.

- Review current codes that may be restricting, delaying or have cost impacts on providers wishing to build underground infrastructure.

- Review policies and procedures to maximize easy access to city rights of way. For cellular providers.

- Streamline permitting and approval processes to enable carriers to deploy infrastructure quickly and efficiently.

Welcome 5G Cellular Service

MM-Wave 5G service could be an effective option for city residents, providing up to 1Gbps service and in home Wi-Fi access. In addition, the city could take advantage of MM-Wave 5G availability to help develop Buffalo into a Smart City. The city should consider the following:

- Following up from a previously stated strategy, the city broadband committee could meet periodically with cellular providers offering services in the city. This would enable the city to understand the cellular providers plans and needs, develop programs to ease and speed deployment and potentially influence the providers in their expansion.

- Allow wireless carriers access to city rights of way.

- Matching city codes and regulations to federal regulations pertaining to size of equipment allowed on poles.

- Allow wireless carriers affordable access to city vertical assets such as streetlights.

Invest in providing access to the city community centers and other key locations.

"Research suggests that the socio-economic returns to investment in broadband are significant," including higher property values, increased job and population growth, higher rates of new business formation, lower unemployment rates, and improved health and life outcomes. It is recommended that the City of Buffalo provide access to broadband in key physical spaces throughout the City where residents can depend upon reliable access to technology.

Community centers and libraries are examples of key locations for ***educating the community in the benefits and use of the Internet***. The city should fund the construction needed to bring acceptable internet services to locations such as these. Funding should also be allocated from the recently passed Infrastructure Bill to pay for the installation of service, equipment, and digital literacy.

Long Term Strategies (2+ years):

ErieNet

Erie County is endeavoring to build a 450-mile open access dark fiber network (ErieNet), to connect county facilities, Public Safety Answering Points (PSAP's) and libraries. Dark fiber is the term used in the industry to describe fiber optic strands (in the cable) that are leased or sold to the customer or end user without services delivered over them. Unlike fiber from a service provider, the end user must light and operate the fiber strands with their own electronics. They plan to make available non-allocated fiber optic strands available for lease by government, enterprise, healthcare, education, providers, or any entity requiring the use of the fiber optic infrastructure. The County is currently refining the routing and business plan prior to construction. It will be necessary for a significant portion of the routing of the network to be through the City of Buffalo. The routing and business plan are expected to be completed in February 2022. Design and construction of the network is expected to take 2-3 years.

The City should work cooperatively with and support Erie County's efforts to establish ErieNet open access dark fiber network. Leveraging this network could allow the City to save on costs for fiber connection to City and DPW sites, as well as provide diverse routing for disaster recovery. In addition, the City may be able to influence the County on network routing to enable the City to better take advantage of the network.

Build the Foundation for a Smart City/Create a City Owned Network

The City of Buffalo should on its own or work in conjunction with a public/private partnership, develop its own city-wide network to deploy smart cities technology and applications. An example is the Streetlight Conversion Project, National Grid recently converted 2300 roadway lights by partnering with the city. With its own network, the city could deploy a suite of sensors (typically hundreds or thousands) to collect electronic data from and about infrastructure to improve efficiency and quality of life. Residents and city workers, in turn, may be provided with apps that allow them to access city services, receive and issue reports of outages, accidents, and crimes, pay taxes, fees, and the like. In the smart city, energy efficiency and sustainability are emphasized. Cameras can be used to enhance public safety. Sensors can be used to manage traffic flow during heavy congestion or for emergency vehicles.

Measuring Success:

Set a five-year goal to ensure all city addresses and housing units have access to at least 1 coaxial based and 1 fiber-based provider.

Meet and interview providers annually on permitting and progress with construction. Measure turn-around times from permit application to approval.

Measure miles of added city conduit placed during underground construction as part of the Dig Once policy.

Create a 5-year goal to obtain availability of 5G nm bandwidth service to all through-out the City of Buffalo.

Develop, deploy, and evaluate the effectiveness of various Digital Literacy programs

To effectively improve on broadband availability, competition, adoption, and utilization, it is important to not only implement the strategies identified above, but progress needs to be measured and adjusted along the way as needed to obtain the desired results.

Summary of Findings:

Based on the information gathered in this study, it was determined that while broadband infrastructure including Cable TV, and fiber optic and DSL based broadband is available within a few hundred feet of city residents and businesses, offerings in the city are either limited, costly, or slow. ECC's suggested course of action, is that the City of Buffalo make immediate efforts to improve internet competition, service offerings and adoption as part of its commitment to increasing quality of life, equity, and efficiency of government services, following the recommendations summarized herein. The general findings from the summary with respect to competition, service offerings and adoption are as follows:

- Finding: city residents and businesses generally have access to Spectrum Internet. However, in areas where the customer needs to be served via underground pathway, the construction required to run the cable from the main feed to the address can be costly and prohibitive to broadband adoption.

- Finding: Verizon offers fiber to the home (FTTH) with its FIOS offering, predominately in the northern portions of the city in the University, Delaware, and North Districts. In addition, FTTH is available in the South District. Other areas are served by slower DSL service. However, Verizon has elected to no longer expand its FIOS service. Instead, the company is focusing on its 5G cellular deployment.

- Finding: Greenlight Networks is establishing its FTTH service in the western portion of the city in the Niagara District. Construction began in 2021. Greenlight has a 4-year plan to expand their service in the city. However, the current city underground ordinances are very restrictive. Per an interview with Greenlight Networks representatives, they stated a five-year moratorium on underground construction under recently repaved streets impedes the ability for Greenlight and other providers from expanding services in the city. The delays in permitting, code restrictions and lack of timely cooperation by other providers for conduit access makes for a difficult and challenging environment from which to expand rapidly. This moratorium is in Section 413-21 B of the City Charter.

- Although many of the residential areas have access to infrastructure via pole lines running along their backlots, the main feeder infrastructure is fed via underground facilities along main and secondary roads. Adding additional infrastructure along these underground pathways can often be costly. This could be an opportunity for the City to work with the providers to assist in expanding the feeder infrastructure to reach more addresses. Examples of which could be providing access to existing underground pathways, provide subsidies or incentives to providers to expand their networks creating choice and competition.

- Verizon Wireless has plans to expand their 5G cellular service throughout the city. Verizon is looking to add 500 to 600 small cells in the city. 5G providers need access to poles and streetlights to mount their antennas and electronics. The providers also need access to city rights of way to access pole lines running in backlots. The city should consider providing pricing structure in line with the FCC recommendation to 5G Carriers to help speed deployment.

- Private Sector and Community Development Projects to expand affordable broadband in the City. University at Buffalo and Mission:Ignite have worked together to secure a $300,000 grant from the National Science Foundation's Project Overcome program. This grant will be used to provide wireless broadband to 150 homes in the Fruit Belt in Buffalo with the goal of providing the FCC standard 25 Mbps download and 3 Mbps upload speeds to each home. This program combines free/low-cost Internet access, with low-cost equipment in combination with educating the users on the benefits and use of the Internet. M&T Bank provided engineering, purchasing of equipment and installed a wireless system throughout the City of Buffalo. University at Buffalo provided the "Fiber Assets" for the network, as well as network engineering expertise along with the City of Buffalo, which lead to a franchise agreement with M&T for the network. The project was done at no expense for the City. Buffalo is allowed use of the infrastructure, including poles and roads.

- Most of the city residents have access to Spectrum cable or slow DSL from Verizon. Based upon the feedback from respondents of the BAAT survey, most feel Spectrum has a monopoly on internet service in the city. The respondents desire other alternative provider to compete with Spectrum. Many are not happy with the reliability and customer service Spectrum provides. The respondents also indicated that the price for Internet service is too expensive.

- ErieNet - will be a wholesale provider of broadband capacity throughout the county, leasing dark and lit optical fiber access to carrier, enterprise, and other entities that desire to manage and control their own broadband networks. ErieNet will focus on partnerships with service providers and enterprise entities, encouraging the use of the ErieNet backbone to expand competitive services and create efficiencies throughout the county. ErieNet is meant to complement existing carrier infrastructure so as to not devalue the existing investments in our communities.

  "The mission is to create a foundation to address the broadband needs of unserved areas, improve services in underserved areas of the community and enable world class broadband investment and deployment county wide. The fiber optic backbone will be owned by the county but managed and controlled by ErieNet, a not-for-profit local development corporation (LDC). ErieNet will be open for any viable entity to use or provide services to support broadband technologies and services. It is intended to enhance economic development opportunities, promote better quality of life and enhance Erie County as a globally competitive community."

  Construction is expected to begin by June 2022 for nearly 400-mile optical fiber backbone and will take approximately 30 months to complete.