

**WALTON COUNTY, FLORIDA**

**TECHNOLOGY  
ACTION PLAN &  
BROADBAND  
FEASIBILITY STUDY**

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**MAY 2018**



**CONNECTED  
NATION<sup>SM</sup>**



- I. Introduction.....4**
  - Goals and Objectives ..... 4
  - Context and Background ..... 5
  - Report Organization ..... 6
- II. Why Does It Matter? .....8**
- III. Community Assessment ..... 10**
  - County-Wide Infrastructure..... 10
  - Households..... 23
  - Business and Economic Activity ..... 32
- IV. The Path Forward ..... 41**
  - County-Wide Infrastructure Recommendations ..... 41
- V. Appendix..... 49**
  - I. Florida Statutes ..... 49
  - II. Broadband Providers..... 51
  - III. Infrastructure Damage ..... 52
  - IV. Sample Antenna Pattern ..... 54
  - V. Fiber Projects ..... 55
  - VI. Sample System Parameters ..... 58
  - VII. Estimated CATV Construction Costs per Unit ..... 60
  - VIII. Adoption Recommendations ..... 61
  - IX. Broadband Maps..... 65



I

# INTRODUCTION



## Introduction

Today, technology plays a pivotal role in how businesses operate, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has become dependent on how broadly and deeply the community adopts technology resources, which includes access to reliable, high-speed networks, the digital literacy of residents, and the use of online resources locally for business, government, and leisure.

The purpose of this document is to summarize the results of a county-wide technology assessment for Walton County and to provide the next steps for addressing any deficiencies or opportunities for improving the local technology ecosystem in order to advance broadband expansion for the betterment of economic, social, healthcare, and educational opportunities for families, businesses, and institutions in the community.

This technology action plan was developed for Walton County following a comprehensive assessment performed by Connected Nation (CN) with guidance from the local broadband team. While the results of the assessment indicate that the community has made tremendous strides and investments in technology, this plan is a blueprint for leveraging technology to improve quality of life and advance community and economic development. Below are the detailed results and recommended strategies for Walton County.

## Goals and Objectives

From the Request for Qualifications (RFQ) for Broadband Feasibility Study, the vision of the County is to provide a world-class community telecommunications infrastructure to their community, facilitated by new access to the public's local telecommunication assets. The County intends to empower its citizens and local businesses to be network economy producers, not just consumers of network information and data services. This requires access to gigabit-class broadband infrastructure to support needed services and capabilities:

1. Broadband Infrastructure
2. Open Access
3. Competitive Marketplace
4. Compare Globally

The following bullets represent the goals and objectives of this process and plan established at the outset of the project:

- ✓ Evaluate the current and future demand for broadband products and services in Walton County through a range of efforts and methodologies, including but not limited to conversations with:
  - Private stakeholders (e.g., local businesses, business organizations, healthcare providers, digital divide advocates, or other interested groups).
  - Broadband providers regarding the demand for, and adoption of, their products.
- ✓ Research and evaluate the current supply of broadband communications assets, products, and services in the County and region through a range of efforts and methodologies.
- ✓ Create a profile of the County's broadband services.
- ✓ Develop a map which defines which areas of the County have broadband or 25 Mbps available.
- ✓ Identify where all copper and fiber lines are located.
- ✓ Identify who are the providers and competitors.
- ✓ Identify Walton County's options to improve services.
- ✓ Discuss whether 5G technology will hurt the broadband community.





- ✓ Conduct a customer survey to understand the needs of the community (utilize schools and other public avenues to reach homes).
- ✓ Feasibility of a Municipality Network.
- ✓ Converse with other counties on where they are in exploring a multi-county operation.
- ✓ Research any wireless conflicts with nearby military bases.
- ✓ Provide bi-monthly updates to the County's committee (Walton United Broadband Initiative).
- ✓ Using the results of the entire analysis, develop a comprehensive written report that presents alternatives for deploying broadband services throughout the community, assuming the use of the County's existing and planned economic development dark fiber infrastructure and other available telecommunications assets. The analysis must consider a wide continuum of business models and highlight associated costs for expansion, maintenance, and operations. It must propose a maintenance strategy and action plan which includes best management practices and procedures to protect assets, and marketing and management strategy and action plan for the County's dark fiber network if it is expanded.

## Context and Background

From the onset, the local broadband team should be applauded for their past, and ongoing, efforts to foster broadband expansion in Walton County. Under the guidance of Sara Comander, and tenacious leadership of Rick Wilson, the team's efforts have paid dividends and their message has been heard by the citizens and the broadband providers across the County.

As a recipient of the 2016 Broadband Communities Cornerstone Award, the local broadband team's work is evident and noteworthy. Additionally, the Walton United Broadband Initiative, submitted through Triumph Gulf Coast, Inc. has cleared round 1 and has received an "A" ranking<sup>1</sup>.

The local broadband team includes Sara Comander (District 4 Commissioner), Rick Wilson (Projects and Programs Manager; Walton County Administration), Jason Cook (Technology Support Specialist; Walton County Administration), Jed Sconiers (Director of Information Technology; Walton County Clerk of Courts), Josh Sconiers (IT Administrator; Walton County Sheriff's Department), and Henry Martin (Technology Information Officer; Walton County School District).

"We're a model for the State. We get calls all the time from people in Washington, D.C. wanting to know how we did it. Well, we did it together."

-Sara Comander, Walton County, Florida

It is CN's opinion that the localized campaign to improve broadband has resulted in substantial improvement in infrastructure expansion over the past 36 months, much of which can be attributed to the last 12 months of new home construction in recently developed subdivisions.

Highlights from the residential survey appear to support the local broadband team's assumptions that there is ample room for improving the broadband landscape in Walton County:

- Overall, 1,607 residents of Walton County responded to the survey, either in paper form or online. By comparison, Connected Nation typically samples 1,200 respondents for its statewide surveys, and samples of 1,000 are typical for randomly-selected national surveys (these responses were not randomly selected). Of these responses, 1,495 adults living at unique addresses were identified.
- 67% of Walton County households subscribe to fixed, terrestrial broadband; by comparison, 84% of households in Florida subscribe to broadband such as cable, DSL, or fiber<sup>2</sup>.
- Over half of Walton County's internet subscribers have cable connections (52% of internet-connected households), followed by DSL (23% of internet-connected households).

<sup>1</sup> <http://www.waltonsun.com/news/20180308/county-looking-to-award-triumph-funds>

<sup>2</sup> U.S. Census Bureau, American Community Survey (ACS) 2016 1-Year Estimates.



- On average, Walton County households report paying an average of \$71.07 per month for their home internet service.
- More than one-half of Walton County internet subscribers (54%) say their current service does not meet their needs. Slow speeds (especially during tourist season), unreliable connections with dropped or lagging service, and the cost of service, exacerbated by a perceived lack of competition, are the top reasons given for not being satisfied.
- Nearly every respondent (95%) said they are interested in having improved or additional choices for internet service in the County.

According to recent FCC Form 477 data<sup>3</sup>, Walton County has broadband access at speeds of 25 Mbps download/3 Mbps upload to 42,938 people (78.0%) and 18,086 households (81.1%)<sup>4</sup>. Through provider outreach and on the ground infrastructure and asset mapping, CN determined broadband availability in the County to be considerably lower.

## Report Organization

The report is divided into three primary sections: 1) introduction and background, 2) community assessment, and 3) challenges and recommendations. The assessment and all other discussions are centered on three areas of community technology analysis: 1) community-wide infrastructure, 2) households, and 3) businesses.

The **Community-Wide Infrastructure** section checks to see whether the broadband and technology foundation exists for a community. The criteria within this section endeavors to identify gaps that could affect a local community technology ecosystem including issues related to last-mile connections, cost, and competition.

**Household** access, adoption, and use are important for consumers, institutions, and communities alike to take the next step in fully utilizing broadband appropriately. The Households component of the assessment seeks to ensure the ability of all individuals to access and use broadband and to recognize the value of a connection and its impact on quality of life.

Robust use of technology among the **Businesses** in a community is a critical component of the broadband landscape because it is where the value of technology can finally be realized. However, without supporting infrastructure and households that can afford, adopt, and use broadband, meaningful use of technology among various sectors is not possible. Additionally, ensuring the community has the technology talent and workforce to support local businesses and economic activity is also critical to leveraging broadband for improved quality of life.

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<sup>3</sup> FCC Form 477 Broadband Deployment Data as of December 31, 2016, released November 16, 2017.

<sup>4</sup> Calculated from U.S. Census Bureau 2010 data; information is not available at census block level for more recent datasets.



II

**WHY DOES IT MATTER?**



## Why Does It Matter?

Independent research supports the concept that a critical gap exists in the broadband infrastructure in Walton County.

In a paper written by Dr. Ed H. Moore (Independent Colleges & Universities of Florida) titled *Expanding Residential Access to the Internet Infrastructure & Locally Customized Distance Learning in Schools To Advance Educational Attainment, Economic Development, Health Care & County Growth*, Dr. Moore suggests that 27% of Walton County's population (17,047) is without access to broadband.<sup>5</sup> Of these 17,000+ without access, Dr. Moore suggests that 40% are rural and only 2% are urban.

CN's research has found a striking relationship between the overall wellbeing of a community and the Digital Divide in that community. Communities with robust access, adoption, and use are generally doing better.

From healthcare, agriculture, public safety, and tourism, to government, education, libraries, talent, and economic activity, every sector of a community requires the power of broadband and related applications to function at the highest capacity.

One thing is clear, broadband and related technologies have transformed nearly every facet of society. While many of these technology changes can be discussed on a global scale, local community technology advancements depend on community leadership and action.

A critical first step in advancing technology is identifying and understanding local assets along with opportunities and barriers to technology advancement.

State and local governments, for example, tend to be the largest consumer of internet connectivity from private sector ISPs. Walton County clearly understood this relational aspect when it chose to migrate away from CenturyLink and replace its phone and internet connections with Information Transport Solutions (ITS). The County's \$1.5 million dollar investment in fiber optic expansion has already proven to be a sound, and cost effective, decision.



Between 2001 and 2010, income grew faster and unemployment grew slower in rural counties with home internet adoption rates higher than 60%.



During the same period, rural counties with home internet adoption rates lower than 40% lost more businesses and more jobs than counties with higher rates of adoption.



Small businesses (less than 20 employees) who have websites have higher annual revenues and are more likely to have recently hired than businesses without websites.



Employees who do not telework in any capacity tend to have incomes that are 75% of that of their teleworking neighbors.



As overall digital literacy increases, so too does the digital interaction between residents and local businesses, local government, and other organizations.



Access to infrastructure of all types is positively associated to business start-ups, and broadband is more conducive to start-ups than highways, rail, etc.



A study in Ohio found that having a broadband connection gave households an estimated economic benefit of \$1,850 per year.



Rural counties with at least two broadband technologies available have experienced significant in-migration compared to rural counties without broadband.



By adopting web-enabled technology, local government can become more responsive, transparent, and cost-effective.



Dr. Moore's study (cited below) suggests that nearly 700,000 Floridians cannot access higher education distance learning programs from home.



Telemedicine applications are estimated to add \$522,000 to rural economies and reduce hospitalizations of nursing home patients and generate savings for Medicare.



Two-thirds of new jobs created between 2010 and 2016 required medium to high digital skills, and 1.1 billion jobs, globally, are automatable today.



Small businesses with faster internet connections tend to have a higher proportion of employees with advanced technology skills compared to those with slower speeds.



More than 86,000 hours of Netflix were watched and Amazon made approximately \$220,000 for every minute of 2016.

<sup>5</sup> [https://www.floridahighereducation.org/doc\\_meetings/20171030/Moore-10\\_30\\_17-Access-to-Internet-Distance-Learning-for-Educational-Attainment-Economic-Development-County-Growth.pdf](https://www.floridahighereducation.org/doc_meetings/20171030/Moore-10_30_17-Access-to-Internet-Distance-Learning-for-Educational-Attainment-Economic-Development-County-Growth.pdf)





III

# COMMUNITY ASSESSMENT



## Community Assessment

The following sections provide detailed findings for Walton County.

Each section incorporates a series of topics in order to identify gaps and leverage opportunities.

## County-Wide Infrastructure

### Introduction

Since its inception in 2001, Connected Nation’s mission has been to change lives through technology and bring the benefits of universal broadband access, adoption, and use to communities and ensure their competitiveness in the twenty-first century global economy. We remain committed to building on this experience and have enjoyed the opportunity to conduct an extensive review of Walton County’s broadband landscape.

As a national 501(c)(3) that advocates for rural broadband expansion, CN is often asked to discuss its position on municipal projects, most commonly fiber-to-the-home (FTTH). CN takes a neutral stance but highly recommends that municipalities exercise caution and conduct structured and methodical due diligence before making the decision to enter the arena.

In the current environment, deploying broadband infrastructure, services, and applications, as well as supporting the universal adoption and meaningful use of broadband, are challenging but required, to advance twenty-first century technologically empowered communities. From healthcare, agriculture, public safety, and tourism, to government, education, libraries, talent, and economic activity, every sector of a community requires the power of broadband and related applications to function at the highest capacity.

One thing is clear, broadband and related technologies have transformed nearly every facet of society. While many of these technology changes can be discussed at a global scale, local community technology advancements depend on community leadership and action. A critical first step in advancing broadband technology is identifying and understanding local assets along with opportunities and barriers to technology advancement. This plan is a roadmap to advancing technology in Walton County, Florida.

The success of a community has become dependent on how broadly and deeply the community adopts technology resources, which includes access to reliable, high-speed networks, the digital literacy of residents, and the use of online resources locally for business, government, and leisure.

“In today’s economy, nothing tells the world your community is open for business quite like access to broadband Internet.”

–Mayor Ralph Van Brocklin,  
Johnson City, Tennessee

### Understanding the “Big Picture”

Municipalities electing to engage in the delivery of broadband services often have no experience serving as a utility and even less experience with broadband. As long as the return on investment (ROI) model seems reasonable, the cost of building a network, of any type, should not be among the final concerns. Instead, understanding the big picture should be the initial priority.

Being prepared to answer the following three questions before moving forward is key:

- Do we fully understand every aspect of the competitive landscape?
- Are we willing to risk bankruptcy if our business plan is founded on emotion instead of fact?
- Is there demonstrable proof of demand and willingness, from consumers, to switch providers?



There is no “one size fits all” option for success. In order to have a chance to reasonably survive and prosper as a municipal broadband provider, thinking and preparing like a commercial broadband provider before getting started will be beneficial. Understanding the nuances of the competitive landscape and being prepared to do as much, if not more, than the competition is essential. This includes researching relevant federal and state regulations, identifying funding sources, and completing a sound business model. This will likely require the following steps:

- Offering a 24x7x365 “help desk” call center and technical support.
- Hiring a professionally trained customer service and technical staff that not only understand the product lines and infrastructure, but know how to “upsell” when a customer is happy and is proficient enough at customer retention to save the account when the customer is not happy.
- Providing continuous access to capital to fund ongoing and routine maintenance, technical upgrades, and expanding the broadband project.
- Being prepared to work with the Florida Public Service Commission and the Federal Communications Commission. At a minimum, even if it is decided not to become an “eligible telecommunications carrier,” there will still be requirements to maintain regulatory compliance through routine submissions of FCC Form 477 and other state/federal reports and filings.
- Asking if the business model should be forged on singular control or if a partnership is more appealing.

Even a public-private partnership (P3) can be complex and impacted by a number of factors including state laws, capital funding, competitive landscape, necessity of service, and ultimately the ROI models. State laws, for example, can often include a litany of hard-to-find, and sometimes unique, impediments (often referred to as If-Then, Minefield, Total Bans, etc.).

During the 2011 legislative session, House Bill CS/CS/HB 1231 (the Regulatory Reform Act) was passed and signed into law July 1, 2011. This effectively relaxed, if not almost completely removed, the Florida Public Service Commission’s retail oversight authority over telecommunications wireline companies. However, statutes remain intact that may impede or encourage municipal efforts by Walton County:

- **FS §§ 125.421, 166.047, 199.183 (all taxation)<sup>6</sup>**
- **FS §§ 350.81 Railroads and Other Regulated Utilities; Florida Public Service Commission**

Paraphrasing FS §§ 350.81: Municipalities that wish to provide communications services are to conduct at least two public hearings at which they must consider a variety of factors, including “a plan to ensure that revenues exceed operating expenses and payment of principal and interest on debt within four years.”

Accordingly, should Walton County elect to become a municipal broadband provider, it must first be able to satisfy FS §§ 350.81 with a satisfactorily demonstrable financial analysis.

Other laws may encourage, or curtail, the advancement of broadband but may be equally as hard to find. A few examples specific to Florida and/or Walton County can be found in **Appendix I: Florida Statutes**.

In the majority of communities, broadband service is a private-sector industry. Internet connectivity can be delivered via several technology platforms including cable modem, DSL, fixed wireless, mobile wireless, fiber, and satellite. Companies offering service via these platforms often compete with each other in areas with high household density, but that competition can wane as household density decreases in rural areas.

Florida’s relaxed regulatory environment can, in some ways, be viewed in a positive manner. There are portions of the County where two cable television providers compete to provide service to homes and businesses. If competition is a desirable option, can Walton County influence the private sector or should Walton County become the competitor?

Because broadband service typically responds to market forces, competition impacts the cost of broadband service. Therefore, in theory, the more Internet Service Providers (ISPs) available to a consumer, the lower the cost of service. Broadband competition is measured by analyzing the percentage of homes in a geographic area that have access to two or more fixed, terrestrial broadband providers with service of at least 10 Mbps download and 1 Mbps upload (non-mobile and non-satellite).

<sup>6</sup> <http://www.leg.state.fl.us/statutes/>



“Competition between broadband services enables consumer alternatives, helps to lower costs, improves services, and induces broadband providers to upgrade their networks. By encouraging competition in communities, communities will benefit directly through the expanded services and competitive prices,” said Tom Wheeler, former chair of the Federal Communications Commission.

## Census Data

The 2017 estimated population for Walton County is 68,376<sup>7</sup>. The official 2010 U.S. Census Bureau data reports a population of 55,043 spread across the County with the largest population in Miramar Beach<sup>8</sup> of 6,146 people. The next 3 largest incorporated population areas include DeFuniak Springs with 5,184, Freeport’s 1,787 population, and Paxton with only 644. The most significant population group, however, is the 41,325 in unincorporated areas like Rosemary Beach and Seacrest, rural areas like Argyle and Mossy Head, and remote rural areas such as Bunker Creek.

Mathematically, this 2010 Census<sup>9</sup> population base of 55,043 suggests a density of 53 persons per square mile. Census data also suggests that **of the 45,132 housing units in the County**, only 22,301 are permanently occupied (16,194 owner and 6,107 renter), while a staggering **22,831 units are listed as vacant**; 15,780 of which are designated seasonal, recreational, or occasional use.<sup>10</sup>

If 50% of the housing units are vacant at least 30% of the time (typically December, January, and February) it may suggest that this single event could be enough to skew an ROI model.

## Adjacent Counties

CN conducted outreach to nearby counties, including Covington and Geneva Counties in Alabama, as well as Bay, Holmes, Okaloosa, and Washington Counties in Florida.

Throughout the months of February and March 2018, CN spoke with county commissioners, directors of Information Technology, and others to gauge interest in the development of a project(s) that might overlap into these adjacent counties and/or to discuss what projects were being considered in their respective counties. The content of these discussions have been shared with the Walton County broadband team.

On March 27, 2018, CN appeared before the Covington County Board of Commissioners<sup>11</sup> to discuss the project in Walton County and to determine if there may be an interest in developing a more regionalized approach to broadband expansion. Both counties were aware of Alabama SB 149<sup>12</sup>, yet suggested that funding could be a key issue in overall participation.

CN will continue outreach to neighboring counties through the duration of this project; this report can be distributed to adjacent counties for their review as well.

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<sup>7</sup> U.S. Census Bureau, 2017 Population Estimates.

<sup>8</sup> With an area of 4.6 square miles, there is a population density of 518.1/square mile.

<sup>9</sup> U.S. Census Bureau 2010 data is used here as the full breakdown of housing units, including “seasonal, recreational, or occasional use” is not available in more recent estimates.

<sup>10</sup> U.S. Census Bureau, 2010 Census Summary File 1.

<sup>11</sup> <https://m.andalusiastarnews.com/2018/03/28/commission-hears-option-for-broadband/>

<sup>12</sup> Signed into law on March 28, 2018 by Governor Kay Ivey: <https://governor.alabama.gov/press-releases/governor-ivey-signs-alabama-broadband-accessibility-act/>





## Broadband, Service Providers, Citizens & Visitors

Broadband access refers to the infrastructure that enables a high-speed internet connection. There are two primary types of broadband connections: fixed and mobile.

Fixed broadband is delivered to a user via several technology platforms including cable, digital subscriber line (DSL) over a phone line, fiber optics, and fixed wireless. Fixed broadband is designed for stationary use at a fixed location such as a home, business, or institution.

Mobile broadband is a wireless technology used to connect portable devices to the internet. These networks are designed to provide seamless connectivity as the user moves from one location to the next while accessing the web from a portable device. Many households and businesses in the rural areas of Walton County find themselves without fixed or mobile options, while others rely on mobile broadband as a substitute for the lack of a fixed network connection. Mobile connections may work for some users but may be impacted by data caps, weather, vegetation, latency, and other issues of connection reliability and restriction.

The eventual deployment of fifth generation, or 5G, wireless services, however, may help solve some of these issues. 5G services are more likely to appear in areas with large populations that push immense amounts of data across the mobile network. 5G networks will be engineered to enhance the speeds delivered over the network and overall responsiveness of such networks, which should translate into lower latency levels and packet loss. Such improvements will be due to more available bandwidth and advanced antenna technology.

In their article titled “*What is 5G?*”<sup>13</sup> PCMag.com opines on the initial launch of 5G networks stating, “...we think this will be ‘millimeter wave’ 5G, which requires dense networks of cells that don’t reach very far (say, about 1000 feet each), but deliver extremely high speeds.” This coincides with early indications that, as an industry, millimeter wave service (combined with massive MIMO antennas) may be deployed across existing 4G networks as a precursor of things to come. Due to Florida’s relaxed legislative laws, it is quite possible that small cell densification will be visibly noticeable in Florida’s tourism areas, such as Walton County.

The Federal Communications Commission (FCC) has recently announced the Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services with Auctions 101 (28 GHz) scheduled to commence November 14, 2018 and Auction 102 (24 GHz) to begin shortly thereafter.

CN has provided the Walton County staff with a copy of *How to Deal With Florida’s New “Advanced” Wireless Law* presented at the Florida League of Cities 91st Annual Conference by the firm of Gray|Robinson, Attorneys at Law<sup>14</sup>.

Broadband availability is essential infrastructure for twenty-first century communities. Broadband empowers a community to access applications ranging from healthcare and education to business and government services. Unfortunately, many communities suffer from inequities of access on several fronts: between income levels, between urban and rural areas, between traditional business areas and nontraditional ones, and differing levels of service due to geography or infrastructure limitations.

A high-speed internet connection is critical for families, students, businesses, and institutions to participate in the digital economy. The FCC defines “advanced broadband service” as an internet connection of 25 megabits per second (Mbps) download and 3 megabits per second (Mbps) upload. While broadband connections do exist at speeds slower than this benchmark, 25 Mbps download and 3 Mbps upload represents the current aspirational goal for connecting every home in the United States.

Residential broadband availability is typically measured by analyzing the percentage of homes in the community that have access to fixed broadband speeds of 25 Mbps download and 3 Mbps upload. Broadband availability often follows patterns of household density, so geographic disparities in availability do exist. The FCC Form 477 Broadband Service Inventory map (see **Appendix IX: Broadband Maps**) shows areas with and without broadband service at this speed, with beige areas being those without such service.

<sup>13</sup> <https://www.pcmag.com/article/345387/what-is-5g>

<sup>14</sup> <http://www.floridaleagueofcities.com/docs/default-source/2017-conference-presentations/Fri/wireless-5g-all.pdf?sfvrsn=0>



Satellite internet is often a service of last resort in many rural areas. Satellite broadband users often experience the same restrictions of those using mobile broadband as a substitute for a fixed broadband connection. For these reasons, this plan examines fixed broadband and discusses ways in which to improve that service. Neither mobile broadband nor satellite connections are included in this report.

Ensuring robust broadband within Walton County for the local citizens and visitors is of equal importance. According to the Tourist Development Council's 2016 final report, visitors generated 65% of all spending in the County<sup>15</sup>. In 2016, there were 3.6 million visitors and, according to local officials, numerous complaints about poor broadband service areas are routinely received from those visiting the County, especially along the 16 beachside neighborhoods.

During the months of January and March 2018, CN staff members discussed broadband services with local residents, home owners association (HOA) members or property managers at Bar Harbor, Live Oak Landing, Magnolia Lane, Sunset King RV Park, Twin Lakes RV Park, Watersound, West Park Place, and Western Lake Drive, among others.

It would be fair to state that the majority of these discussions ended in an expression of dissatisfaction with their level of broadband service. It is, however, difficult to gauge if these perceived problems are random or systemic (see additional details in the "Satisfaction" section).

The speed test below was conducted on January 6, 2018 on the Sunset King RV Park Wi-Fi network at 6:26 p.m. (CST). The download speed was 19.20 Mbps, with an upload speed of 3.55 Mbps, and there was a latency of 46.24 milliseconds measured.



CN staff members also spent the months of January and March 2018 driving the majority<sup>16</sup> of the roadways in Walton County, mapping the CATV outside plant (OSP) routes, FTTH OSP routes, and identifying the DSLAM and central office (CO) locations across the County (see sample map below).

<sup>15</sup> [https://www.visitsouthwalton.com/sites/default/master/files/page/files/FINAL\\_Annual%20Report%2011.15.2016.pdf](https://www.visitsouthwalton.com/sites/default/master/files/page/files/FINAL_Annual%20Report%2011.15.2016.pdf)

<sup>16</sup> Several small gated communities were inaccessible during these periods of time. It can generally be assumed that these outliers receive DSL service, at a minimum, and likely receive cable modem service from the CATV company serving their respective areas.





With a granular mapping structure, CN and the Walton County broadband team can analyze the locations of census blocks with zero population, pinpoint which homes are served and more importantly, which are not, then make informed decisions guiding the direction of the County’s overall broadband expansion efforts.

## Fiber

The most challenging task included tracking down the various fiber routes throughout the County (OSP fiber routes illustrated in orange on the previous page; pink signifies CATV OSP routes). This was completed by examining the name, approximate age, and lineage of each company’s fiber marker(s). Twenty-two different names appeared (see list below). Although it is possible that the placement of single-mode fiber in Walton County could have been as early as 1982<sup>19</sup>, it is more likely that wide-scale fiber deployment is attributed to BellSouth’s 1988 advanced digital switching network. Long-haul fiber, used as a transport mechanism spanning long distances (e.g., state-to-state, coast-to-coast), has improved greatly over time, although it is difficult to determine what type of optical fiber is below ground at each fiber route. Optical circuits range from OC-1 (51.84 Mbps) to OC-3840 (200 Gbps).

- AT&T (long-haul)
  - BellSouth (long-haul)<sup>20</sup>
  - Southern Bell<sup>21</sup>
  - South Central Bell<sup>22</sup>
  - Southwestern Bell<sup>23</sup>
- CenturyLink (metro and long-haul)
  - Centel<sup>24</sup>

<sup>19</sup> MCI leased right of way to install single-mode fiber from New York to Washington. The system operated at 400 million bits per second at 1.3 micrometers.

<sup>20</sup> Founded in 1984 after the U.S. Department of Justice forced American Telephone & Telegraph Company to divest itself of regional telephone companies as a way to prevent monopolistic control over phone services. Subsequently re-acquired by AT&T Inc. in 2006.

<sup>21</sup> Founded in 1879 as Atlantic Telephonic Exchange, reincorporated as SBT&T Company in 1983.

<sup>22</sup> Founded in 1968, became a holding company of BellSouth in 1984.

<sup>23</sup> Founded in 1882 as the Missouri and Kansas Telephone Company, consolidated with numerous other companies in 1912 and, after a 1917 merger with three other companies, the resulting entity was renamed Southwestern Bell Telephone Company.

<sup>24</sup> Founded in 1900, acquired by Sprint in 1993, divested by Sprint as Embarq 2006, and acquired by CenturyLink in 2008.





- Embarrq<sup>25</sup>
- Level 3 Communications<sup>26</sup> (long-haul)
- Qwest<sup>27</sup>
- Witel Communications<sup>28</sup>
- Fibernet Direct<sup>29</sup> (long-haul)
- Florida Department of Transportation
- Southern Telecom<sup>30</sup> (metro)
- Sprint (long-haul)
- Uniti
  - Southern Light (metro)
- Verizon (long-haul)
  - MCI<sup>31</sup>
  - XO Communications<sup>32</sup> (long-haul)
- Windstream (metro and long-haul)
- WideOpenWest (WOW) Business (metro)

Uniti has disclosed that it operates a 288 strand backbone throughout the County and it appears Consolidated utilizes a 144 count fiber optic cable.

## Local Exchange Carriers (LEC)

There are two incumbent local exchange carriers serving the County. Consolidated Communications (formerly FairPoint) provides limited digital subscriber line (DSL) service in Paxton, Flowersville, and Gaskin, while CenturyLink covers the rest of the County providing DSL, fiber-to-the-home (FTTH), and fiber connectivity to numerous tower sites and business units in Walton County.

Data collected on the ground in January and March 2018 focused primarily on identifying the location of the LEC's digital subscriber line access multiplexers (DSLAMs). DSLAMs can be classified by the type of xDSL technology they support, by form factor, by architecture, and by deployment location, however, CN did not attempt to classify the DSLAMs and assumed that each likely provided either asymmetric digital subscriber line (ADSL) 2+ service (with backward compatibility), as may be the case with Consolidated Communications, and/or very-high-bit-rate digital subscriber line 2+ (VDSL2+) through CenturyLink<sup>33</sup>. This assumption was also predicated on conducting address level searches on the primary LEC website.

CenturyLink's DSL service levels vary by area and their advertised speed tiers suggest service levels of up to 140 Mbps with no mention of FTTH<sup>34</sup>.

Using various addresses in the search tool of CenturyLink's website, the speed tiers most consistently returned were between 3 Mbps up to 10 Mbps x 1 Mbps for \$45. A 25 Mbps package is offered in portions of Santa Rosa Beach<sup>35</sup>.

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<sup>25</sup> Spun off by Sprint in 2006 as an independent company; formerly the local telephone division of Sprint.

<sup>26</sup> Founded in 1985 as Kiewit Diversified Group, spun off with new name in 1998, acquired by CenturyLink in 2017.

<sup>27</sup> Founded in 1996, merged with US West in 2000, acquired by CenturyLink in 2011.

<sup>28</sup> Spun off from Williams Communications in 2001, adopted the name Witel Communications in 2002 after reorganizational bankruptcy. Acquired by Level 3 in 2005.

<sup>29</sup> Founded in 2000 and acquired by Crown Castle in 2017.

<sup>30</sup> Founded in 1997.

<sup>31</sup> Founded in 1963, acquired by WorldCom in 1998, and acquired by Verizon in 2006.

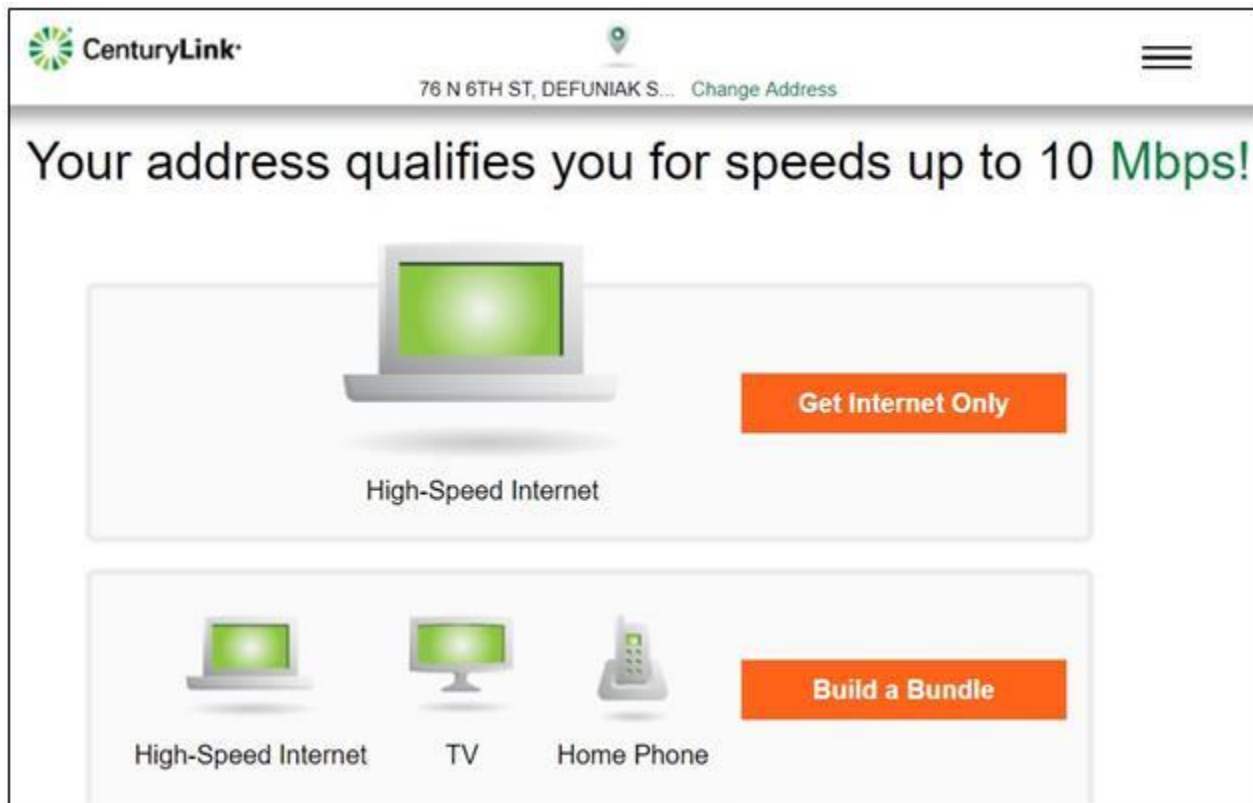
<sup>32</sup> Founded in 1996 and acquired by Verizon in 2017.

<sup>33</sup> Based on consumer's disclosing that there is an Actiontec C1900A VDSL2+ wireless router in their home.

<sup>34</sup> <http://www.centurylink.com/home/internet>

<sup>35</sup> <https://shop.centurylink.com/MasterWebPortal/freeRange/login/shop?newlap=true#step=choose>

*Note:* The County's address was used and, despite the proximity the CenturyLink's central office, service at 76 North 6<sup>th</sup> Street is limited to 10 Mbps (see image below).



## Cable Television

Cable television companies, offering some form of cable modem service, include Cox Communications, Mediacom, Spectrum, and WideOpenWest.

**Cox Communications:** Cox has an exclusive contract with the home owners association (HOA) within the Sandestin communities (North and South) and covers westward from Sandestin through Miramar Beach to the county border. Services are currently being upgraded to a hybrid-fiber-coaxial network that will be capable of delivering 1 Gigabit services (fiber-to-the-node).

Information on the Sandestin community fiber optic project can be found at the following links:

- [http://www.sandestinowners.com/sites/sandestinowners.com/files/imce\\_uploads/FAQ%2010.13.17.pdf](http://www.sandestinowners.com/sites/sandestinowners.com/files/imce_uploads/FAQ%2010.13.17.pdf)
- <http://www.sandestinowners.com/content/cox-cable>

Cox currently provides service to Camp Gulf, but the contract is being terminated; they also cover the area on the north side of Choctawhatchee Bay and the center of the County (east and west along Highway 20).

Cox and Mediacom are overbuilt in an area just north of Burnt Pine Golf Club; both are providing services in the area bordered by Driftwood Point Road.





**Mediacom:** Mediacom covers the south end of Walton County starting approximately at Mack Bayou Road and covers territory eastward into the Inlet Beach area (serving all of 30-A). Hybrid-fiber-coaxial (HFC) service can be found at vacation homes near Seagrove Beach and Seaside (see Arris RF over Glass (RFoG) single dwelling unit (SDU) customer premise equipment (CPE) at right).



Mediacom and WideOpenWest are overbuilt in Inlet Beach on most roads north and south of Highway 98.

Mediacom's website advertises that speeds of up to 1 Gigabit are available.

Closer examination suggests that 3 Mbps service is the standard, with 50 Mbps being the upper end. Those closest to the node might also experience 150 Mbps speeds. Anecdotally, the consistently available speeds seem to be closer to 3 Mbps based on conversations with numerous residents conducted during March 2018.

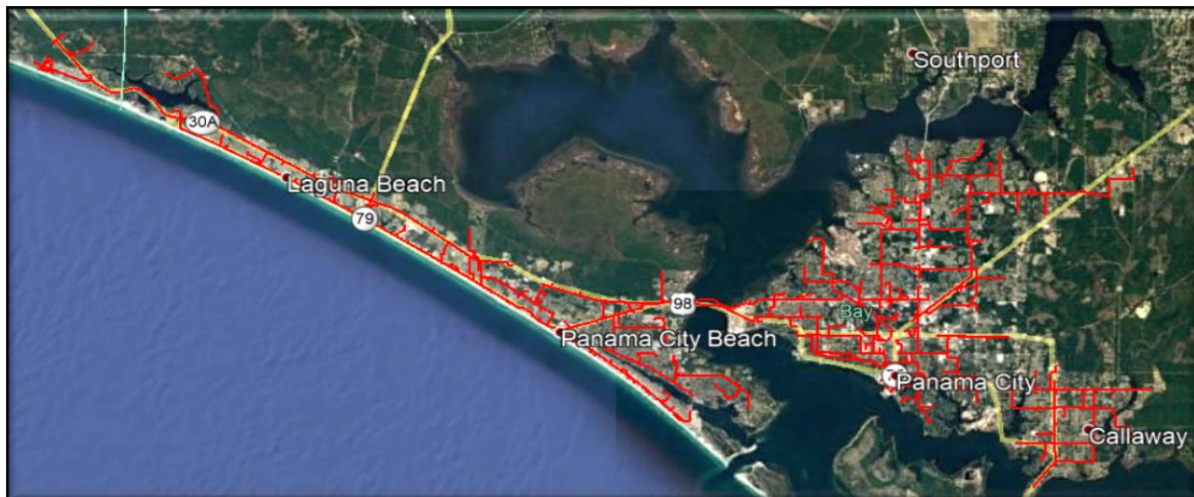
Mediacom's service is often the subject of discussion and can be found as the topic of conversation on websites<sup>36</sup>.

*Observation:* The fastest delivery level on a broadband network is equivalent to the slowest "link in chain." It is difficult to ascertain whether there is insufficient backhaul in specific portions of the County to support the aggregate customer base or if "choke points" exist due to problems with the outside plant. Examples can be seen in **Appendix III: Infrastructure Damage**.

**Spectrum (formerly Bright House):** Spectrum provides cable modem service in the north end of the County with service levels starting at 100 Mbps for \$29.99 per month. Very few complaints were observed during CN's onsite mapping exercise with many people complimenting the consistency of the service.

Spectrum has installed Wi-Fi hotspots (primarily in DeFuniak Springs) along portions of Highways 98 and 331. These hotspots should be kept in mind if the County chooses to move forward with a near-ubiquitous Wi-Fi network<sup>37</sup>.

**WideOpenWest (WOW):** Walton County's coverage is actually the westernmost portion of WOW's Panama City fiber project (which includes a 10 GB ring).



WOW offers residential HFC services (DOCSIS 3.0 and 3.1) throughout Inlet Beach with speeds from 10 Mbps starting at \$29.99 and ranging in speeds up to 300 Mbps. Fiber-to-the-home is available along Alys Beach and at the Origins Golf Club community with 1 Gbps service for \$79.99 per month.

<sup>36</sup> <http://30aprime.com/community/threads/looking-for-best-mediacom-alternatives-for-internet-on-30a.40/>

<sup>37</sup> <https://www.spectrum.com/browse/content/communitiesolutions>





WOW for Business offers<sup>38</sup>:

- 30 Mbps for \$30/month
- 120 Mbps for \$70/month
- 240 Mbps for \$109/month
- 1 Gbps for \$199/month

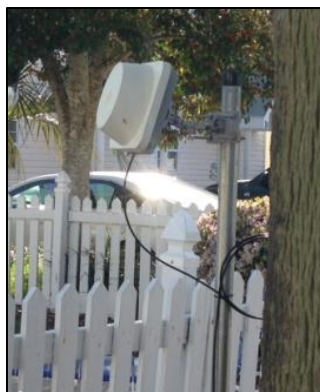
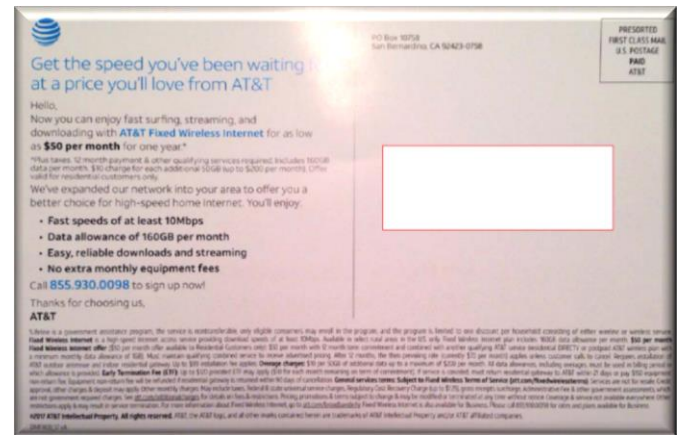
## Other Internet Services

**AT&T FirstNet<sup>39</sup>** will likely utilize the maximum power level of 1.25 watts in the rural portions of Walton County. This could result in coverage areas of 30 miles from tower sites as the propagation characteristics of Band 14 (758-768 MHz downlink and 788-798 MHz uplink) are similar to that of TV white space.

**AT&T Mobility** has been deploying a fixed wireless service across the U.S. using their 2.3 GHz wireless communications service (WCS) spectrum. Although it offers limited speed of 10 Mbps and contains a data cap, this fixed wireless service may also begin finding its way into rural counties in Florida (see postcard mailing at right).

**Spectrum Review:** Spectrum analyzer testing did not yield any potential spectrum conflicts with nearby military bases (i.e., Eglin Air Force Base). Should the County pursue a fixed wireless network, the use of directional antenna will be critical in mitigating any potential radio frequency interference to Eglin AFB. See **Appendix IV: Sample Antenna Pattern**.

**Fixed Wireless:** Although there were no wide area networks discovered in Walton County, there was evidence of the use of a 60 GHz millimeter wave radio distribution. A point-to-point radio link, capable of delivering 1 Gbps of capacity, was discovered in the Miramar Beach area pointed towards the rooftop at Grand Dunes (see images below).



<sup>38</sup> <https://www.wowforbusiness.com/offers/florida/panama-city>

<sup>39</sup> The First Responder Network Authority of the United States was created under the Middle Class Tax Relief and Job Creation Act of 2012. AT&T was awarded the right to build, operate, and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety across Band 14: <https://www.firstnet.gov/>



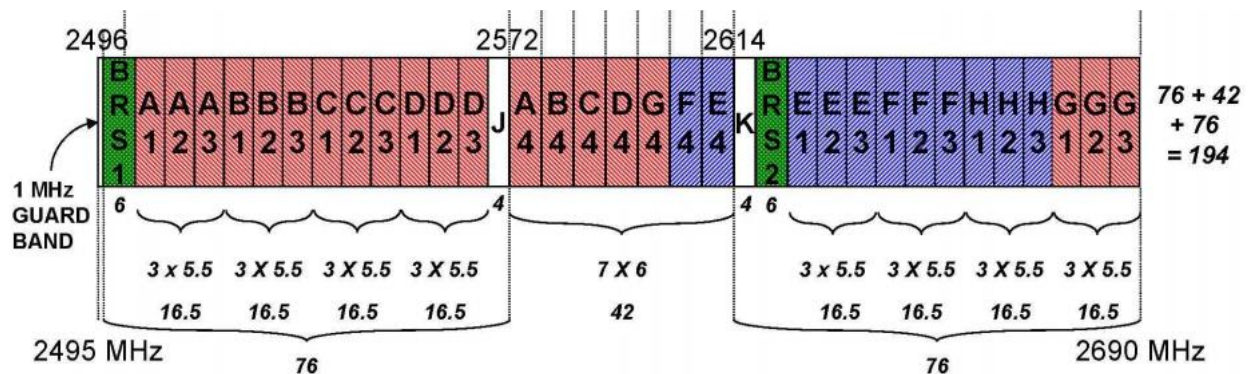


**Walton County School District (WCSD)** is the educational broadband service (EBS) licensee of station WNC884 and leases its excess capacity to Sprint. This license covers a 22.5 MHz swath of spectrum whose specific frequencies range from 2,502.00 MHz through 2,507.50 MHz (channel A1), 2,507.50 MHz through 2,513.00 MHz (A2), 2,513.00 MHz through 2,518.50 MHz (A3), and 2,572.00 MHz through 2,578.00 MHz (A4).

Pursuant to its *Educational Broadband Service Long-Term De Facto Transfer Lease Agreement* with Sprint, WCSD receives both financial compensation (monthly lease fees) and account credits allowing WCSD to receive certain services from Sprint each month.

Although not directly related to the Walton County broadband expansion initiative, WCSD has the opportunity to also provide its high school students with free mobile devices and high-speed internet access through a program operated by the Sprint Foundation known as the *1Million Project* (<http://www.1millionproject.org/>)<sup>40</sup>. While this doesn't directly impact Walton County's initiative, it does create a way for the County to reduce the broadband gap in the educational sector, and it's free of charge. This opportunity has been presented to Henry Martin, the Technology Information Officer of WCSD, along with a map of Sprint's mobile coverage area, supplied by CN, as a tool for WCSD to use to determine where students reside in areas capable of receiving Sprint's mobile service.

On May 10, 2018, the FCC adopted a Notice of Proposed Rulemaking<sup>41</sup> (NPRM; WT Docket No. 18-120) to consider updating the framework for licensing EBS spectrum, such as that held by WCSD through its licensed station WNC884. EBS constitutes the single largest band of contiguous spectrum below 3 GHz (see channels A1-G4 in chart below showing re-banded Educational Broadband Service (EBS) and Broadband Radio Service (BRS) alignments) and is prime spectrum for next generation mobile operations, including 5G.



According to the FCC, 50% of the EBS spectrum across the United States remains unused, primarily in rural areas. The NPRM proposes to rationalize the service areas of existing EBS licenses and to provide additional flexibility to current and future EBS licensees and seeks comment on whether to establish up to three local priority filing windows to allow applicants physically located in a license area to access 2.5 GHz spectrum:

1. Establish a window for existing licensees to expand their service to the county boundaries. This could be of particular interest to WCSD, however, it would likely have little impact on the County's broadband expansion plan. It's highly probable that the current EBS lease contains language that simply allows Sprint the right to utilize the spectrum rather than WCSD.
2. A second window for Tribal Nations located in rural areas to acquire licenses.
3. Finally, a window for educational entities that do not currently hold EBS licenses to acquire licenses. The County could discuss this option with a local private, parochial or charter school, community or technical college to apply for spectrum in the upper northeast corner of the County (or other available areas).

<sup>40</sup> Also see **Appendix VIII: Adoption Recommendations.**

<sup>41</sup> [https://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2018/db0510/DOC-350646A1.pdf](https://transition.fcc.gov/Daily_Releases/Daily_Business/2018/db0510/DOC-350646A1.pdf)



The NPRM proposes to make any spectrum remaining after these priority windows available for commercial use through competitive bidding and seeks comment on alternative approaches to the priority filing windows for licensing the spectrum for commercial use.

## Validated Broadband Results

After the completion of provider outreach and on the ground broadband infrastructure and asset mapping, CN analyzed the resulting data to calculate broadband availability in the County. While the most recent FCC Form 477 data indicates that Walton County has broadband access at speeds of 25 Mbps download/3 Mbps upload to 42,938 people (78.0%) and 18,086 households (81.1%), CN validated broadband data shows that access is more likely available to only 33,822 people (61.5%) and 14,352 households (64.4%).

	Households		Population	
	Number	Percent	Number	Percent
<b>Walton County</b>	22,301	-	55,043	-
<b>Form 477 Broadband</b>	18,086	81.10%	42,938	78.01%
<b>CN Validated Broadband</b>	14,352	64.36%	33,822	61.45%

Composite broadband coverage maps and fiber route maps, as well as a comparison of CN validated broadband compared to FCC Form 477 broadband data, can be found in **Appendix IX: Broadband Maps**.



## Households

While the County-Wide Infrastructure section examines broadband access available to residents, businesses, and institutions throughout the community, the Households section examines the ways in which a community's residents access, adopt, and use broadband and related technology in their everyday lives.

Although infrastructure information is available and consistent from one community to the next, the detailed assessment of household access, adoption, and use is not. In order to gather this information, a residential technology survey was made available throughout the County (via paper form and online).

The survey was designed to gather detailed information on the access, adoption, and use of broadband and technology among residents of Walton County. The residential survey, distributed between January 15 and February 15, 2018, gathered 1,607 responses. This return rate provides for a deep analysis into local issues and barriers preventing residents from leveraging technology to improve quality of life.

The Households section of the assessment examines several areas in order to form a comprehensive view of the technology access, adoption, and use among residents.

## Highlights

8,029

Households without a fixed broadband connection

54%

Households with internet access dissatisfied with current service

- ✓ Adults aged 18-34
- ✓ Households with School-Age Children
- ✓ Households Earning Less than \$35k

Groups struggling with digital equity in the community

64%

Residents who digitally interact with healthcare information or providers at least monthly

39%

Residents who regularly telework

\$34.8M

Estimated annual savings from prevented doctor and ER visits



## Access, Adoption, and Use

CN is dedicated to helping communities improve lives through the expansion of broadband and technology access, adoption, and use. It is often asked why we look beyond infrastructure when addressing broadband issues when many other community broadband assessments and studies are focused on the wires in the ground and the signals in the air. Access to infrastructure is only the beginning of a community's journey to fully leverage technology to improve quality of life and community and economic development. CN recognizes that in order to fully participate in a digital economy, communities need to address not only the access to broadband (supply), but also the ways in which it is adopted and used (demand) to create a truly digitally inclusive community. Wires and wireless signals are useless if they are not leveraged to improve civic engagement, retain families and youth, improve leadership, and develop local human capital.

### Access

Broadband access refers to the infrastructure that enables a high-speed internet connection. Broadband is delivered to a user via several technology platforms including cable, digital subscriber line (DSL) – through a phone line, fiber optics, fixed wireless, mobile wireless, and satellite. While these are currently the primary methods of delivery, new innovations and technologies are being developed that continue to improve the efficiency and speed of connectivity.

Broadband availability is essential infrastructure for twenty-first century communities. Broadband empowers a community to access applications ranging from healthcare and education to business and government services. Unfortunately, many communities suffer from inequities of access on several fronts: between income levels; between urban and rural areas; between traditional business areas and nontraditional ones; and in differing levels of service due to geography or infrastructure limitations.

### Adoption

Broadband adoption is a different issue from broadband access. While access refers to one's physical connection to the internet, broadband adoption is the choice made by a resident, business, or institution to embrace and use broadband and its related technologies. Broadband adoption cannot occur without having access to high-speed infrastructure; however, even with access to the internet, broadband adoption may not follow.

Several studies have shown that even with access to broadband, residents, businesses, and institutions may not adopt. Barriers to adoption can often include cost (of either a device used to connect or the cost of the connection itself), lack of relevance to the user, or lack of digital literacy (knowledge and skills associated with the use of digital hardware or software). Lack of broadband infrastructure availability is also cited as a barrier.

The broadband adoption gap (the difference between the number of entities with access to broadband and the number of those same entities that subscribe to it), can increase or decrease depending on the demographics of a community. For example, low-income populations tend to have lower adoption rates than those with higher incomes. This same disparity can be found between age cohorts, physical locations, employment status, educational levels, etc. However, regardless of socioeconomic status, demographic composition, or geographic location, every person should have the opportunity to participate in the digital economy.

### Use

The access and adoption of internet technologies leads to the use of that connection and applications to improve the quality of life of a community. Technology impacts every sector of our economy, and opportunities abound for residents, businesses, and institutions to leverage technology to make improvements in their day-to-day lives and operations.

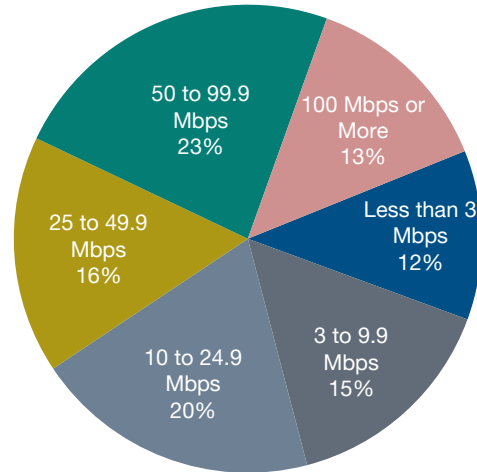




The well-being of a community involves the complex interaction of several sectors including healthcare, K-12 and higher education, public safety, government, libraries, residents, private-sector businesses, and others. These distinct, yet entwined, sectors (and their many individual parts and entities) contribute to that community’s place in the digital economy. As broadband and related technology have developed over time, applications pertinent to each of these sectors have been developed that allow them to function, provide services, generate revenue, and generally operate more efficiently, which impacts their contribution to the wellbeing of their community. The use of technology is critical to the impact these sectors have on the overall quality of life in a community.

While access, adoption, and use form a spectrum of sorts, (i.e., one cannot adopt broadband without having access to it, and one cannot use broadband without adopting it), all three components are equally important for every member of a community to fully realize a digitally inclusive and digitally connected community.

Household Connections by Download Speed



## Household Access

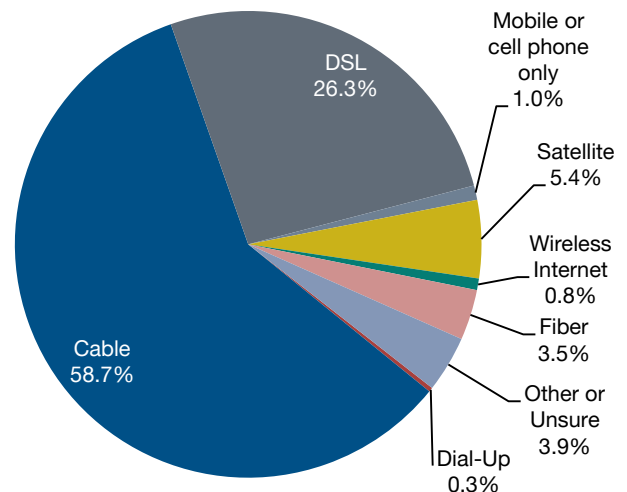
### Speed and Platform

The information contained in the County-Wide Infrastructure section examines the general availability of broadband in the community across several aspects. However, just because broadband is available at certain speeds, does not mean that households and residents are adopting or subscribing to internet service at the maximum speed available. The chart above shows the distribution of connection speeds as reported by households in the community.

The average download speed among surveyed residents who are aware of their connection speed is 38 Mbps. Additionally, survey results shows that only 13% of residents report subscribing to 100 Mbps internet service or faster; a speed only available in some areas of the County. Across other Connected Nation communities, the average reported connection speed is 41.1 Mbps.

Most respondents report connecting to the internet via a cable or DSL network. Some residents (5.4%) report using a satellite connection for their internet service, and 1% of residents rely on a mobile broadband connection for their home internet service.

Household Connections by Platform





## Satisfaction

Competition provides residents and businesses with choices for service, allowing them the ability to switch providers if their current service does not meet their needs. According to the Residential Survey, 54% of households with a broadband connection state that their current internet service does not meet their needs. Among residents who state that their connection does not meet their needs, 77% state that the speed is too slow, 67% report the connection is unreliable, 61% report the cost is too high, and 41% state that poor customer service is the reason for dissatisfaction. By comparison, 46.9% of residents across all Connected Nation communities indicate their current service does not meet their needs.

Additionally, many households are interested in having additional internet service choices at their location. Nearly all (95%) of responding households indicate that they are interested in having improved or additional internet service options. On average, 91.5% of households across all Connected Nation communities indicate they are interested in additional choices for internet service.

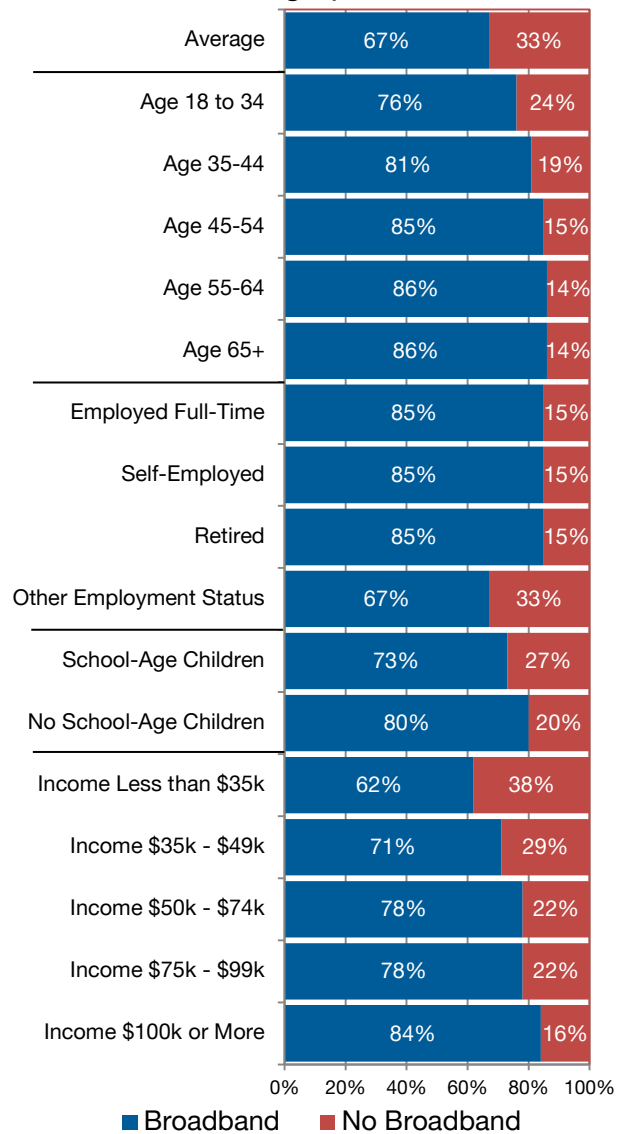
## Household Adoption

The adoption of home internet service is the single most critical step for families to experience the benefits of being connected to the digital economy. Adoption represents the choice families make to be connected or not. There are several factors that influence broadband adoption. Sometimes these factors are internal and influenced by behavior patterns and knowledge (e.g., digital literacy skill, awareness of benefits, etc.); other times these factors are external and the adopter has little or no control over them (e.g., cost and infrastructure availability). Adoption often follows broadband availability, but not always. With more and more services being conducted in an online environment and an increased desire to digitally communicate, those without a home broadband connection most often seek connections elsewhere, breaking the *access-first-adoption-second* pattern.

Home Broadband Adoption looks at the percent of the community's population that subscribes to (adopts) internet service.

In 2016, Walton County had an estimated 27,207 households<sup>42</sup>. According to the Residential Technology Survey, 67% of households in the County subscribed to internet service with a broadband connection at home, (households indicating internet connections via dial-up, satellite, or mobile wireless only are not included in this calculation). On average, 67.3% of households

Fixed Broadband Adoption by Demographic



<sup>42</sup> With 49,956 housing units. U.S. Census Bureau, 2016 American Community Survey (ACS) 1-Year Estimates.



across all Connected Nation communities subscribe to a fixed broadband connection. While this statistic provides a macro-level look at adoption in the community, additional survey questions allow for a deeper analysis of adoption in order to find the demographic or socioeconomic groups struggling with digital inclusion.

For comparison, the U.S. Census Bureau American Community Survey estimates that 74.4% of households across the country have a fixed internet connection. Across Florida, this figure is lower at 68.6% of households. Adoption in Walton County is lower than the national average, but only slightly lower than that of Florida.

## Digital Divide

The chart above provides insight into fixed household broadband adoption for various demographic groups in the County. From this data, the following observations can be made regarding those on the wrong side of the Digital Divide in Walton County:

- Households earning less than \$35,000 annually are less likely to adopt an internet connection at home compared to households earning more. This is consistent with national and state trends.
- Households with school-age children tend to adopt broadband at a lower rate than those without children.
- Adults aged 18 to 34 are slightly less likely to have a home broadband connection than other age groups.

Recommendations that may lower this margin can be found in **Appendix VIII: Adoption Recommendations - Launch a Digital Equity Initiative**.

## Barriers to Adoption

Once the broadband adoption rates for various socioeconomic and demographic groups have been identified, the next important step is to examine the barriers to broadband adoption among them. This analysis examines groups of current non-adopters and the barriers they face: 1) households earning less than \$35,000 annually; 2) households with school-age children; and 3) adults age 18 to 34. The table below shows the percent of households in each group that indicated their primary barrier to having a home internet connection.

Barriers to Broadband Adoption Among Various Groups				
Barrier to Adoption	All Households	Income Less than \$35,000	Households with School-Age Children	Adults Age 18-34
Not Available	44%	47%	47%	44%
Too Expensive	31%	40%	26%	30%
No Computer	-	-	-	-
Access the Internet Elsewhere	5%	-	5%	5%
Dissatisfied with Current Options	9%	4%	9%	7%
Do Not Need the Internet	4%	4%	5%	4%
Other	7%	5%	8%	10%

Across Walton County, the primary barrier preventing home broadband adoption is a lack of infrastructure. Among all households without a home internet connection, 44% cite a lack of availability as the primary barrier. This is reflected across all of the demographic groups included in the table. This indicates that if infrastructure were available, these groups would be likely to adopt.

The cost of a home internet connection is the second most oft-cited barrier to adoption. Among all non-adopting residents, 31% say that a home internet connection is too expensive. This sentiment is reflected among the four groups in the chart as well. As expected, households earning less than \$35,000 annually indicate cost as the primary barrier more frequently than other demographic groups.



Many are dissatisfied with the current internet service options available to them. Among all households with an internet connection, 9% indicate they do not like the current options available. Finally, a small minority of non-adopting households (4%) indicate that they do not need the internet at home.

Additionally, non-adopting households were asked to indicate how they access the internet if they are without a connection at home. The table below shows the percent of non-adopters and where they access the internet. Most non-adopters access the internet from a mobile device only, while approximately one-third do so from their place of employment. Respondents were allowed to select more than one location.

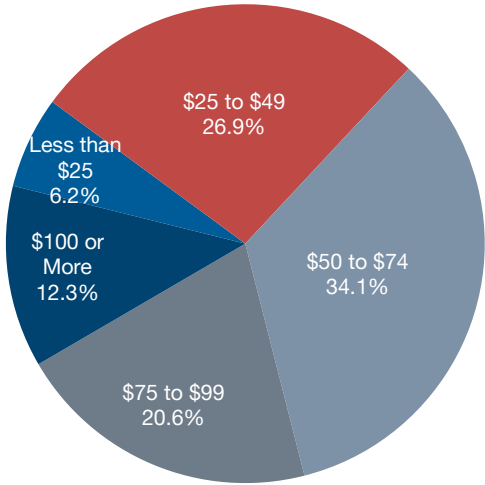
Locations for Accessing the Internet Among Non-Adopters	
Coffee Shop or Restaurant	17%
Do Not Access the Internet	3%
Mobile Device Only	62%
Library	16%
Friend or Family's Home	29%
Place of Employment	35%
School	5%
Hotel	7%
Other	1%

### Affordability

The Affordability metric examines one of the primary barriers to broadband and technology adoption. The cost of having an internet connection can stem from several sources, including the monthly cost of service, installation and equipment costs in order to obtain service, and the cost of an internet-enabled device (e.g., computer, tablet, smart phone, etc.). These costs can be a burden for families with lower incomes and thus the choice to connect is controlled by the external cost of service for these households. This disconnection can leave families on the wrong side of the Digital Divide.

The affordability metric compares the average annual cost of internet service in the community as reported through the Residential Technology Survey and the median annual income of the community. In Walton County, the average monthly cost of internet service reported by residents is \$71.07. Multiplying this figure by twelve, households in the community pay, on average, \$853 per year for internet service. The U.S. Census Bureau reports that in 2016, the median household income of the community was \$46,910. Therefore, on average, 1.8% of household

Reported Monthly Cost of Residential Service







income in the community is dedicated to internet service.

By comparison, the average monthly cost of internet service in the United States is \$78.47, according to the FCC. With a median household income across the country of \$55,322, Americans spend approximately 1.7% of their annual income on internet service. Across Florida, the average price is \$64.47 per month. With a median household income across the state of \$48,900, Floridians spend 1.6% of their income on broadband. Across all Connected Nation communities, households report paying \$58.75 per month, on average, for internet service.

Additionally, most residents report paying less than \$75 per month for internet service.

## Household Use

Households with access to the internet that go on to adopt a high-speed connection, are then ready to use and leverage that connection to improve their quality of life in any way they see fit. From teleworking or operating a small business from home, to accessing e-government services and telemedicine, there are a myriad of ways in which residents can use their internet connections to enrich their lives. The following examines a few of those ways to provide insight into how Walton County residents are leveraging their connections.

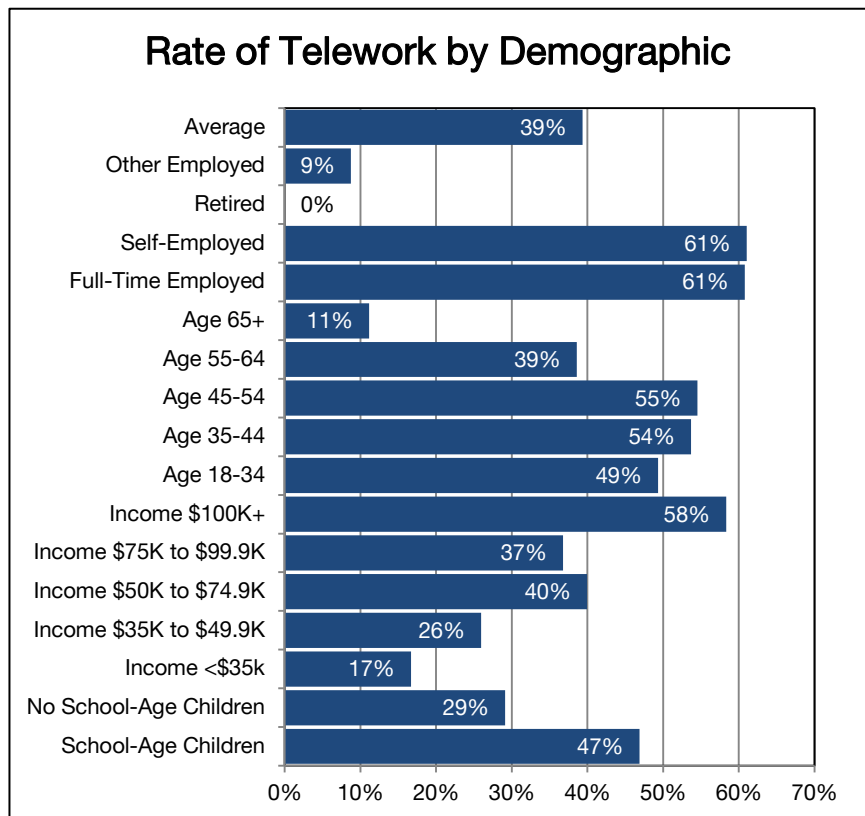
## Telework

Teleworking, or telecommuting, refers to working outside of the conventional workplace and communicating with it by way of telecommunications or computer-based technology. Further, telework is a form of organizing and/or performing work, where work, which could also be performed at the employer’s premises, is carried out away from those premises.

Teleworking is a spatially flexible work style that typically also involves greater flexibility in one’s daily routine.

Teleworkers typically have higher incomes and higher rates of advanced degree attainment. While traditional teleworkers are often thought of as those in management occupations or professional service industries, recently, technology has enabled new opportunities for teleworkers across the occupational and industry sector spectrum.

Teleworkers often do not register on typical measures of economic or workforce activity. Traditional economic development strategies typically involve the attraction or retention of employees. While this is a critical part of growing a local economy, telework represents an opportunity to attract or retain employees even though their employer may not be located within the community itself, as long as those employees have access to advanced broadband infrastructure.





Across all communities participating with Connected Nation, approximately 30.9% of residents indicate that they telework with some frequency.

Respondents to the Residential Technology Survey were asked, “Do you currently telework or telecommute in any capacity for your job?”

According to survey results, 39% of residents in Walton County are teleworkers, a rate higher than the national average.

- More than half (54%) of adults aged 35 to 54 report that they telework with some frequency, while younger residents, those aged 18 to 34, are slightly less likely to telework (49%).
- Frequency of telework also follows a pattern of household income. About one-quarter (26%) of households earning less than \$35,000 annually report that they telework, compared to 58% of those with household incomes greater than \$100,000.

Adults living in households with school-age children telework more frequently (47%) than those without children (29%).

## Healthcare

Access to quality healthcare is essential for quality of life in any community. From access to emergency services and family practitioners, to specialists, laboratories, and mental health services, access to healthcare provides opportunities for all to live healthy, fulfilling lives.

New healthcare technology developments offer not only new treatments and methods of diagnosis, but also greater access to healthcare providers via the internet. This is especially critical for two primary groups: 1) those living in rural communities that may not have a local presence for various specialty healthcare providers, and 2) those unable to physically visit a doctor’s office due to medical conditions or other issues. However, any resident can leverage technology and the internet to improve their health and reduce healthcare related expenses.

Survey respondents were asked several questions related to the use of their internet connection for accessing healthcare-related information and how that connection impacted their decision to visit a healthcare professional.

Respondents were asked to indicate how often they go online to interact with doctors or other healthcare professionals or to seek out medical information. Overall, residents indicate they use the internet to interact with healthcare professionals or seek information at least once per week or at least once per month. Approximately 8% of residents indicate they go online for healthcare purposes every day. The chart shows the distribution of the frequency of this activity. When examining specific demographic groups, those earning less than \$50,000 per year tend to go online more often than other demographic groups. Conversely, households earning between \$75,000 and \$100,000 per year tend to access healthcare services and data less frequently than other groups.

Frequency of Accessing Healthcare Information Online	
Every Day	8%
At Least Once a Week	19%
At Least Once a Month	37%
At Least Once a Year	16%
Less Often Than Once a Year	7%
Never	11%
Unsure	2%

Going online to research healthcare information can help improve one’s health, but can online access to healthcare information translate to financial savings? According to survey respondents, 53% believe that accessing healthcare information online prevented trips to the doctor or a medical center in the last year. Further, 3.8 trips to the doctor per household were saved according to those who believe online access to healthcare information can prevent unnecessary visits to a medical professional. Similarly, respondents were also asked if accessing healthcare information online prevents trips to a hospital emergency room. Over one-quarter (28%) of respondents indicate that online healthcare information prevented a trip to the emergency room, and 3.4 emergency room trips were saved, on average, per household.



Based on statistics from [healthcarebluebook.com](http://healthcarebluebook.com), a fair price<sup>43</sup> for an emergency room visit to deal with a moderate problem is \$696 out of pocket, and \$73 for a 15 minute office visit for an established patient. This means that on average, Walton County residents who sought medical information online saved \$2,366 on Emergency Room trips and \$277 on trips to the doctor or healthcare facility in one year. Walton County's adult population (over the age of 18), is estimated to be 52,556 residents (U.S. Census Bureau, 2016 estimate). Overall, 43.4% of those residents reported going online to prevent an average of 3.8 trips to the doctor or healthcare facility.

That represents a total approximate savings of \$6.3 million dollars for County residents over the course of a year. Similarly, 22.9% of residents said that information they accessed online prevented an average of 3.4 trips to the hospital or emergency room, resulting in a saving worth approximately \$28.5 million in one year.

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<sup>43</sup> Healthcare Bluebook uses a proprietary calculation to determine the "fair price," or the price that once can expect to pay by being a prudent healthcare consumer and doing basic research to determine which facilities in an area offer the best price for a specific service.



## Business and Economic Activity

Positive economic activity in a community depends on the success of its private-sector business establishments to develop new and innovative products, provide services, attract investment, and create jobs.

Small business establishment and growth, entrepreneurship, and innovation are hallmarks of the American economic system, and internet connectivity, coupled with new technology, devices, and applications, is perpetuating these ideals in new and exciting ways.

The Business and Economic Activity section examines several areas of access, adoption, and use of broadband and related technologies in the community among private-sector business establishments across all sectors in the community.

Surveys were distributed throughout the community to capture information for this section. The Business Technology Survey received responses from 73 businesses across Walton County.

Recommendations on ways to improve the electronic business landscape can be found in

**Appendix VIII: Adoption Recommendations - Economic Prosperity - Host Website and Social Media Classes for Local Businesses.**

## Highlights

90%

Businesses with a fixed internet connection

80%

Businesses with a website

49%

Businesses using or planning to use advanced technology applications

81%

Businesses using social media at least weekly

26%

Average share of business revenue from online sales

65%

Businesses dissatisfied with current internet service





## Access

### Connections for Businesses

Just as a home internet connection is critical for residents, a broadband connection for businesses is equally important. The charts at right and below provide insight into the speed, platform, and cost of broadband service among Business Survey respondents.

The majority of responding businesses (57.4%) indicate they have an internet download speed of less than 25 Mbps. Approximately one in seven businesses (14.8%) connect with a download speed of 100 Mbps or faster. Approximately 17% of businesses do not know their connection speed. The average connection speed among businesses in the community is 74.3 Mbps. All businesses across all communities participating in Connected Nation's Connected<sup>SM</sup> program have an average connection speed of 66.4 Mbps.

Most businesses connect to the web over a cable or DSL network. Additionally, a small number of businesses (6.2%) utilize a mobile broadband connection as their primary source of connectivity. Among businesses in all Connected<sup>SM</sup> participating communities, 31.5% subscribe to cable internet, 20.4% to a DSL connection, and 14.5% to a fiber network.

Half of responding businesses pay less than \$100 per month for broadband service, and 12% indicate they pay more than \$300. The cost of service is generally related to the subscribed to download speed for the business, but some businesses pay more for the same level of service than others. Across all businesses in all Connected<sup>SM</sup> participating communities, the average monthly cost of internet service is \$126.00.

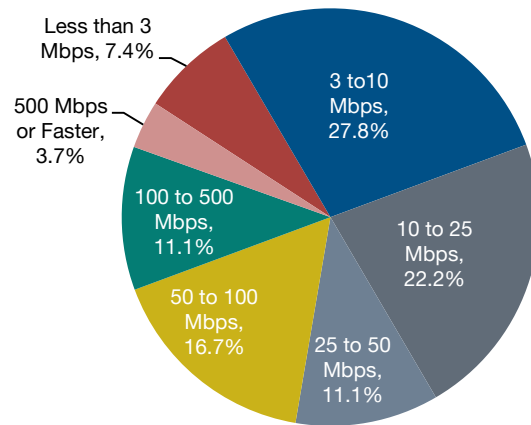
Additionally, 28.1% of responding businesses indicate that they offer free Wi-Fi connectivity to the public at their location. Among responding businesses across all Connected<sup>SM</sup> participating communities, 25.7% indicate they offer free Wi-Fi to the public.

## Adoption

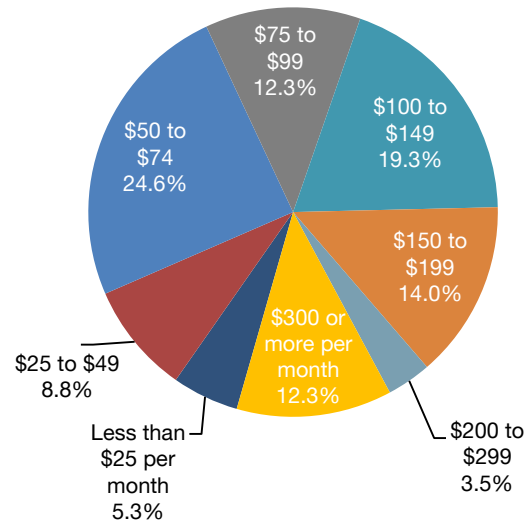
### Broadband Adoption

The presence of a broadband connection can be one of the most critical needs for a business looking for a location. Competing in a global economy requires a competitive advantage, and a broadband connection and its other related technologies, coupled with the adoption and meaningful use of that technology, can provide businesses with a resource to expand their market, create operational efficiencies, and find that advantage.

**Connection Speed Among Businesses**



**Connection Cost Among Businesses**

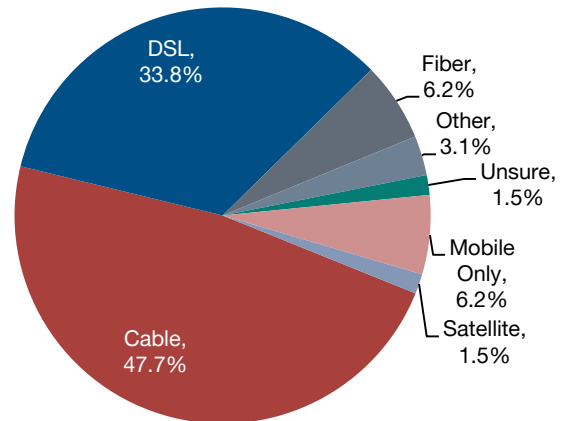




According to the business technology survey, 90% of responding businesses subscribe, or adopt, a fixed broadband service. However, a small number (8%) of responding businesses have an internet connection through a mobile or satellite broadband network. These types of connections can be plagued by monthly data limits and can be limited by weather, vegetation, and terrain and are not considered in the calculation of fixed broadband adoption for businesses in the community. Across businesses in all Connected<sup>SM</sup> participating communities, 87% have a fixed broadband connection, and 9% rely on a mobile-only or satellite service for their network connectivity.

For responding businesses without internet service, they indicate that they do not have a connection because one is not available to them and others responded that the available service is poor due to the speed of the connection.

### Connection Type Among Businesses



## Satisfaction

While having broadband available and adopting a connection, the subscribed to service needs to be able to meet the needs of the business. Survey respondents were asked if their current service met the needs of their business. Nearly two-thirds (65%) of respondents indicate that their internet service does not meet their needs. Among those that state their service does not meet their needs, most (88%) indicate that the speed of their connection is too slow. Nearly two-thirds (61.9%) say the price is too high, and 74% report that the connection is unreliable. Additionally, 43% indicate they are dissatisfied with customer service, and 19% indicate that data caps prevent them from fully utilizing their connection. One business owner responded that, “Internet is constantly cutting out and crippling my business.” The quality of service and the availability of services that businesses need are critical to ensuring the community can participate in the digital economy.

## Website Adoption

A website is one of the most basic ways in which a business establishes an online presence. A website provides a “virtual face” for a business.

According to the Business Technology Survey, 79.7% of responding businesses in the community have a website. Across all Connected<sup>SM</sup> participating communities, 78.7% of business survey respondents indicate that they have a website.

Examining survey results further, businesses with annual revenues greater than \$500,000 are more likely to have a website than those with revenues less than \$500,000. All responding businesses with revenues greater than \$500,000 have a website, while 69% of businesses with revenues less than \$500,000 have a website.

## Use

### Advanced Applications

Beyond a website, there are many internet-enabled technologies that can benefit businesses of all types. These technologies are aimed at increasing revenue and reducing expenditures to give businesses a competitive advantage. In the Business Technology Survey, respondents were asked to identify the advanced applications of technology they are currently using or plan to implement. In Walton County, 49.5% of businesses either currently

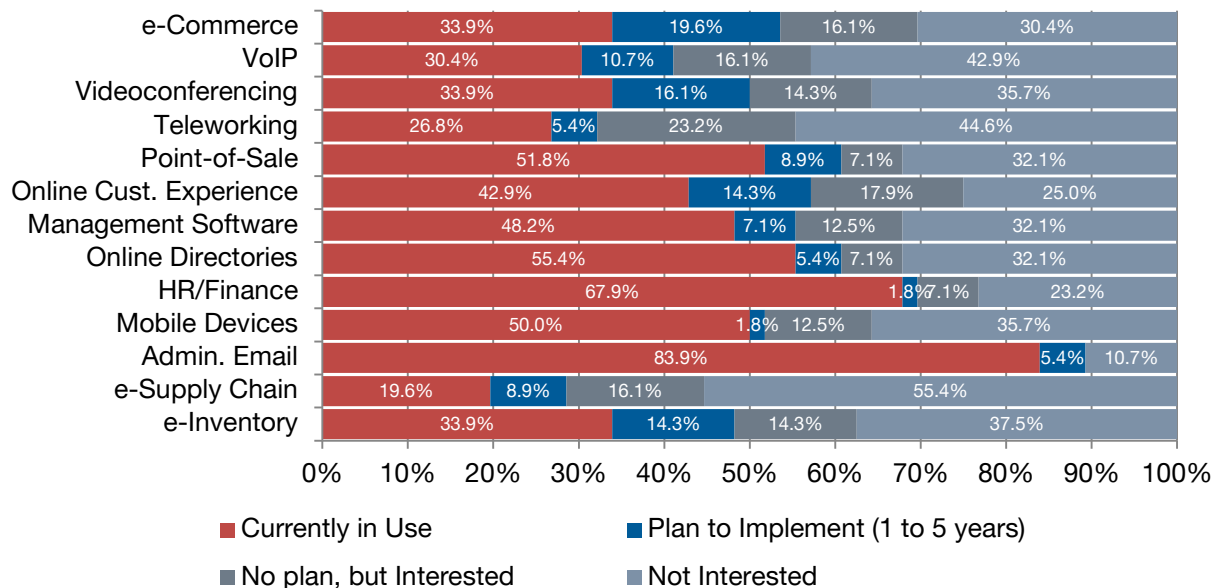


use or plan to implement one or more of the advanced applications within one year. Across responding businesses from all Connected<sup>SM</sup> participating communities, 44.6% of businesses either currently use or plan to implement one or more of the advanced applications within one year. The advanced applications include:

- Electronic inventory device or software
- Electronic supply chain management resources
- E-mail service for at least 75% of administrative staff
- Employer-issued mobile device for at least 50% of administrative staff
- Human resources or finance-related software
- Participating in industry-specific online directories and aggregation services
- Industry-specific management or performance monitoring software
- Interactive online customer experience
- Point-of-sale software
- Teleworking policy for employees
- Videoconferencing used regularly
- Voice over Internet Protocol (VoIP) phone service
- Web-based e-commerce application

The three most common applications currently in use included e-mail service for at least 75% of administrative staff (83.9%), human resources or finance software (67.9%), and participation in online directory services (55.4%). The chart provides more information on the implementation state of each advanced application across all businesses.

## State of Advanced Application Implementation Among Businesses



While not every business has a need for every one of these advanced applications, there may be opportunities to leverage these technologies to help sustain and grow businesses in the community.

Among respondents, 9.2% state that they plan to implement one or more of the advanced applications within the next five years. More interesting are the 12.6% of businesses that state they have no plan to implement one or more of the advanced applications but are interested in the technology. These businesses represent an opportunity for the community to educate and build awareness for how technology can enhance a business plan.



## Online Sales

e-Commerce and online sales can improve the revenue, sustainability, and market reach of businesses anywhere on the globe through online transactions. The business technology survey asked respondents to estimate the percent of their revenue that is generated through online sales and transactions. Forty-seven respondents provided data to this question. Among these respondents, an average of 26% of their revenue was from online sales. Nearly two-thirds of these respondents indicated that they earn no revenue from online sales, while 15% indicated that at least 80% of revenue is generated through online sales. Among responding businesses that provided both an estimate of their online sales as well as their annual revenue, it is estimated that approximately \$7.8 million in business revenue is generated annually by these establishments through online sales.

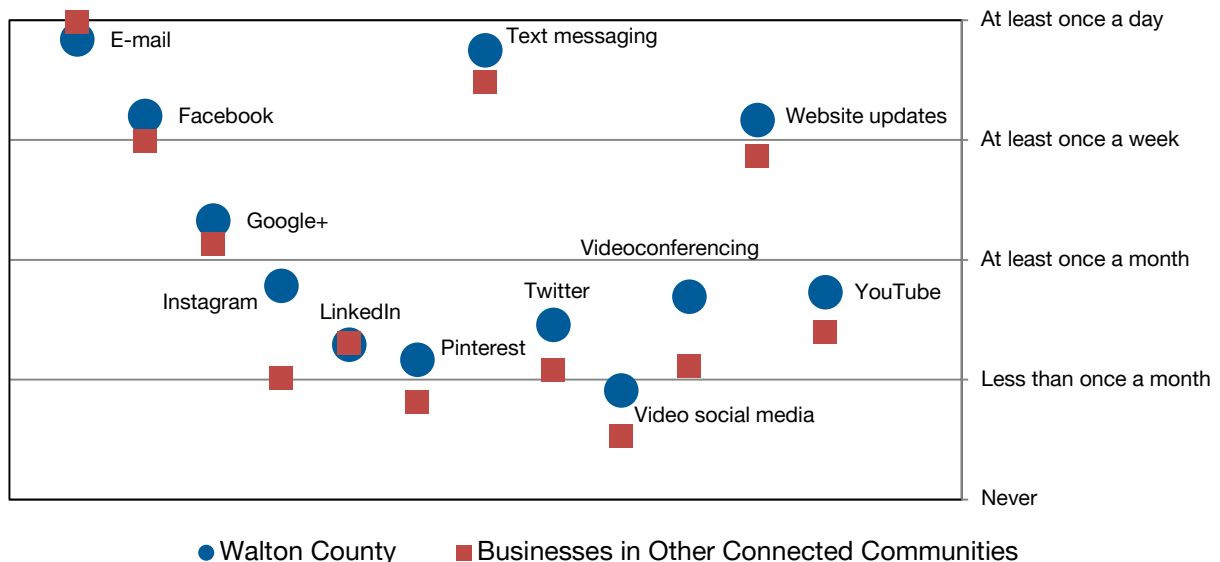
## Digital Communications

Similar to the use of internet-enabled technologies, broadband also enables businesses to communicate electronically with clients, potential customers, and colleagues. The Frequency of Business Digital Communication metric examines how often local businesses are leveraging digital tools and social media.

The chart below shows the average frequency of use for each of the digital communications tools included in the survey. Additionally, the chart shows the average frequency of use of these tools by all responding businesses across other Connected<sup>SM</sup> participating communities.

E-mail, text messaging, Facebook, and website updates are the most popular tools among businesses. Google+, Instagram, and YouTube represent the next most popular platforms for digital communication. LinkedIn, Pinterest, and Twitter are used, but less frequently than other tools. Video-based social media is rarely used. As shown, businesses in Walton County tend to use digital communications tools slightly more frequently than businesses in other Connected<sup>SM</sup> participating communities.

**Frequency of Digital Communication by Local Businesses**





## Talent and Workforce

The workforce, talent, and human capital ecosystem in a community is often an informal cooperation between employers, K-12 and higher education, and various supporting organizations. While some communities have formal facilities and structures to support these elements, this amalgam of entities contributes to the overall workforce development of a community in a largely ad hoc fashion. Internet connectivity and web-enabled technology contribute to talent and human capital development and can facilitate entrepreneurship. As technology advances and is increasingly used in the public and private sectors, the skills of the workforce must also advance.

### Technology Skill Alignment and Skill Mix

The technology-related skills necessary to be successful on the job are changing to keep pace with new innovations, tools, and applications that make production and services more efficient. The skills of the workforce should match the needed skills of the employer in order for establishments to take advantage of new technologies.

The Technology Skill Alignment metric measures the current technology skill alignment between employers and their employees. Respondents to the Business Technology Survey were asked how well the technology skills of their employees matched the technology needs of their business. According to survey results, the skills of the majority of the Walton County employees match the skills of their employers well or very well. The table below shows the distribution of responses across all businesses in the community, as well as the responses from employers in other Connected Nation communities.

<i>How well do the tech. skills of employees match the tech. needs of the business? (All Establishments)</i>	Walton County	Employers In Other Communities
Poor	2%	2.3%
Fair	26%	27.0%
Well	43%	31.7%
Very Well	22%	27.9%
Excellent	7%	11.0%

Among all responding businesses, 28% stated that the technology skills of their employees only poorly or fairly met the technology needs of their business. While these responses were spread among businesses of all types, a few clusters stand out. Among businesses earning less than \$500,000 annually, 43% state the technology skills of their employees meet the needs of their business very well or excellently. For businesses earning more than \$500,000 annually, however, none of the responding businesses of this size indicate that their employee skills match the needs of their business very well or excellently.

Additionally, businesses were asked to indicate the technology skill mix of their staff. They were asked to indicate the percent of their staff comprising the following four categories of technology skills:

- Non-Users: Employees that do not need any technology-related skills.
- Basic Users: Employees that use basic office software, internet browsers, e-mail, or other primary technologies in their job.
- Moderate Users: Employees that are required to use more advanced software/hardware in their job that may be sector/industry/task-specific.
- Advanced Users: Employees that develop, operate, maintain, modify, and manipulate technology systems, software, or hardware.

The table at right provides the mix of employee technology skill types as reported by businesses responding to the survey. Also, the table provides the mix of technology skill types as identified by employers across other Connected Nation communities.

<i>Employee Tech. User Type</i>	Walton County	Other Communities
Non-Users	8%	7.6%
Basic Users	30%	34.6%
Moderate Users	38%	37.4%
Advanced Users	24%	20.4%





## Technology Training

If technology is ever-changing, and employee technology skills are important to meeting the needs of local businesses, then technology-related training is essential for ensuring employees keep up with the latest technology tools, devices, and applications.

The Technology Training metric examines the importance of technology-related training for employees among local businesses. Respondents to the Business Technology Survey were asked to rate the importance of technology-related training, continuing education, or professional development. According to survey results, responding local businesses in the community feel that technology-related training and continuing education is moderately or very important. The table at right shows the distribution of responses across all businesses, as well as the distribution of responses among employers in other Connected Nation communities.

<i>How important is tech-related training and continuing education?</i>	Walton County	Other Communities
Not Important	11%	2.3%
Slightly Important	12%	11.6%
Neutral	13%	14.7%
Moderately Important	17%	25.5%
Very Important	47%	45.9%

## Continuing Education

The first two metrics, Technology Skill Alignment and Technology Training, examine the current state of technology knowledge of employees, the needs of employers, and the importance of training to boost the technology skills of the workforce. This metric explores the various ways in which employers contribute to and encourage technology-related training and continuing education for employees.

Respondents to the Business Technology Survey were asked to indicate two things: 1) their overall continuing education framework and 2) the specific policies they have in place to support their framework. The continuing education framework establishes whether employees are required or encouraged to pursue continuing education. The table at left provides the breakdown for businesses in the community that support each framework, and the same breakdown for businesses across other Connected Nation communities.

Continuing Education Framework	Walton County	Other Connected Communities
Employees are <b>REQUIRED</b> to pursue continuing education	21%	29.4%
Employees are <b>ENCOURAGED</b> , BUT NOT <b>REQUIRED</b> to pursue continuing education	56%	51.3%
Employees are <b>NEITHER ENCOURAGED NOR REQUIRED</b> to pursue continuing education	23%	19.3%

Additionally, employers were asked about the policies they have in place to support continuing education among their employees. The four policies included in the survey are:

- Allowing time off work to pursue training;
- Providing financial support for continuing education;
- Regularly offering on-site training by outside experts; and
- Offering on-the-job training by in-house experts.

Active Continuing Education Policies	Walton County	Other Connected Communities
Time Off Work	40%	39.2%
Financial Support	26%	34.8%
On-Site Training	15%	26.8%
On-the-Job Training	49%	53.1%
<i>Participants could choose more than one response</i>		



The survey results show that, on average, businesses in the community have one or two of these policies in place.

Less than one-quarter (21%) of businesses require continuing education among their employees, while 56% encourage the practice, but it is not required. Nearly one-fifth (23%) of businesses neither encourage nor require continuing education for their employees. Some businesses (12%) have no policies in place to support continuing education.

On-the-job training is the most commonly adopted continuing education policy, followed closely by time off work and financial support for professional development and training.

Among businesses that require continuing education of their employees, 50% report that their employee skills match the needs of their business very well or excellently. For businesses where continuing education is encouraged, but not required, the businesses reporting very well or excellently matched skills drops to 24%.

A man and a woman are looking at a tablet together. The man is on the right, wearing a cap and a denim jacket, smiling. The woman is on the left, wearing a plaid shirt, looking down at the tablet. The background is a blurred outdoor setting. The image has a blue overlay and a red diagonal shape in the bottom right corner.

IV

# THE PATH FORWARD



## The Path Forward

While Walton County has exhibited great progress in broadband and technology advancement, this technology plan offers recommended actions that may help the community fill the technology gaps identified in this report. These recommended actions for project implementation are subject to evolution as implementers assimilate various local organizational goals and objectives.

## County-Wide Infrastructure Recommendations

Three possible options rise to the surface for the County to consider in the furtherance of their broadband expansion efforts. The implementation of any such efforts should originate in areas of the County that are truly unserved by broadband. This serves to immediately reduce the chasm of the Digital Divide and focuses on a captive audience with pent-up demand.

Areas served by only one broadband provider or areas where the speed level falls below the federal benchmark of 25 Mbps download and 3 Mbps upload should be the focus of a secondary campaign designed to introduce competition and potentially reduce service pricing.

Wide-area deployments, designed to saturate the County, will be better positioned financially to maintain an ROI by using this greenfield and brownfield strategy from the onset. Additionally, considerations will need to be given to the implementation of advanced low-cost programs for the unserved portions of the County with high student and senior populations. CN presents the following recommendations in reverse order, leading up to the recommendation that is believed to be the most beneficial for the County.

### Option #3: Fiber-to-the-Home (FTTH)

In CN's opinion, this recommendation would be the least probable, and most expensive, option for the County for the following reasons. Whether the County is considering a dark or lit fiber network, the following considerations are important:

- There are more known failures than there are success stories (see **Appendix V: Fiber Projects**).
- **The Census data doesn't seem to support the creation of a municipal FTT(x<sup>44</sup>) network.** Of the 45,132 housing units in the County, only 22,301 are permanently occupied (16,194 owner and 6,107 renter), while a staggering **22,831 units are listed as vacant; 15,780 of which are designated seasonal, recreational, or occasional use.** If 50% of the housing units are vacant at least 30% of the time (typically December, January, and February) it may suggest that this single event could be enough to skew an ROI model.
- Assuming that Walton County could comply with FS §§ 350.81, there might not be enough unserved homes in the County to financially sustain the operational costs of such a network.
- Attempting to develop a County-wide network would require untold permits, pole attachment negotiations, make ready, negotiations with home owners associations, etc.

#### Provo, Utah: iProvo Project

After its 2006 completion, it wasn't long before the *negative option* charges, levied against consumers and businesses, in the iProvo project should have been a visible red flag to many.

Households were levied a \$5.35 per monthly tax and business taxed \$10 per month (whether they subscribed to services or not) to try and help pay for the initial build-out cost of the network (\$39.5 million) and subsequent operating losses.

Five years after its launch city officials admitted to failure and began seeking an immediate exit strategy. In a riveting move, Google acquired the network for staggering price of \$1.00!<sup>45</sup>

<sup>44</sup> X representing any number of variables such as the curb, node, home, etc.

<sup>45</sup> <http://archive.slttrib.com/article.php?id=56288307&itype=CMSID>



- The County would be unnecessarily overbuilding existing broadband infrastructure; possibly perceived as a waste of taxpayer dollars.

The U.S. Census Bureau<sup>46</sup> reports that the geographic area of Walton County is 1,240 square miles, comprised of 1,037.63 square miles of land, 241.48 of which is Eglin Air Force Base, and the remaining 202.37 square miles being bodies of water.

The County's population is 55,043<sup>47</sup> with the largest population in Miramar Beach<sup>48</sup> (6,146) followed by DeFuniak Springs (5,184), Freeport (1,787), Paxton (644), and the in rural, unincorporated areas of the County (41,325).

Fiber construction costs can range from less than \$5,000 per mile (roughly \$0.95 a foot) to more than \$72,000<sup>49</sup> per mile, depending on the population density, soil composition, cost of permits, right-of-way issues, obstacles, and potential trenching issues (such as rock). In at least one instance, a cost of \$100,000 per mile (\$100 million<sup>50</sup> on a 1,000 mile fiber optic network) was reported in the state of Illinois. The Walton County commissioners, sheriff's department, county clerk of courts, and the school district discovered the disparity associated with estimating trenching costs during the \$1.5 million collaborative Southern Light project.

Based on historical reviews of soil conditions, existing infrastructure, and laws regulating pole-attachment fees and public rights-of-way (PROW), CN estimates that the anticipated cost per mile for a fiber-to-the-home (FTTH) system<sup>51</sup> in Walton County, Florida would be approximately \$3,000.00/home passed or \$29,750/linear mile (see table on **Appendix V: Fiber Projects**). While the initial price may sound reasonable, it does not include recurring backhaul or ongoing pole attachment fees, customer service/help desk, installation and maintenance technicians, routers, caching servers, ARIN fees, service fleet, etc.

The ROI for an FTTH system should be underpinned by revenues generated from community anchor institutions (CAIs) such as Walton County School District (WCSD), rather than relying exclusively on revenue generated from single family housing units. This is underscored by the fact that none of the five known municipal fiber projects<sup>52</sup> in Florida offer residential service to single family homes and the system formerly operated by the City of Leesburg was just sold to Summit Broadband<sup>53</sup>.

Timing misalignments can prevent the opportunity to secure contracts with critical CAIs. For example, the January 5, 2018 request for proposals (RFP) issued by WCSD illustrates the ever-changing needs of the end user. In its RFP, WCSD states "...These improvements will allow Walton County School District to increase device scope, and allow for growth of the network in general... The majority of fiber optic cable currently installed at school sites is either OM1 or OM2 multimode fiber. These links currently run at 1 gigabit per second (Gbps). Walton County School District desires to upgrade all fiber optic backbone connections within the scope of this project to a minimum of OM3 multimode fiber with link speeds of no less than 10 Gbps."

The expectation for FTTH today includes the delivery of "The Fantastic Four" (video, voice, and data with wireless servicing provisions) as a minimum with options for IoT (Internet of Things) smart devices and home security.

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<sup>46</sup> U.S. Census Bureau, 2010 TIGER Data.

<sup>47</sup> 2010 U.S. Census Bureau data was predominantly collected in March; the peak Spring Break month for Florida, which seems to support seasonal population spikes (topping out at 55,043) and off-season vacancy rates (peaking at 50.6%).

<sup>48</sup> With an area of 4.6 square miles, there is a population density of 518.1/square mile.

<sup>49</sup> New Hampshire: The state spent \$63 million on an 865 mile fiber optic network. The result positioned 12,000 business entities within a 3 mile perimeter of the fiber backbone.

<sup>50</sup> The statewide project was funded by a \$62 million competitive award from the American Recovery and Reinvestment Act, (ARRA) which was made possible by a \$24 million commitment from the Illinois Jobs Now capital program and nearly \$10 million in other resources.

<sup>51</sup> Estimated using a 48 count cable for the first 2 miles followed by 24 count thereafter.

<sup>52</sup> Palm Coast FiberNET, Ocala Utility Services, Gainesville Regional Utilities d.b.a. GRUCom Fiber Optics, City of Leesburg, and Fort Pierce Utilities Authority d.b.a. FPUAnet Communications.

<sup>53</sup> <http://www.govtech.com/network/Leesburg-Fla-Sells-Off-Fiber-Infrastructure.html>



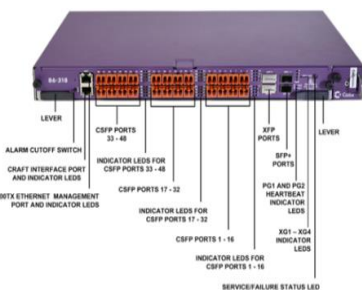
Combined with the ever increasing licensing fees associated with entertainment television<sup>54</sup>, retransmission fees for carriage of local networks and the cost per gigabit for backhaul delivery, building an FTTH system from scratch could be a risky proposition. Who would supply the backhaul network and how much capacity would be required? WideOpenWest indicated their service area along 30-A, near Inlet Beach, is supported by a 10 GB ring.

Delivery of the voice component, be it the Triple Play or the Fantastic Four, can be exacerbated by the necessity to comply with E911 requirements if offering voice-over-IP (VoIP). On May 19, 2005, the FCC adopted rules<sup>55</sup> requiring providers of VoIP services that connect with the traditional telephone network to supply E911 capabilities to their customers. The E911 hookup may be directly with the Wireline E911 Network, indirectly through a third party such as a competitive local exchange carrier (CLEC), or by any other technical means. The FCC explained that they felt compelled to issue this mandate because of public safety concerns.

Such requirements include:

- Offer E911 services as a mandatory feature, and do not allow customers to opt-out of the service.
- Register a customer's physical location prior to activating the E911 service and provide an easy method for updating location information.
- Transmit all 911 calls, the callback number, and the caller's physical location to the appropriate emergency service call center or local emergency authority.
- Educate customers on any limitations of their E911 services. VoIP providers must distribute warning labels to be placed on customer equipment used with the VoIP service.
- In areas where emergency services cannot process location information or callback numbers, VoIP providers must ensure 911 calls are routed to the proper public-safety answering point (PSAP) to designate the appropriate resources.

A core FTTH system, such as that built on a Calix B6 platform offering Active Ethernet<sup>56</sup>, GPON<sup>57</sup>, and NG-PON2<sup>58</sup>, would require highly trained service technicians and installers. A public-private partnership (P3) business model would be unlikely to bear fruit. The County would need to be comfortable managing a County-wide network comprised of **remote switch(es)**<sup>59</sup> necessary to provide an active Ethernet fiber optic connection to each subscriber location using a **central switch homerun** (CSH) design. **Remote cabinets** and **fiber cross-connects** would be installed over a vault or astride a concrete pad at locations throughout the County.



The Calix B6 Active Ethernet platform can use a variety of blades, such as **B6-318 blades** capable of providing symmetrical 1 Gbps FTTH service to end users. The system would be designed to be expandable so the initial blade architecture would be based on probable lowest common denominator. A B6-318 blade, or line card as they are often called, has 48 optical Gigabit Ethernet (GE) ports and 4 optical 10 GE ports.



<sup>54</sup> March 7, 2017 Business Insider article titled “Cable and satellite TV customers pay more than \$9.00 per month for ESPN networks whether they watch them or not” states that ESPN now charges \$7.21/subscriber:

<http://www.businessinsider.com/cable-satellite-tv-sub-fees-espn-networks-2017-3>

<sup>55</sup> FCC First Report and Order and Notice of Proposed Rulemaking, WC Docket No. 05-196:

[https://apps.fcc.gov/edocs\\_public/attachmatch/FCC-05-116A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/FCC-05-116A1.pdf)

<sup>56</sup> Active Ethernet (a type of Ethernet in the first mile) is a common AON, which uses optical Ethernet switches to distribute the signal, incorporating the customers' premises and the central office into a large switched Ethernet network.

<sup>57</sup> Gigabit Passive Optical Network.

<sup>58</sup> Next Generation Passive Optical Network.

<sup>59</sup> For each node.



The initial investment, by category, could be roughly broken down categorically as indicated below (based on a review of comparable system designs in Iowa, Ohio, Minnesota, and Tennessee).

- Construction<sup>60</sup>: 63.00%
- Engineering: 13.00%
- COE<sup>61</sup>: 4.00%
- CPE<sup>62</sup>: 10.00%
- Allowable contingency: 10.00%

## Option #2: Public-Private Partnership

A public-private partnership (P3) model also allows the County to express some control over the areas served, but passes the burden on to a private partner. Where the County may fund the front-end capital costs (CAP-EX), the P3 partner might provide the overall operating expenses (OP-EX) and necessary manpower. Portions of the profits, if any, would vest to the County for the retirement of its CAP-EX debt used to fund the build-out.

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The County has expressed an interest in pursuing the development of a “free” Wi-Fi network capable of covering the majority of the County and capable of extensive data mining<sup>63</sup>; the idea being that “free” equates to paid advertisements on a splash page rather than charging the actual user, who would be required to log in using a specialized pass code and accept the terms and conditions (T&Cs) effectively allowing the mining of data.

Free public Wi-Fi networks are often known for notoriously slow speeds, an almost non-existent level of customer service (which is generally absolved in the T&Cs) and subject to high security risks. Also, how does one effectively subsidize a “free” network?

Since House Bill 4565<sup>64</sup> died in Transportation and Tourism Appropriations Subcommittee on March 11, 2018, other sources of funding should be considered for use as a financial incentive to create a P3 for the development and operation of a fixed wireless and Wi-Fi system serving the County. Such financial opportunities may be available through the United States Department of Agriculture – Rural Utilities Service (RUS) within programs such as the **Rural Broadband Access Loan and Loan Guarantee**<sup>65</sup> or the less desirable **Rural Economic Development Loan and Grant program**<sup>66</sup>.

“Most of our residents have either no internet connectivity, no cell phone connectivity, or unaffordable connectivity... that’s why the committee came up with a Wi-Fi plan.”

-Rick Wilson, Walton County, Florida

<sup>60</sup> Estimated costs for constructing a fiber-to-the-home network include costs for aerial and buried fiber, fiber drops, fiber splicing, poles, pole line hardware, and right of way clearing.

<sup>61</sup> Central office equipment (COE) includes costs for blades, optics, batteries, hardware, and installation labor.

<sup>62</sup> Customer premise equipment (CPE) include costs for optical network terminals (a.k.a. network interface device), hardware, fusion splicing, and installation labor for all locations.

<sup>63</sup> Primarily as a way to study the travel and spending patterns of its highly transient population base: <http://www.wjhg.com/content/news/Walton-County-searches-for-broadband-accessibility-solutions--465551923.html>

<sup>64</sup> Filed January 7, 2018; referred to Transportation and Tourism Appropriations Subcommittee on January 10, 2018; Indefinitely Postponed and Withdrawn from Consideration on March 10, 2018; Died in Transportation and Tourism Appropriations Subcommittee on March 11, 2018: <http://www.flsenate.gov/Session/Bill/2018/4565>

<sup>65</sup> <https://www.rd.usda.gov/programs-services/rural-broadband-access-loan-and-loan-guarantee>

<sup>66</sup> <https://www.rd.usda.gov/programs-services/rural-economic-development-loan-grant-program>



This wireless network could include either a stand-alone point-to-multipoint (PMP) fixed wireless network or a hybrid PMP combined with a more traditional Wi-Fi component. A fixed wireless represents the option with the quickest time-to-market and at the lowest cost per home passed.

Based on the County's dense foliage, a ubiquitous Wi-Fi network, in its truest form, would be problematic. Aside from its native hardwoods, the density of pine trees in the County would create the biggest issue. Pine needles are an organic material, primarily composed of water, that can also conduct electricity (especially when wet). A typical pine needle is 15 centimeters (5.9") and can create radio frequency anomalies such as absorption or resonant scattering. Additionally, a pine needle is approximately the same size as a Wi-Fi wavelength (at 2,400 MHz) or roughly ¼ wavelength size of a cellular signal (at 800 MHz); in other words, pine needles and radio signals don't mix well.

A more logical approach would be a system combining the "best of breed" approaches for fixed wireless and Wi-Fi. This would likely require the use of TV white space and other frequencies (e.g., 900 MHz) to reach homes that are surrounded by trees.

Wi-Fi access points could be installed in high traffic areas with the heaviest possible use potential, i.e., the beach communities. Random access points could also be installed along the key thoroughfares (e.g., 331, 98, and 30-A). These targeted locations should account for the greatest data mining potential.

In a conventional system, Wi-Fi access points and/or transmitters are placed on electric utility poles or similar structures such as light poles, traffic control poles, water tanks, broadcast towers, and rooftops. Among other Florida statutes and proposed laws<sup>67</sup>, FS §§ 337.401, SB 596, and HB 687 will provide guidance on how Walton County will be required to deal with such pole attachments.

Free Wi-Fi would also be a great addition in and around the schools, public libraries, and gathering points (i.e., parks). However, one must remember that supplying such service is by no means "free." The cost of backhaul alone is a significant financial burden.

Between December 2017 and March 2018, CN analyzed 100+ water tanks and broadcast towers located in Walton County that could be used as potential transmit sites in the development of wireless network.

It quickly became apparent that many of these locations were passed by fiber backbone, but would require lateral installations, from a local fiber provider, for network circuit connections. As such, CN contacted Uniti and requested quotes for 22 target sites. Of the original 22, only 14 could receive cost effective laterals.

The monthly recurring charges, estimated for these 14 sites, equated to slightly under \$20,000 per month for the delivery of 100 Mbps circuits and a 1 Gig aggregation point within the County.

If free Wi-Fi access points were then intermingled with the subscription-based fixed wireless network, the subsidization of the backhaul connectivity may be solved; provided however, that enough consumers subscribe to the "not free" network.

The Central Ohio Transit Authority (COTA) offers free unrestricted, unthrottled Wi-Fi service as part of its role in the Columbus Smart Cities program. During an April 2018 presentation before the Ohio Public Transit Association, COTA reported a consumption of 1 Terabyte of data per day. Now, consider whether that \$20,000/month fee is affordable, or sustainable, if it were subject to a data cap?

In a P3, Walton County could help subsidize the capital requirements for the construction of a wide area network while the partner handles the other day-to-day tasks such as back office and "help desk" support to patrons using (or attempting to use) the network. Seeking recommendations from companies already in the business of developing Wi-Fi and using data mining software can be a great way to learn the ups and downs of this part of the equation.

Additionally, "free" should have its limits. A 1 Mbps x 1 Mbps internet connection can accomplish basic tasks. Patrons could then be asked to "upgrade" their service levels for a fee in order to receive higher speeds, such as a 25 Mbps x 3 Mbps package meeting the FCC's definition of advanced broadband service.

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<sup>67</sup> <https://www.flsenate.gov/PublishedContent/Session/2017/BillSummary/CombinedPDF/CU.pdf>

There are creative and inexpensive ways to monetize Wi-Fi service in addition to selling data or advertising space on a splash screen.

A great, local example can be found at Eagle's Landing RV Park, located at 4504 Log Lake Road, Holt, Florida, 32564<sup>68</sup>.

**Experience Our New and Improved Wi-Fi Service!**

The benefits of the new system are:

- **Optimized for mobile devices, like smart phones and tablets**
- **No bandwidth restrictions or limitations**
- **Super fast 'in home like' WiFi experience**

Our Rates for the new service is as follows (effective 11/1/2015):

- **Daily: \$1 per device**
- **Weekly: \$6 per device**
- **Monthly: \$26 for the first device**
- **Monthly: \$7 per additional device (after the first one)**



For additional information see **Appendix VI: Sample System Parameters**.

## Option #1: Competitive Application Process – Grant Program

This logical approach may provide Walton County with the greatest flexibility and control. The County could create a grant pool<sup>69</sup>, as a set aside, to provide financial incentive/support to broadband providers willing to expand into “high cost, remote and rural areas.” Two notable examples are included for consideration:

### Tennessee

- The state of Tennessee, for example, passed a bill entitled *The Broadband Accessibility Act of 2017*<sup>70</sup>. Its purpose is to give \$30 million in grants, and an additional \$15 million in tax credits, to private service providers to upgrade their equipment or expand into rural areas.
- Over 60 applications were received in the inaugural round.
- Broadband providers applied for grant funding and each application was graded, based on its merits, and winning applicants were awarded funds that are to be reimbursed upon successful completion of construction and activation of network. The state selected the applications it believed were in alignment with its broadband mission and that “moved the needle forward.” *Up to 70% of the grant request could be funded, based on certain parameters outlined by the state.*
- A scoring rubric was developed that included such parameters as “proposed locations, service and pricing levels, project scalability, community support, technical capabilities of the applicants, proof of financing, budget, and sustainability.”
- The State also opened a public comment period, which occurred following the application submission dates, allowing interested parties to contest and/or protest an applicant/application. Such protests might have been filed by consumers or by companies claiming that the proposed service area is already served by a broadband provider.

<sup>68</sup> <http://www.eagleslandingrvpark.com/rates.html>

<sup>69</sup> Using monies procured from Triumph grants, etc.

<sup>70</sup> <https://www.tn.gov/governor/news/2018/1/26/haslam--rolfe-announce-nearly--10-million-in-grants-through-the-tennessee-broadband-accessibility-act.html>



## Minnesota

- The **Border-to-Border Broadband Development Grant Program**<sup>71</sup>, a similar program in Minnesota, has been underway since 2014 and has awarded approximately 114 grants since its inception.
- In 2017, the state's legislature included \$20 million in funds. *Up to 50% of the applicant's project development costs could be funded.*
- MS §§ 116J.395<sup>72</sup> subd. 5a lists the **Challenge Process** available for existing broadband service providers who believe a potential grant (offered to a competitive provider) would serve to overbuild existing service area.
- The award office routinely selects projects that have been flagged as complete (or a phase has been completed) and conducts extensive field validation and verification prior to finalizing reimbursement payments. Under MS §§ 15.061 and 116J.397, the state is empowered to engage such assistance as is deemed necessary. In this case, the accuracy of the applicant's data is verified and "on the ground" testing is performed.

CN is proud to have played a significant role in the review and/or validation of these two exciting programs.

A competitive grant program would allow Walton County to selectively choose the project(s) it believes create the most value by satisfying the needs of the consumers within high demand, unserved areas. Grant funding often changes the dynamics of a provider's ROI model and can be the catalyst that makes a difference for companies such as Spectrum, WOW, or other HFC or FTTH companies (see **Appendix VII: Estimated CATV Construction Costs per Unit**).

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<sup>71</sup> <https://mn.gov/deed/programs-services/broadband/grant-program/>

<sup>72</sup> <https://www.revisor.mn.gov/statutes/>





V

# APPENDIX



## I. Florida Statutes

### **FS §§ 364.0135: Railroads and Other Regulated Utilities; Telecommunications Companies**

Promotion of broadband adoption. — (1) The Legislature finds that the sustainable adoption of broadband internet service is critical to the economic and business development of the state and is beneficial for libraries, schools, colleges and universities, health care providers, and community organizations. The term “sustainable adoption” means the ability for communications service providers to offer broadband services in all areas of the state by encouraging adoption and utilization levels that allow for these services to be offered in the free market absent the need for governmental subsidy.

### **FS §§ 364.0135**

Requires the Commission to gather data from the telecommunications industry to prepare its annual report to the Florida Legislature on telecommunications competition.

### **SB 596<sup>73</sup>: Utilities**

Laid on Table; companion bill HB 687 passed.

### **HB 687<sup>74</sup>: Utilities**

Authorizes DOT & certain local governmental entities to prescribe & enforce rules re: placing & maintaining communications services lines/wireless facilities; prohibits authority regulation of facility collocation; authorizes authority to require registration process & permit fees; requires authority to process applications; prohibits authority from requiring approval/fees for maintenance/placement of facilities; provides requirements for collocation on authority utility poles; requires authority to waive certain application & placement requirements; prohibits authority from adopting/enforcing certain regulations & imposing certain fees; authorizes wireless infrastructure provider to apply to place utility poles; authorizes authority to enforce certain local codes/rules/regulations under certain circumstances.

### **HB 755<sup>75</sup>: Oversight, Transparency and Administration Subcommittee**

Pub. Rec./Nationwide Public Safety Broadband Network; Provides exemption from public records requirements for certain information relating to Nationwide Public Safety Broadband Network held by agency; provides for future legislative review & repeal of exemption; provides statement of public necessity.

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<sup>73</sup> <https://www.flsenate.gov/Session/Bill/2017/00596>

<sup>74</sup> Approved by Governor on June 23, 2017:

<https://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=57682&SessionId=83>

<sup>75</sup> Approved by Governor on March 21, 2018:

<https://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=61142&SessionId=86>



## **HB 865<sup>76</sup>: Department of Transportation**

Requiring the department, in consultation with the Department of Highway Safety and Motor Vehicles, to develop the Florida Smart City Challenge Grant Program; providing for assessment and calculation of a fine for unlawful weight and load of a vehicle fueled by natural gas; requiring the department to undertake an economic feasibility study relating to the acquisition of the Garcon Point Bridge; prohibiting the South Florida Regional Transportation Authority from entering into certain contracts or agreements without department approval of the authority's expenditures, etc.

## **HB 1103<sup>77</sup>: Regional Rural Development Grants**

Provides that regional rural development grants may be used to hire regional economic development organization professional staff; provides maximum amount of grant funding that certain economic development organizations may receive in year; revises amount of required matching funds; requires certain contracts to include certain information & be placed on certain websites; provides that improving access to & availability of broadband internet service may be included in project that is eligible for rural infrastructure grant funds.

## **SB 1646<sup>78</sup>: Regional Rural Development Grants**

Providing that regional rural development grants may be used to hire regional economic development organization professional staff; authorizing the use of matching grant funds to provide technical assistance to certain entities; requiring that contracts or agreements involving the expenditure of grant funds be placed on a certain website for a specified time period; requiring that a plain language version of certain contracts or agreements be placed on a certain website; providing that improving access to and availability of broadband internet service may be included in a project that is eligible for rural infrastructure grant funds, etc.

## **HB 4565<sup>79</sup>: Walton County Broadband Wi-Fi**

Provides for a \$2,100,000.00 appropriation for the Walton County Broadband Wi-Fi project.

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<sup>76</sup> Approved by Governor on May 31, 2017:

<https://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=58359&SessionId=83>

<sup>77</sup> Filed on December 28, 2017; Indefinitely postponed and withdrawn from consideration on March 21, 2018:

<https://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=62226&SessionId=86>

<sup>78</sup> Filed on January 5, 2018; Indefinitely postponed and withdrawn from consideration on March 10, 2018:

<https://www.flsenate.gov/Session/Bill/2018/01646>

<sup>79</sup> Filed on January 7, 2018; Indefinitely postponed and withdrawn from consideration on March 10, 2018:

<https://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=62637&SessionId=86>



## II. Broadband Providers

Provider	Technology	Website
AT&T	Long-haul Fiber	<a href="https://www.att.com/">https://www.att.com/</a>
CenturyLink	Long-haul & Metro Fiber	<a href="http://www.centurylink.com/">http://www.centurylink.com/</a>
CenturyLink	DSL	<a href="http://www.centurylink.com/">http://www.centurylink.com/</a>
CenturyLink	FTTH	<a href="http://www.centurylink.com/">http://www.centurylink.com/</a>
Consolidated (FairPoint)	DSL	<a href="https://www.consolidated.com/">https://www.consolidated.com/</a>
Cox Communications	Cable	<a href="https://www.cox.com/">https://www.cox.com/</a>
Crown Castle	Long-haul & Dark Fiber	<a href="http://www.crowncastle.com/">http://www.crowncastle.com/</a>
DirectTV	Cable (SMATV)	<a href="https://www.directv.com/">https://www.directv.com/</a>
Florida DOT	Proprietary Fiber	<a href="http://www.fdot.gov/">http://www.fdot.gov/</a>
Mediacom	Cable	<a href="https://www.mediacomcable.com/">https://www.mediacomcable.com/</a>
Southern Telecom	Long-haul Fiber	<a href="http://www.southern-telecom.com/">http://www.southern-telecom.com/</a>
Spectrum	Long-haul & Metro Fiber	<a href="https://www.spectrum.com/">https://www.spectrum.com/</a>
Spectrum	Cable	<a href="https://www.spectrum.com/">https://www.spectrum.com/</a>
Sprint	Long-haul Fiber	<a href="https://www.sprint.com/">https://www.sprint.com/</a>
Uniti	Long-haul & Metro Fiber	<a href="https://uniti.com/fiber/">https://uniti.com/fiber/</a>
Verizon	Long-haul Fiber	<a href="https://www.verizon.com/">https://www.verizon.com/</a>
Windstream	Long-haul Fiber	<a href="https://www.windstream.com/">https://www.windstream.com/</a>
WOW	Long-haul & Metro Fiber	<a href="https://www.wowway.com/">https://www.wowway.com/</a>
WOW	Cable	<a href="https://www.wowway.com/">https://www.wowway.com/</a>
WOW	FTTH	<a href="https://www.wowway.com/">https://www.wowway.com/</a>



## III. Infrastructure Damage

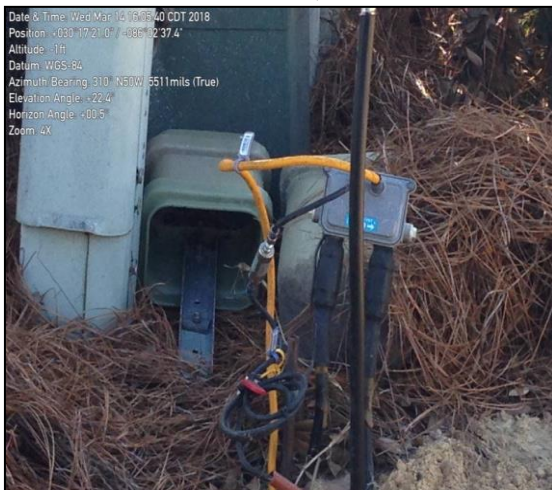
Open CenturyLink Remote Terminal  
Village Commons Blvd; Freeport



Mediacom Cable TV Pedestal  
Lupine Road; Grayton Beach



Mediacom Cable TV Pedestal  
Pelican Glide Ln; Seacrest



Mediacom Cable TV Pedestal  
Park Drive; Grayton Beach







**Mediacom Cable TV Aerial Tap  
Birmingham Street; Seagrove Beach**



**CenturyLink Telephone Pedestal  
Leisure Lane; Santa Rosa Beach**



**CenturyLink Telephone Pedestal  
Waterwood Ct; Santa Rosa Beach**



**CenturyLink Telephone Pedestal  
Park Drive; Grayton Beach**



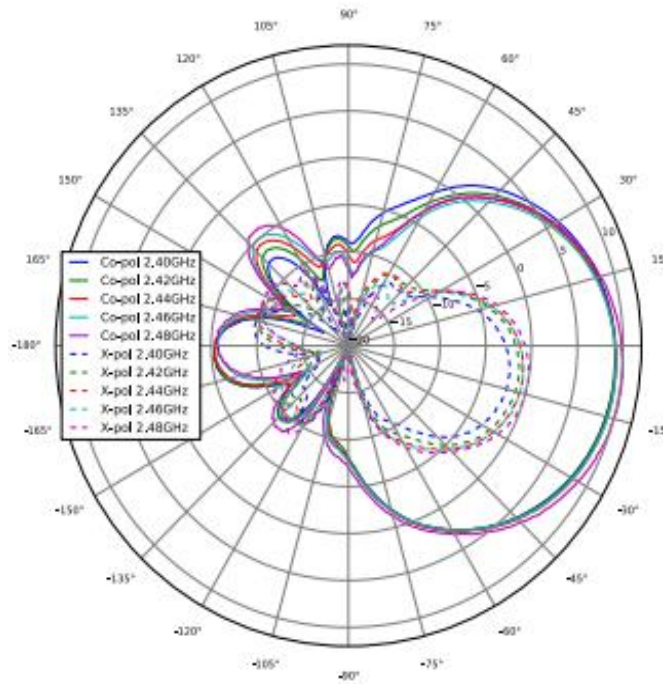
**CenturyLink Telephone Pedestal  
Bald Eagle Ct; Santa Rosa Beach**





## IV. Sample Antenna Pattern

V-POL AZIMUTH GAIN (DBI) FOR ZERO ELEVATION





## V. Fiber Projects

### Positive examples of fiber projects:

Burbank (CA) Water and Power: BWP leases dark fiber to other organizations within the city boundaries to promote economic development. Charges are based on a multiple of link distance and contract length.

Vernon, CA: Vernon, CA, recovered its estimated project costs two years after inception of operation. The town, however, had an incredible advantage for its ROI model: 1,800 businesses and only 100 residences. Not a typical FTTH system.

New Hampshire: The State of New Hampshire spent \$63 million to build 865 miles of fiber optic network that puts 12,000 (25%) of the state's business entities within 3 miles of a fiber backbone. Again, not a typical FTTH model. The success here relies entirely on the business community.

### Florida fiber projects include:

Palm Coast FiberNET: Started in 2007-2008 as a layer 2 IP network; uses active Ethernet. Partners with two ISPs (Palm Coast/Flagler Internet and DataCom) to deliver services to businesses only. The city of Palm Coast charges the ISP for colocation, installation (activation), and throughput; plus a one-time set-up fee.<sup>80</sup>

Ocala Utility Services: Started in 1995; uses active Ethernet. Delivers service to businesses only<sup>81</sup>.

Gainesville Regional Utilities d.b.a. GRUCom Fiber Optics: Started in 2001; uses active Ethernet. Provides service to businesses, multiple dwelling units (MDUs), and greenfield projects<sup>82</sup>.

City of Leesburg: Started in 2001. Provides service to businesses only.

Fort Pierce Utilities Authority d.b.a. FPUAnet Communications: Started in 2001; uses active Ethernet. Provides service to businesses only.

### Other projects across the nation include:

Burlington, VT: A second similar negative option system was located here. After borrowing \$33.5 million from CitiBank to underwrite project costs, the municipality soon discovered that its citizens weren't as prone to adopt service as had been projected. With a dismal subscription rate of <12% (estimated to have been only 4k of the 39k residential and business units), the city then borrowed an additional \$17 million to try and keep the network floating. CitiBank subsequently sued Burlington and reached a settlement in which the network was sold to a private company for \$6 million (in financing).

Kentucky: The *KentuckyWired* project is a proposed 3,000 mile optical fiber network with a \$325+ million price tag. *KentuckyWired* was contemplated as an open access, middle-mile network designed to interconnect state offices and educational entities. The project is behind schedule (best estimates are now a late 2018 completion) and will likely result in increased costs to Kentucky<sup>83</sup>.

<sup>80</sup> <http://docs.palmcoastgov.com/fibernet/service%20provider%20info.pdf>

<sup>81</sup> <http://www.ocalafl.org/government/city-departments/shared-business-internet>

<sup>82</sup> <https://www.gru.com/GRUComFiberOptics.aspx>

<sup>83</sup> Money the state had assumed could be directed from E-rate subsidies. Note: The financing model for KentuckyWired assumed that the state-controlled Kentucky Communications Network Authority would win the K-12 schools network contract.





**Cedar Falls, IA:** In order to build the network, the city-owned electric, water, and gas utility assumed \$14.7 million to construct the network and then “borrowed”<sup>84</sup> another \$2.4 million before receiving \$1 million in additional ARRA funding. The network is still incomplete and costs of service are perceived as relatively unaffordable<sup>85</sup>.

**Monticello, MN:** Construction costs, estimated at just under \$17 million, were acquired through a series of bonds. An additional \$9.6 million in bonds were needed for “related expenses.” Rather than generating ample cash to manage its debt service, the network found itself with a half million dollar a year deficit and less than a 10% take rate. FiberNet Monticello received nearly \$3.5 million dollars in additional “loans”<sup>86</sup> in an effort to change the tide. Unfortunately, the debt load was certain to drown the project and FiberNet found itself unable to pay its debts. This resulted in an estimated \$4 million dollar loss of tax-payer money and a \$5.75 million dollar settlement agreement<sup>87</sup>.

Project	State	Estimated Base Project Cost	Households (HH)	Estimated Cost per HH	Approximate HH Density per Construction mi <sup>2</sup>
Monticello	MN	\$22,445,000	5,004	\$4,485.41	1,427
Windom	MN	\$9,470,000	2,328	\$4,067.87	1,117
Salisbury	NC	\$30,000,000	14,163	\$2,118.20	1,488
Wilson	NC	\$29,190,000	21,630	\$1,349.51	1,907
Churchill County	NV	\$21,000,000	10,756	\$1,952.40	5
Bristol	TN	\$24,500,000	12,515	\$1,957.65	908
Chattanooga	TN	\$162,000,000	154,746	\$1,046.88	623
Clarksville	TN	\$40,200,000	56,524	\$711.20	1,392
Fayetteville	TN	\$11,000,000	3,286	\$3,347.53	1,401
Morristown	TN	\$25,500,000	12,640	\$2,017.41	1,394
Pulaski	TN	\$8,500,000	3,960	\$2,146.46	1,200
Tulahoma	TN	\$16,975,000	8,896	\$1,908.16	794
Walton County	FL	\$137,652,600	45,132	\$3,050.00	36

**Additional Sources Include:**

- *How Much Does Fiber Optic Cable Installation Cost, Cost Aide*<sup>88</sup>
- *Municipal Fiber in the United States: An Empirical Assessment of Financial Performance*, Christopher S. Yoo (John H. Chestnut Professor of Law, Communication, and Computer & Information Science at the University of Pennsylvania and Founding Director of the Center for Technology, Innovation and Competition) and Timothy Pfenninger (University of Pennsylvania Law School)<sup>89</sup>
- *A Financial Assessment of Municipal Fiber in the U.S.* Christopher S. Yoo and Timothy Pfenninger, May 2017<sup>90</sup>
- *Breakeven Analysis of Wavelength Services vs. Leasing Dark Fiber*, MVR, 2015

<sup>84</sup> Without the consent from Cedar Falls electric and water customers.

<sup>85</sup> Approximately \$150 per month for residential gigabit service and \$900 for comparable business service.

<sup>86</sup> Funded through the local government.

<sup>87</sup> To Wells Fargo Bank (the bond trustee) and local bond holders.

<sup>88</sup> <https://costaide.com/fiber-optic-cable-installation-cost/>

<sup>89</sup> <https://www.law.upenn.edu/live/files/6611-report-municipal-fiber-in-the-united-states-an>

<sup>90</sup> <https://publicpolicy.wharton.upenn.edu/issue-brief/v5n5.php>



- *Correcting Community Fiber Fallacies*, Christopher Mitchell (Community Networks Initiative at the Institute for Local Self-Reliance), May 2017<sup>91</sup>
- *Your City Is Going To Be Able To Build Its Own Broadband Network And Blow Evil Cable Companies Away*, Jessica Leber, February 2015<sup>92</sup>
- *Better data would support better muni broadband decisions*, Tellus Venture Associates, June 2017<sup>93</sup>
- *The Dirty Dozen: Examining the Failure of America's Biggest & Most Infamous Taxpayer-Funded Broadband Networks*, Taxpayer Protection Alliance, July 2016<sup>94</sup>

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<sup>91</sup> <https://muninetworks.org/sites/www.muninetworks.org/files/2017-05-TPA-boondoggle-rebuttal-final.pdf>

<sup>92</sup> <https://www.fastcompany.com/3042605/why-municipal-broadband-is-poised-for-high-speed-growth>

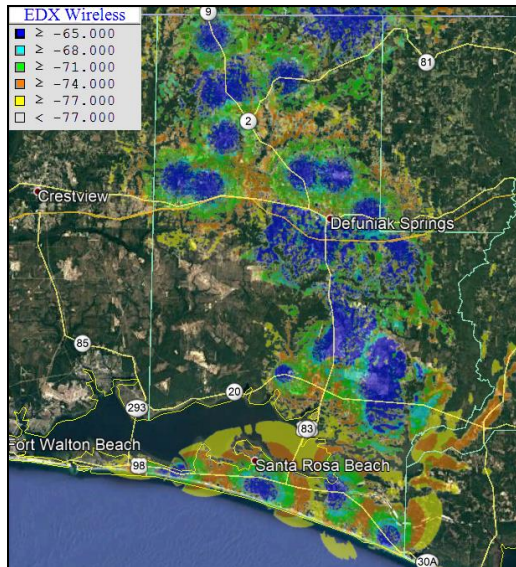
<sup>93</sup> <https://www.tellusventure.com/blog/better-data-support-better-muni-broadband-decisions/>

<sup>94</sup> <https://www.protectingtaxpayers.org/blog/a/view/the-dirty-dozen-examining-the-failure-of-americas-biggest-most-infamous-taxpayer-funded-broadband-networks-july-2016>





## VI. Sample System Parameters



The sample system design (at left) achieves a cost of  $\leq \$87.25/\text{mile}$  and at a rate of approximately  $\$200^{95}/\text{HH}$  thereafter. It does not include the use of Wi-Fi nor TV white space (TVWS) equipment.

The Cambium Networks ePMP 1000<sup>96</sup> integrated radio provides more than 200 Mbps of real user throughput. Each transmit radio uses 2x2 MIMO<sup>97</sup>-OFDM technologies with a 24° azimuth (beam width) and 14 dBi output on the 5 GHz radios and a 65° azimuth with 11 dBi output on the 2.4 GHz radios which is also capable of providing more than 200 Mbps of real user throughput; all for under \$250 per radio.

The transmit radios connect to a 14 port cluster management module (Cambium CMM4; combined switch and GPS synchronization unit). The Cambium CMM4 retails between \$2,200 and \$3,200.

Assuming lack of fiber connectivity at the base of a tower, a point-to-point backhaul link (e.g., Cambium PTP 550; 1.3 Gbps max) can be purchased for \$775.

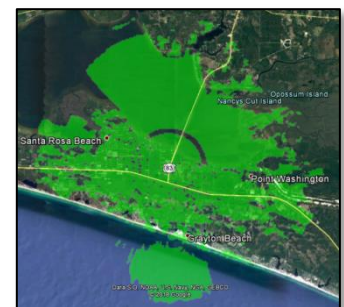
Combining the use of TVWS equipment<sup>98</sup> at certain tower sites will help reach non-line-of-site households in heavily foliated areas on the northeast portion of the County. However, due to the limited number of elevated water tanks or broadcast towers in that area, it may be necessary to gain access to a site, operated by Pinnacle Towers (ASR 1039239) located in Geneva County, Alabama at 30° 56' 46.9" N x 86° 05' 58.6" W.

TVWS equipment is more expensive than other unlicensed radios and the typical "trade out" is less throughput in exchange for non-line-of-site coverage. These radios, for example, can deliver between 1.65-1.8 bits per hertz, so when combining three 6 MHz channels, the end user can receive approximately 18 Mbps.

By contrast, a standard 2.4 GHz fixed wireless device can deliver approximately 40 Mbps+ speeds to the end user, at about 1/3 the cost of TVWS equipment, but to a much reduced coverage area.

The propagation study (at right) illustrates a theoretical transmit site near the Coastal Bend Library, where a 6 mile radius is capable of serving roughly 56.9 square miles (counting bodies of water, the radius is closer to 113 square miles).

Should the County determine that speed of deployment, flexibility, and lower, yet national standard speeds are the goal, then a fixed wireless network is most effective.



- Construction: 6.58%
- Engineering: 3.82%
- OE: 3.25%
- CPE: 79.05%
- Allowable contingency: 7.30%

<sup>95</sup> \$99 per customer premise unit and \$100 labor for installation of external CPE.

<sup>96</sup> 2.4 GHz; device includes three QoS level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority.

<sup>97</sup> Multiple in-multiple out.

<sup>98</sup> Carlson Wireless and/or Adaptrum.



A 5 year budget for such a project might look like this:

Walton County, Florida Fixed Wireless Model						
	Year 1	Year 2	Year 3	Year 4	Year 5	Summary
Gross Business Ads	24	24	24	24	24	
Gross Residential Adds	585	420	420	420	420	
Est. Churn 1% Monthly	-34	-89	-126	-160	-189	
Customer Total	573	897	1,186	1,446	1,678	
<i>Subscription - Wireless</i>	\$105,801	\$282,920	\$399,906	\$504,650	\$598,431	\$1,891,708
<i>Service Call Revenue</i>	\$1,662	\$4,427	\$6,264	\$7,908	\$9,381	\$29,642
<i>Penalty Fees</i>	\$3,324	\$8,854	\$12,528	\$15,817	\$18,762	\$59,285
<b>Total Recurring Revenues</b>	<b>\$113,538</b>	<b>\$304,158</b>	<b>\$430,039</b>	<b>\$542,747</b>	<b>\$643,658</b>	<b>\$2,034,140</b>
<b>Expenses</b>						
Advertising	(\$12,000)	(\$12,000)	(\$12,000)	(\$12,000)	(\$12,000)	(\$60,000)
Auto Expense (Gas); Technician	(\$3,000)	(\$3,000)	(\$3,000)	(\$3,000)	(\$3,000)	(\$15,000)
Bank Charges	(\$2,838)	(\$7,604)	(\$10,751)	(\$13,569)	(\$16,091)	(\$50,853)
Billing Expense	(\$3,324)	(\$8,854)	(\$12,528)	(\$15,817)	(\$18,762)	(\$59,285)
Cost of Sales - Wireless E-Mail	(\$2,493)	(\$6,640)	(\$9,396)	(\$11,863)	(\$14,072)	(\$44,463)
Cost of Sales - Inventory Item	(\$392)	(\$1,764)	(\$2,572)	(\$3,296)	(\$3,944)	(\$11,967)
Depreciation	(\$5,503)	(\$4,505)	(\$4,505)	(\$4,505)	(\$16,091)	(\$35,108)
Freight Expense	(\$720)	(\$720)	(\$720)	(\$720)	(\$720)	(\$3,600)
Income Tax Expense	(\$2,766)	(\$7,394)	(\$10,452)	(\$13,190)	(\$15,641)	(\$49,443)
Installation supplies (RJ45, Cat5e, etc.)	(\$9,600)	(\$9,600)	(\$9,600)	(\$9,600)	(\$9,600)	(\$48,000)
Loss on Non-Repairable Equip	(\$750)	(\$750)	(\$750)	(\$750)	(\$750)	(\$3,750)
Rent or Lease	(\$90,000)	(\$90,000)	(\$90,000)	(\$90,000)	(\$90,000)	(\$450,000)
Telephone & Backhaul	(\$19,875)	(\$238,500)	(\$238,500)	(\$238,500)	(\$238,500)	(\$973,875)
Utilities: Electricity @ Buildings	(\$3,000)	(\$3,000)	(\$3,000)	(\$3,000)	(\$3,000)	(\$15,000)
Wages Expense (Labor)	(\$93,120)	(\$93,120)	(\$93,120)	(\$93,120)	(\$93,120)	(\$465,600)
Wage Expense (Benefits)	(\$27,936)	(\$27,936)	(\$27,936)	(\$27,936)	(\$27,936)	(\$139,680)
<b>Total Expenses</b>	<b>(\$493,657.77)</b>	<b>(\$507,582.00)</b>	<b>(\$517,460.83)</b>	<b>(\$526,305.83)</b>	<b>(\$534,225)</b>	<b>(\$2,579,231)</b>
<b>E.B.I.T.D.A.</b>	<b>(\$374,736.04)</b>	<b>(\$199,929.88)</b>	<b>(\$84,433.39)</b>	<b>\$18,977.11</b>	<b>\$111,564</b>	<b>(\$528,559)</b>
<b>Net Income</b>	<b>(\$383,005.11)</b>	<b>(\$211,828.22)</b>	<b>(\$99,389.67)</b>	<b>\$1,282.89</b>	<b>\$91,418</b>	<b>(\$601,522)</b>
<b>Cash Flow</b>	<b>(\$444,104.61)</b>	<b>(\$255,140.72)</b>	<b>(\$142,702.17)</b>	<b>(\$42,029.61)</b>	<b>\$48,105.43</b>	<b>(\$835,872)</b>
<b>CAP EX: CPE</b>	<b>(\$57,915.00)</b>	<b>(\$41,580.00)</b>	<b>(\$41,580.00)</b>	<b>(\$41,580.00)</b>	<b>(\$41,580.00)</b>	<b>(\$224,235)</b>
<b>CAP EX: Spares &amp; Replacements</b>	<b>(\$8,687.25)</b>	<b>(\$6,237.00)</b>	<b>(\$6,237.00)</b>	<b>(\$6,237.00)</b>	<b>(\$6,237.00)</b>	<b>(\$33,635)</b>
<b>TOTAL CAP-EX</b>	<b>(\$66,602.25)</b>	<b>(\$47,817.00)</b>	<b>(\$47,817.00)</b>	<b>(\$47,817.00)</b>	<b>(\$47,817.00)</b>	<b>(\$257,870)</b>
<b>5 Year CAP-EX (With Tower Equipment)</b>						<b>(\$507,870)</b>



## VII. Estimated CATV Construction Costs per Unit

A CATV company, for example, may refrain from expansion into areas with densities  $\leq 10$  homes per mile. In Walton County CATV plant extensions likely begin in the range of \$1,700.00 per home passed (estimated raw cost at \$16,800 per linear mile).

Subsidizing the construction costs, through a grant program, could allow a CATV operator to realize a break-even model within the initial 5 years after construction and receive marginal profits thereafter.

There are a number of factors that change the CATV ROI model, some of which are shared factors used in the FTTH model or even the DSL model; expressed in the chart below, based on an average of costs reviewed for CATV expansion projects in Florida, Iowa, Kentucky, Minnesota, Ohio, Pennsylvania, and Tennessee.

Unit Type	Unit Description	Estimated Cost
FT	New Build Aerial, Coaxial Plant	\$1.30
FT	Overlay Aerial, Coaxial Plant	\$1.20
FT	Additional Aerial Cable, Coaxial Plant	\$0.25
FT	Overlash Cable	\$0.60
FT	Delash Cable	\$0.40
EA	Remove Anchor	\$36.50
EA	Install Anchor	\$73.00
EA	Install Riser	\$60.00
EA	Make Ready Rearrangement	\$72.00
FT	Plow/Trench, Coaxial Plant Composite	\$5.75
FT	Ped Placement and Splicing only, Coaxial Plant Composite	\$0.75
FT	Directional Bore, 2"	\$10.00
FT	Directional Bore, 4"	\$13.00
EA	Ped, Tap/Line Extender	\$25.00
EA	Aerial/Pole Mount	\$575.00
EA	Coaxial Cable Splicing – Line Extender or Power Supply	\$140.00
EA	Coaxial Cable Splicing - Passives	\$48.50
EA	Coaxial Cable Splicing Setup Fee	\$142.00
EA	Misc Materials	\$1.00



## VIII. Adoption Recommendations

### Promote Low-Cost Broadband Service Offerings for Vulnerable Populations

**GOAL:** Overcome the barrier to broadband adoption related to cost.

**DESCRIPTION:** Currently, several national and a few local providers offer special low-cost services for vulnerable populations, older adults and low-income families with children.

Furthermore, the Federal Communications Commission (FCC) is expanding its Lifeline program to allow Lifeline monthly subsidy to be applied to purchases of broadband service (as of December 2, 2016).

Administered by the FCC, the Lifeline program provides a \$9.25 per month subsidy for the purchase of voice telephone service, including mobile, and broadband (as of December 2, 2016) by low-income households. This move would make low-cost service a reality for Lifeline participants.

**ACTIONS:**

1. Research low-cost offering in the community. Visit <http://everyoneon.org/> to find local low-cost, high-speed internet offers by ZIP code or contact local providers listed in this plan to determine their offerings.
2. Schedule community meetings (or summits) to discuss the opportunity to serve non-adopters who are experiencing a cost barrier to adoption.
3. Advertise low-cost offerings via government and other community organizations websites via the digital equity initiative.

**RESPONSIBLE PARTIES:**

- Non-profit organizations
- Libraries and schools
- Parent-Teacher Organizations
- Broadband providers with low-cost programs
- Senior centers
- Social service providers
- Local and County government

**RESOURCES:**

- Use the FCC's Cost Comparability tool to check the reasonability of local broadband prices: <https://www.fcc.gov/general/reasonable-comparability-benchmark-calculator>.
- Universal Service Administrative Company: <https://www.usac.org/li/default.aspx>.
- Lifeline Program for Low-Income Consumers: <https://www.fcc.gov/general/lifeline-program-low-income-consumers>.
- Carrier-based programs Include:
  - o Access from AT&T: <https://www.att.com/shop/Internet/access/#/>
  - o Spectrum Internet Assist (Charter): <https://www.spectrum.com/browse/content/spectrum-Internet-assist>
  - o Comcast Internet Essentials: <https://www.Internetessentials.com/>

**BENEFITS:**

1. Availability of low-cost services will help vulnerable populations overcome the cost barrier to accessing the internet.



## Launch a Digital Equity Initiative

**GOAL:** This initiative provides a foundation for overcoming the barriers to broadband adoption via outreach, awareness; access to affordable broadband services and devices and digital skills training.

**DESCRIPTION:** This initiative will help to sustain in-depth discussions around the adoption issue in the community by bringing together public-private partners.

With the data gathered through this technology planning process, leaders will be able to focus on specific studies and solutions that will have the most positive impact on the community.

There are several tasks the digital equity initiative can undertake depending on the needs identified in the community. Each task has its own implementation profile, but include: developing a community-based technology awareness program, promoting low-cost broadband service offerings; facilitating digital literacy training; making available low-cost devices; and identifying and expanding wireless hotspots in the community.

### **ACTIONS:**

1. Create a digital inclusion taskforce composed of public and private stakeholders. The digital equality initiative will seek programming that address the Digital Divide for groups without an internet connection at home.
2. The taskforce will use this plan to create a vision for advancing broadband adoption and assign responsibilities.
3. The taskforce will oversee the implementation of projects that will advance the adoption of broadband technologies for all residents.
4. After implementation the taskforce will show results and shift plans in accordance with technology changes.
5. Economic development, new jobs, and an improved quality of life will be achieved when a community experiences increased usage of computers and the internet; improved basic computer skills, increased use of technology in day-to-day operations of a community, and increased access to economic opportunities.

### **RESPONSIBLE PARTIES:**

- Non-profit organizations focused on technology
- Libraries and schools
- Public computer centers
- Local governments
- Private sector
- Broadband providers
- Local financial institutions and foundations

### **RESOURCES:**

- Partners Bridging the Digital Divide helps communities establish robust digital inclusion programs: <http://pbdd.org/>.
- Department of Commerce guide to broadband adoption programming: <http://bit.ly/2dfr77p>.

### **BENEFITS:**

1. Leverages community resources to create opportunities for the advancement of those being left behind in the digital age.
2. Unifies vision of community stakeholders.
3. Highlights successes, opportunities, and challenges regarding community technology planning.
4. Promotes an ongoing dialogue around improving broadband access, adoption, and use.





## Economic Prosperity - Host Website and Social Media Classes for Local Businesses

**GOAL:** Encourage small local businesses to develop websites and to use social media, e-commerce, and other advanced uses of broadband and technology.

**DESCRIPTION:** For small businesses, an online presence and the use of social media are vital to stay competitive in the twenty-first century. A website and social media are not just for companies that have the experience, staff, or budget; any small business can tap into these resources. Training should be provided to small businesses regarding the use of websites and social media within that small business. Website topics should range from starting a basic website to more advanced topics such as e-commerce. Social media topics should include a variety of social media outlets including Facebook, Twitter, YouTube, Pinterest, and LinkedIn.

Broadband empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connected Nation's 2012 Jobs and Broadband Report, businesses that are using the internet bring in approximately \$300,000 more in median annual revenues than those unconnected.

### **ACTIONS:**

1. Work with the local chamber of commerce and/or the libraries to expand on existing programs that promote e-commerce, such as free websites and social media development, within the small businesses of the community including those involved in agriculture.
2. Partner with providers to sponsor workshops (providers may be willing to sponsor events since small business workshops will likely lead to increases broadband adoption and use).
3. Identify regional and community partners with resources and expertise to assist the community in producing "free" website and social media workshops.
4. Schedule workshops and advertise classes via local media.

### **RESPONSIBLE PARTIES:**

- Chamber of commerce/economic development organization
- Libraries
- Community College
- Broadband providers
- IT/Technology organizations
- Local SCORE representatives

### **RESOURCES:**

- The Creative Collection <http://www.thecreativecollective.com.au/social-media-training-course>
- On-Site Technology Training for Small, Rural Michigan Businesses: <http://reicenter.org/projects/completed-projects/digital/on-site-technology-training-for-small-rural-michigan-businesses-2012>
- Importance of Tech for Small Businesses: <http://brightside.cedam.info/episodes/episode-11/>
- Revenue Trends for Small Businesses: [http://connectmycommunity.org/wp-content/uploads/2016/11/Small\\_Business\\_Infographic-FINAL.pdf](http://connectmycommunity.org/wp-content/uploads/2016/11/Small_Business_Infographic-FINAL.pdf)
- Google Helps Businesses Get Online with Free Resources: <http://connectmycommunity.org/project-view/google-helps-businesses-get-online-with-free-resources/>
- Boosting Business with an Online Presence: <http://connectmycommunity.org/project-view/boosting-business-with-an-online-presence/>
- Building E-Commerce in Wright County, IA: <http://connectmycommunity.org/project-view/building-e-commerce-in-wright-county-iowa/>
- Harbor Springs, MI Goes Social: <http://connectmycommunity.org/project-view/harbor-springs-michigan-goes-social/>
- Resources for Small Business e-Commerce Development: [http://srdc.msstate.edu/ebeat/small\\_business.html#](http://srdc.msstate.edu/ebeat/small_business.html#)



**BENEFITS:**

1. Provides entrepreneurial support.
2. Eliminates knowledge gap.
3. Promotes business growth and workforce development.
4. Lowers start-up costs.
5. Assists in accelerating business development.



## IX. Broadband Maps

FCC Form 477 Broadband Service Inventory

CN Validated Broadband Service Inventory

Broadband Service Comparison to FCC Form 477

Density of Households Unserved by Census Block

Broadband Service Inventory – Infrastructure Composite

Residential Broadband Survey – Internet Subscribers

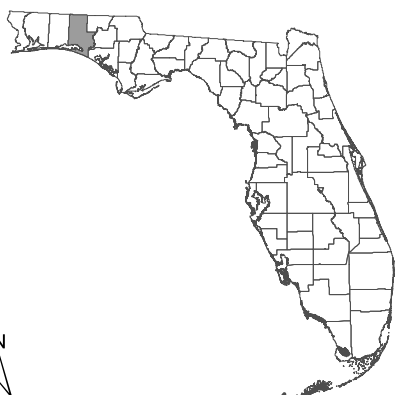
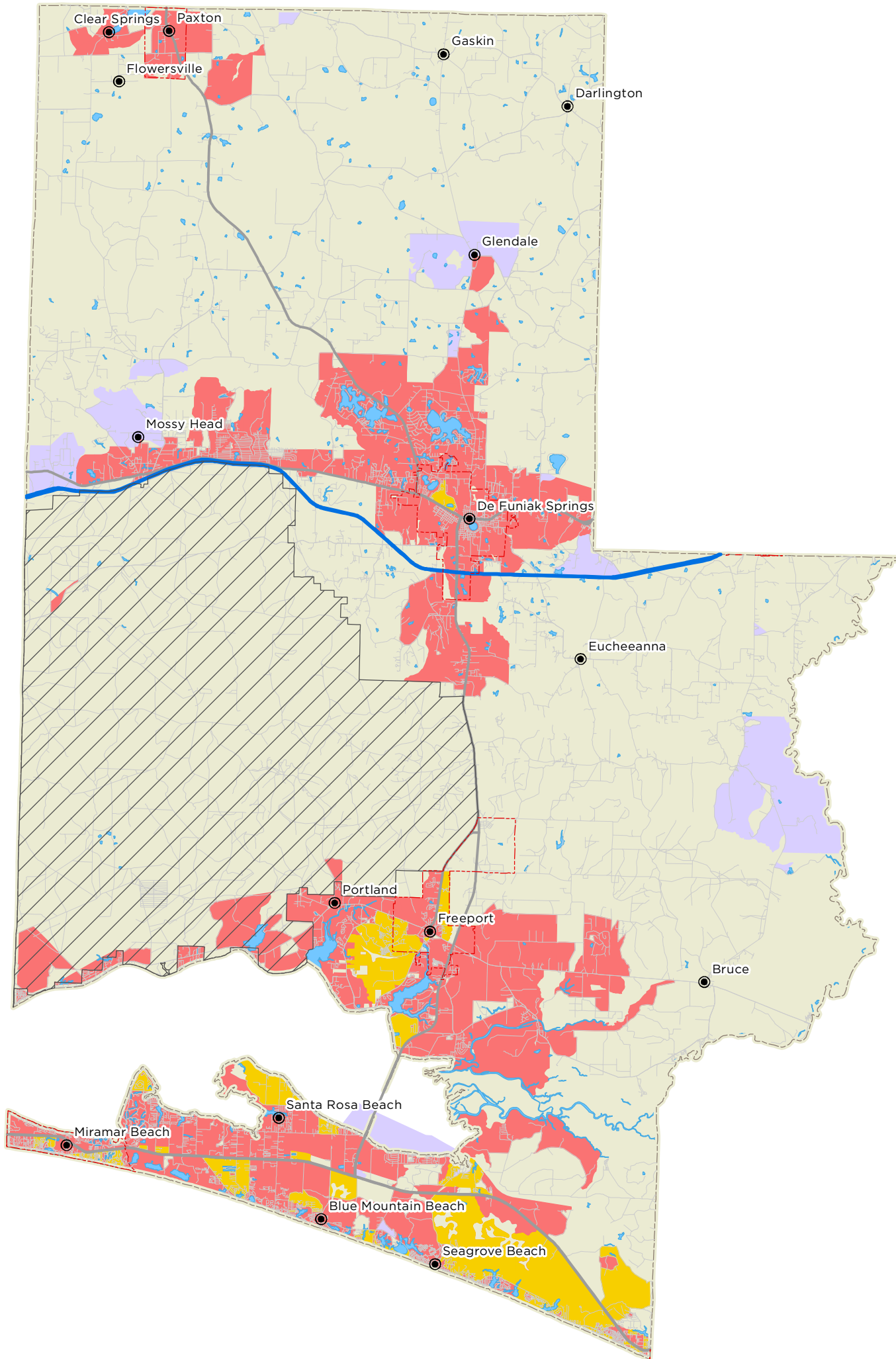
Residential Broadband Survey – Download Speed

Residential Broadband Survey – Internet Price

Broadband Service  
Inventory  
FCC Form 477  
25 Mbps Download/  
3 Mbps Upload

Walton County  
Florida

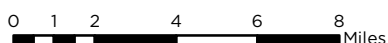
Published May 8, 2018



Symbology

In areas where multiple broadband providers offer service, this platform composite map stacks coverage display layers in the order presented below.

- City
- Interstate
- US Road
- Local Road
- - - Municipal Boundary
- Water
- Eglin AFB
- Fiber Broadband
- Cable Broadband
- DSL Broadband
- Fixed Wireless Broadband (N/A)
- Unserviced Areas



Data Source: FCC Form 477  
Broadband Deployment Data  
as of December 31, 2016,  
released November 16, 2017.

Mobile and satellite  
broadband services may also be available.

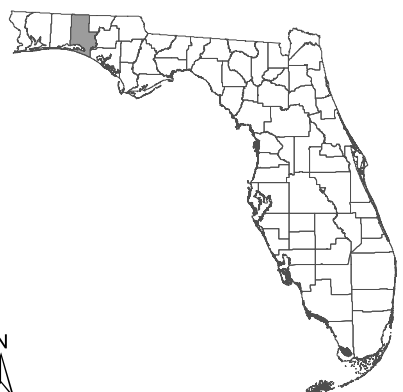
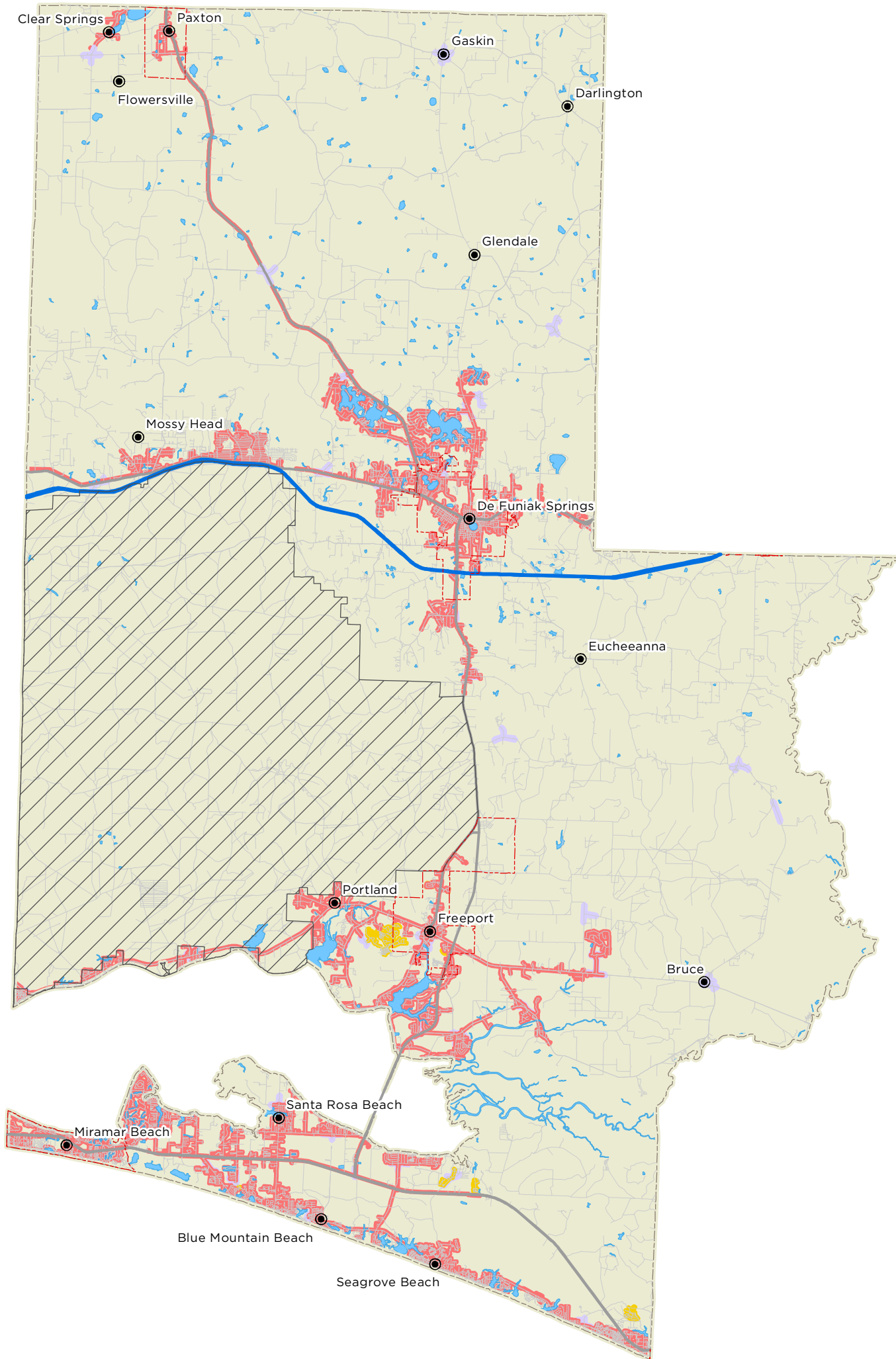
# Broadband Service Inventory

## Walton County

### Florida

Published May 8, 2018

25 Mbps Download/  
3 Mbps Upload

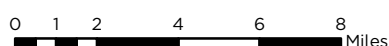


#### Symbology

- City
- Interstate
- US Road
- Local Road
- ▭ Municipal Boundary
- Water
- ⊕ Eglin AFB
- Broadband Service
- FTTH Service
- DSL Service
- Cable Service
- Unserved Areas

In areas where multiple broadband providers offer service, this composite technology map stacks coverage display layers in the order presented at left.

Data Source: On the ground field data collection and online resources.

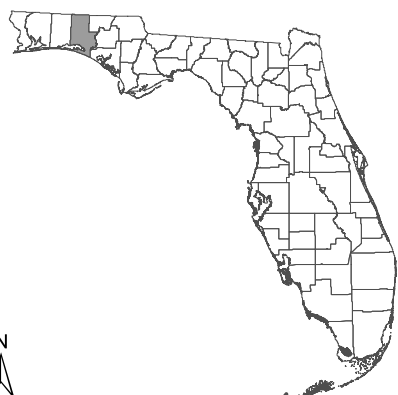
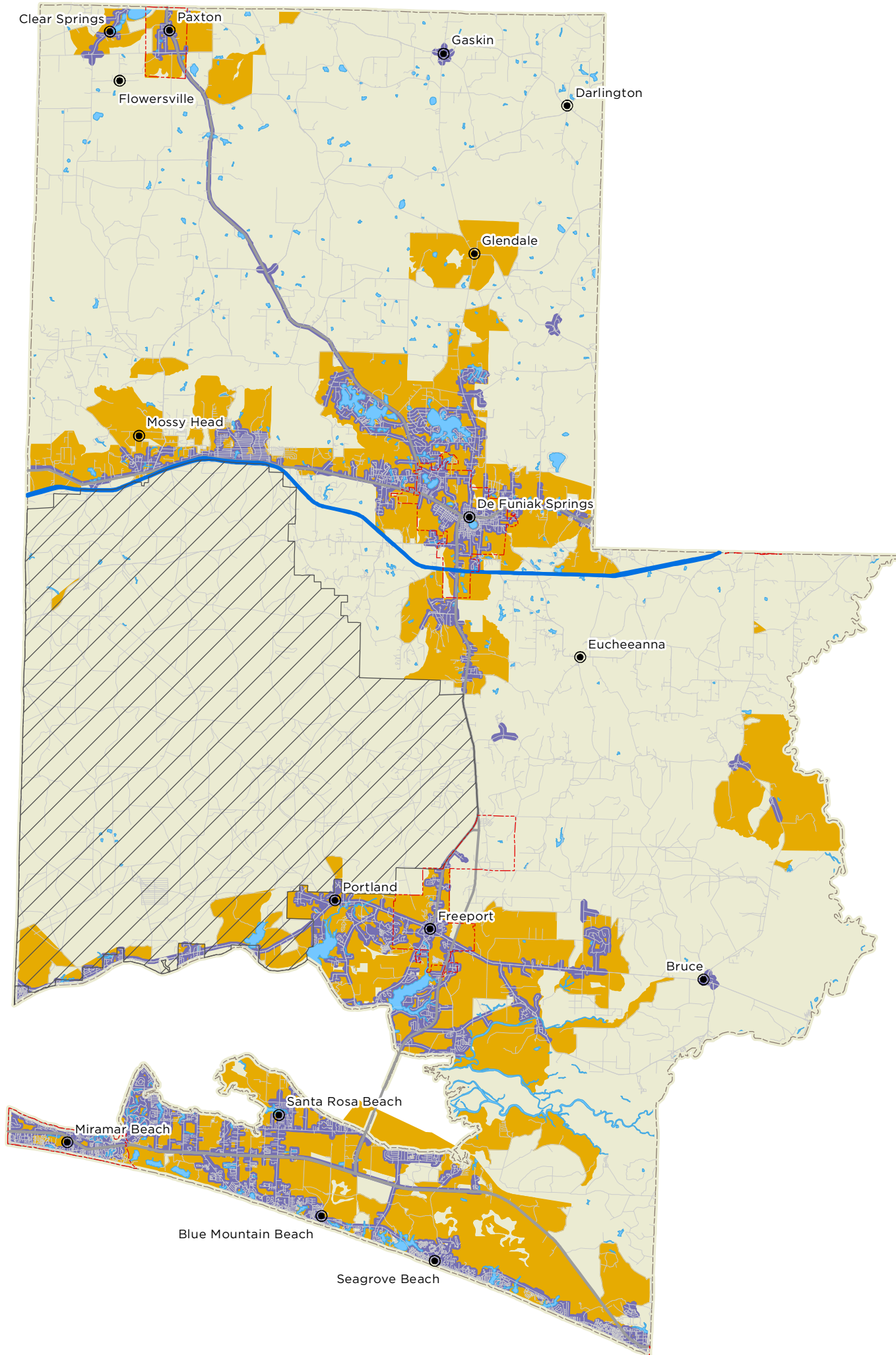




Broadband Service  
Comparison to  
FCC Form 477  
25 Mbps Download/  
3 Mbps Upload

Walton County  
Florida

Published May 8, 2018

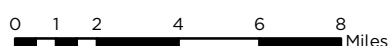


Symbology

- City
- Interstate
- US Road
- Local Road
- ⬡ Municipal Boundary
- ☁ Water
- ⊕ Eglin AFB
- CN Validated Broadband
- FCC Form 477 Broadband
- Unserved Areas

CN Data Source: On the ground field data collection and online resources.

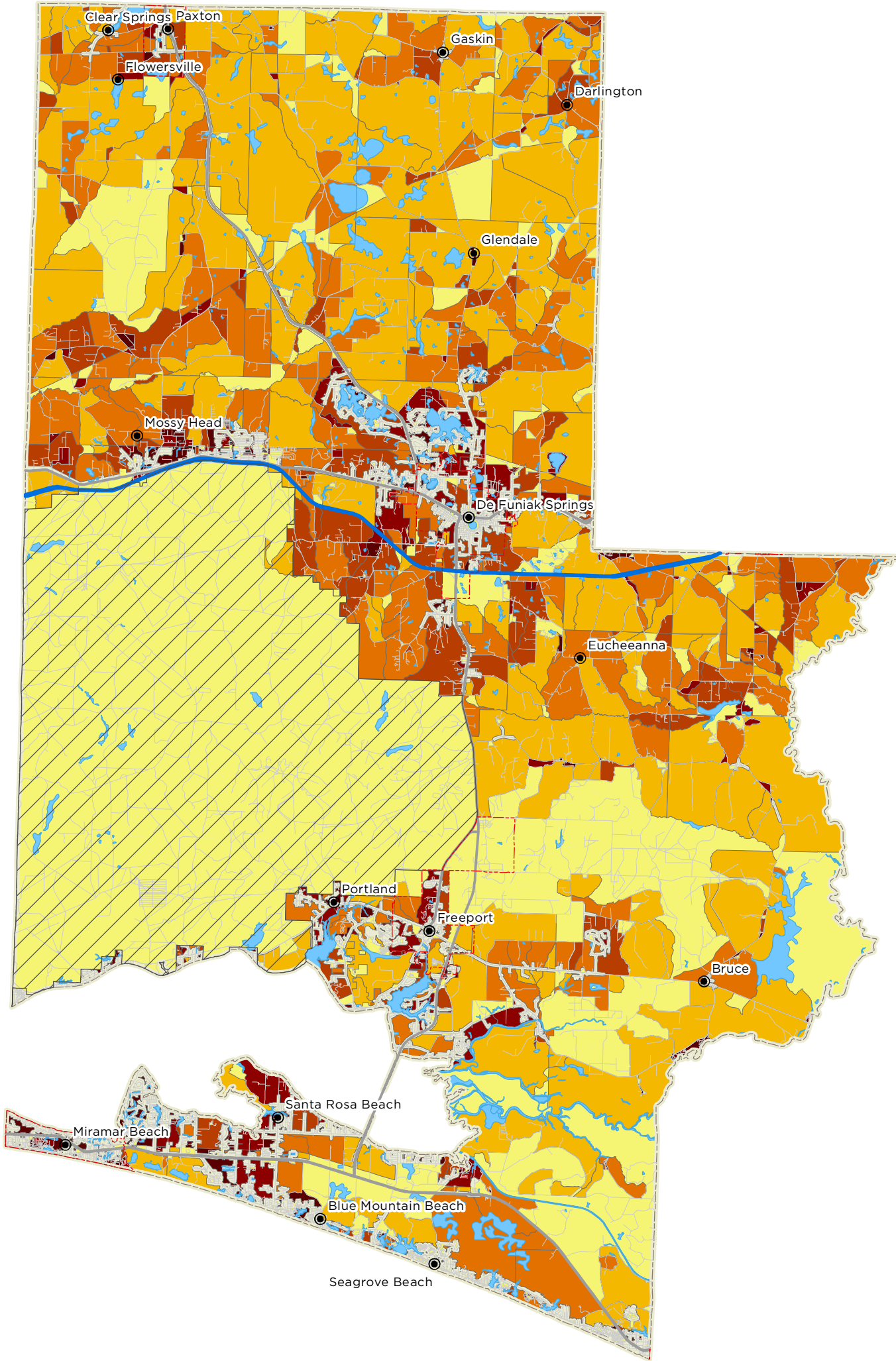
FCC Data Source: FCC Form 477 Broadband Deployment Data as of December 31, 2016, released November 16, 2017.



Density of Households  
Unserviced by Broadband  
by Census Block  
25 Mbps Download/  
3 Mbps Upload

Walton County  
Florida

Published May 8, 2018

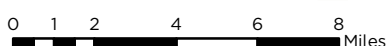


Symbology

- City
  - Interstate
  - US Road
  - Local Road
  - Municipal Boundary
  - Water
  - ⊕ Eglin AFB
- Number of Households per Square Mile, per Census Block\*
- 85.5+
  - 40.50 - 85.49
  - 20.50 - 40.49
  - 8.50 - 20.49
  - 0.06 - 8.49
  - Unpopulated Census Blocks
  - Fixed Broadband Available

Data Source: On the ground field data collection and online resources.

\*Census blocks with zero households not included.



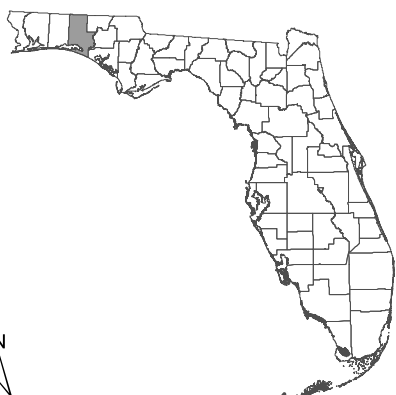


# Broadband Service Inventory

## Infrastructure Composite

# Walton County Florida

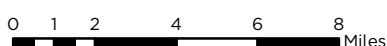
Published May 8, 2018



### Symbology

- City
- Interstate
- US Road
- Local Road
- ⬡ Municipal Boundary
- Water
- ⬡ Eglin AFB
- Fiber Route
- ⬡ Unserved Areas

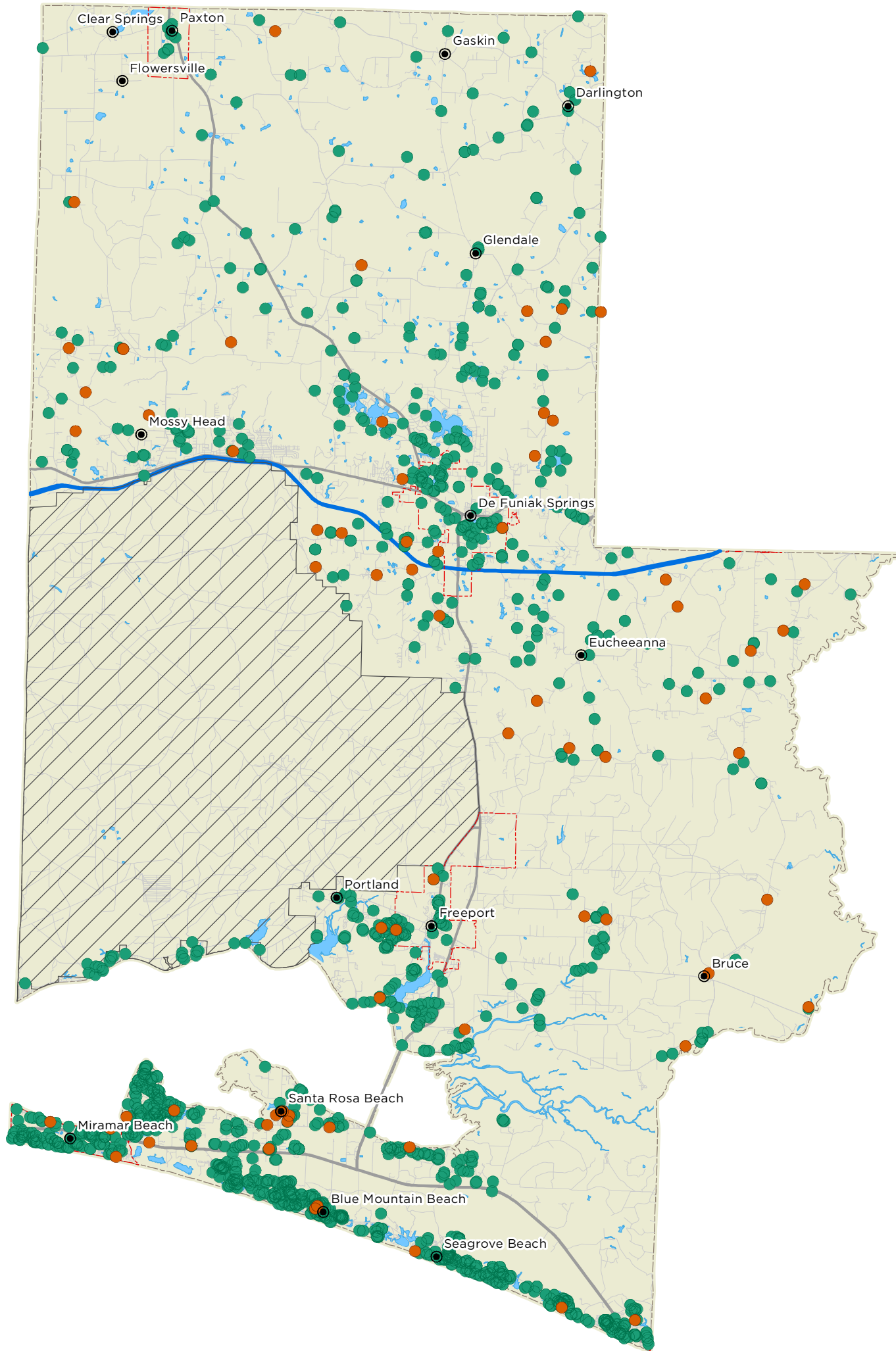
Data Source: On the ground field data collection and online resources.



Residential  
Broadband Survey  
Internet Subscribers

Walton County  
Florida

Published May 8, 2018

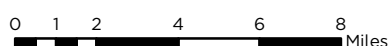


Symbology

- City
- Interstate
- US Road
- Local Road
- ⬡ Municipal Boundary
- Subscribe to Internet?\*
- Yes
- No
- Water
- Eglin AFB

Data Source: 2018 Walton County Residential Broadband Survey.

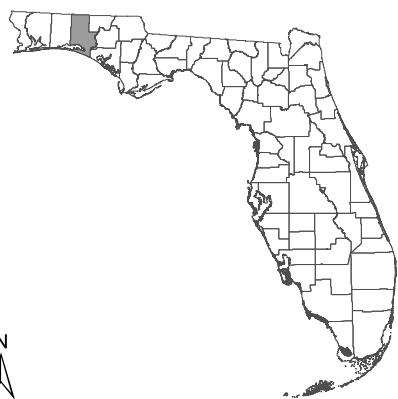
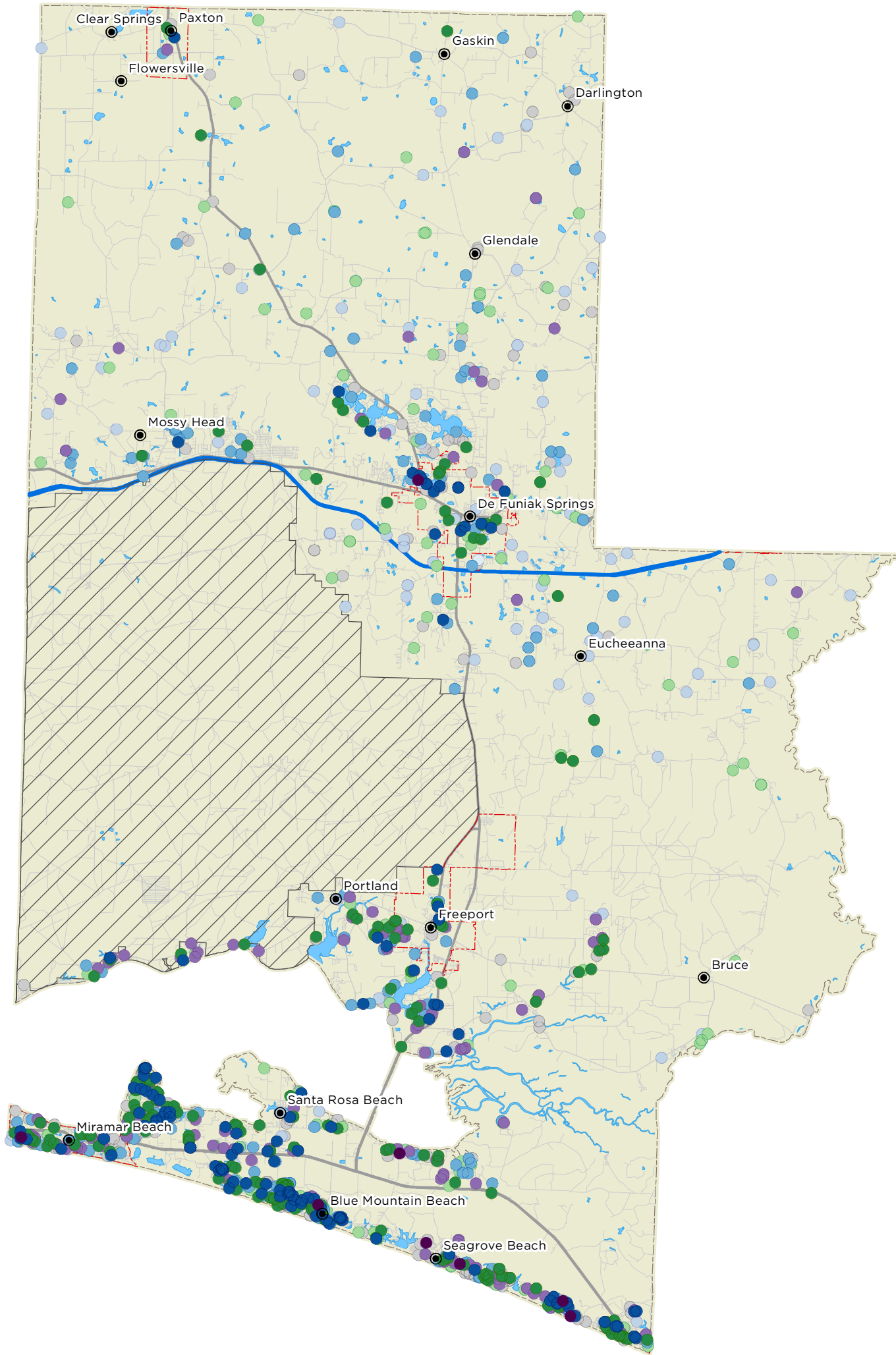
\*All internet services and speeds, including dial-up.



Residential  
Broadband Survey  
Download Speed

Walton County  
Florida

Published May 8, 2018



Symbology

- City
- Interstate
- US Road
- Local Road
- ▭ Municipal Boundary
- Water
- ✈ Eglin AFB

Subscribed Speed Tier

- 500 Mbps or Faster
- 100 Mbps to 499.99 Mbps
- 50 Mbps to 99.99 Mbps
- 25 Mbps to 49.99 Mbps
- 10 Mbps to 24.99 Mbps
- 3 Mbps to 9.99 Mbps
- Less than 3 Mbps
- Dial-up
- Unsure

Data Source: 2018 Walton County Residential Broadband Survey.

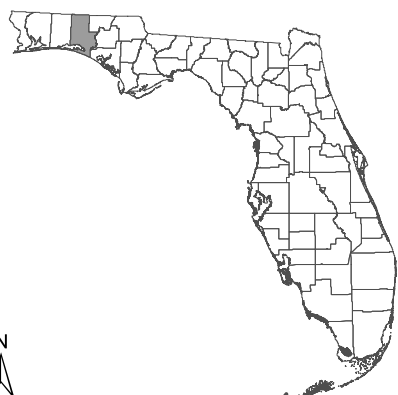
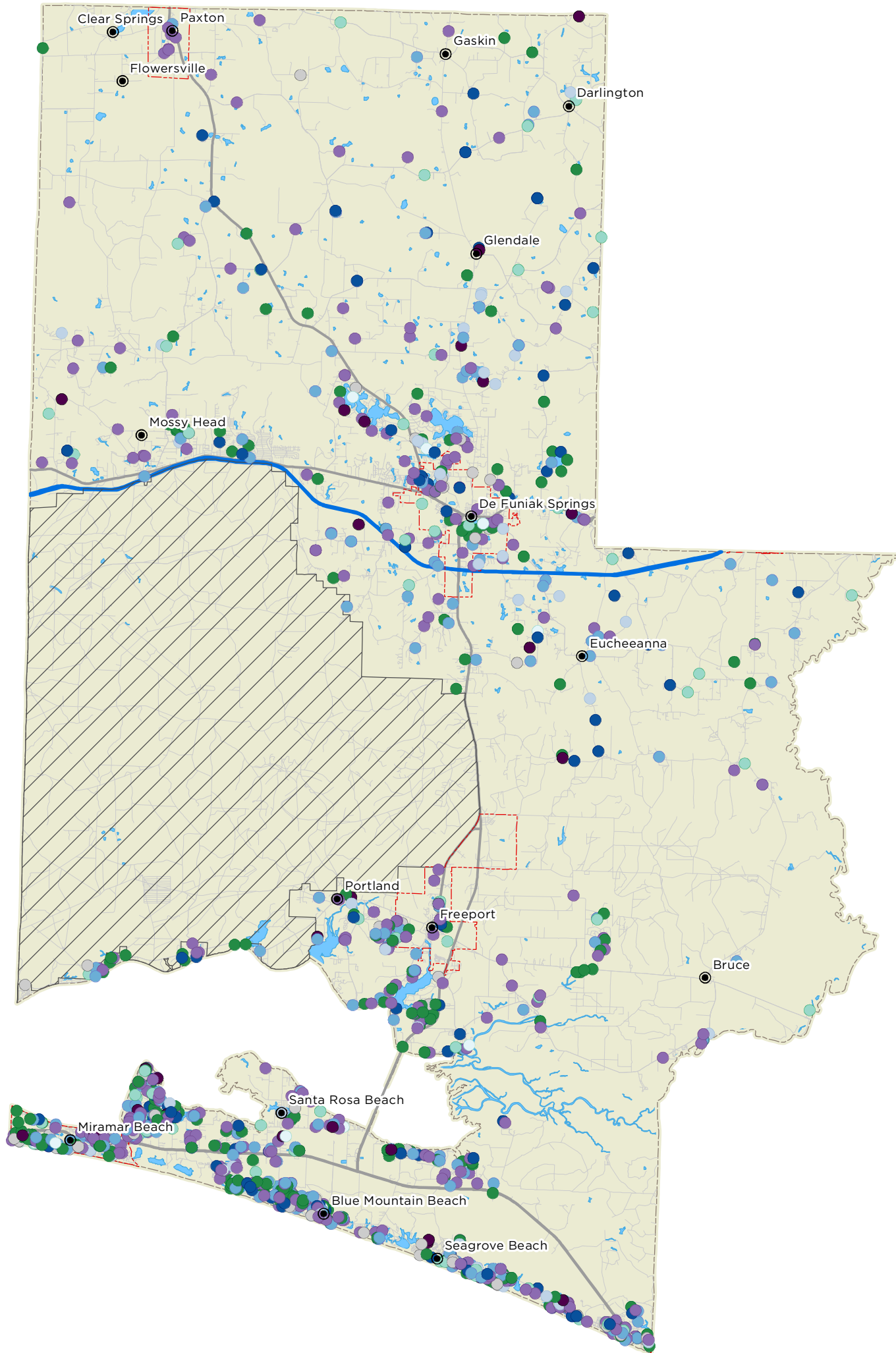
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Residential  
Broadband Survey  
Internet Price

Walton County  
Florida  
Published May 8, 2018



Symbology

- City
- Interstate
- US Road
- Local Road
- - - Municipal Boundary
- Water
- Eglin AFB

Internet Price

- \$150 or more per month
- \$100 to \$149.99 per month
- \$75 to \$99.99 per month
- \$50 to \$74.99 per month
- \$35 to \$49.99 per month
- \$25 to \$34.99 per month
- \$15 to \$24.99 per month
- Less than \$15 per month
- Unsure

Data Source: 2018 Walton County Residential Broadband Survey.

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