North Florida Rural Area of Critical Economic Concern (RACEC) Broadband Feasibility Study

Prepared for:

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Executive Summary

In 2009, the North Florida Economic Development Partnership (NFEDP) commissioned a feasibility study to determine the viability of expanding broadband services in the North Central Florida Rural Area of Critical Economic Concern (RACEC) and to determine, if broadband expansion was concluded to be a viable exercise, the best network design and funding strategy to do so.

In the course of this study it was determined that the best option for the North Central Florida RACEC was a wireless open-access Middle Mile network. The design of such a network is provided in this study, and as designed this network is politically and technically feasible, and is financially feasible provided external funding can be secured as an initial investment.

THE PARTNERS

The North Central Florida RACEC encompasses the following 14 counties:

- Baker
- Bradford
- Columbia
- Dixie
- Gilchrist
- Hamilton
- Jefferson
- Lafayette
- Levy
- Madison
- Putnam
- Suwannee
- Taylor
- Union

The North Florida RACEC was so designated because of a number of socio-economic factors. Some of these include demographics, depressed economic activity and financial metrics, educational achievement and the challenges faced in creating job growth, attracting new businesses and enhancing the economic opportunities in the region.

The North Florida Economic Development Partnership (NFEDP) is a public-private partnership formed to facilitate economic initiatives and activities specifically in the 14-county North Central Florida RACEC region. Members of this partnership include local economic developers, county and municipal elected officials, regional workforce development boards, regional planning councils and private businesses.

During this feasibility study, an opportunity to pursue federal American Recovery and Reinvestment Act (ARRA) funding to support the expansion of broadband infrastructure throughout the RACEC region presented itself. A new regional entity was created and established to apply for the grant and meet the BTOP federal grant application criteria. Based on home rule statute, the North Florida Broadband Authority (NFBA) was created on August 7, 2009 for the purpose of applying for federal grant funding to implement, maintain and sustain a broadband network within the North Central Florida RACEC. The NFBA board of directors is comprised of the various governing bodies within the region who will work together to ensure design, creation and maintenance of a shared broadband network.

THE CASE FOR WIRELESS BROADBAND IN THE NORTH CENTRAL FLORIDA RACEC

As recognized by Congress and the Federal Communications Commission, broadband networks are a vital component of the nation's infrastructure. Broadband networks provide a fundamental platform upon which the nation's economy, educational system and critical government services rely. It has now become the central nervous system - the primary communications and information exchange - in American society.

As is shown in this study, the fastest, most cost-effective means of delivering the needed broadband capacity across the 9,137 square miles of the North Central Florida RACEC is through an independent, open-access and flexible Middle Mile network. A Middle Mile network is the interim transport between the First Mile (the Internet backbone of ultra-high-capacity fiber optic networks that link major metropolitan areas around the country and around the world) and Last Mile providers (those who carry services directly to customers).

Currently, the North Central Florida RACEC has access to the major Internet backbone that runs through the state of Florida, along Interstates 10 and 75, including access to Last Mile providers that provide services to businesses, public institutions and residences in the areas. However, the North Central Florida RACEC lacks connecting infrastructure.

The NFBA network as described in this study is an independent and open pipeline to Last Mile providers and anchor institutions such as schools, libraries and government offices. Such a design proposes to meet the needs of the North Central Florida RACEC and has the following characteristics:

Open Access: ability to deliver at least 100 Mbps capacity to any Last Mile provider/anchor tenant on an equal basis

Capacity: cost-effectively deliver at least 100 Mbps to each Last Mile provider; at least 10 Mbps to each anchor client, maximum 80ms of network latency

Reliability: provide comparable reliability at or above industry standards

Architecture: redundant service through ring and consecutive point architecture where practicable; must have multiple backbone connection points

Secure: provide security sufficient for anchor institutions, government agencies and businesses

Flexibility: network must be able to adapt to changing conditions such as increased customer capacity needs, changing demographics, usage patterns, network connection density and location of key customers

Scalability: secure the region against the inevitable rise in demand for speed/capacity, bandwidth intensive applications

Cost-effective: appropriate for serving the region

Sustainable: a sustainable business model

Proven: utilization of technologies with successful track record

Full Coverage of the Region: reach Last Mile providers and anchor tenants that serve customers throughout the entire 9,137 square-mile region

WHY OUTSIDE FUNDING IS CRITICAL

Obtaining federal ARRA funding was deemed critical by the NFEDP for two reasons. First, to be designated a RACEC, this area had to demonstrate that certain socio-economic, economic development and quality of life conditions existed and that these conditions were of critical concern to the future well-being of the residents within the region and the state as a whole. These conditions include:

- High unemployment and underemployment
- Low per capita income
- Low wages compared to more urban areas and the state average
- Higher percentages of families living below the poverty level and receiving public assistance
- Lower housing values compared to the state average
- Lower volume, diversity, and access to higher wage and higher quality business, industry jobs and economic development
- Highest percentage of underperforming public schools, including two of the three lowest graded districts in the state
- Largest ratio of eligible families for free and reduced lunch program services in the state

In addition to designation as a RACEC, the counties within this region are also designated as "fiscally constrained counties" pursuant to section 218.67, Florida Statutes. This means that these counties lack the revenue generating ability of larger, more populous areas. Each fiscally constrained county is entitled to additional state revenue shared funds and priority for other state appropriations to help fund government operations and essential services in these economically challenged areas. The fiscally constrained designation of these communities demonstrates the financial limitations of each of the member governments. These governments have severely limited funds available to provide essential public services such as fire protection, emergency medical services, solid waste collection/disposal and transportation improvements. As a result, these governments would have to reduce funding for essential public services and facilities in order to create needed broadband infrastructure themselves. As this is not a realistic option, it was evident early in the study that there are no state or local resources to underwrite the cost of implementing.

Secondly, federal funding is critical because no incentive for private investment exists. With low population density in the region, translating into fewer people and businesses to serve, the opportunity for existing providers to recover increased investment in capacity and infrastructure is limited. This limits geographic coverage and supply of service providers.

The type of infrastructure that delivers high quality telephone service, which is predominant in the region, is not as efficient and is more costly for providing the high data rate demands of today's Internet applications and uses. Telephone conversations require small data capacity and dedicated connections, while Internet usage is most efficiently served by very large data capacity pipes that do not require dedicated, end-to-end connections. The result is that expansion of telephone infrastructure to meet Internet demands is a more expensive and less efficient proposition.

Also, the underlying economic challenges facing the region make broadband service unaffordable. In larger metropolitan areas, where broadband capacity is plentiful and service providers have a larger customer base, high-speed broadband is readily available and at significantly lower cost per Mbps. Seven of the fourteen counties in the RACEC have the most expensive connectivity in the state primarily because of the lack of incentive for private carriers to develop Middle Mile networks. For these reasons, the NFEDP made application for federal ARRA funding through the stimulus programs of critical importance.

FEASIBILITY

Before the NFBA could proceed with application for federal stimulus funding, the feasibility of creating a Middle Mile network was examined. The following factors were considered and analyzed:

Political Feasibility, Regional and Community Support In this context, as a wholesale provider, with a charter to connect all customers without discrimination, the single-purpose government entity created to pursue the federal broadband grant funding (the NFBA) is a most appropriate form of governance. Each county within the RACEC membership retains a seat on the NFBA board of directors, ensuring that all voices will be heard and that decisions will support policies to be rendered on regional priorities.

The demonstration of support in the creation process of the North Florida Broadband Authority was tremendous. A total of 22 local governments reached agreement within a span of a few weeks; commitment and enthusiasm from the region's residents, businesses and public agencies with the ability to leverage the power of abundant broadband capacity was abundant. Support for this pursuit was near unanimous, and the demonstration of political feasibility could not have been clearer.

Financial Feasibility, Validity of Assumptions, Operationally Sustainable Contingent upon outside federal funding, the projected financial statements indicate that by the second year, the NFBA will become cash flow positive. By the fifth year, the NFBA is expected to be profitable and scaling efficiently, with enough positive cash flow to support a replacement program.

Considering the leverage that may be provided through federal grant funding creates a uniquely strong operating position. Without grant funding, there would be little hope for an undertaking like this in such a sparsely populated area. Provided the grant is awarded and all identified capital costs are deemed to be eligible, this is a strong and viable enterprise. Even allowing substantial room for varying subscription rates, proposed fees are well below what is currently available (where it is available), and this must be considered a sustainable business model.

Technology Selection, Architecture and Performance Feasibility The suggested technology is proven reliable, and the design of the network has been certified by a network engineer. The technology is appropriate to the region for meeting immediate needs and is suitably flexible and mobile to accommodate future needs. The design is also cost-effective, a must for this economically depressed region. The network architecture is open and efficient, allowing for a range of Last Mile providers to purchase services. The proposed network also meets or exceeds the following minimum federal standards:

- The network will provide linkable coverage to the entire 9,137 square mile region.
- A minimum available bandwidth of 100 Mbps will be available at every customer connection point (customers may select smaller increments of 10Mbps) and up to 1Gbps per link.
- Multiple backbone points of connection will ensure redundant network access to the Internet. Ring and consecutive point architecture will allow increased density and path diversity.
- Carrier-grade services will be available throughout the network. Industry standards for availability and mean time to repair (MTTR) will be maintained.
- Direct Internet Access and transport will be available to anchor tenants and Last Mile providers.
- The network is scalable to meet increasing demand and enables a sustainable business model.
- The network is flexible in both design and growth, allowing customer needs to be met wherever they exist, not just where the point of connection happens to be.
- Costs to connect and for high-speed capacity are a fraction of today's costs and facilitate the business models of Last Mile providers.

Introduction

In 2003, former Governor Jeb Bush created the third and largest of Florida's three Rural Areas of Critical Economic Concern (RACEC). The North Central Florida RACEC (designation recertified in 2008) encompasses 14 counties:

- Baker
- Bradford
- Columbia
- Dixie
- Gilchrist
- Hamilton
- Jefferson
- Lafayette
- Levy
- Madison
- Putnam
- Suwannee
- Taylor
- Union

The North Florida RACEC was so designated because of a number of socio-economic factors; some of these include demographics, depressed economic activity and financial metrics, educational achievement and the challenges faced in creating job growth, attracting new businesses and enhancing the economic opportunities in the region.

The North Florida Economic Development Partnership (NFEDP) is a public-private partnership formed to facilitate economic initiatives and activities specifically in the 14-county North Central Florida RACEC region. Members of this partnership include local economic developers, county and municipal elected officials, regional workforce development boards, regional planning councils and private businesses.

The NFEDP has identified limited access to broadband services as one of the fundamental factors that continues to trump the success of many of the positive attributes of the region that could otherwise attract new businesses to the region, including quality of life, low cost of living, educational institution partnerships and proximity to transportation corridors. Economic development efforts within the State of Florida emphasize the degree of access to information and virtual markets, describing broadband connectivity similar to an essential utility. It has become very difficult for an individual or entity to participate in mainstream economic or social activity without access to broadband connectivity.

The NFEDP, in an effort to identify ways to increase economic activity, create jobs and attract more businesses to the region, has commissioned this study to determine the technical, political and financial feasibility of creating a new broadband network to extend the reach of the high-capacity Internet backbone throughout the 14-county region. This study will assess the current needs of the region, including the region's demographic profile, existing broadband infrastructure and critical needs and barriers to progress. Additionally, the study will discuss the prospective benefits to greater broadband availability in the region, the proposed solution(s) and, finally, develop a business case that will assist in the determination of the financial feasibility and long-term sustainability of the proposed solution.

During this feasibility study, an opportunity to pursue federal American Recovery and Reinvestment Act (ARRA) funding to support the expansion of broadband infrastructure throughout the RACEC region presented itself. A new regional entity was created and established to apply for the grant and meet the BTOP federal grant application criteria. Based on home rule statute, the North Florida Broadband Authority (NFBA) was created on August 7, 2009 for the purpose of applying for federal grant funding to implement, maintain and sustain a broadband network within the North Central Florida RACEC. The NFBA board of directors is comprised of the various governing bodies within the region who will work together to ensure design, creation and maintenance of a shared broadband network.

Funding was awarded to the NFBA on February 18, 2010, prior to submission of this feasibility report. However, it was clear early in the course of this study that expanded broadband access in the RACEC region was technically feasible, and the process through which the NFBA was established showed that it was politically desired uniformly in each of the 14 RACEC counties. Thus, the focus of this feasibility study narrowed to look at the viability of one solution in particular, the expanded "Middle Mile" infrastructure proposed in the grant, to ensure that such a solution was the most viable one in terms of financial sustainability.

Feasibility Study Methodology

METHODOLOGY AND ANALYSIS

The North Florida Economic Development Partnership directed commissioning of this study to determine the feasibility of developing a new broadband access network that would extend the reach and quality of services available throughout the 14-county region. The NFEDP undertook a nationwide search to identify the leading technology, governance and business expertise to determine whether a broadband network - contingent upon federal funding - could deliver the much needed access and capacity, meet the needs of the region and operate indefinitely as a sustainable business model. The following report will provide evidence to support the analysis of the fundamental questions of need, technological capability and financial sustainability of a new broadband access network.

Meeting federal funding criteria was a factor in this feasibility study. An initial step in the study was to determine how the North Central Florida RACEC would be categorized before collecting and analyzing data and information.

The federal government has classified geographic areas with similar characteristics with regard to broadband services in order to prioritize the use of funds for broadband. The categories are remote, rural, underserved and unserved. The characteristics defining each category are reflective of the degree to which the barriers to growth and investment have been greatest.

According to these definitions,[1] the North Central Florida RACEC is a predominantly rural area. In order to determine the areas of need for broadband infrastructure and adoption, a five-step process was used to

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[1] Federal definitions are as follows:

Remote area: An unserved, rural area 50 miles from the limits of a non-rural area.

Rural area: Any area, as confirmed by the latest decennial census of the Bureau of the Census, which is not located within: 1) a city, town, or incorporated area that has a population of greater than 20,000 inhabitants; or 2) an urbanized area contiguous and adjacent to a city or town that has a population of greater than 50,000 inhabitants. For purposes of the definition of rural area, an urbanized area means a densely populated territory as defined in the latest decennial census of the U.S. Census Bureau.

Underserved area: A proposed funded service area composed of one or more contiguous census blocks meeting certain criteria that measure the availability of broadband service and the level of advertised broadband speeds. These criteria conform to the two distinct components of the Broadband Infrastructure category of eligible projects—Last Mile and Middle Mile.

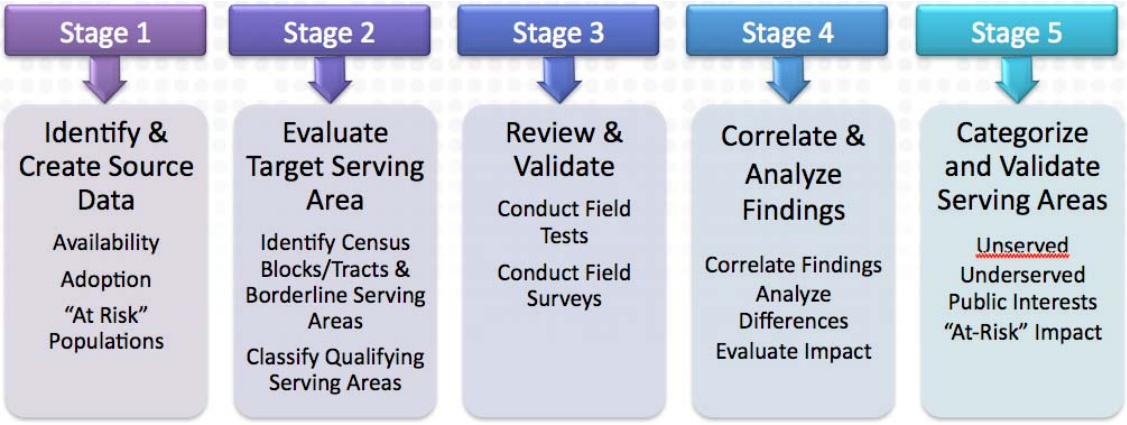
Specifically, a proposed funded service area may qualify as underserved for Last Mile projects if at least one of the following factors is met, though the presumption will be that more than one factor is present: 1) no more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed (set forth in the definition of broadband above); 2) no fixed or mobile broadband service provider advertises broadband transmission speeds of at least three megabits per second (mbps) downstream in the proposed funded service area; or 3) the rate of broadband subscribership for the proposed funded service area is 40% of households or less.

A proposed funded service area may qualify as underserved for Middle Mile projects if one interconnection point terminates in a proposed funded service area that qualifies as unserved or underserved for Last Mile projects.

Unserved area: A proposed funded service area, composed of one or more contiguous census blocks, where at least 90% of households in the proposed funded service area lack access to facilities-based, terrestrial broadband service,

gather and analyze supporting data for the focus market(s) and is depicted in Graphic 1. All supporting data are provided in the Data Supplement submitted with this report.

Graphic 1. Five-Step Process to Gather and Analyze Data



In Stage 1, the source data was identified and created related to availability, adoption and "at risk" populations. Next, in Stage 2 the proposed service area was evaluated in related to identified Census Blocks/Tracts along with borderline service areas. In Stage 3, data was reviewed and analyzed using an established business review database which has conducted field tests and surveys. Stage 4 consists of correlating and analyzing the findings to identify differences and to evaluate possible impact. Finally, in Stage 5, the proposed service area was categorized and validated to positively identify "unserved" and underserved" areas related to provision of broadband service.

DATA COLLECTION

To determine the percentages of broadband availability, adoption and vulnerable populations in the region, Mediamark Research and Intelligence (MRI), Pew Data, Carrier Data, Demographics Now and other survey data were used as independent sources of information. Each source provides differing metrics and granularity, as well as certain overlapping information that allows comparative result verification.

Relative to adoption of broadband, MRI Internet data was used since it provides the following metrics at the census block level.[2] This supporting data is included within both the initial grant application and subsequent, detailed analysis (Supplemental Information Request) as provided during the review phase of the grant application process (due diligence). These submissions accompany this study.

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either fixed or mobile, at the minimum broadband transmission speed (set forth in the definition of broadband above). A household has access to broadband service if the household can readily subscribe to that service upon request.

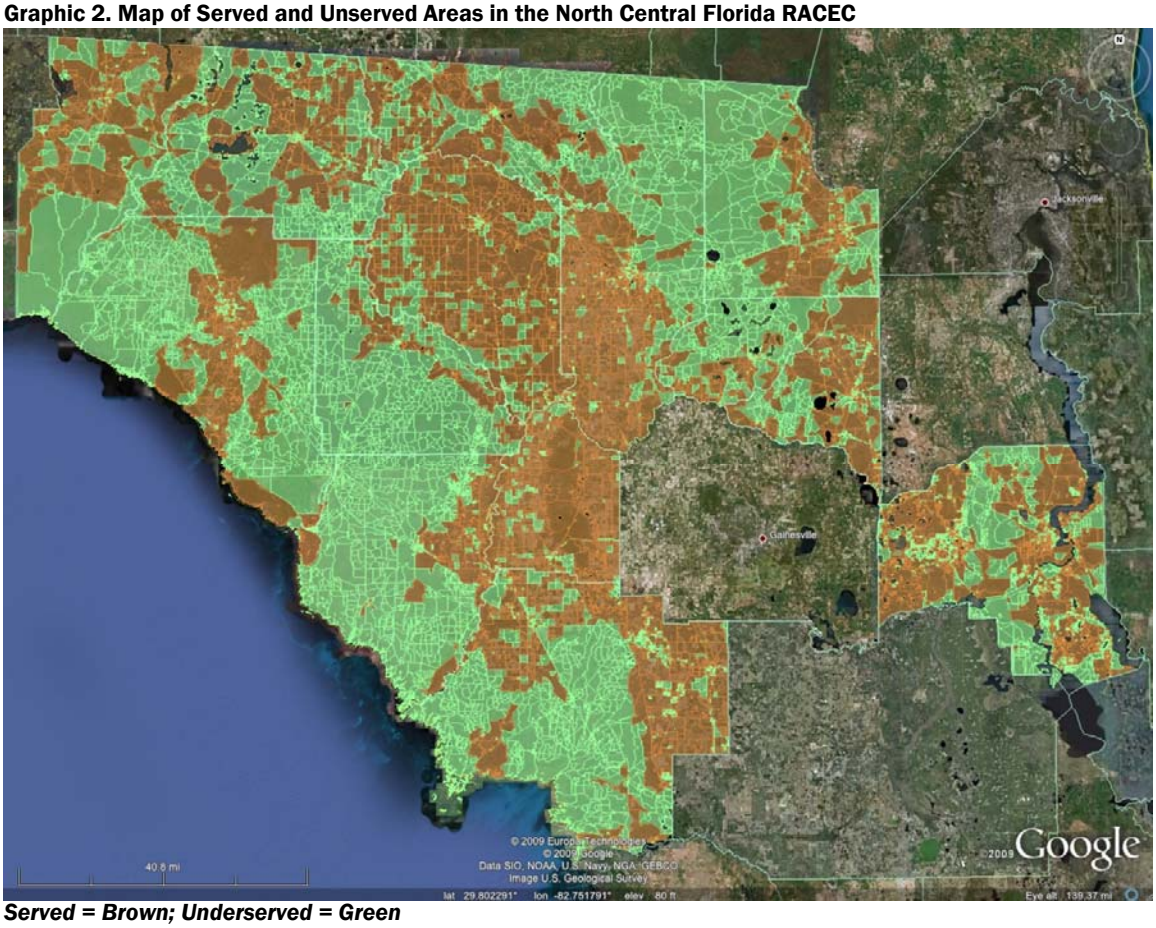
[2] The MRI data on Broadband/High Speed Internet cited here is derived from the Mediamark Research and Intelligence (MRI) Survey of the American Consumer™. The Survey of the American Consumer™ collects information from 26,000 adult consumers on media choices, product usage, demographics, lifestyle and attitudes. Usage of nearly 6,000 product and service brands across 550 categories are measured, along with the readership of hundreds of magazines and newspapers, Internet usage, TV viewership to the program level, national and local radio listening, Yellow Pages usage and Out-of-Home exposure. The MRI Internet portion of the data from this survey was accessed through Demographics Now, a product of SRC Company and an aggregator of in-depth demographic data.

EVALUATE TARGET DATA

The information used to evaluate the target population and to classify the 2000 census blocks as unserved or underserved for broadband, or at least 75% rural included the use of a comprehensive data mining method. Municipal boundaries of incorporated areas with more than 20,000 population were identified, as well as urbanized areas contiguous and adjacent to cities of 50,000 and above (as defined by the U.S. Census Bureau) to create "non-rural" classification areas. Geographic Information Systems (GIS) mapping tools were used to define a 50-mile buffer zone around the non-rural areas. Census blocks that fell within or touched the buffer zone were classified as "non-remote." Those falling outside the non-rural border but with the buffer were marked as rural in addition to non-remote. Any blocks that fell completely outside the buffer zone were marked "remote" in addition to rural. Additional borders, places and boundaries recognized by the Census Bureau were also layered.

After significant data analysis, a final comprehensive methodology was established to determine broadband availability and uptake. The assumption was made that most areas will begin as "underserved." Broadband uptake was calculated using the following method: count of 2008 FCC Form 477 residential broadband lines (200 Kbps symmetrical) divided by 2008 census estimated total households on a state-by-state basis to create a state average uptake percentage. This uptake was then applied to the 2000 census total household count at the block level where the survey data (survey described later in this section) reported a broadband subscriber. The calculated number of "served" households was then compared to determine the status for the North Central Florida RACEC region.

Graphic 2. Map of Served and Unserved Areas in the North Central Florida RACEC



Served = Brown; Underserved = Green

The data indicate the underserved areas, using the third criteria established by the National Telecommunications and Information Administration (NTIA) and recorded in the Notice of Funds Available for this program. The region qualifies as underserved because the uptake or adoption rate is less than 40%. While portions of the region qualify as served, the entire region is considered underserved when taken as a whole.

REVIEW AND VALIDATE

Data available from multiple commercial and public sources were combined to create a Broadband Indicator, to the level of detail possible. Self-reported consumer information included Internet registrations, survey cards, online surveys, registrations and marketing solicitation data (this includes mail, telephone and in-person interviews). Input sources were meticulously compiled, and the Broadband Indicator was constructed using these aggregated inputs.

Detailed summary data from each of the region's counties are provided in Appendix A.

These Broadband Indicator results were mapped and compared using GIS software to the 2000 census block areas. The Broadband Indicator (data tag) that would identify the presence of infrastructure in a census block was determined by data analysis for cable companies, DSL providers, Independent Wireless Internet Service Providers and fixed and mobile-data providers (i.e., cellular and PCS carriers). Each census block is further classified as rural, non-rural, remote and non-remote (See Graphic 2).

REGIONAL BROADBAND SURVEY

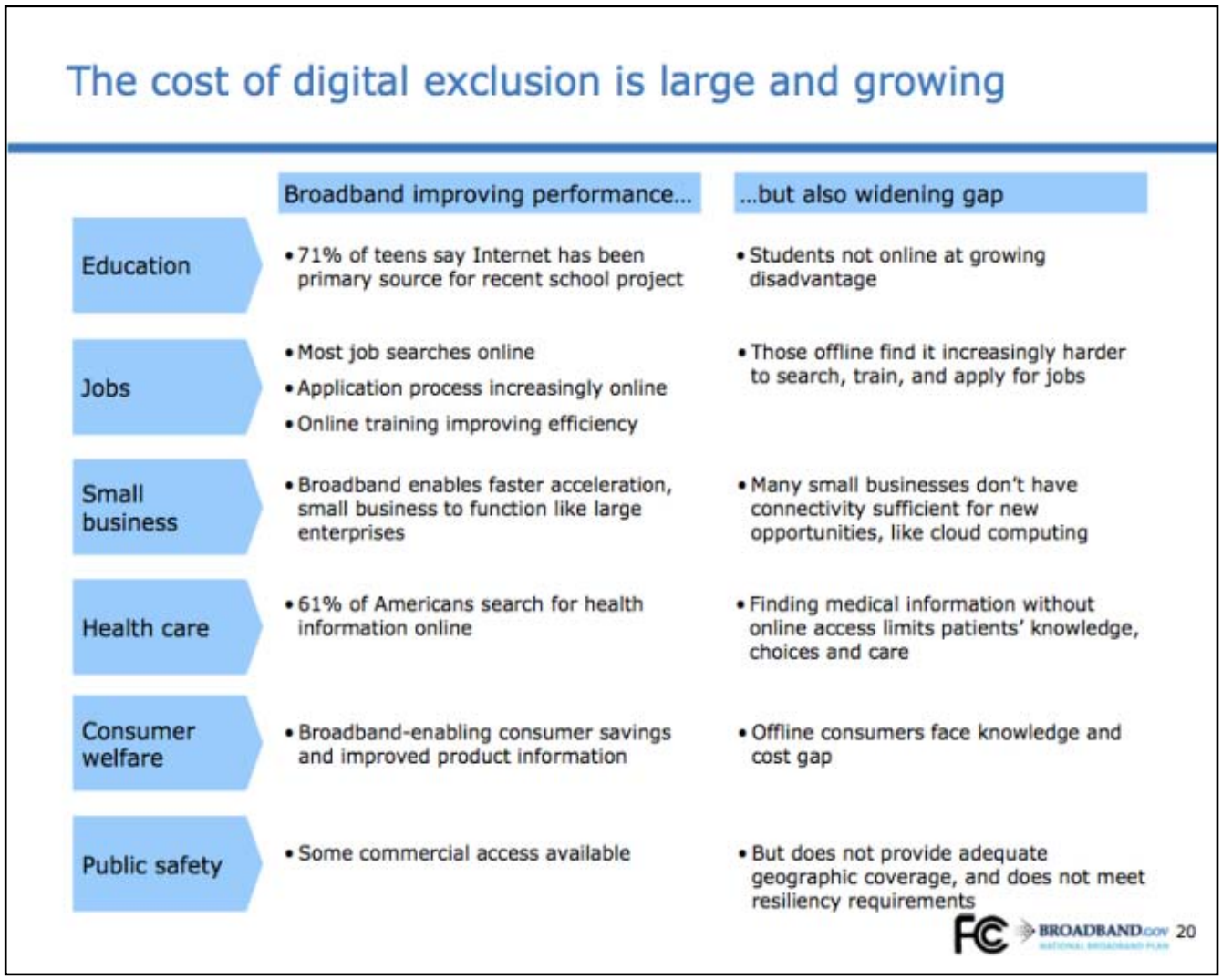
In addition to the extensive analysis of external data sources, a survey was conducted to ascertain the existing level of service offered within the RACEC. An online survey was developed including ten questions regarding their Internet service. Nearly 100 surveys were taken by residents, business owners, public agencies and not-for-profit organizations. The results of the surveys (full surveys in Appendices B and C) strongly coincide with the results of the detailed data analysis as explained later in this report.

Many of the assumptions included within this study were based on background research performed during the initiation of this study. This background research produced credible sources supporting the assumption that broadband yields positive economic benefits and will do so specifically for the North Central Florida RACEC. A summary of this research is provided in the following section.

Background Research

As recognized by Congress and the Federal Communications Commission, broadband networks are a vital component of the nation's infrastructure. Broadband networks provide a fundamental platform upon which the nation's economy, educational system and critical government services rely. It has now become the central nervous system - the primary communications and information exchange - in American society.

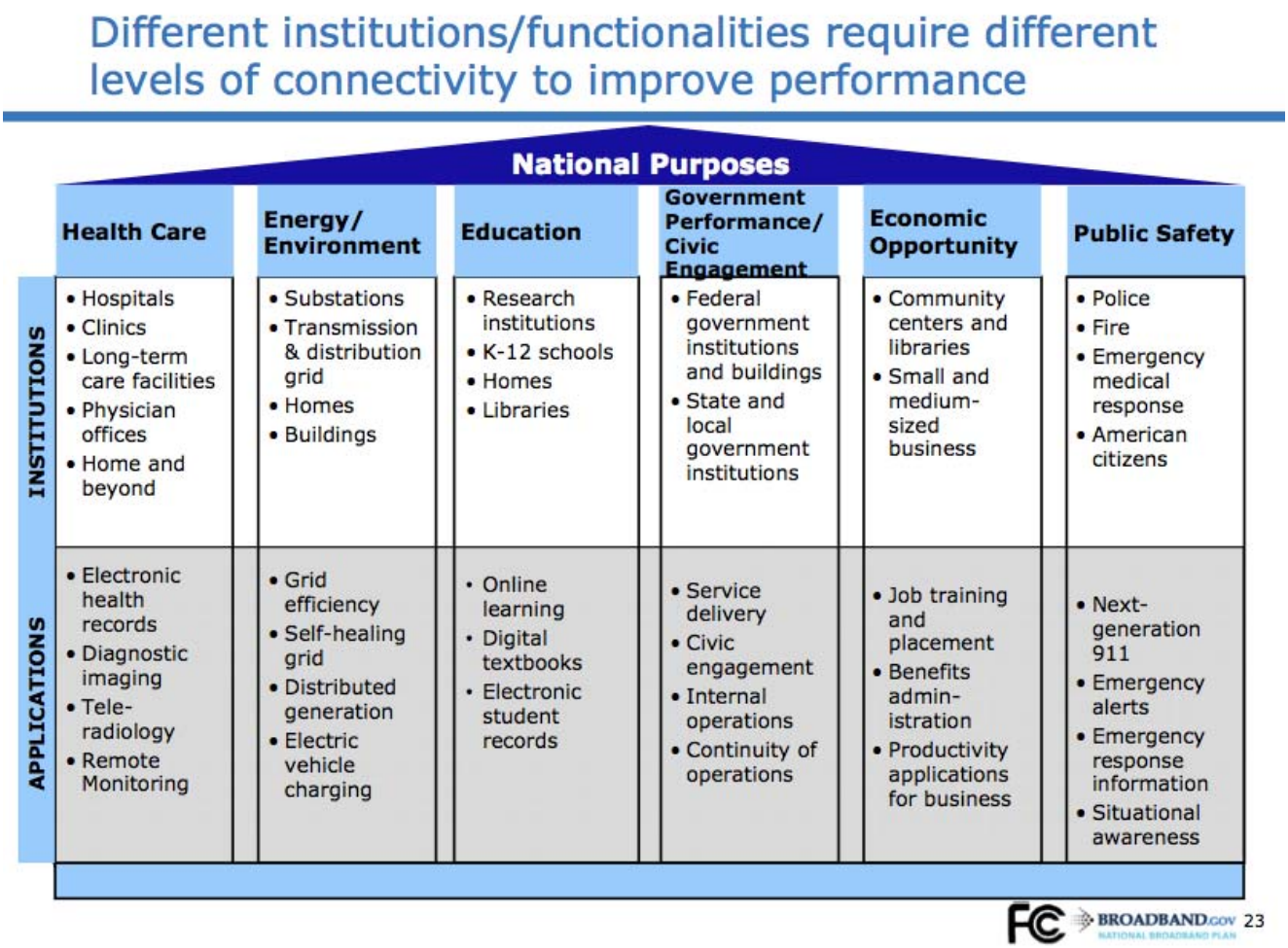
Graphic 3. The Cost of Digital Exclusion is Large and Growing



This chart, provided as part of a presentation by the FCC in a series of workshops on rural broadband issues, demonstrates the disparity of services and opportunities for those with broadband access and those without.

Today, it is not just physical or transportation access that is critical to the success of a company. Immediate access to information, electronic market data, real–time inventory management, and a virtual presence in distant markets have turned the flow of information into the competitive life blood of business. Without high-speed/high-capacity broadband networks, it becomes nearly impossible for businesses to compete.

Graphic 4. Institutions/Industries Have Differing Applications, but All Need Broadband



Another graphic from the FCC workshops that preceded the release of the Broadband Stimulus Program funding. Shown here are the diverse ways that industries and functional areas take advantage of broadband to improve efficiency and delivery of services.

Office-based businesses have also undergone a transformation. It is unusual to find an office-based business that does not take advantage of home offices, telecommuting, and part-time support from remote consultants or contractors. Flexible office hours - as a result of remote connectivity - have become a means of reducing office expense and overhead. Once again, access to high-speed broadband infrastructure becomes a critical factor in the competitiveness of today's businesses; and with the lack of affordable broadband capacity, office-based businesses cannot take advantage of this efficiency.

Even agriculture has adapted the information super-highway as a means to monitor moisture content in the soil to manage irrigation; nutrient monitors identify fertilizer needs and real-time access to market prices allow farmers to proactively manage their agribusinesses.

Great attention is being given to controlling healthcare costs. Digitization of medical records has been touted as a critical step in that direction. Rural hospitals and clinics must meet increasingly stringent modernization and technology requirements to maintain (or achieve) accreditation, or their prospects for remaining a viable businesses are grim. High-speed broadband access (and not the federal government's current standard) is a critical element in ensuring these facilities remain open to serve their communities.

Local healthcare providers and medical testing facilities rely heavily on immediate access to information. Based on requests for service placed with a local telecommunications integration firm that provides

competitive quotes from service providers for many parts of the region, doctor's offices place more requests for boosting their Internet speeds than any other industry or type of business. They are demanding greater speeds to deal with the combined burden of very large files and increased reimbursement administration. Laboratories and testing facilities in major cities are equipped with high-speed broadband and are accustomed to immediate transmission of results. Smaller, rural hospitals and doctor's offices often have to wait days to get results, limiting their ability to make complete and timely treatment decisions.

BROADBRAND INFRASTRUCTURE

The telecommunications landscape, which includes broadband services, is sometimes described as the First Mile/Middle Mile/Last Mile. The First Mile refers to the Internet backbone - the vast collection of ultra-high-capacity fiber optic networks that link major metropolitan areas around the country and around the world. Service providers of the First Mile might include providers such as Level 3 Communications, Verizon and AT&T. Florida is fortunate to have several of these backbone routes traverse the state. Incumbent service providers, who are most often the traditional telephone carriers, purchase capacity from the backbone providers and distribute that capacity over their own network components to their retail subscribers (residents, businesses and public agencies). Within a specific or small area of decent population density, the physical infrastructure by which service is delivered to their customers is called the Last Mile. When substantial distances need to be covered in order to deliver Last Mile connections (which are the actual copper, co-axial or fiber cables to a home or business), the service provider must use a somewhat different approach, either via fiber or wireless transmission to efficiently carry portions of the backbone capacity to where it can be effectively distributed by Last Mile technologies. This interim transport is called the Middle Mile.

Unlike urban areas, the delivery of broadband services to rural areas inevitably requires the use of Middle Mile infrastructure to extend the reach of the ultra-high-speed fiber backbones that provide the long-haul distribution of Internet traffic. It is normally cost-effective to build or co-locate local distribution facilities in urban areas simply because of the size and density of the customer base. An Internet Service Provider (ISP) in a metro area can justify the cost of buying a large-capacity connection and remain competitive in their pricing. Unfortunately, that is not the case with rural and small-town areas like the North Central Florida RACEC. Purchasing large capacity connections at the backbone is only the beginning. Rural customers - who are distant, spread out and less likely to tolerate the cost of the service - also have to be reached.

TELEPHONE ARCHITECTURE

Because of past and current federal funding processes, basic dial tone telephone infrastructure is almost ubiquitous in the United States and throughout the RACEC region. Telephone companies have built fewer central offices in rural areas due to the fact that there are fewer households per square mile. Physical extension of the telephone infrastructure to deliver broadband Internet services more than a few miles from a central office (without amplifying equipment) is not possible. Therefore, bringing broadband Internet to an unserved community means an expensive addition or upgrade to an existing telephone or cable system. This is often not justifiable because the resulting rates necessary to recover the investment would be too high given the low population density per square mile.

Logically, distance equates to higher cost. The architecture and the method of delivery also increase cost. The original telephone-based infrastructure utilized by most of the incumbent providers, while ideal for delivering telephone circuits, is not well-suited to delivering large amounts of data or Internet capacity over

great distances. Similar to water/sewer infrastructure, telephone architecture could not feasibly construct a separate pipe from the water plant to every customer premise in the region: not practical and extremely inefficient. Instead, water mains are constructed - large pipes that carry capacity over long distances and provide direct water connection via smaller individual connections. This would be a similar and appropriate "Last Mile" mechanism.

The economics of expanding Middle Mile infrastructure do not work for most incumbent providers, whose investment in existing infrastructure requires a minimum return on investment. They have little incentive to spend a lot of money to deliver services for which they would never see an appropriate return. As a result, little motivation to build a network in advance of demonstrated customer demand exists.

LACK OF COMPETITION/CHOICE

The current lack of competition is a major disincentive to expanding investment in real broadband connectivity, particularly in rural areas. Many incumbent providers enjoy a vertically integrated monopoly for broadband services where price and available capacity are not driven by demand or competing value propositions. This is a result of the way the telephone service areas were established in the past. Historically, as telephone networks were first built out, it was determined that telephone companies would be given franchise areas - areas where they would deploy telephone service to all the residents and businesses. While they had no "competition" in those days, they were required to provide telephone service to anyone that requested it, and their rates were regulated so as to be affordable.

As the Internet developed and the need to transport large amounts of data (requires greater volume than voice traffic) became common, the telephone infrastructure upon which it initially relied could not cost effectively meet the increased data demands.

While it did not make sense to have multiple companies deliver residential telephone lines (or cable for that matter), it is common to have multiple wireless options to choose from in metropolitan areas since data and Internet services can now be cost effectively delivered wirelessly. Whether a Wireless Internet Service Provider (WISP), or an incumbent service provider, the creation of competitive service options will invariably increase value, choice, affordability and adoption.

BENEFITS OF A BROADBAND "MIDDLE MILE" INVESTMENT

Investment in a Middle Mile wholesale broadband network will increase business activity, enhance and make government services more efficient and generate new educational and employment opportunities among others.

Additional benefits include:

- Economic development and increased business activity
- Business recruitment, new employers and expanded facilities
- Enhanced educational environment in K-12, community colleges and vocational schools and new modes of learning such as virtual classrooms
- Enhanced and continuing education and job training
- Employment opportunities, more efficient job searches, research into industries and companies

- Home-based business opportunities and remote offices
- Improved public safety and law enforcement via enhanced access to life-saving information and first responders
- Efficient government services such as on-line access and self-help services
- Entrepreneurial opportunities and lower cost of new business start-ups
- Enhanced access and efficiencies within health care systems and services

The deployment of e-government services depends heavily on widespread broadband access. Without it, residents, particularly low-income, unemployed, aged and otherwise vulnerable populations in these rural areas, will not have access to organizations and agencies that can provide outreach and support services, such as the American Red Cross, Department of Education, Department of Health and Human Services and many federal, state and local organizations.

Anchor institutions, such as schools, hospitals, physical and mental health clinics, public safety organizations and vocational and technical community colleges are deemed the highest priority by the State of Florida for high-speed broadband access. Many do have connectivity now, but virtually all have need for faster speeds and greater capacity. Applications that demand greater capacity are the norm in urban areas, but remain out of reach to most of the anchor institutions in the region.

The remainder of this section explores three of the key sectors - emergency services, education and health care- -in the North Central Florida RACEC area that most need broadband access.

EMERGENCY SERVICE PROVIDERS—FIRST RESPONDERS

The challenges routinely associated with delivering emergency services are compounded without adequate access to real-time data. First responders in urban areas have the ability to get real-time information in response to 911 calls, saving lives through ready access to medical assistance while enroute to the hospital. Real time information such as remote location video monitoring, access to offender databases and missing person's pictures, etc., can be accessed within minutes.

Today, most public safety entities utilize Land Mobile Radio solutions for critical voice communications. These systems use very small slices of spectrum and are usually backhauled via non-redundant copper infrastructure. These networks are especially vulnerable - they are typically unprotected and non-redundant.

There are multiple needs for public safety in rural areas. There exist a series of bottlenecks to the deployment of broadband services for public safety in rural areas. Those bottlenecks include, but are not limited to, the lack of available spectrum to support 4G public safety services, Middle Mile infrastructure to support 4G Last Mile public safety services and IP-enabled PSAPs.

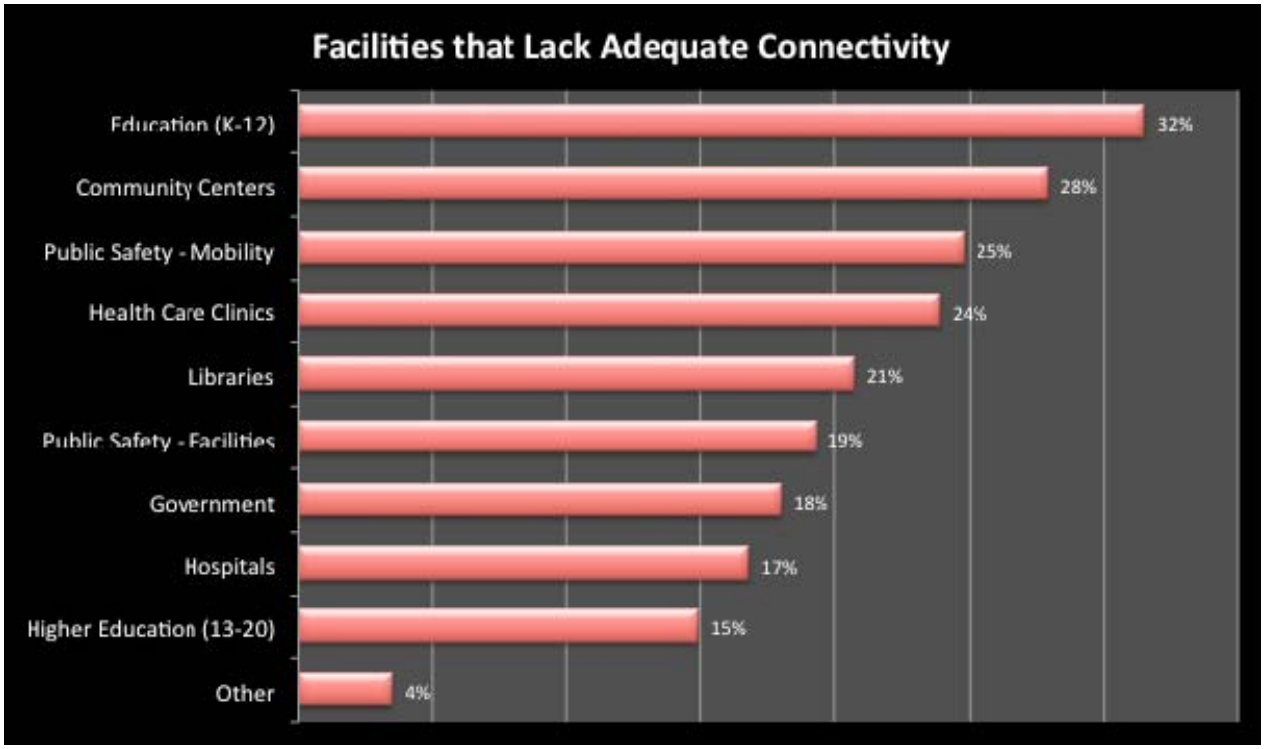
In the near future, all public safety departments within rural areas should have access to ubiquitous mobile broadband services supporting voice, video and data services at high speeds (70 MPH plus). In the short term, failing a mobile service, a fixed wireless broadband service to support portable/nomadic wireless broadband voice, video and data may be an acceptable solution. A fixed wireless broadband service to support video surveillance and vehicle monitoring could be achievable within the region. The addition of a Middle Mile transport solution - 100 Mbps or greater - is necessary to support the above applications and enable this capability. The NFBA proposed network would provide a secure separate public safety intranet that could survive and be utilized during an emergency situation.

EDUCATION

The challenges that affect consumer and enterprise broadband applies to schools as well. Educational facilities, like all public facilities, are victims of population density and investment challenges. In a recent national survey of state and county leaders, respondents stated that educational facilities most lacked adequate Internet connectivity and would be the facilities that could most benefit from improved connectivity (See Graphic 5).

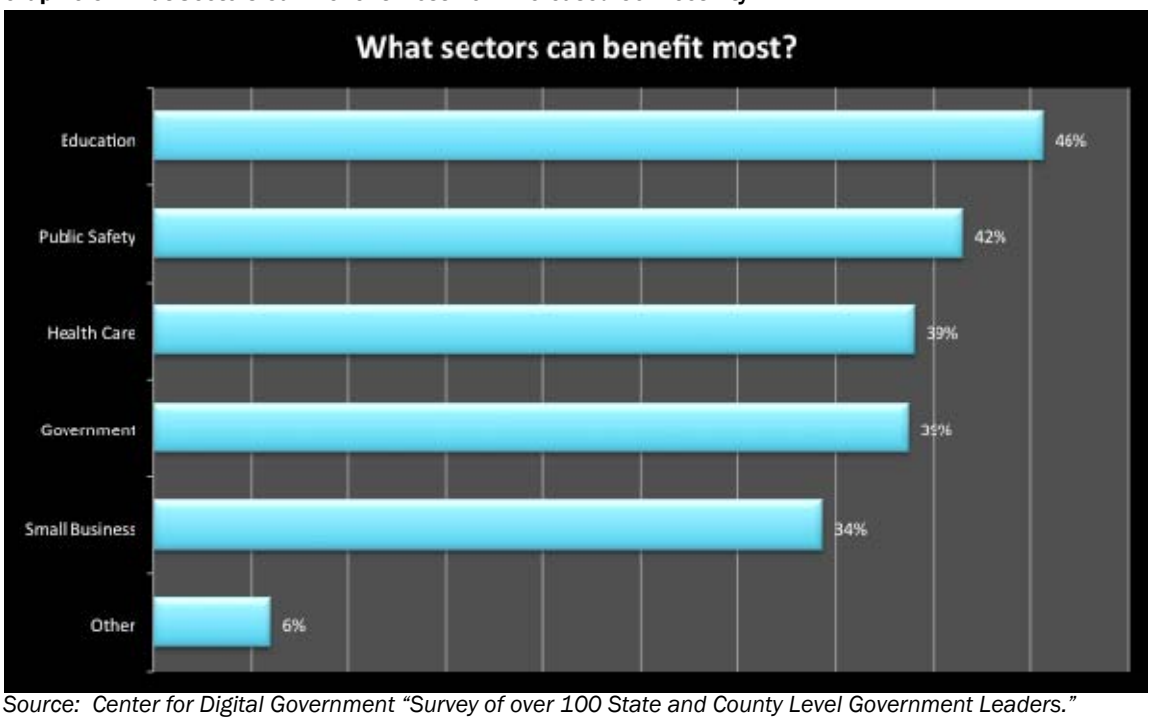
Students in K-12, community colleges and universities rely increasingly on the Internet not only for conducting research on school assignments, but also as a means to monitor work progress, receive and submit assignments and communicate with classmates and teachers. Distance learning opportunities are also increasing, offering more educational and job training opportunities (See Graphic 6).

Graphic 5. Facilities that Lack Adequate Connectivity



Source: Center for Digital Government "Survey of over 100 State and County Level Government Leaders."

Graphic 6. What Sectors Can Benefit Most from Increased Connectivity?



Source: Center for Digital Government "Survey of over 100 State and County Level Government Leaders."

HEALTHCARE

Nearly every sector of the health care industry utilizes Internet access. As access becomes more the norm and as medical technology progresses, the demand for higher capacity access will only increase.

Hospitals, clinics, long-term care facilities, radiology, clinical laboratories and home health care providers could benefit from the performance capabilities of improved broadband infrastructure. Real-time access to specialists, labs, medical research facilities and teaching hospitals would be enabled.

Hospitals and clinics, in particular, which routinely send large files, such as x-rays and MRI scans, should be connected at the highest bandwidth available (100 Mbps minimum). Today, ARRA funding is available for Electronic Health Record Systems, which require broadband access to achieve full functionality.

As the number of patients seen in emergency departments and admitted to hospitals rises, the potential volume of records transferred in a health information exchange setting climbs in tandem. These numbers will only increase as the population in the North Central Florida RACEC coverage area grows.

Providing additional broadband infrastructure in the region will allow health care delivery companies to handle the traffic.

New, enhanced or redundant broadband affects many components of healthcare, and the value of broadband in healthcare applications is just now being realized. Specific examples include:

1. Doctors can watch and guide other doctors remotely. This allows doctors to get help or second opinions when treating new or complex issues.
2. Doctors can communicate with patients in real time across wide geographies along with broadband messaging and more efficient patient reminders of meetings and pharmacy interaction.

3. Patients can communicate with doctors more efficiently. Patients can request information or be monitored remotely using broadband capabilities.
4. Doctors can write online orders of prescriptions to pharmacies, and this might reduce the chance of transcription errors and allow pharmacies to use modern technology for potential drug interactions before the patient gets the prescription.
5. Patients can share information about their doctors and treatments in modern social networks.

A recent study by the Rand Corporation found that if most hospitals and doctors' offices adopted electronic health records, up to $77 billion of savings would be realized each year through improvements such as reduced hospital stays, avoidance of duplicative and unnecessary testing, more appropriate drug utilization and other efficiencies.

POTENTIAL MIDDLE MILE NETWORK BENEFITS

Even though the creation of expanded broadband access via a Middle Mile network will stimulate economic development, it is not the single solution. Benefits specific to investment in a Middle Mile network include:

1. Abundant supply of capacity which would drive costs down.
2. A neutral, open-access Middle Mile network encourages adoption of new technologies for Last Mile delivery. Competition from new market entrants may be anticipated, direct competition with incumbents is not. The network that can market its capacity to any public and private sector entity in the region will inspire Last Mile activity.
3. Focus on infrastructure investment where there is inadequate capacity will yield immediate returns to the region. The largest revenue opportunities are likely to be found in those areas were current transport is most limited.
4. A Middle Mile network may offer pure transport capacity for existing network traffic to first responders and law enforcement - expanding the reach of their secure private networks.

LAST MILE

Last Mile providers are the direct links to the residents, businesses, and agencies (public and private). These companies often deliver many more services than direct Internet access, including phone service, web-based content and services, and television programming. Providing enough capacity to Last Mile providers so that they can offer low cost per Mbps to their subscribers is the final step in delivering affordable access across the region.

Unfortunately, without the Middle Mile bridging the distances necessary for Last Mile delivery technologies to be cost effective, there must either be very significant subscriber density or very cost-effective Middle Mile transport, neither of which are likely to occur in rural regions. In the case of the incumbent providers, they most often take an incremental approach, justifying the extension of their own private Middle Mile infrastructure based on proven demand (the degree to which facilities based providers invest on future demand varies widely). Seeking to expand Last Mile providers in rural areas will not yield the benefits that expansion of a Middle Mile network would.

TECHNOLOGY CONSIDERATIONS

When it comes to transport technologies and delivering capacity over long distance, fiber optic cable is the standard. Long-haul networks have relied upon fiber to deliver massive capacity across long distances. Today's fiber optic long-haul networks are capable of previously unimaginable capacity, and that scalability has justified the long-haul business case. However, while fiber is particularly well suited for long-haul transport, it is a substantial capital investment on a per mile basis. Establishing points of connection is also a capital-intensive proposition; as a result, Internet backbone connection points and aggregation centers for service providers are infrequent. Fiber regeneration facilities (where the light source is amplified) today can be 40 (or more) miles apart.

The North Central Florida RACEC Region

The benefits of broadband with regard to public safety, education, economic growth and overall government efficiency are well documented; and these benefits are felt even more strongly in rural areas where the digital divide keeps communities from accessing vital services and opportunities. This study will address whether this situation exists within the North Central Florida RACEC's 14 counties.

As part of the background research, it was necessary to compile qualitative and quantitative data that would provide a profile of the region, highlighting the characteristics most likely to impact and be impacted by expanded broadband access. Demographic data has been mapped, and the maps can be found in Appendix D. Additional supporting data can be found in the Supplemental Data document submitted with this report.

NORTH FLORIDA RACEC CHARACTERISTICS

As mentioned previously, the 14 counties that make up the North Central Florida RACEC are Baker, Bradford, Columbia, Dixie, Gilchrist, Hamilton, Jefferson, Lafayette, Levy, Madison, Putnam, Suwannee, Taylor and Union. Those counties cover a total of 9,197 square miles. The area is home to more than 400,000 Floridians and contributes resources to five metropolitan statistical areas.

To be designated as a RACEC, this area had to demonstrate that the following socio-economic, economic development and quality of life conditions existed and were of critical concern to the future well-being of the residents within the region and the state as a whole:

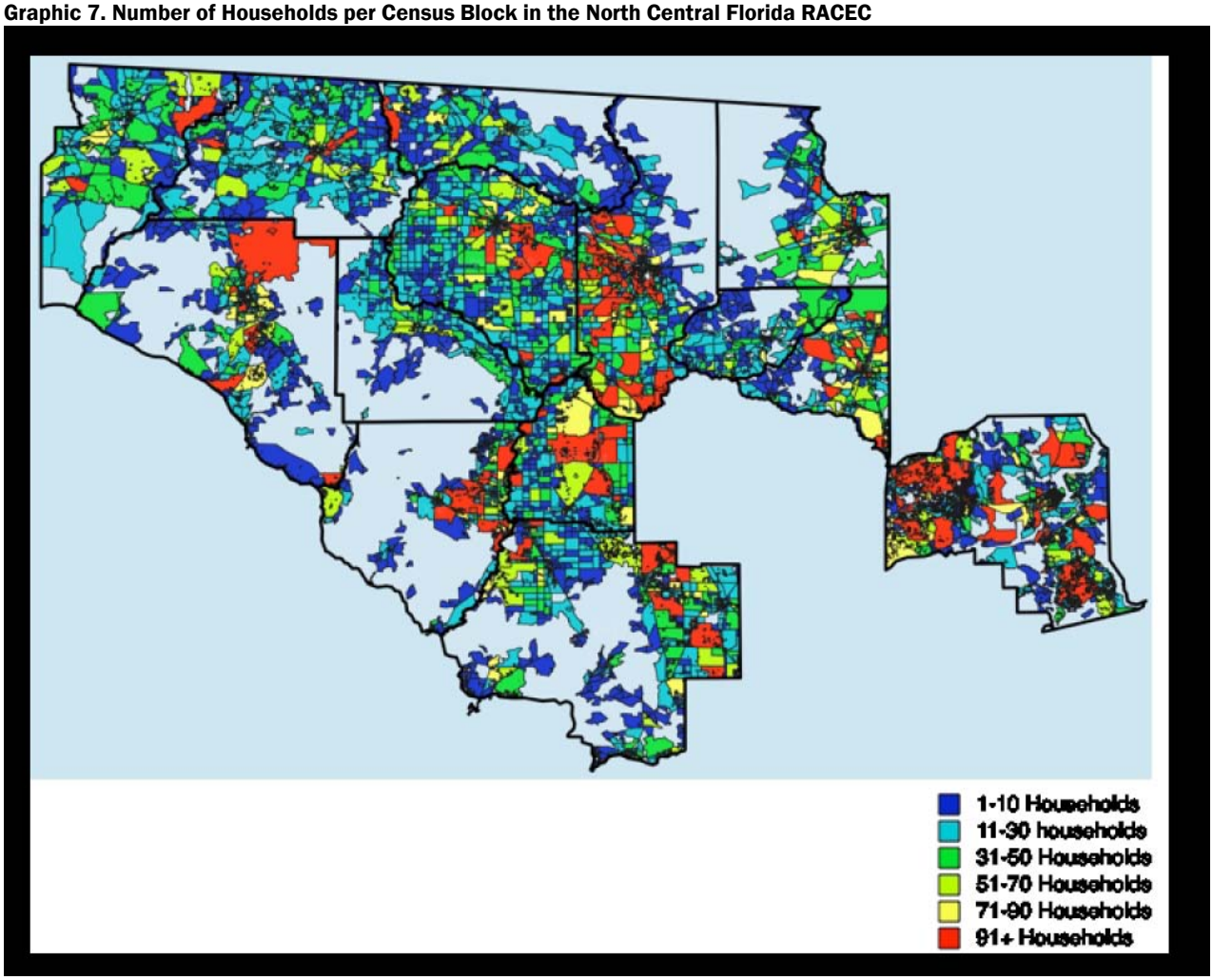
- High unemployment and underemployment
- Low per capita income
- Low wages compared to more urban areas and the state average
- Higher percentages of families living below the poverty level and receiving public assistance
- Lower volume, diversity, and access to higher wage and higher quality business, industry jobs and economic development
- Highest percentage of underperforming public schools, including two of the three lowest graded districts in the state
- Largest ratio of eligible families for free and reduced lunch program services in the state

In addition to designation as a RACEC, the counties within this region are also designated as "fiscally constrained counties" pursuant to section 218.67, Florida Statutes. This means that these counties lack the revenue-generating ability of larger, more populous areas. Each fiscally constrained county is entitled to additional state revenue shared funds and priority for other state appropriations to help fund government operations and essential services in these economically challenged areas. The fiscally constrained designation of these communities demonstrates the financial limitations of each of the member governments. These governments have severely limited funds to provide essential public services such as fire protection, emergency medical services and solid waste collection/disposal and transportation improvements. As a result, these governments would have to reduce funding for essential public services and facilities in order to create needed broadband infrastructure themselves. This is not a viable option.

POPULATION PROFILE

Total Population And Density

Graphic 7. Number of Households per Census Block in the North Central Florida RACEC



This image depicts the distribution of population in the North Central Florida RACEC based upon 2000 census data. Low population density creates a disincentive for infrastructure investment by incumbent service providers.

The total number of households in the North Central Florida RACEC is 153,237. The total population is 407,966, with a mean county population of 29,140. All 14 counties are in the bottom 50% of the state with regards to total population. Of the 67 counties in Florida, six of the ten lowest population counties are in this region.

Not only is this one of the least populous regions in the state, it is also one of the least dense. Six of the ten least dense counties in the state belong to the RACEC, and the remaining eight counties are in the bottom 50% of the state.

Low population and low population density create a disincentive for infrastructure investment by incumbent service providers as they cannot recoup the required investment.

Figure 1. Total Population and Density for Counties in the North Central Florida RACEC Area

County	Population	Population Rank in State	Area (MI^2)	Density (Persons per Mi^2)	Density Rank in State
Baker	25,890	52	585.2	44	51
Bradford	29,059	50	293.1	99	38
Columbia	66,121	40	797.1	83	41
Dixie	15,963	60	704.0	23	62
Gilchrist	17,256	57	348.9	49	50
Hamilton	14,779	61	514.9	29	59
Jefferson	14,553	62	597.7	24	61
Lafayette	8,287	66	542.8	15	65
Levy	40,817	46	1,118.4	36	55
Madison	20,152	55	691.8	29	58
Putnam	74,989	38	721.9	104	37
Suwannee	40,927	45	687.6	60	44
Taylor	23,199	54	1,041.9	22	64
Union	15,974	59	240.3	66	43
Florida	**18,807,219**	**-**	**53,927**	**349**	**-**

POPULATION MAKEUP—GENDER

With regards to the gender makeup of the individual county populations, only two of the fourteen counties reflect the approximate state-wide makeup of a higher percentage of females than males. Figure 2 provides the county specific population and the gender distribution within that population.

Figure 2. Total Population and Gender Distribution for Counties in the North Central Florida RACEC Area

County	Total Population	Male	Percentage (Male)	Female	Percentage (Female)
Baker	25,890	13,867	53.6	12,023	46.4
Bradford	29,059	16,467	56.7	12,592	43.3
Columbia	66,121	34,260	51.8	31,861	48.2
Dixie	15,963	8,542	53.5	7,421	46.5
Gilchrist	17,256	8,986	52.1	8,270	47.9
Hamilton	14,779	8,676	58.7	6,103	41.3
Jefferson	14,553	7,632	52.4	6,921	47.6
Lafayette	8,287	5,270	63.6	3,017	36.4
Levy	40,817	19,858	48.7	20,959	51.3
Madison	20,152	10,621	52.7	9,531	47.3
Putnam	74,989	36,920	49.2	38,069	50.8
Suwannee	40,927	20,630	50.4	20,297	49.6
Taylor	23,199	12,691	54.7	10,508	45.3
Union	15,974	10,475	65.6	5,499	34.4
Florida	**18,807,219**	**9,216,853**	**49.0**	**9,590,366**	**51.0**

POPULATION MAKEUP—AGE

Though overall the age distribution of the population in the RACEC region aligns with that of the state - with most residents being between the ages of 0 and 34 or 80 and over - the age distribution in this region also reflects a slightly younger population than in the state as a whole. All but three counties in this region, those highlighted, have a higher percentage of youth than the state overall. More than half of the counties have a lower percentage of residents between the ages of 18 and 64 - generally the laboring ages - and almost all of the counties have a lower percentage of the elderly, those aged 65 and over. Figure 3 shows the age distribution within each county as compared to the state age distribution.

POPULATION MAKEUP—ETHNICITY

Florida has one of the most diverse populations in the country and often serves as a bellwether state on issues of race and ethnicity. The distribution of population within the ethnicity categories in this region, however, reflects a generally less diverse population than in the state as a whole. Figure 4 shows the total population distribution by ethnicity within each county as compared to the state distribution. All but two counties, those highlighted, have a higher percentage of non-Hispanic whites than in the state overall. More than half of the counties have a higher percentage of non-Hispanic blacks, and all of the counties have a significantly lower percentage of Hispanics. Figure 5 shows the mean of the county distributions as a percentage in comparison to the state ethnicity distribution.

Figure 3. Age Distribution by County for the North Central Florida RACEC Area

County	Ages 0-17 (%)	Ages 18-34 (%)	Ages 35-54 (%)	Ages 55-64 (%)	Ages 65-79 (%)	Ages 80 & Over (%)
Baker	23.35	28.95	10.87	8.46	2.37	26.01
Bradford	25.91	28.91	11.18	9.78	3.93	20.29
Columbia	22.41	26.56	12.39	11.44	4.13	23.07
Dixie	20.92	25.17	13.55	14.55	4.99	20.82
Gilchrist	23.15	26.49	12.33	12.01	3.93	22.08
Hamilton	27.13	28.64	10.81	8.63	3.34	21.45
Jefferson	21.45	29.88	13.69	10.63	4.75	19.60
Lafayette	33.46	27.13	8.77	9.21	3.33	18.10
Levy	18.35	25.63	14.32	14.08	5.19	22.44
Madison	26.32	25.34	10.87	10.68	4.62	22.18
Putnam	18.84	25.14	13.33	14.27	5.00	23.42
Suwannee	21.75	26.44	12.39	12.98	5.60	20.83
Taylor	22.91	29.08	12.44	10.54	3.69	21.33
Union	27.23	34.73	9.61	6.37	1.94	20.12
Florida	**21.14**	**27.47**	**11.79**	**11.91**	**5.41**	**22.28**

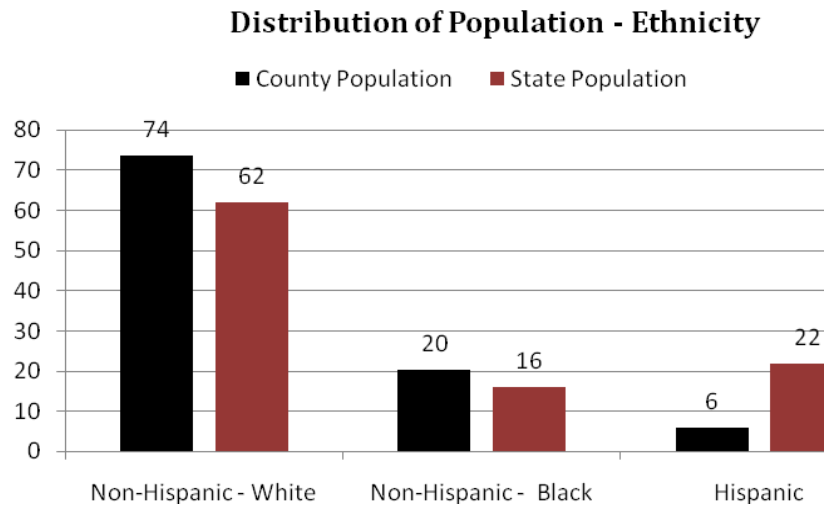
Note: Figures highlighted in red are below the state percentage.

Figure 4. Total Population and Ethnic Distribution by County for the North Central Florida RACEC Area

County	Total	Non-Hispanic White	Non-Hispanic White (%)	Non-Hispanic Black	Non-Hispanic Black (%)	Hispanic	Hispanic (%)
Baker	25,637	21,324	83.18	3,616	14.10	697	2.72
Bradford	28,656	21,315	74.38	6,413	22.38	928	3.24
Columbia	65,120	50,714	77.88	11,487	17.64	2,919	4.48
Dixie	15,817	13,958	88.25	1,555	9.83	304	1.92
Gilchrist	17,152	15,101	88.04	1,279	7.46	772	4.50
Hamilton	14,641	7,593	51.86	5,487	37.48	1,561	10.66
Jefferson	14,414	8,609	89.73	5,194	36.06	611	4.24
Lafayette	8,216	5,698	69.35	1,366	16.63	1,152	14.21
Levy	40,436	32,972	81.54	4,271	10.56	3,193	7.90
Madison	19,957	10,954	54.89	7,899	39.58	1,104	5.53
Putnam	74,224	55,296	74.50	12,268	16.53	6,660	8.97
Suwannee	40,544	32,769	80.82	4,387	10.82	3,388	8.36
Taylor	22,759	17,064	74.98	5,091	22.37	604	2.65
Union	15,777	11,205	71.02	3,836	24.31	736	4.67
Florida	**18,326,942**	**11,364,106**	**62.01**	**2,929,440**	**15.98**	**4,033,396**	**22.01**

Note: Total numbers may differ from earlier population estimates due to methods of estimation. Figures highlighted in red are below the state percentage.

Figure 5. Mean of RACEC County Ethnicity Distribution Compared to the State Population



CHANGE IN POPULATION, 2000-2008

While all 14 counties had positive net population changes for the years between 2000 and 2008, nine of the fourteen counties had individual growth rates less than the state growth rate of 17.7%. This lag in growth rate serves as a disincentive for further infrastructure investment; it also indicates that the funding needed to support such investments is unlikely to be generated by private or public resources within the region.

Changes in county population can either be attributed to natural change (the number of births or deaths) or migration (persons entering or leaving the county). All 14 counties received the majority of their increase in population as a result of migration. This in itself is not unusual in Florida, as migration has traditionally been the major factor for population growth, but it does indicate that this trend should be monitored as a transient population changes service demands. Please see Figure 6 for county-specific growth rates.

Figure 6. Population Growth in 2000 and 2008 for Counties in the North Central Florida RACEC Area

County	Population 2000	Population 2008	Growth Rate (2000 to 2008)
Baker	22,259	25,890	16.3
Bradford	26,088	29,059	11.4
Columbia	56,513	66,121	17.0
Dixie	13,827	15,963	15.4
Gilchrist	14,437	17,256	19.5
Hamilton	13,327	14,779	10.9
Jefferson	12,902	14,553	12.8
Lafayette	7,022	8,287	18.0
Levy	34,450	40,817	18.5
Madison	18,733	20,152	7.6
Putnam	70,423	74,989	6.5
Suwannee	34,844	40,927	17.5
Taylor	19,256	23,199	20.5
Union	13,442	15,974	18.8
Florida	**15,982,824**	**18,807,219**	**17.7**

Note: those rates below the state growth rate are highlighted in red.

EDUCATIONAL PROFILE

Total Public School Attendance

For the 2008-2009 school year, there were 59,390 students attending grades K-12 at 117 public schools across the region. All but three of the fourteen school districts experienced a negative change in net total attendance from the 2007-2008 academic year, reflecting statewide trends. The decrease in attendance in nine of the counties was three or more times the statewide decrease, a statistic that is of interest as this region has a slightly higher percentage of school-age children than the state overall.

Figure 7. Total School Attendance and Change in Attendance Rates for Counties in the North Central Florida RACEC Area

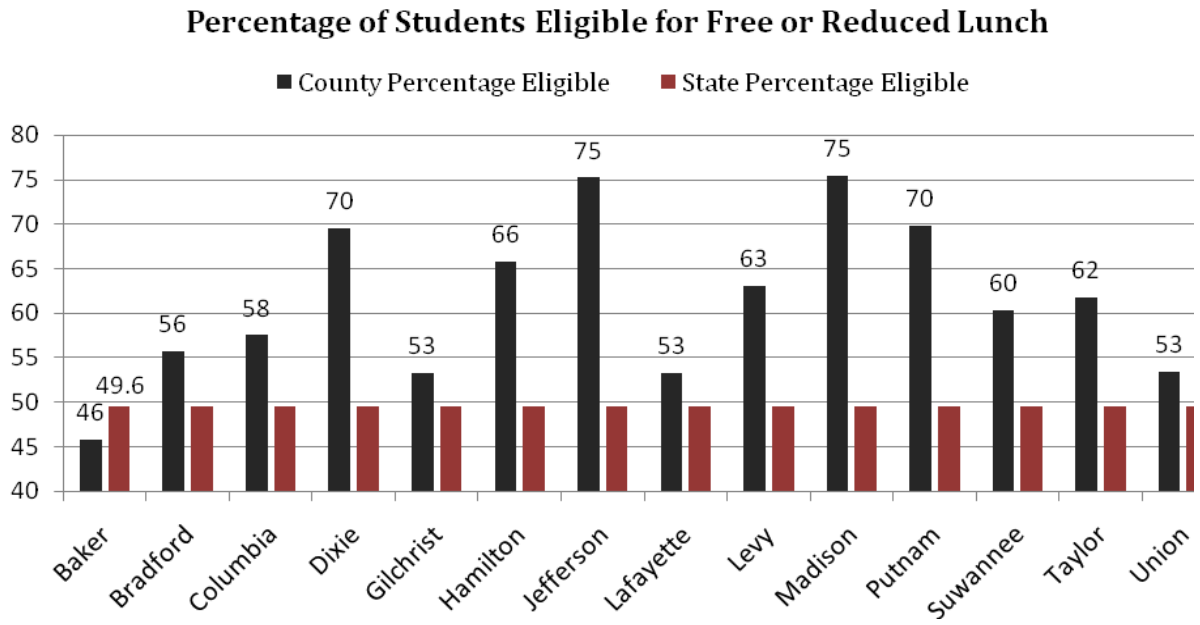
County	Number of Schools	Total Attendance	Rate Change from 2007-2008 (%)
Baker	6	5,066	2.9
Bradford	9	3,400	-4.8
Columbia	13	10,058	-0.7
Dixie	4	2,119	-3.2
Gilchrist	4	2,750	-4.8
Hamilton	6	1,952	-3.3
Jefferson	7	1,106	-4.2
Lafayette	2	1,118	2.5
Levy	16	6,022	-3.3
Madison	8	2,715	-2.4
Putnam	20	11,492	-2.7
Suwannee	9	5,978	-0.4
Taylor	8	3,299	-2.7
Union	5	2,315	0.8
Florida	**3,884**	**2,628,754**	**-0.9**

Note: Those rates higher than the statewide rate are highlighted in red.

Free or Reduced Price Lunch Eligibility

The state percentage of students eligible for free or reduced-price lunch was 49.58% for the 2008-2009 academic year. All but one of the RACEC counties had eligibility rates higher than the state percentage. As this figure further indication of the struggling economy in this area. Figure 8 presents the comparison of individual county eligibility rates to the statewide eligibility rate of 49%.

Figure 8. Percentage of Students Eligible for Free or Reduced Lunch for Counties in the North Central Florida RACEC Area Compared to the Statewide Percentage



FCAT Scores

The Florida Comprehensive Assessment Test (FCAT) is a standardized test administered to public school students at various points in their K-12 career. The test is used as a benchmark for comparing student progress across school districts in the state. Student performance in grades K-12 is an indicator of the educational level and preparedness of a community and is a factor in spurring economic growth.

At the high school level, the FCAT is administered to tenth grade students every academic year in reading and mathematics. For the 2009 reading test, the passage rate for the state as a whole was 57%. Of the fourteen counties, only two counties met or exceed the state average; Gilchrist with a passing rate of 76% exceeded the statewide rate, and Taylor County met it. The remaining twelve counties had passage rates below the state average, including the lowest in the state for public districts (Jefferson County, 24%).

For the mathematics assessment, the state passing percentage was 81%. Five of the fourteen counties met or exceeded this rate, but Jefferson County again held the lowest passage rate in the state at 60%.

Science assessments are also administered every year to students in grade eleven but are only utilized as benchmarks. In the science assessment, 37% of all students statewide tested above a level 3 on the test, which is defined as "on or above grade level." Only Gilchrist County exceeded the state percentage, while Levy County matched it. Jefferson County had the lowest passage rate, 5%.

Graduation And Dropout Rates

Graduation and dropout rates are another factor of the readiness of a community to take advantage of economic development opportunities as they indicate the general education level. The statewide four-year graduation rate for high school students for the 2007-2008 academic year was 75.4%. Only half of the 14 counties in the RACEC area met or exceeded this rate.

The statewide dropout rate is 2.6%, a rate which 10 of the 14 counties exceeded. Five of the counties had dropout rates two or more times that the statewide rate. Figure 9 includes the comparison of individual county graduation and dropout rates to the respective statewide rates of 75.4% and 2.6%.

Figure 9 Graduation and Dropout Rates for Counties in the North Central Florida RACEC Area

County	Graduation Rate (%)	Dropout Rate (%)
Baker	77.5	1.8
Bradford	75.4	5.0
Columbia	77.6	0.6
Dixie	76.6	4.3
Gilchrist	92.1	0.7
Hamilton	60.0	4.4
Jefferson	57.5	5.3
Lafayette	92.0	2.8
Levy	72.1	2.9
Madison	69.5	5.1
Putnam	78.0	5.7
Suwannee	71.6	6.8
Taylor	74.0	4.0
Union	71.4	1.2
Florida	**75.4**	**2.6**

Note: Dropout rates highlighted in red indicate those county rates equal to or higher than the state rate.

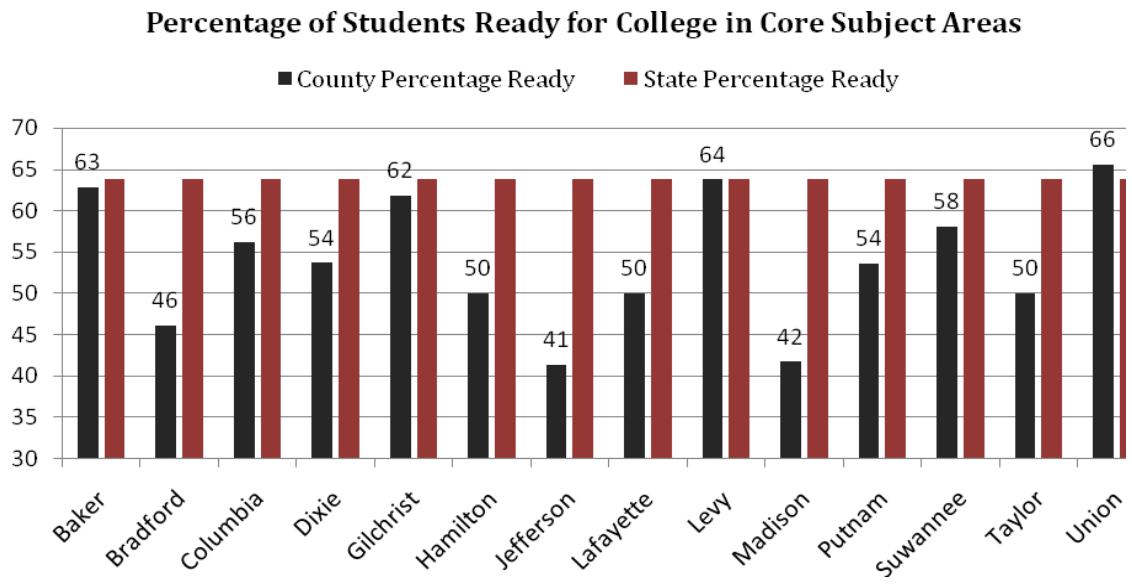
College Readiness

Florida measures readiness for college through the administration of the Common Placement Test (CPT). The CPT measures competency in reading, writing, and mathematics, and those students who tested

competent in all areas are defined as ready for college. This test is given to graduates entering college in Florida at any level, and the rates reported in this section are for those students who graduated in 2007 and enrolled as college students in the 2007-2008 academic year.

Statewide, the rate of students who tested ready for college was 64%. Of the 14 counties, only Union County had a readiness rate above the state rate, testing at 66%. Two counties were among the lowest in the state, with Jefferson and Madison testing at 41% and 42%, respectively. Figure 10 presents the comparison of individual county college readiness rates to the statewide college readiness rate of 64%. All rates are percentage values.

Figure 10. Percentage of Students Ready for College in Core Subject Areas by County for Counties in the North Central Florida RACEC Compared to the Statewide Rate



EMPLOYMENT PROFILE

The 14-county RACEC region encompasses approximately 1,288 businesses. In addition, there are 265 health care facilities, according to the Florida Agency for Health Care Administration. Key industries in the region include agriculture, distribution, manufacturing, utilities, and public services.

Figure 11. Percentage of the 2007 Statewide Average FCWI for Counties in the North Central Florida RACEC Area

County	FCWI	Rank
Baker	97.24%	29
Bradford	96.67%	31
Columbia	93.65%	47
Dixie	92.21%	49
Gilchrist	94.34%	42
Hamilton	91.32%	56
Jefferson	91.49%	54
Lafayette	90.79%	58
Levy	94.19%	46
Madison	88.38%	65
Putnam	95.51%	36
Suwannee	91.25%	57
Taylor	88.72%	62
Union	95.59%	35
Florida	**100%**	**-**

Relative Wages

The Florida County Wage Index (FCWI) measures the relative wages paid to a typical worker performing an identical job at a specific point in time. Data shown is a percentage value of the statewide average FCWI, and the rankings are relative to other counties across the state. Of the ten lowest-ranked counties, four are in the region. A lower FCWI percentage value indicates a lower relative wage. Please see Figure 11 for regional data.

Per Capita Earnings

Per capita earnings measures the total income for a specific county and divides it by the total population of the same county. Per capita income figures are not limited to the income earners in a county, but rather include the whole population. Compared to state and national averages, per capita income is a key indicator of the economic health of a community. The North Central Florida RACEC region has some of the lowest incomes in the state, including the four lowest and five of the lowest ten. Figure 12 includes county specific information and respective rank within the state.

Figure 12. Per Capita Earnings for Counties in the North Central Florida RACEC Area and the Statewide Ranking of Each County

County	Per Capita Earnings	Rank
Baker	25,292	44
Bradford	23,922	49
Columbia	23,916	50
Dixie	20,055	64
Gilchrist	26,064	40
Hamilton	17,142	67
Jefferson	26,781	37
Lafayette	17,196	66
Levy	24,417	46
Madison	21,293	60
Putnam	23,914	51
Suwannee	24,929	45
Taylor	24,062	48
Union	17,297	65
Florida	**38,417**	**-**

Labor Force And Unemployment Rate

Data contained in this section provide information on the total potential labor force in a county, the total employment, as well as the rate of unemployment within that county, as of 2008. Six of the 14 counties have unemployment rates that are higher than the statewide rate, again demonstrating the depressed economic conditions in this region. Figure 13 illustrates the data for each county.

Figure 13. Total Labor Force and Unemployment Rates for Counties in the North Central Florida RACEC Area (2009)

County	Labor Force	Employed	Unemployed	Unemployment Rate
Baker	12,038	10,677	1,361	11.3%
Bradford	12,655	11,545	1,110	8.8%
Columbia	33,087	29,652	3,435	10.4%
Dixie	5,493	4,752	741	13.5%
Gilchrist	7,849	7,030	819	10.4%
Hamilton	4,833	4,231	602	12.5%
Jefferson	6,732	6,124	608	9.0%
Lafayette	3,067	2,800	267	8.7%
Levy	17,126	14,942	2,184	12.8%
Madison	6,884	6,001	883	12.8%
Putnam	32,808	28,568	4,240	12.9%
Suwannee	17,928	15,965	1,963	10.9%
Taylor	9,220	8,131	1,089	11.8%
Union	5,258	4,772	486	9.2%
Florida	***9,147,000***	***8,090,000***	***1,058,000***	***11.6%***

Note: Unemployment rates higher than the statewide rate are highlighted in red

EXISTING INFRASTRUCTURE

[Note: Data documenting the existing infrastructure in this region are found in the Supplemental Data document submitted with this report.]

Florida has a plentiful supply of Internet backbone pathways that have tremendous amounts of available capacity. In Miami, for example, from the Network Access Point (NAP) of the Americas, all traffic coming and going to South America rides the undersea fiber optic superhighway. Two paths northbound from Miami provide massive trunks of capacity up both coasts, interconnecting again in Orlando and routing directly though the North Central Florida RACEC region headed to Tallahassee (along I-10), Atlanta (along I-75) and Jacksonville (along I-95).[3] There is even a major backbone pathway through the cities of Chiefland and Perry.

In the United States, there are three primary long-haul (another way to describe the backbone) fiber carriers that control a majority of the long haul fiber access. They are AT&T, Verizon and Level 3 Communications. All three carriers have facilities within the North Central Florida RACEC region that are available for upstream connection.

Additionally, the State of Florida built a telecommunications network operated by contracted commercial carriers. Currently, AT&T runs the State of Florida network. The Florida Department of Management Services (DMS) then buys and sells services to specific state and local entities. By statute, state government agencies must purchase capacity from DMS. The stated goals of DMS are providing quality and cost effective telecommunications and radio services statewide to public entities that serve Florida's citizens. Utilizing capacity from the state network or providing capacity and reach for the customers of the state network will certainly have the benefit of greater Middle Mile infrastructure. The proposed NFBA open access Middle Mile network could provide a completely new diverse path or a redundant connection for intra-networking among government entities and to the Internet for the 14 counties to be served.

As stated previously, connecting to the Internet backbone is the first step in putting a Middle Mile network in place - as it represents the “supply” of available capacity. Fortunately, there are several points at which connection in the North Central Florida RACEC region is geographically advantageous. With a Middle Mile network it is even possible to connect to Internet access points outside of the region and transport the capacity back to the network. (For the Last Mile - or where the network connects to the customer - there is another set of considerations and parameters).

In portions of the RACEC, incumbent providers have invested in infrastructure that makes broadband service (defined by the federal government as 768 Mbps down, or inbound to a computer, and 200 Mbps up, or outbound from a computer) available to large portions of their franchise areas (areas where they are approved to provide regulated telephone service). Windstream, NEFCOM, Comcast, Embarq and other providers cover portions of the region with fiber and copper wire-line infrastructure, which allows them to provide Internet access over the same assets through which telephone or cable services are offered.

Despite their investment, the 14-county region when taken as a whole remains underserved. Of the three criteria used by the federal government to designate served versus underserved areas, the RACEC fails to meet the minimum uptake or adoption rates. To be classified as a “served area” there must be at least 40% of the households in the service area that actually purchase broadband service. The North Central Florida RACEC uptake rate is 34.9% (full data set is summarized in Appendix A), and it is thereby classified (as a region) as underserved.

[3] Interstate highways I-10 and I-75 traverse the region offering ideal access to regional markets and inter-modal facilities. State and local access roads provide excellent and uncrowded access to the region’s cities and counties. Manufacturing businesses also find the transportation infrastructure to suit their need to conveniently access markets.

BARRIERS TO PROGRESS

Three main barriers to progress exist within the North Central Florida RACEC region. The first is low population density in the region. With fewer people and businesses to serve, the opportunity for existing providers to recover increased investment in capacity and infrastructure is limited, which limits geographic coverage and available choice of service providers.

Second, the type of infrastructure that delivers high quality telephone service, which is predominant in the region, is not as efficient and more costly for providing the high data rate demands of today's Internet applications and uses. Telephone conversations require small data capacity and dedicated connections, while Internet usage is most efficiently served by very large data capacity pipes that do not require dedicated, end-to-end connections. The result is that when you expand telephone infrastructure to meet Internet demands, it is a more expensive and less efficient proposition.

Third, the underlying economic challenges that face the region, many referenced previously in this report, make affording broadband service difficult. In larger metropolitan areas, where broadband capacity is plentiful and service providers have a larger customer base, high-speed broadband is readily available and at significantly lower cost per Mbps. There is also a more diverse economy as well as a larger tax base, making public and private investments financially sound options. The North Central Florida RACEC, however, is characterized by a dispersed population, struggling economy and limited public and private resources.

The result is that within the 14-county RACEC, there are Last Mile providers and the long-haul Internet pathway, but there is little Middle Mile infrastructure. The barriers that have been identified are concentrated in areas where incumbent providers have made substantial investment in their own networks and are successful in distributing real broadband services to their subscribers. In much of the region, however, accessing Middle Mile infrastructure owned by an incumbent can be prohibitively expensive, making it infeasible even for many government agencies and businesses to afford greater needed capacity.

Existing carriers have little economic incentive to expand access and capacity or build additional Middle Mile infrastructure. Little competition and the unlikelihood of an adequate return on their investment are the primary obstacles. The weakness of the local economy is exacerbated by the inability to attract new businesses to the region - frequently as a result of the lack of cost-effective broadband internet access. The poor economic climate and the current recession within the 14 counties is difficult enough; but when the geographic expanse (more than 9,000 square miles) and terrain and limited population in the cities and towns are factored in, there is not a large enough customer base over which to allocate the costs of such an investment for a private carrier to receive an adequate return on their investment. In some cases incumbent providers have built out Middle Mile assets, but they are limited to their own service areas, and (generally) serve their own Last Mile networks.

COST FOR EXISTING SERVICE

Cost for service is a primary factor in adoption of services, and this definitely proved to be the case in the North Central Florida RACEC. Even when it is possible to deliver broadband services to a group of customers, the incumbents frequently determine that they cannot recover their investment by charging rates that the customers can afford - without competition - and so they cannot justify the investment.

A typical cost for 3 Mbps Internet service in a metropolitan area is approximately $40-60/month. In the RACEC region, the cost per Mbps/month delivered to anchor government tenants by current providers is an average of $228/Mbps/month. The capacity may be available to deliver broadband service, but this would hardly fall in the range of residents whose household income is 33% below the state average.

The average cost per megabit for Direct Internet Access in this region is $228 per month. Six of the 14 counties in the North Central Florida RACEC are in the top t counties in the state that have the most expensive Internet connectivity (see Figure 14). With costs like these, the federal standards for considering access to broadband become somewhat distorted and unrealistic. Many of the counties listed below are within the North Central Florida RACEC.

Figure 14. The Most Costly Counties for Connectivity in Florida

Counties	Average Annual Cost per MBPS
1. Dixie County	$23,76 3/ Mbps
2. Union County	$8,910 / Mbps
3. Gilchrist County	$7,129 / Mbps
4. Putnam County	$6,256 / Mbps
5. Osceola County	$4,016 / Mbps
6. Santa Rosa County	$2,727 / Mbps
7. Monroe County	$2,521 / Mbps
8. Hamilton County	$1,642 / Mbps
9. Baker County	$1,594 / Mbps
10. Escambia County	$1,445 / Mbps
11. Miami-Dade County	$994 / Mbps
12. Alachua County	$922 / Mbps
13. Indian River County	$840 / Mbps
14. Taylor County	$760 / Mbps

Source: April 29, 2009, Information Use Management and Policy, Florida State University (http://www.ii.fsu.edu).

This study examined the costs for two key institutions in the RACEC region: the school district and public libraries.

School District Analysis and Cost

Data provided by the Department of Management Services shows that a total of 126 Mbps of capacity is provided to the school districts in the North Central Florida RACEC by AT&T through the State of Florida DMS contract. Based on the increments of speed, these services are provided via T-1 (1.5 Mbps) infrastructure. The total annual cost for all 14 county districts combined is $344,906 or $28,742 per month. The average cost per Mbps is $228/month.

Competitive pricing was provided by the State of Florida's Department of Management Services. Figure 15 indicates the current annual cost of Direct Internet Access to school systems in the region.

Figure 15. Direct Internet Access to the School Districts in the North Florida RACEC Area

City	County	Zip	Internet Service Provider	Current Connection Speed to District DMARC	Number of Connections Networked to School District	Annual Connection Cost
MACCLENNY	BAKER	32063	AT&T	9 MBPS	1	$27,946.44
STARKE	BRADFORD	32091	AT&T	6 MBPS	1	$19,019.28
LAKE CITY	COLUMBIA	32055	AT&T	12 MBPS	1	$30,536.04
CROSS CITY	DIXIE	32628	AT&T	9 MBPS	1	$27,946.44
TRENTON	GILCHRIST	32693	AT&T	9 MBPS	1	$27,946.44
JASPER	HAMILTON	32052	AT&T	6 MBPS	1	$19,019.28
MONTICELLO	JEFFERSON	32344	AT&T	3 MBPS	1	$10,328.64
MAYO	LAFAYETTE	32066	AT&T	6 MBPS	1	$19,019.28
BRONSON	LEVY	32621	AT&T	15 MBPS	1	$32,154.60
MADISON	MADISON	32340	AT&T	10 MBPS	1	$29,452.92
PALATKA	PUTNAM	32177	AT&T	15 MBPS	1	$32,154.60
LIVE OAK	SUWANNEE	32064	AT&T	6 MBPS	1	$19,019.28
PERRY	TAYLOR	32347	AT&T	14 MBPS	1	$31,343.88
LAKE BUTLER	UNION	32054	AT&T	6 MBPS	1	$19,019.28

Library Analysis and Cost

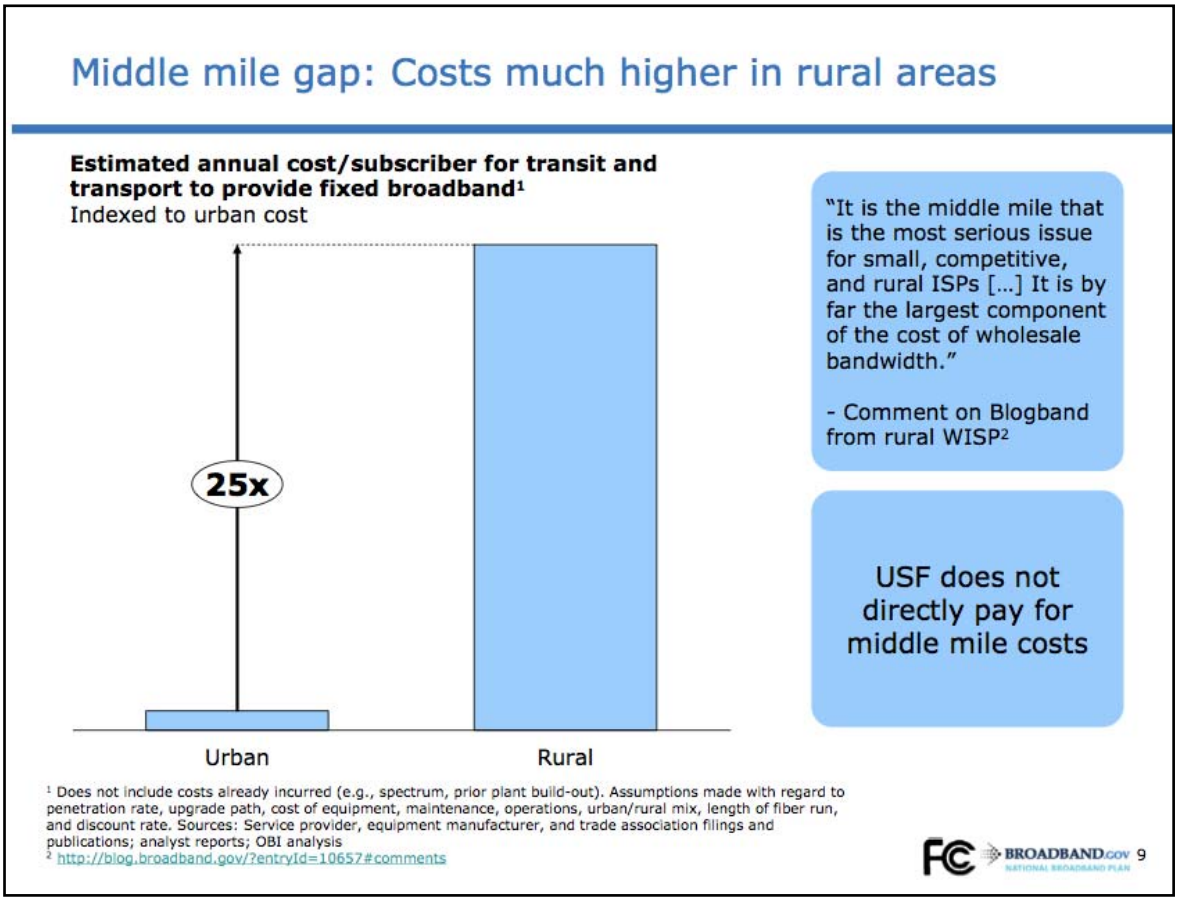
Libraries are becoming more and more important than ever in today's economy as central facilities where people can go to get information, conduct commerce and find jobs. They take on an additional level of importance in rural areas, where broadband infrastructure has not yet reached residences. Price per Mbps is extremely high and capacity at these libraries is relatively low.

While each school district and library system has access to broadband, when compared to their urban, suburban counterparts, they get far less capacity at far greater cost. In reality, while the federal government has not stipulated an organizational definition of broadband, it is clear that rural school districts and library systems are forced to operate at a major "value disadvantage" that will not change without greater capacity or competition in the region.

The cost of providing Middle Mile capacity/service across large geographic areas is what creates the pricing gap. While Universal Service Funds (funds provided through separate federal subsidies) defray the cost of providing telephone and Internet service (which is a Last Mile function) to rural areas, it does not pay for the Middle Mile transport, leaving the cost for services much higher to the end user.

This gap in affordability between urban and rural counties is noted in the Federal Communication Commission's research, as well. Graphic 8, provided by the FCC in their broadband workshops in 2009, identifies the key difference in the ultimate cost for providing broadband to urban versus rural customers.

Graphic 8. Gap in Middle Mile Costs in Urban versus Rural Areas



EXISTING BROADBAND CAPACITY

There is not enough available capacity distributed throughout the 14-county RACEC to meet today's needs (much less the future needs) of the local governments, public service providers, businesses or residents. Sufficient coverage of minimum broadband standards exists in portions of the region; but as a whole, there is not enough capacity available to most parts of the RACEC. A shortage of capacity coupled with a large geography and low population density makes it difficult to justify the very significant investment required to provide broadband service across the entire region.

The basic challenge becomes finding a way to distribute more bandwidth across the RACEC. More bandwidth translates into growth, economic opportunity and lower costs to end users. Private investment by incumbent providers has been inconsistent and limited to their internal parameters for a return on investment. Unfortunately, as facilities-based providers of telephone service, they have business models that may not currently include adoption of alternative methods of service delivery or be able to fully utilize their existing infrastructure to accommodate the demand at price points they can afford. Low population density compounds their challenge in projecting an adequate return.

WHAT IS NEEDED AND WHY

The simple answer to what is needed is more capacity at lower cost, but how is that best achieved? The local incumbent providers have not been able to expand services on a regional basis; and in today's world, the lack of broadband capacity for a business, school, library, clinic, non-profit organization or public safety department has become a limiting factor in the services that can be leveraged or provided. Limited access to real high-speed broadband (by "real" it is meant substantially faster than the federal government's minimum standard) is a major handicap to economic development in the region. Companies looking to relocate or expand consistently cite access to high-speed broadband among prime criteria for site selection.

The RACEC region lacks the ability to distribute the available capacity from the huge Internet backbone pathways that traverse it. Thus, it is the recommendation of this study to create and deploy an open-access Middle Mile network that can provide much greater data capacity to local access providers (Last Mile Providers) and anchor institutions (public safety, healthcare, education, etc.).[4] This would have the dual advantage of encouraging additional Last Mile provider activity in expansion of coverage areas and new entrants to the market. By making capacity plentiful, where it can then be inexpensively resold to the end users, all facets of the local economy can benefit.

Key anchor institutions that serve the communities are vital drivers for capacity demand; if they have the bandwidth they need, then there is much greater potential for that capacity to spill over to the region's residents. In order for a network to be regional (covering a substantial geographic area), it stands to reason that it must be a Middle Mile distribution network.

Deploying a Middle Mile network could be compared to adding more on-/off-ramps and state and county roads to an Interstate highway system. This expands access, capacity, and reliability for service providers who can then reflect those lower costs in providing much more capacity at lower cost. Opening the access also makes it easier for more companies to enter the marketplace, creating more competition and choice.

If the Middle Mile network is intended to distribute capacity across the region, then its ability to bring abundant capacity to the region must seek to connect to as many customers/entities as possible. Defining the network as open-access wholesale is the logical choice for offering more capacity (and certainly more choices of providers); this structure allows anyone to purchase supply. Last Mile providers, whether they are large or small, incumbent or new, would have access to the network's capacity.

The creation of a new network across the 14 counties will allow for specific economies of scale to use a common shared infrastructure. This does not exist today. Rural counties individually may encompass expanses of sparsely populated areas. The 14 counties in the North Central Florida RACEC could be linked across multiple jurisdictions and share infrastructure like software and databases, making for a stronger regional connection, reduction in redundant services and sharing of costs.

Today, most public safety entities utilize Land Mobile Radio solutions for critical voice communications. These systems use very small slices of spectrum and are usually backhauled via non-redundant copper infrastructure. These networks are especially vulnerable - they are typically unprotected and non-redundant. Many public safety entities in the North Central Florida RACEC region have serious concerns about this situation, and the cost of traditional backhaul solutions can be prohibitively expensive for rural public safety enterprises. Any network solution must address the critical needs of the regions first responders. Redundancy and increased capacity must be high priorities for the Middle Mile solution.

To make up for the challenges of distance, increased access to high-speed broadband could enable remote monitoring, instant availability to information and create other efficiencies for critical government services, including police, fire rescue and emergency management. The jurisdictions would be able to pool resources, coordinate regional efforts and provide the kind of information access that could save time, money and lives.

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[4] An infrastructure that cost-effectively distributes capacity to *all* current Last Mile providers as well as to any new providers is an essential parameter of the regional broadband solution.

Currently, most schools in the region are connected to the internet at T-1 speeds and below. In order to gain the benefit of broadband, and maintain some degree of equality with those in urban areas, schools should have 50-100 Mbps or more, capacity that could be provided through a new Middle Mile network.

Because the needed investment will not come from within the region due to the limiting factors described, pursuit of federal grant funding is critical as it offers a unique opportunity to leverage outside capital that could legitimately benefit every sector of the local economy. By providing the capital investment for a Middle Mile network, the primary barrier to economic growth and opportunity - lack of broadband access - would be eliminated, creating a platform for individual and institutional advancement.

Proposed Solution

PROPOSED NETWORK

As stated in the previous section of this report, the fastest, most cost-effective means of delivering the needed broadband capacity across the 9,137 square miles of the North Central Florida RACEC is through an independent, open-access and flexible Middle Mile network. This proposed network will rely heavily on proven high-capacity wireless technologies which can meet quality and capacity needs of the region.

Announcement of available federal stimulus funding led to the creation of a new governmental entity, the North Florida Broadband Authority (NFBA). The NFBA was created pursuant to an interlocal agreement between all 14 RACEC counties and several cities within - 22 separate governmental entities in all. The proposed wireless Middle Mile network is hereafter referred to as the NFBA network.

Aside from adding a new entity to the mix, the decision by the North Florida Economic Development Partnership to lead the formation of the NFBA in order to pursue federal funding shaped the development and evaluation of this proposed Middle Mile solution. Recognizing the level of competition for broadband stimulus grant funding, it was necessary to take a low-cost/high-value approach to selecting the most appropriate solution for the network. With roughly $4 billion in first-round funding available, and more than seven times that amount requested, it was clear that there would at some point be an analysis of greatest return on the allocated funds. In other words, those applications that demonstrated greatest need AND delivered a proposed solution that cost-effectively solved the problem would logically have the greatest opportunity for success. The wireless Middle Mile solution detailed in this report was the type of solution that was the best case to evaluate for feasibility (contingent on grant award).

Having described the problems associated with extending access across the Middle Mile, the goal was to configure a network that by design eliminated the ability for incumbent providers to control, restrict or excessively charge for access to the backbone or other vital network infrastructure. The proposed network includes a new, independent and open pipeline to Last Mile providers and anchor institutions. This technology solution gives access directly to the main backbone of the Internet and avoids the “special access” fees that have historically restricted growth and uptake by customers.

The key network components involved in this proposed solution for Middle Mile access are the Microwave Ring Topology and the Microwave Point-to-Point (PTP) link to the Last Mile provider or anchor tenant premise, all of which is subsequently explained. This is primarily a new deployment to areas that currently do not have public high-capacity bandwidth options. The funding requested in the broadband grant application is intended to cover the capital costs of building out the Middle Mile Access, Microwave Ring Topology and some Microwave PTP links to customer premises.

This design proposes to meet the needs of the North Central Florida RACEC and will have the following characteristics:

Open Access: ability to deliver at least 100 Mbps capacity to any Last Mile provider/anchor tenant on an equal basis

Capacity: cost-effectively deliver at least 100 Mbps to each Last Mile provider; at least 10 Mbps to each anchor client, maximum 80ms of network latency

Reliability: provide comparable reliability at or above industry standards

Architecture: redundant service through ring and consecutive point architecture where practicable; must have multiple backbone connection points

Secure: provide security sufficient for anchor institutions, government agencies and businesses

Flexibility: network must be able to adapt to changing conditions such as increased customer capacity needs, changing demographics, usage patterns, network connection density and location of key customers

Scalability: future proofing the region against the inevitable rise in demand for speed/capacity, bandwidth intensive applications. Back-office services and upstream capacity must also be scalable

Cost-effective: appropriate for serving the region

Sustainable: a sustainable business model

Proven: utilization of technologies with successful track record

Full Coverage of the Region: reach Last Mile providers and anchor tenants that serve customers throughout the entire 9,137 square-mile region

WIRELESS TECHNOLOGIES

Wireless technologies for point-to-point communications have been around for decades and have evolved tremendously since MCI helped to change the telecommunications landscape. As the demand for Direct Internet Access (DIA) connectivity increased dramatically in the 1990s, variations of the wireless point-to-point architecture evolved. Consecutive point architecture emerged as a viable alternative to all fiber networks. The advantages of wireless point-to-point communications include flexibility, speed of installation and cost. As microwave and millimetric wave radio technologies matured and manufacturers became more plentiful, wireless communications has become a valuable alternative, yielding many of the same desirable performance characteristics as fiber.

Wireless technologies have the advantage of using a variety of solutions and architectures that scale up as well as down (particularly important in rural markets). When time and money are constrained, building a cost-effective Middle Mile network simply cannot wait for new copper or fiber to be put in place. A wireless Middle Mile solution can be deployed in a matter of months versus years for fiber optic solutions and can cover a vastly greater service area.

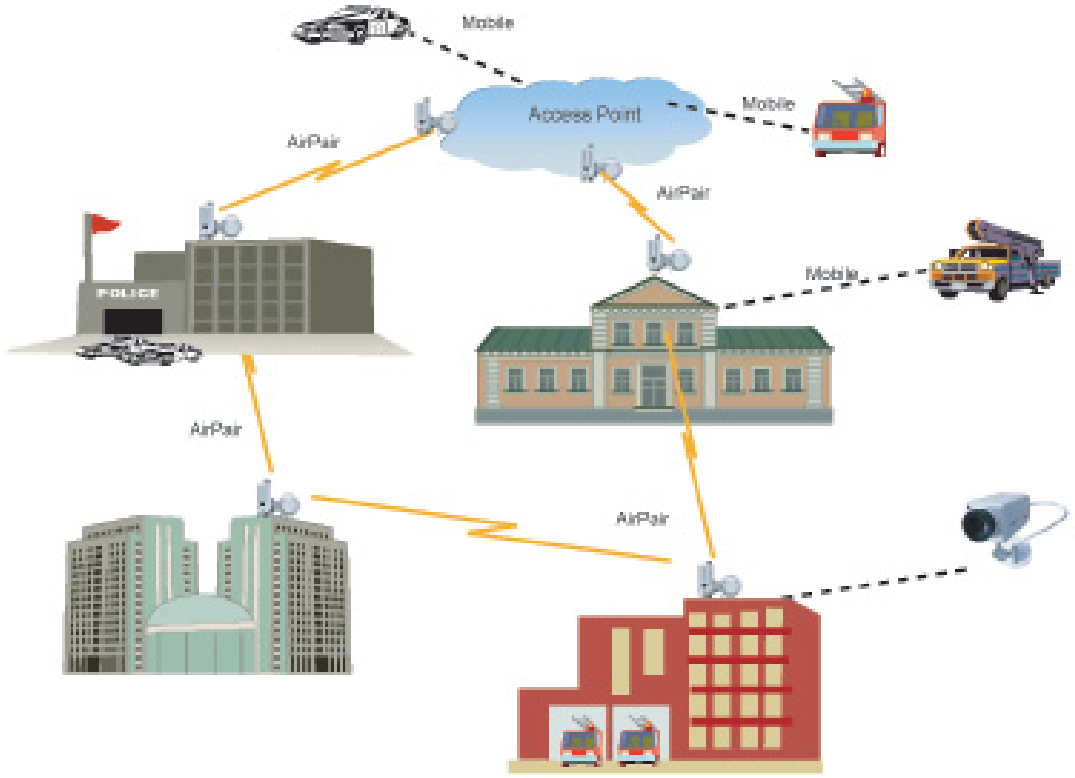
It is common knowledge in the industry that it is cheaper and faster to install a microwave link than to run the same distance with copper or fiber. Where perceptions differ is in the comparative scalability and reliability of microwave networks. When scalability of the technologies are compared, fiber is the clear winner. Its advantage in transport capacity is only limited by the number of available strands in the backbone connection - each strand having multi-Gbps capacity.

Microwave networks have a different set of valuable characteristics. The ability to put up a link in the blink of an eye has no technological peer. To counter the reliability argument, diverse redundant paths are introduced, creating networks that automatically re-route traffic (heal themselves) when a link fails. Adding capacity is no more difficult than adding additional links; this process is quick, inexpensive and may be applied only to those portions of the network that need it. Wireless networks can flexibly and reliably get capacity to where it does not currently exist or where it is not cost effective to provide additional capacity to areas with low customer density.

To provide the level and Quality of Service (QoS) and reliability demanded by the Last Mile providers and anchor institutions, a wireless network must be able to meet the stringent quality of service parameters that deliver accurate and real-time voice, data and video or other applications that Last Mile providers may make available. The physical transport layer and the Direct Internet Access must at least meet industry standards for commercial services providers.

Graphic 9 presents a simple network illustration for a wholesale network. Note the ring configuration - should any link fail, traffic is automatically re-routed. Public safety organizations realize tremendous value in redundant, reliable and fast access to information. Lives depend on the first responder's ability to quickly access data, communicate with other units and have immediate access to reference data.

Graphic 9. Wireless Integration of Public Safety Agencies



This graphic demonstrates the access to real-time integrated information from among public safety agencies.

There are two main scenarios that appear to be clearly in favor of utilizing microwave technologies in a Middle Mile network. The first is when there is not an existing transport network available to serve a portion of the region, and the second is when the existing network does not have enough capacity to handle the traffic. As a corollary, if the additional capacity needed is expensive because it is scarce or without competition, it can for all intents and purposes be unavailable for consideration. For a large portion of the North Central Florida RACEC region this is the case.

According to the Yankee Group, 70% of Middle Mile Infrastructure being constructed today is utilizing wireless transport technologies. Clearwire, one of the nation's leaders in deploying wireless (4G) Last Mile services, also builds its own Middle Mile networks, simply because it is the fastest means of deploying their service. According to John Saw, Clearwire's CTO, an estimated 90% of Clearwire's Middle Mile (backhaul) network utilizes microwave technology.

Technologically, the Middle Mile solutions around the country provide numerous examples of every type of technology. Those most tested and proven are fiber and wireless networks that continue to see evolutionary increases in capacity and reliability as well as greater competitiveness in pricing. Identifying the methodologies that specifically meet the needs of the RACEC region today and in the future will necessarily be a trade-off among several attributes: capacity, reliability, cost, speed of deployment and flexibility.

DETAILED NETWORK DESIGN—A COMPLETE SOLUTION

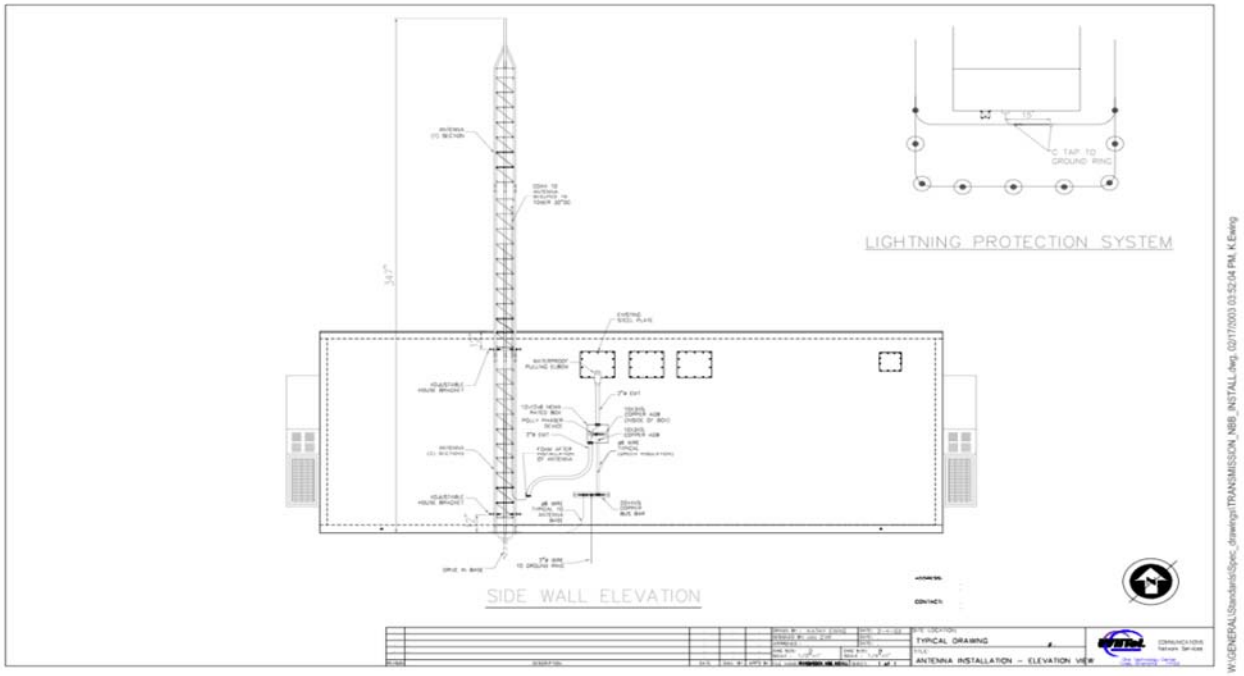
The backbone of the World Wide Web is primarily comprised of a series of inter-connected and very high-capacity fiber networks, a portion of which runs through the 14-county service area. Along these routes there are fiber regeneration facilities that regenerate light transmission signals (the signal must be periodically regenerated due to slight losses in strength over distance). The proposed Middle Mile network will tap into these facilities and connect to a core router capable of delivering at least 5.9 Gbps. It is designed for ultra-reliable operation with a mean time between failures (MTBF) of over 110,000 hours. At these connections, redundancy has been engineered into the system through a secondary router using the same configuration in the standby mode. Dual power supply is standard and a tertiary is available.

The facilities will include both battery backup and diesel generators in case of prolonged power failures. These units are housed in a hardened concrete structure with vandal-resistant features. A self-supporting tower is to be attached to these fiber huts (see Graphic 10) in a process frequently referred to as "Mid-Stage" access. The microwave radios are mounted on the tower. The design utilizes seven of these upstream access sites injecting a minimum gross aggregate of 7 Gbps into the Microwave Ring Topology.

RELIABLE MICROWAVE RING TOPOLOGY

The Microwave Ring Topology uses licensed frequencies at 11, 18, 23 and 80 GHz (generally speaking, the higher the frequency, the shorter the link distance), the selection of which is determined by the distance connected across each link and the bandwidth requirements. These frequencies combine the best characteristics for distance and minimal weather interference and are easily licensed from the FCC on a per link basis. Though these are licensed frequencies, spectrum is readily available. These radios will distribute the bandwidth among the 14 counties using a ring topology. This topology creates a highly available bandwidth because if one link goes down for some reason, the network will automatically switch to the other link. On top of the horizontal ring topology of the microwave network, there is vertical ring topology that allows the existing fiber to not only be the source of Direct Internet Access (DIA), but also redundant links that would be part of the self-healing topology.

Graphic 10. Diagram of a Fiber Hut

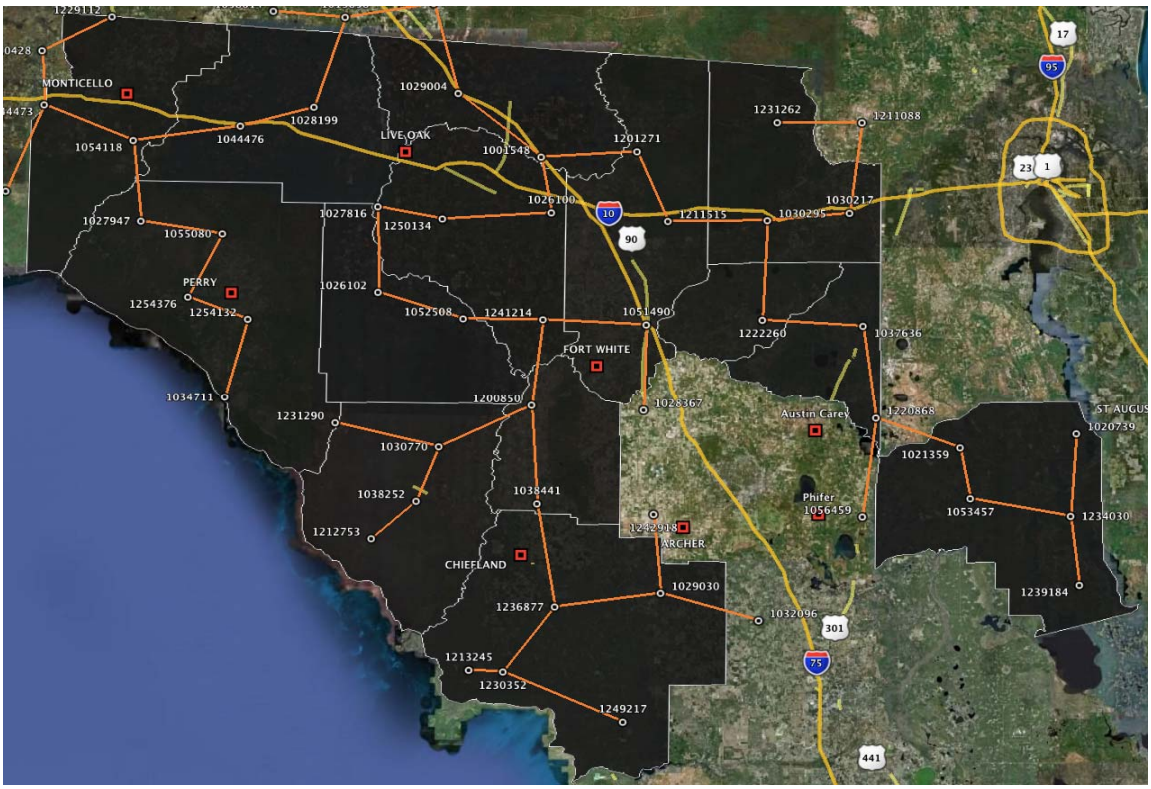


Note: the "Fiber Hut" that houses the switching routing and troubleshooting equipment at a tower site. Each hut must be air-conditioned and access is restricted to tower owner and wireless tenants.

The NFBA ring topology considers two contributing factors to wireless unavailability, including equipment and the path or air unavailability. The equipment unavailability can be avoided by using two redundant, parallel links, which protect against equipment failures. This would increase the service availability of the 99.978% service up to 99.99%, which is equal to the availability to which the path is engineered.[5] For optical services, the fiber path becomes the limiting factor, with a resulting availability of 99.986%.

[5] Similarly, if the path was engineered to 99.995%, equipment redundancy will increase the service availability to also be 99.995%.

Graphic 11. Minimum Link Coverage for the North Florida RACEC Network



Note: Orange = minimum link coverage for the region; Red = fiber backbone connection points (also called "Points of Presence" or POP). Additional radio links will be installed to complete the rings and create dual-path connections to the mid-stage or POP locations at Chiefland, Perry, Monticello, Live Oak, Fort White, Archer, and ultimately St. Augustine to the east.

In order to increase the service availability to 99.999%, link diversity is required. One way of doing this is to introduce a relay site on the redundant link. However, this introduces additional cost. This is why the proposed network is based on a ring topology. It is a more efficient way of providing this diversity.

Lastly, for wireless links the major factor affecting availability is the rain. Providing diverse paths and using different frequencies dramatically reduces the impact of rain on a path. The path diversity improvement factor (PDIF) provides a measure of the joint probability of two connecting links failing simultaneously.

Finally, at these microwave tower sites, battery backup for a minimum of eight hours has been designed into the system, as well as vandal-resistant and hardened concrete features described for the backbone access point (the network Point of Presence, or POP). After evaluating the morphology clutter data, the FCC tower sites with clear line of site and ability to look over tall trees and other obstructions were selected to create an unobstructed Fresnel zone. The industry standard tool, Pathloss, was used to engineer 99.999% availability at a minimum of 100Mbps full duplex, for each link.

CUSTOMER PREMISE LINKS (END USER)

The microwave PTP customer premise link will vary based on customer data rate requirements, but the spacing of the tower sites has been engineered to create a high level of availability to any site within the 14-county footprint. As this is designed as a Middle Mile network, the focus is on providing a robust, reliable infrastructure to which a Last Mile provider or anchor tenant can connect. The planned Customer Premise

Equipment (CPE) meets the critical needs demanded by carrier-class customers by delivering wireless Gigabit Ethernet/100 Mbps connections with up to 600 Mbps full duplex (meaning simultaneous capacity in both directions) over licensed or unlicensed frequencies. The equipment can scale from 10 to 600 Mbps in 10 Mbps increments via simple software configuration. Typical transmit power of these devices will not exceed 26 dBm. This system is designed to scale and deliver up to 1 Gbps with a single wireless connection.

In simple terms, each radio connection from a network tower to a customer site is capable of providing up to 600Mbps (upstream and downstream) without adding additional radios. For critical service requirements, the customer may be connected in a ring to other customers or to other towers, which allow traffic in and out of the customer site in either direction, ensuring against downtime.

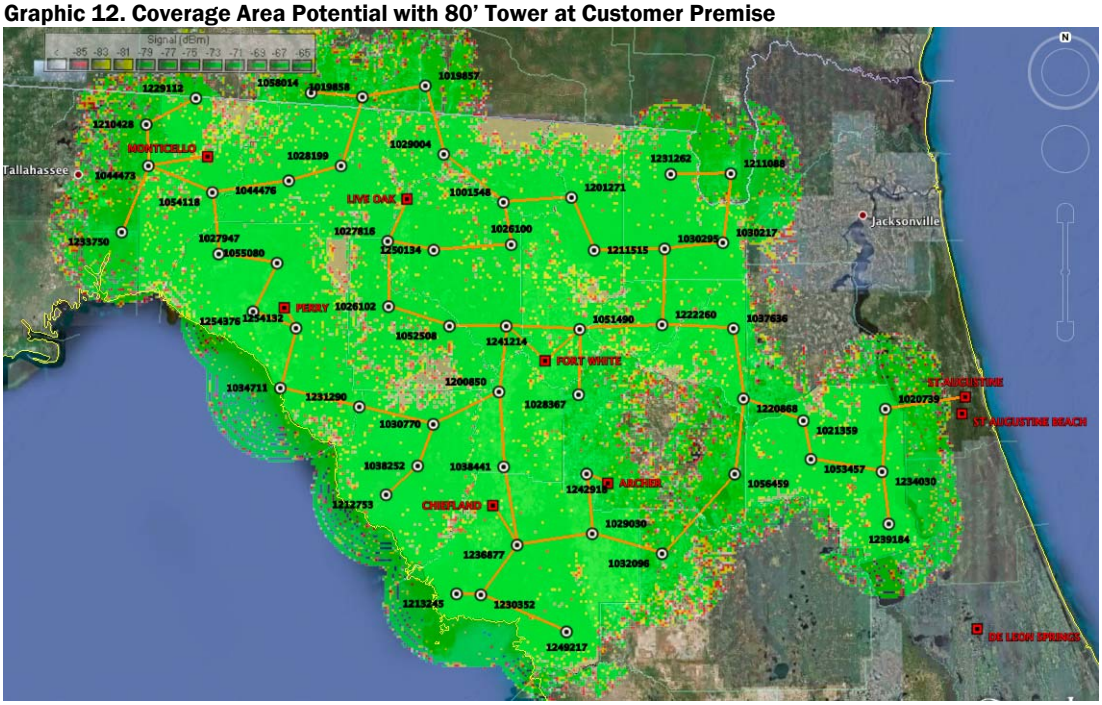
County-by-county network coverage has been mapped, and the maps are provided in Appendix E.

COVERAGE

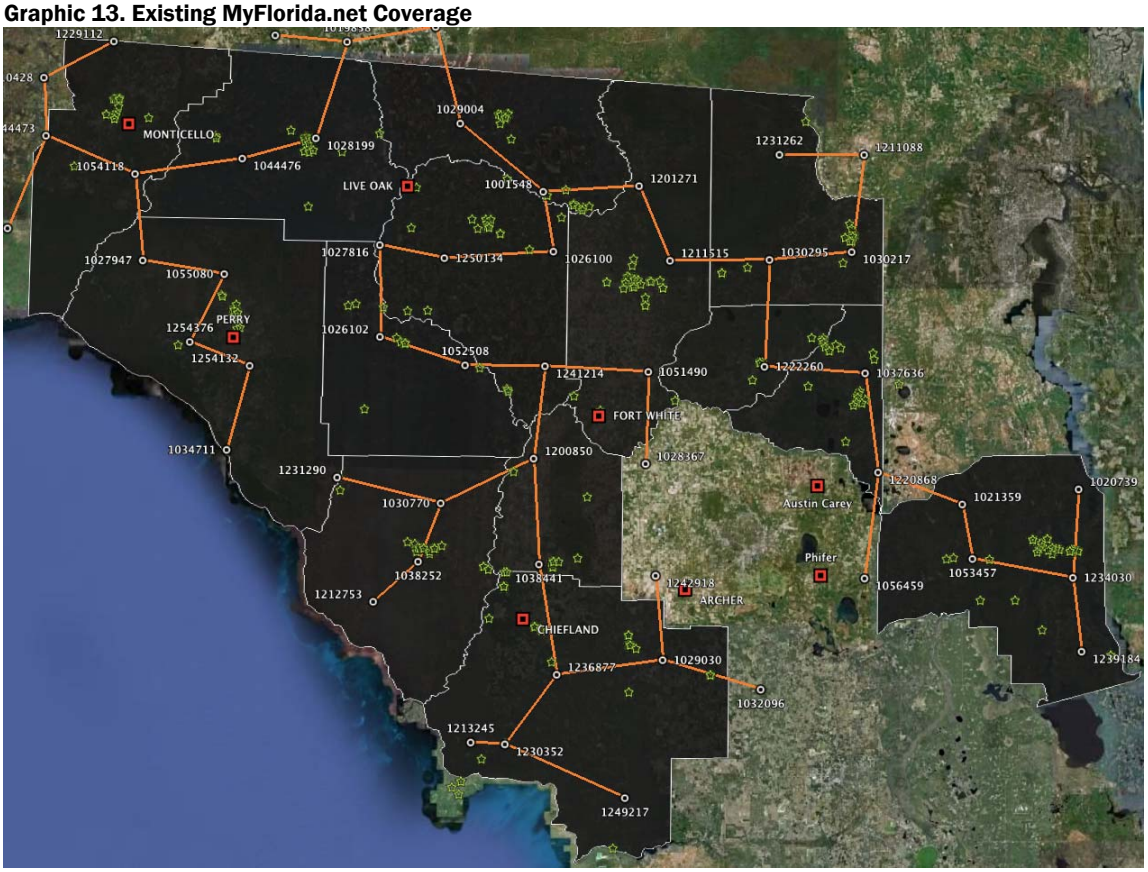
The maps shown in Graphics 12, 13, and 14 show various depictions of the coverage area. In Graphic 12 the shaded green circular areas represent an example of the coverage areas that may be provided by wireless Last Mile providers, with the degree of coverage from just the bare minimum Middle Mile coverage of the region. More than 100 additional customer and available tower assets will augment this network for even greater density of coverage.

Graphic 13 shows the proximity to current MyFlorida.net users (green dots). Existing anchor institutions currently being served via the Florida Department of Management Services (DMS) are well supported by the location of the proposed network towers/links. A list of users is provided in Appendix F.

Graphic 12. Coverage Area Potential with 80' Tower at Customer Premise

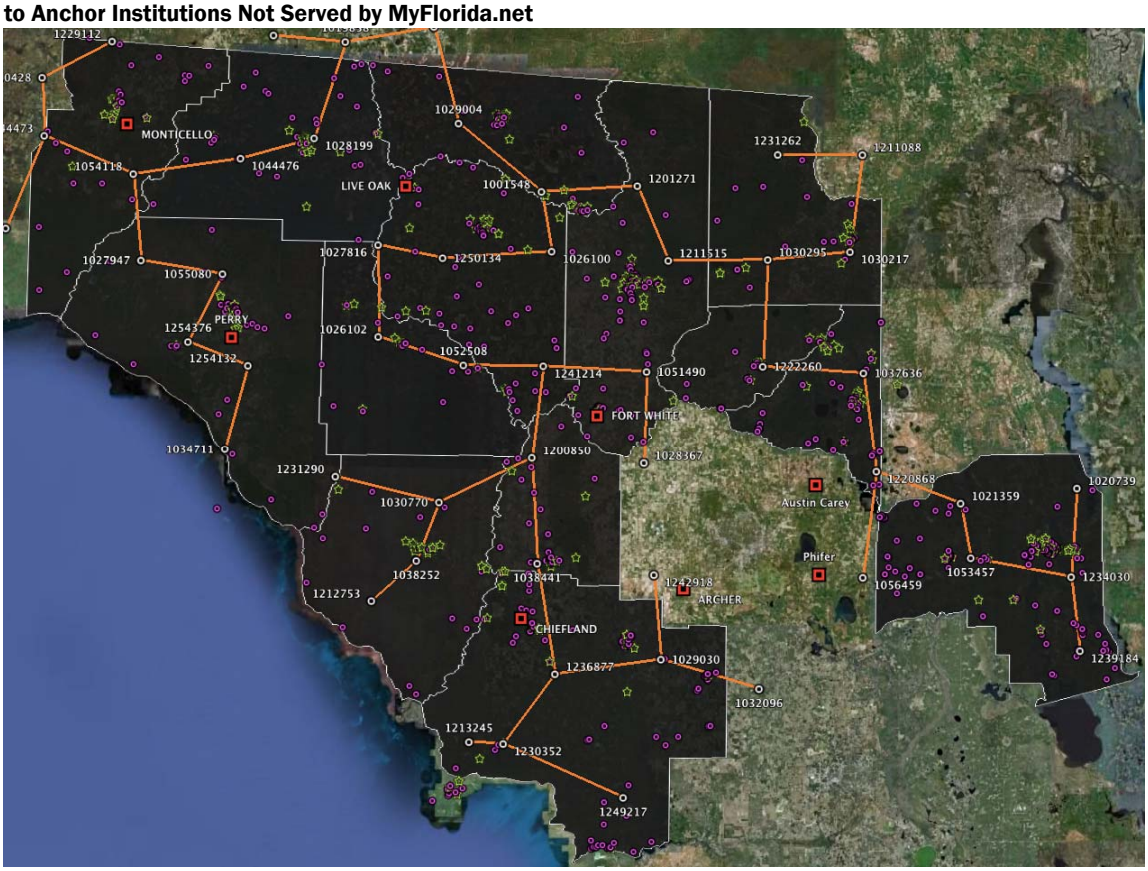


Graphic 13. Existing MyFlorida.net Coverage



In addition, anchor institutions that are not currently being served by MyFlorida.net will also be well covered by the proposed network assets, as Graphic 14 demonstrates.

Graphic 14. Ability of the Proposed Middle Mile Network to Reach and Provide Services to Anchor Institutions Not Served by MyFlorida.net



The purple dots indicate the locations of all other identified anchor institutions that are currently not served by MyFlorida.net.

WIRELESS NETWORK TECHNOLOGY ADVANTAGES

Use of wireless technology offers unique benefits for expanded broadband service in the North Central Florida RACEC region.

Speed Of Deployment

The proposed wireless Middle Mile solution offers a fast, shovel-ready deployment. Aside from reducing initial costs, rapid deployment would enable the North Florida Broadband Authority (contingent upon grant funding) to meet the aggressive timelines dictated by the federal broadband grant programs. Each funded project must be substantially complete within 24 months of funding and fully complete in 36 months. Unlike wireline solutions such as fiber, wireless networks do not require extensive permitting, tunneling, rights-of-way and easements.

Lower Cost Of Wireless

Last Mile cost per bit for wireless broadband, such as WiMAX, is estimated to be at least 40 to 50% lower than the cost for DSL and as much as 80% lower than the cost of fiber. In terms of Middle Mile, similar figures apply.

The proposed RACEC-region network covers 725 linear miles for an estimated total cost of approximately $42,760 per mile. While fiber networks can deliver virtually unlimited capacity, the problem is that the cost

to build them to cover an area like this is prohibitive. For operators interested in making the best use of their funding, wireless solutions clearly offer the most favorable return.

Microwave Can Provide Distribution And Access Functions

A well-known, established technology, microwave can offer wide availability and extremely high capacity. For the NFBA network, microwave is leveraged in the access network to bring broadband connectivity to a number of public safety, education, utilities and other Last Mile provider facilities.

Wireless Addresses Rising Demand For Mobility

Unlike wireline solutions, wireless access offers broadband mobility. It can provide the equivalent functionality of traditional fixed broadband over wireless access. Should the need arise to move a radio to another facility, to better serve the customer, add service, provide redundancy, follow a customer move, etc., it is a simple matter of disconnecting the radios and moving them to a new location, aiming, provisioning and testing. Depending on the location, this is something that can realistically be performed in a day with available line of sight.

Wireless Lowers Barriers To Market Entry—Stimulating Competition

With availability of stimulus funding and proven wireless solutions, the lack of extensive fixed networks is no longer an impediment to delivering broadband solutions. In cases where network infrastructure already exists, wireless solutions can build on deployed equipment, providing seamless growth and lower overall costs.

Wireless Delivers Highly Reliable Transport

Wireless solutions deliver fiber-like reliability at lower cost with faster deployments. Microwave is a proven technology with years of 99.999% availability running the most critical emergency voice and data services. Not subject to "backhoe fades," wireless transport solutions often exhibit superior uptime when compared to fiber.

Graphic 15. Availability Comparison: Fiber versus Wireless

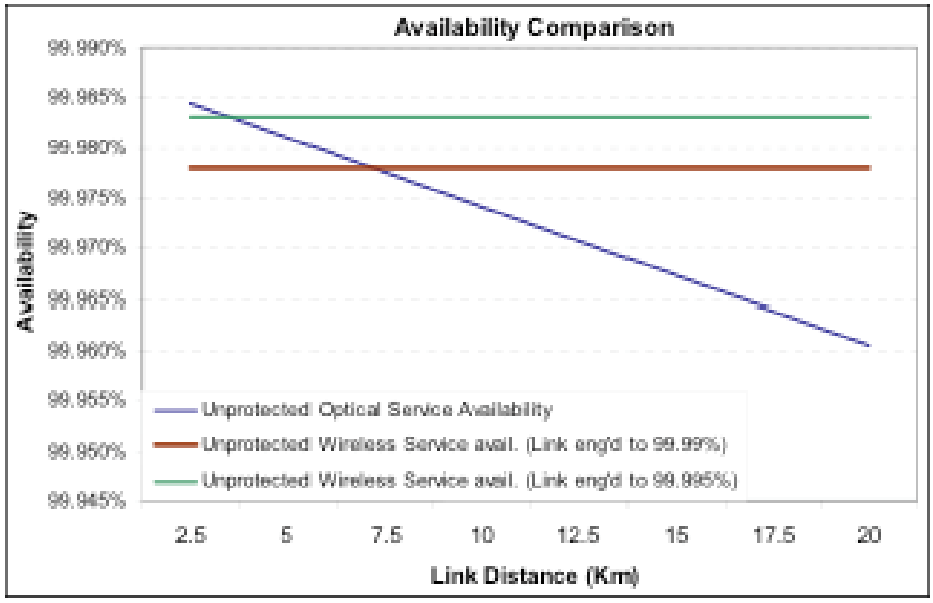


Figure 1 - Effect of Distance on Availability

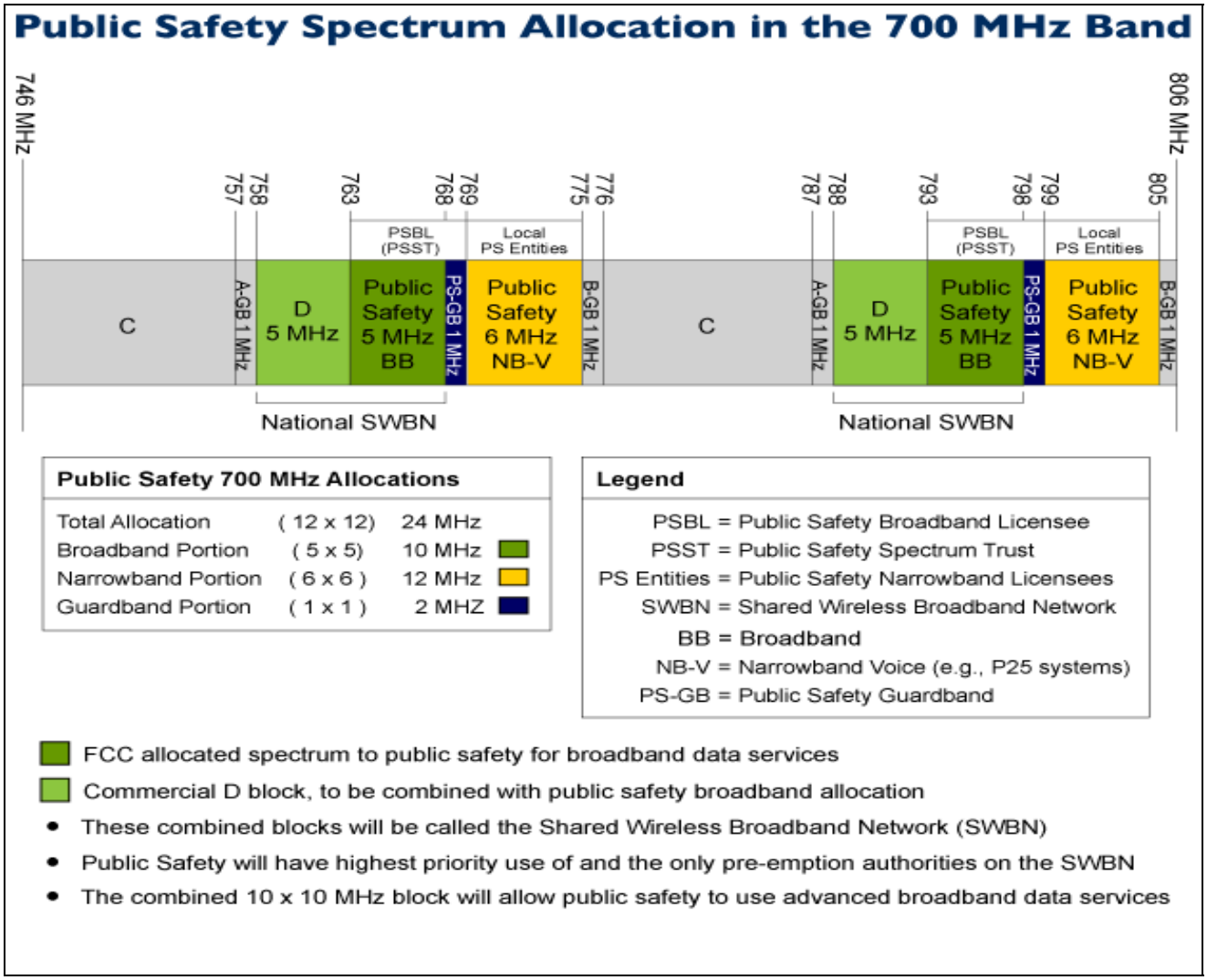
Note: Unprotected service refers to a link that does not have a secondary path. Optical refers to the fiber-optic cable. Availability is measured in percent. To the customer, this equates to the maximum hours/year their access can be down before they are compensated under a Service Level Agreement. In the case above, 99.985% availability represents less than 1.5 hours/year the network is not available. 99.960% availability equates to approximately 3.5 hours/year.

More Spectrum Is Being Made Available

Broad licensed and unlicensed spectrum is available for microwave applications. The lightly licensed 3.65, 4.9 and 80 GHz bands can be immediately available.

Following the DTV transition, the FCC has put in place a regulatory framework for the 700 MHz public safety band to facilitate the establishment of a nationwide, interoperable broadband communications network for the benefit of state and local public safety users. This spectrum, along with the already established 4.9 GHz band, increases frequencies available for public safety applications. Furthermore, the FCC is committed to ensuring optimum spectrum efficiency and providing the highest possible frequency availability for future technologies like SDR and cognitive radio technologies.

Graphic 16. Public Safety Spectrum Allocation in the 700 MHz Band



Note: Fourth Generation (4G) technologies such as WiMAX can prioritize subscribers within the radio platform such that one network can give priority to public safety users over less urgent non-public safety users. A new Middle Mile network will be essential for enabling better public safety for the region. Without adequate Middle Mile service, the value of the additional spectrum will go unrealized.

The 4G 700 MHz network (approximately 40 Mbps per sector) offers high throughput relative to legacy copper wire line broadband facilities. Powerful synergies exist where robust Middle Mile infrastructure is present. Terminating high capacity NFBA Middle Mile services at a 700 MHz 4G base station is relatively inexpensive and may be considered for this network.

Neutral abundant Middle Mile becomes critical in taking best advantage of the 700 MHz spectrum and the technology enhancements they enable in rural America for commercial and public safety communications.

Wireless Solutions Ideal For Public Safety/Critical Services Applications

Because of the low cost, deployment flexibility, speed and mobility characteristics, wireless solutions provide the ideal technology for community anchor and public safety applications.

Usa-Based Wireless Companies Support American Jobs

As required under the grant specifications, an awardee must conform to the "Buy American" requirements of the grant. Beyond those requirements, the solution proposes to utilize local and regional service companies, vendors and staffing resources to the greatest extent practical.

Simplified Backhaul Connectivity For Last Mile Providers

The proposed network will offer Last Mile service providers a resilient, high-performance backhaul network solution. The microwave transmission system offers capacity and reliability for today with the built-in flexibility and scalability Internet Service Providers (ISPs) need for the future.

PROPOSED SERVICE OFFERINGS

The proposed network (contingent upon grant funding), will be deployed and maintained by the newly created North Florida Broadband Authority (NFBA).[6] In addition to maintaining the Middle Mile network infrastructure, the NFBA will be charged with developing, supporting and managing all related services.

The proposed network will provide, support, and configure a versatile and feature-rich microwave-based network. Users will be able to order and specify customized network connection arrangements and combinations of transport and Direct Internet Access (DIA). This is not intended to be an exhaustive or exclusive list of features and uses - for example, DIA can be combined with either VPLS or L3VPN services to create a hybrid design, customizable per customer.

A partial list of proposed services:

1. Intra-Network Transport Only
    - 10 Mbps Transport Only (In-Net)
    - 100 Mbps Transport Only (In-Net)
    - 1000 Mbps Transport Only (Intra-Net where technology allows)
2. Transport Plus Direct Internet Access (DIA)
    - 10 Mbps Transport + Internet (In-Net)
    - 100 Mbps Transport + Internet (in-Net)
    - 1000 Mbps Transport + Internet (Intra-Net where technology allows)
3. Transport and Direct Internet Access with CIR (Committed Information Rates)
    - 10 Mbps Dedicated
    - 100 Mbps Dedicated

[6] The North Florida Broadband Authority is the entity created by the cities and counties in the RACEC region and the North Florida Economic Development Partnership specifically to apply for federal broadband grant funds.

4. Advanced Services

- Direct Internet Access
- BGP-Based IP Transit Service
- Point to Point Transparent LAN Service
- Cellular and ISP Backhaul (TDM and Ethernet)
- Multipoint bridging (EoIP Central Ethernet Bridging)

Public And Private Sector Service Provider Middle Mile (Ethernet And Tdm)

The proposed services and features are predesigned and supported within the routing and switching devices within the NFBA network. These devices will be located locally at the tower sites, creating a uniform, Aggregation Node feature-dense topology. This is unlike most backhaul networks. In other words, each tower site (and associated radio pairs) will be "smarter" and capable of delivering a wide variety of additional features, including security, smarter traffic management, maintenance and troubleshooting, and billing verification.

The proposed network will utilize advanced routing/switching devices at all tower and POP sites, and the services offered will principally draw from the feature sets available to RGNet's rXg R4 devices and VLAN management by Ciena's LE311v Metro Ethernet switch devices. The majority of the supported services will be implemented as applications riding on top of a Multi-Protocol Label Switched (MPLS) transport layer. This will minimize unique device count, (equipment at each site will be configured the same, making them interchangeable and easily replaceable) permitting NFBA to gain operational efficiencies.

Detailed Service Description

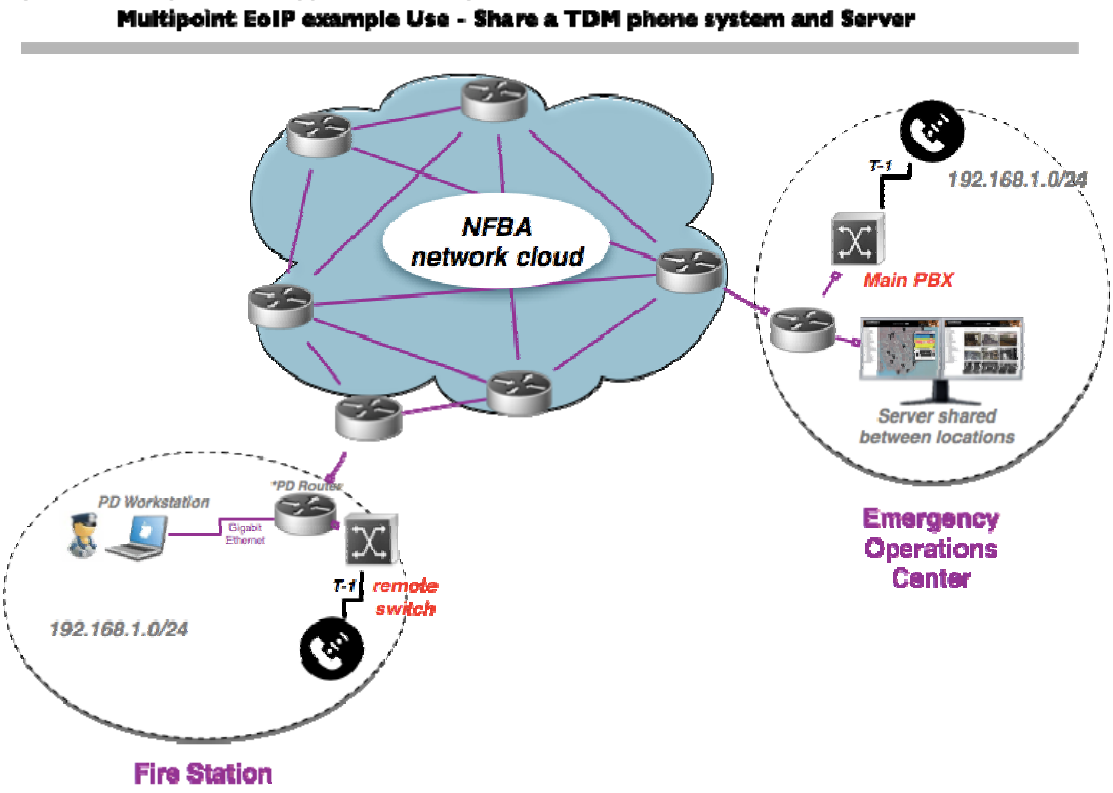
Transport Layer Security (TLS) and Multipoint Ethernet over Internet Protocol (EoIP) represent a novel application of MPLS (Multi-protocol, Label Switching) transport of Ethernet frames. For customers that have simple requirements, such as point-to-point Ethernet transport, each customer will receive a uniquely provisioned "Label Switched Path" - which will be configured to relay Ethernet frames directly between any pair of two Ethernet ports within the footprint of the proposed NFBA network.

In the case of Multipoint EoIP, the proposed NFBA network will configure an EoIP tunnel for each customer, or multiple instances per customer. Each tunnel will function as the equivalent of a network-wide, Layer 2 transparent point to multipoint Virtual Ethernet Switch.

Any customer can elect to include any two or more Ethernet ports, from any NFBA tower or pop location, into the same Ethernet switching instance. This will provide flexible, LAN (Local Area Network)-like Ethernet access, which can interface to customer sites via any Ethernet transport link (i.e., VLAN (virtual LAN) per customer over multipoint WiMAX links, or dedicated point-to-point Microwave links).

Graphic 17 represents a fire station's ability to use the proposed network to connect to the Emergency Operations Center (EOC) and take advantage of the telephone network, servers and all software applications housed at the EOC. Similarly, using the proposed network to connect them, cities and counties and other agencies can connect to share/back-up data, share software applications and facilitate distant secure communications. For example, the Levy County Sheriff's Department could connect directly, via radio, to the Sheriff's Dispatch in Putnam County.

Graphic 17. Multipoint EoIP Application Example



It is anticipated that the majority of public and private sector entities will utilize standard Direct Internet Access (DIA) via Point-to-Multipoint and Point-to-Point dedicated links. In the case of standard customer DIA configurations, it is proposed that the North Florida Broadband Authority proposed network will support full, per-customer customizable IP Quality of Service based on VLAN priority (802.1p) and DSCP values. These are the highest industry standards for service and reliability.

At tower sites that provide Point-to-Multipoint small business and Last Mile retail services for end-user DIA, several different Classes of Service will be established. These classes will be used to provide application-agnostic, fair-user access over the network. This is achieved through the use of a novel “application intent”-based Quality of Service configuration.

The NFBA proposed network will provide BGP (Border Gateway Protocol - routing based on path and programmed network policies) support for IPv4 and IPv6 customers. Each border router on the Level 3 long-haul fiber network will operate a “Route Manager Agent” (the “Agent” contains the preset routing policies established by the NFBA network) that manages and controls overall BGP signaling. Every tower site Point of Presence router will receive a full set of Internet IPv4 and IPv6 routes from the regional Route Manager Agent. This permits every POP site router to both accept customer routes and provide full Internet IPv4+6 routes to clients requesting BGP peering.

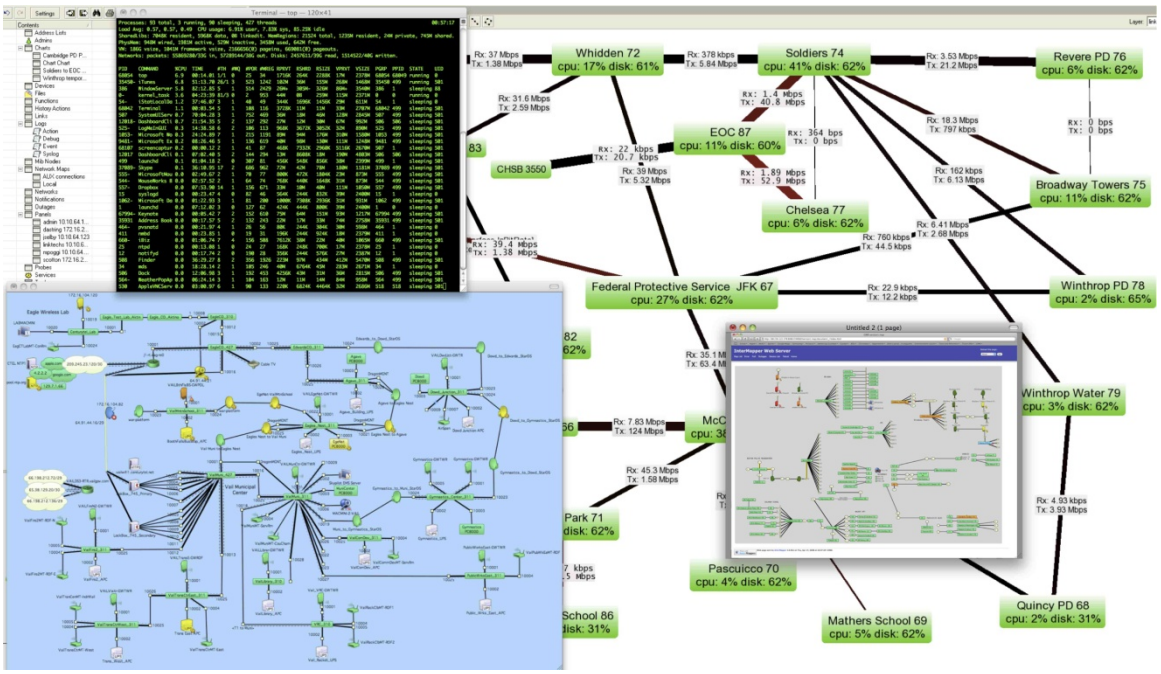
A similar BGP structure will be at the heart of the Level 3 fiber backbone. In this configuration style, the proposed network will create a “virtual routing table” across the network and, similarly to the multipoint Ethernet Transparent LAN Service, permit the inclusion of any port at any tower site. In contrast to the Point-to-Multipoint Ethernet services, the Layer 3 (refers to the security layer) VPN services will permit customers to have best-path, non-broadcast, routed topology that remains private and secure within the NFBA network.

MINIMIZING OPERATIONAL COSTS

The Network Management System (NMS) is based on using a process called Wireless and Virtual Network Operations Center (WaVE-NOC), a sophisticated element management solution that gives the Network Manager the ability to easily deploy, control, monitor and upgrade components network-wide through an intuitive, user-friendly GUI. The NMS combined with the rXg (device name) border gateways create an Operation Support System/Billing Support System, enabling full automation in the system.

This efficient, centralized management system enables the network operators to manage and monitor their systems from anywhere, significantly reducing the cost of operating the network and improving customer satisfaction and enhance their ability to deliver advanced IP services. The network operator will have the requisite competencies to monitor the specific network capacity for proactive subscriber management and will utilize their network engineers to maintain and upgrade the performance and quality of service within the network.

Graphic 18. Example of Network Management through the WaVE-NOC System



Note: This is an example of the volume of information available through the Wave-NOC System. The operator can access this information, review traffic, routing options, identify failures, re-route traffic, set automatic alarms and dispatch crews from any Internet Access Point. The Operator can also add or remove customers, increase or decrease their purchased capacity, and troubleshoot each and every element on the network.

Tier 1 Support Tier 1 support consists of routine, daily customer support issues from end users. This service will be distributed from the WaVE-NOC with staggered shift schedules to create a 24-hour/7-days-a-week/365-days support response. The center will leverage the use of an automated billing and customer care system that provides automated provisioning and network monitoring to ensure rapid service turn on and to provide proactive fault detection service. Leveraging the same technology used in the Department of Homeland Security and Tier 1 NOCs, customers will have three methods of support: 1) VoIP, 2) web portal and 3) e-mail. Tier 1 support will also include trained technicians who live and work in the North Florida RACEC service area.

Tier 2 Support Issues that cannot be solved by Tier 1 support within 24 hours will be escalated to Tier 2 personnel. Tier 2 personnel will have extensive network hardware, software and engineering skills. Tier 2 personnel will support customer and Tier 1 personnel in solving more complex issues. Tier 2 personnel may also be required to mobilize to a remote location to resolve network issues.

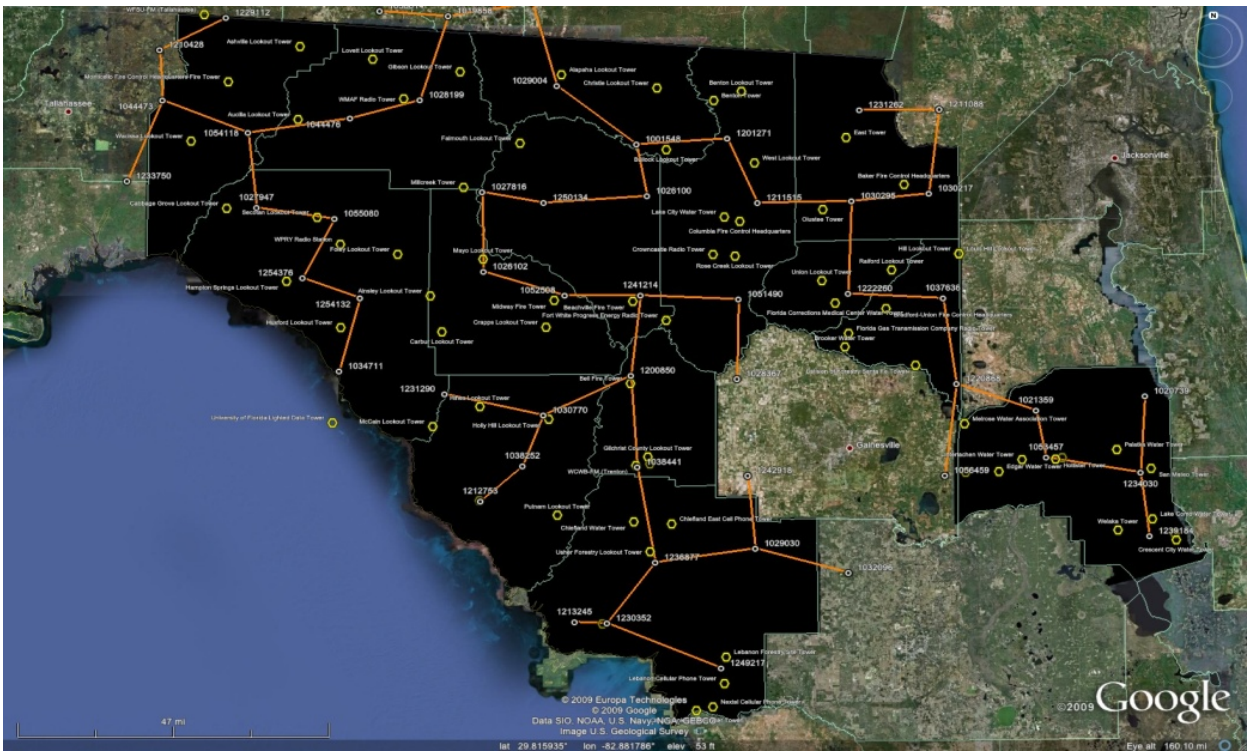
Tier 3 Support Established relationships with several of the leading vendors as required in order to resolve complex issues such as network, protocol and vendor specific troubleshooting. These vendors will be called upon in the rare instance network operations personnel cannot resolve an issue.

Other Support Billing services will be implemented in the same manner as other deployed networks. These billing processes have been in place for several years with large telecommunications companies like CenturyTel (now CenturyLink).

Use Of Member-Owned Assets

The proposed NFBA network design will utilize city, county or state tower/rooftop assets. This allows for reduced capital expenditure and greater flexibility in providing customer premise connections and additional upstream Middle Mile infrastructure for route diversity and ring capacity. The map in Graphic 19 shows locations of county towers and other vertical assets. These are preferred over commercial tower assets as they do not impose recurring monthly charges to the NFBA. Many of these assets will likely need to be upgraded with ARRA grant eligible funds.

Graphic 19. Location of County Towers and Other Vertical Assets in the North Central Florida RACEC Region



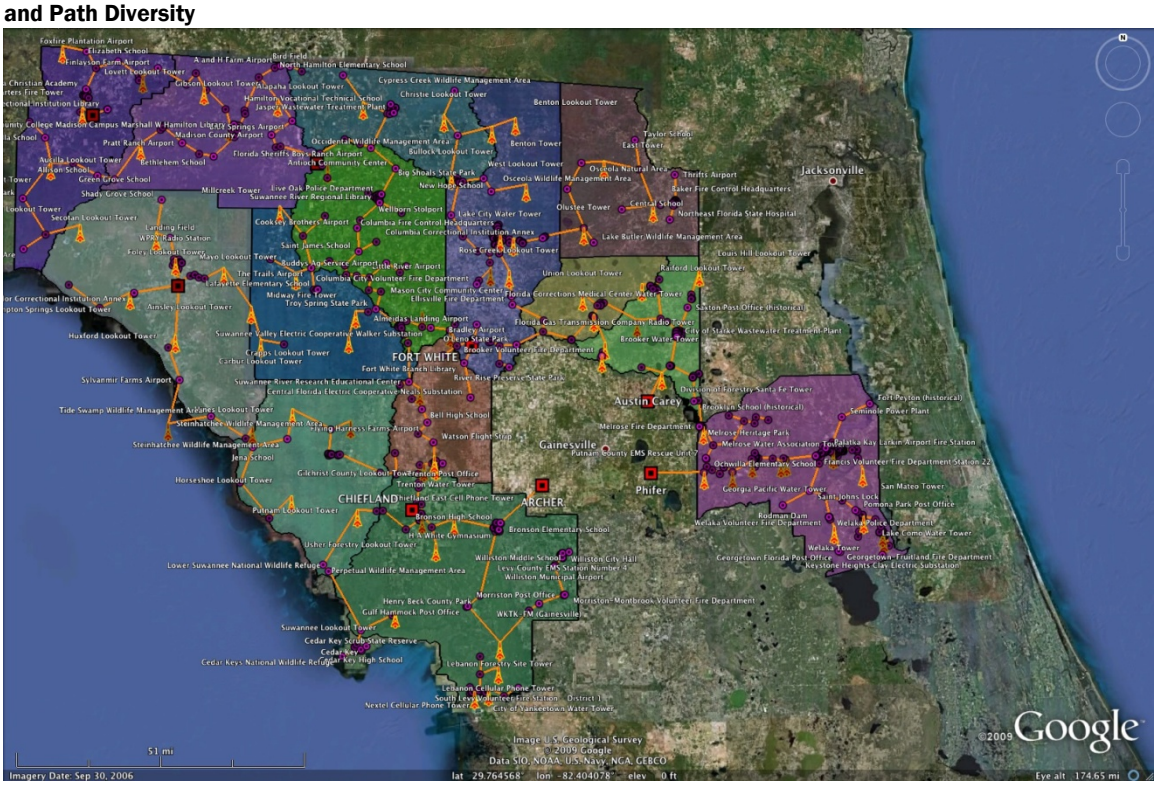
Note: The orange lines represent the baseline network wireless links. Additional links to close rings and create redundant connections to the Level 3 POP's (Points of Presence) will be added as the network is deployed. Each link will be capable of a minimum of 300 Mbps full duplex and up to 1 Gbps to new and existing facilities and Last Mile providers. As technology continues to evolve, it is anticipated that upgrades to this design will allow capacity additions simply and cost effectively over time. County-by-county network diagrams with identified anchor institutions and in-kind asset contributions are identified in Appendix E..

NETWORK DENSITY INCREASES RELIABILITY AND CAPACITY

One of the greatest benefits of the ring and mesh architecture is its flexibility and design redundancy. As the next graphic illustrates, where several anchor tenants have been identified, it is easy to visualize the connectivity with these anchor institutions and Last Mile providers. By increasing the density of links, the path diversity for traffic also increases, benefitting the reliability of the system. Should a radio or link fail, the

network routing automatically selects an alternate path and, without interruption, the network continues to function normally. This self-healing feature ensures very high availability and truly meets the commercial and emergency services standards for performance.

Graphic 20. Example of Using Existing Tower Locations, Anchor Tenants and Last Mile Providers to Increase Network Density and Path Diversity

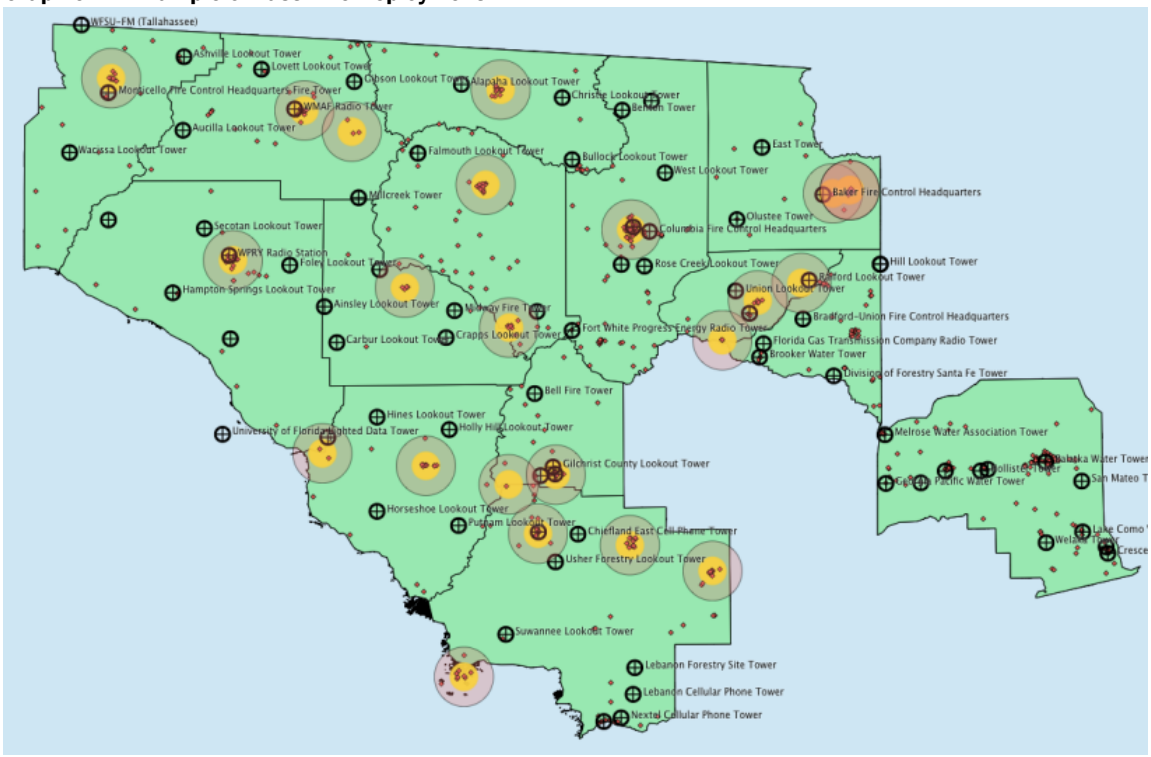


Note: Additional rings between anchor institutions, Last Mile providers and contributed tower assets enhance the density, reliability and capacity of the network.

FACILITATING THE LAST MILE SOLUTION

The map in Graphic 21 shows an example of how this proposed network can facilitate a Last Mile deployment. While the North Florida Economic Development Partnership or North Florida Broadband Authority do not endorse or speak for any Last Mile provider, this example is provided as an illustration as to Last Mile coverage with facilitation using existing towers. Additionally, wireless Last Mile providers will typically have numerous additional locations from which they broadcast their signals, creating a broad and dense coverage area.

Graphic 21. Example of Last Mile Deployment



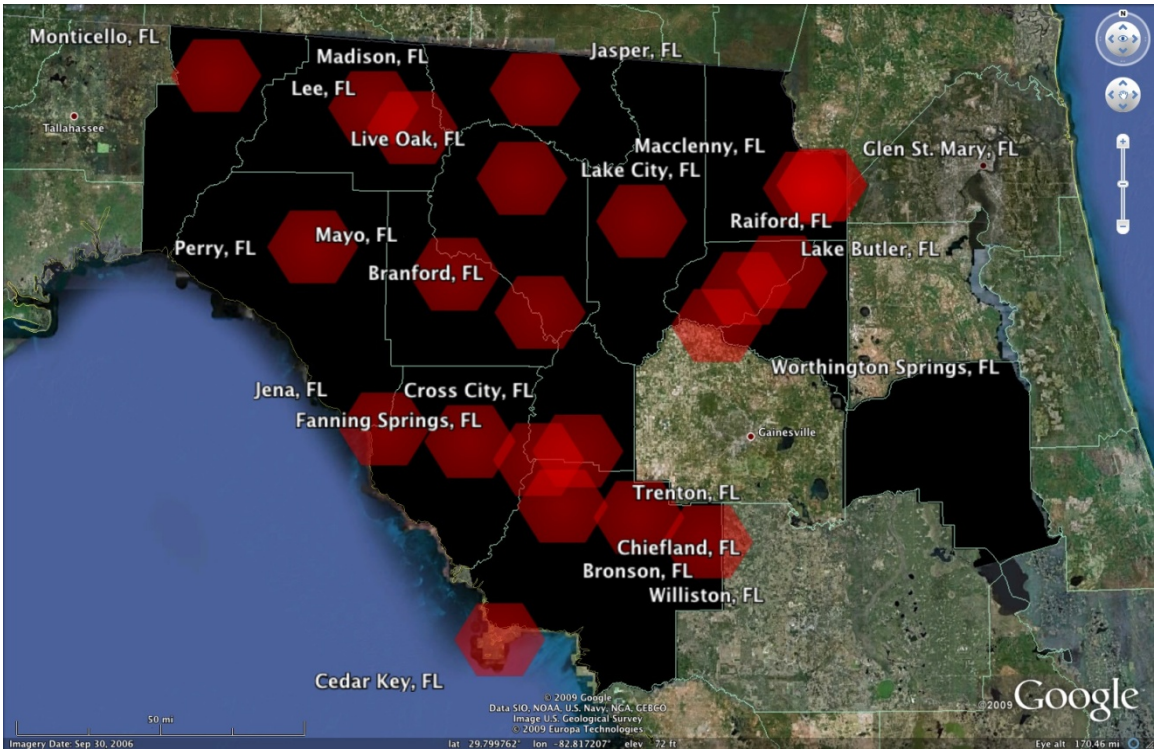
Last Mile Provider Example

There is a Last Mile provider in the region that has already received $8 Million in RUS funding for 12 of the 14 North Central Florida RACEC counties, but has not been able to launch due to lack of Middle Mile access. A Middle Mile deployment will not only allow this entity to proceed, but will speed their deployment and service delivery as well.

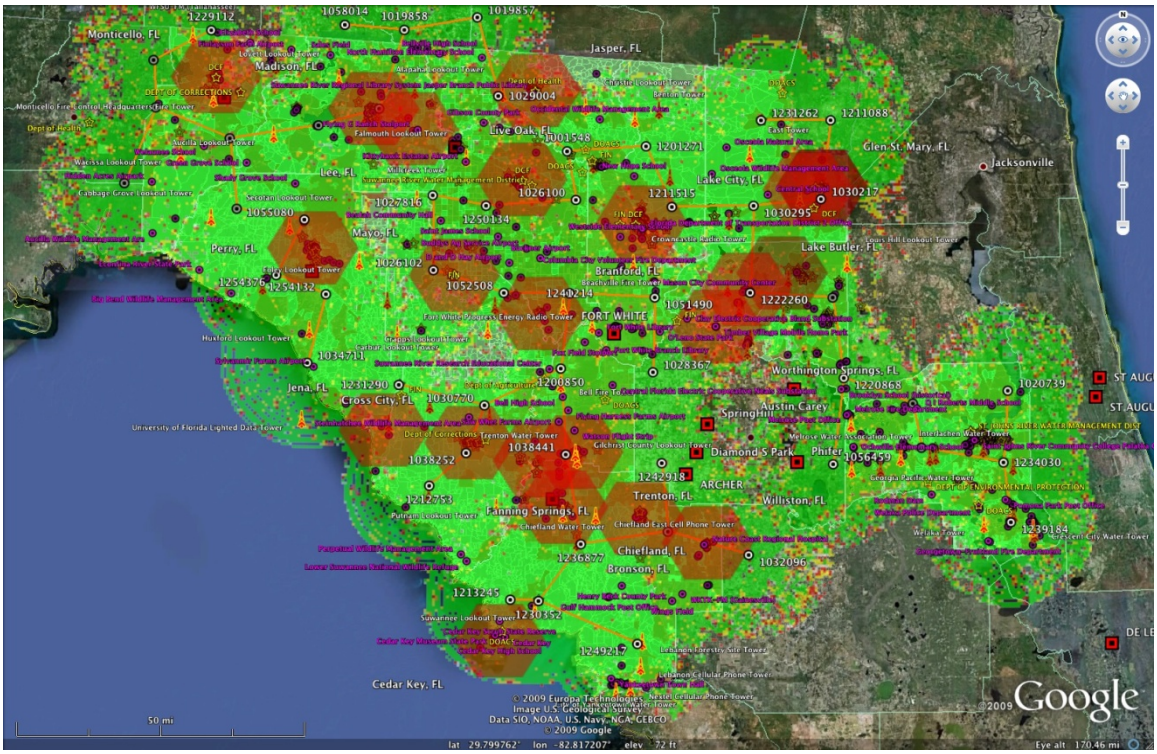
With established Last Mile providers fully ready and funded for deployment, immediate benefits to local residents and businesses are projected. Some of the existing Last Mile providers have already evaluated the lower cost of transport proposed by the NFBA network and determined that there is very substantial savings existing in utilizing an open access Middle Mile network rather than waiting for an incumbent (with whom they would compete) to sell them capacity on their network. The only other option for those Last mile providers would be to build their own Middle Mile network, something economically infeasible for a single Last Mile provider. Early conversations with other providers indicate that there are several additional Last Mile and specialized service providers that are poised to take full advantage of a new Middle mile infrastructure. This addresses two of the critical causal factors for the inequity in available and affordable broadband access in the region.

Graphic 22 illustrates the planned service areas for one of the Last Mile providers. Graphic 23 shows example coverage with this same provider using the proposed Middle Mile network. It is anticipated that several additional providers offering similar levels of coverage will provide service as the network is deployed.

Graphic 22. Existing Last Mile Provider Planned Coverage



Graphic 23. Example Coverage by an Existing Last Mile Provider Using the Proposed Network



Note: The graphic above identifies the Last Mile provider's service areas in red and the NFBA coverage area in green.

Feasibility of Proposed Solution

FUNDING AND SUSTAINABILITY

Funding Source Is Catalyst For Feasibility

As previously explained, the timing of this study coincided with the notice of federal funding available for increasing broadband access. It was apparent early in the study that the North Central Florida RACEC region did not have the resources needed to undertake such an initiative. Because broadband access was deemed critical to spurring economic growth, the North Florida Economic Development Partnership decided to pursue federal support. The American Reinvestment and Recovery Act (ARRA) of 2009 presented a unique opportunity for funding critical broadband projects around the country that might otherwise not be undertaken. As part of the ARRA, $7.2 billion in Federal stimulus funding was set aside to accomplish these stated goals:

- Preserve and create jobs; promote economic recovery,
- Assist those most impacted by the recession,
- Provide investments needed to increase economic efficiency by spurring technological advances in science and health,
- Invest in transportation, environmental protection and other infrastructure that will provide long-term economic benefits, and
- Stabilize state and local government budgets.

To this end, two federal agencies were charged with establishing programs to further the objectives of the ARRA stimulus legislation. The Rural Utilities Service (RUS), Department of Agriculture and the National Telecommunications and Information Administration, Department of Commerce, each established a program by which the administration of the new programs would be handled.

The RUS has established the Broadband Infrastructure Program (BIP), which will extend loans, grants and loan/grant combinations to facilitate broadband deployment in rural areas. NTIA has established the Broadband Technology Opportunities Program (BTOP) which will make available grants for deploying broadband infrastructure in unserved and underserved areas in the United States, enhancing broadband capacity at public computer centers and promoting sustainable broadband adoption projects. Both programs are intended to facilitate the expansion of broadband communications services and infrastructure, and advance the objectives of the Recovery Act to spur job creation and stimulate long-term economic growth and opportunity.

The opportunity to consider a regional approach to solving the Middle Mile problem in the RACEC region stems from the opportunity to successfully compete for grant funding assistance through the BIP/BTOP programs of the Recovery Act. Private sources of funding for a new Middle Mile network are non-existent, specifically because the economics of creating a new, facilities-based private network in low population density areas does not deliver an appropriate return on the invested capital. The cash-strapped cities and counties in the RACEC are not capable of funding networks to deliver the services they need, either.

The NFEDP, working with cities and counties, evaluated a number of options for developing a regional network. They determined that in order to pursue funding for a broadband network that would serve the RACEC, there would need to be an entity that could be an eligible applicant for the Recovery Act funding. Section 163.01(7)(g), Florida Statutes, authorized the cities and counties of the RACEC to form, through interlocal agreement, a new and separate legal entity to exercise the common power of its members, to

acquire, own, improve, operate and maintain broadband facilities. All 14 RACEC counties and seven cities, have now joined the new entity, appropriately named the North Florida Broadband Authority (NFBA).

Given the three categories (technological, political, and financial) for considering the feasibility of building a new, open-access broadband network that would legitimately serve the interests of the entire 14-county RACEC, the task was to select the best candidate design given the organizational structure of the NFBA and the specific constraints required by the federal government should the NFBA be successful in winning a broadband grant.

The North Florida Broadband Authority

In order to be a candidate for ARRA broadband funding, the NFBA was required (as with all applicants) to meet a very strict application deadline. The Notice of Funds Availability (NOFA) which provides the specifics on the grant application process, allowed 35 days for the complete grant application development and submittal. At the time of the NOFA announcement, there was no Authority, only 22 motivated cities and counties in the region.

In less than two weeks, 12 counties and five cities had all passed resolutions adopting the interlocal agreement - thereby joining (and forming) the NFBA. Two more counties and three additional cities followed at a subsequent board meeting. Such an unprecedented outpouring of support, enthusiasm and decisive action by the dedicated commissioners, council members, their staffs and committed community volunteers demonstrated the deep need and desire to elevate the economic opportunities and improved public services that would be enabled by a Middle Mile network in the region.

By creating the NFBA, the member governments expressed their desire to work together for a regional solution to the problem of limited broadband access in their communities. As a newly formed entity without assets, documented revenues or a demonstrated financial history, the NFBA fails traditional underwriting guidelines and is incapable of obtaining conventional financing. The pursuit of the ARRA grant funding is both the catalyst and first critical step to the feasibility assessment of building a Middle Mile solution for the region.

In addition to the formation of the NFBA as an eligible applicant, perhaps its most important long-term value in the process would be the effective local governance of a prospective broadband network. Each city and county member of the NFBA retains a seat on the board of directors, which would maintain the management and control of the network at the local level. As a governing body for a regional network, decisions could be expected to be made that benefit the greatest number of the area's residents, businesses, first responders, local government agencies and community organizations. Services for administering, operating, and maintaining such a system would be contracted, but under the policy guidance of a local/regional board.

Additional Funding Sources

The federal broadband NOFA specifies what costs or expenses are eligible to be covered by stimulus grant funding. The most significant category of ineligible costs is the operating costs. Start-up operation (as proposed in the NFBA Grant Application) is necessarily funded by the applicant. In this case, the newly formed applicant, the NFBA, has no existing source of funds (as an entity). In preparation for submitting the grant application, the NFBA was able to secure a commitment for operational funding from a local bank. The commitment is contingent upon grant award and business underwriting guidelines, but stands as a testament to the value and expected success of new, open and high-capacity Middle Mile network.

The Case For Federal Funding

The requisite parameters for a feasible network solution are all fully addressed (or facilitated) by the proposed wireless Middle Mile solution. In the context of the only identifiable source of financing, the BIP/BTOP Broadband Grant Programs, this proposed network meets the parameters required for funding consideration:

- Serves all five statutory purposes (only needs to serve one) of the ARRA Federal Stimulus Bill,
- Is "shovel-ready," preliminary design completed and prepared to begin work within 120 days of grant award,

- Can be substantially completed in two years, totally finished in three years,
- Proposes to offer service which meets the federal broadband minimum standards (will greatly exceed the guidelines),
- Has been deemed technically feasible by a network engineer,
- Shows commitment to the policies of non-discrimination and interconnection obligations required by the grant programs,
- Designed to ensure available capacity can be distributed via Last Mile providers to all census blocks within the proposed service area, and
- Has been determined to be unfundable without federal grant assistance.

As an applicant for Middle Mile infrastructure funding, the non-discrimination and interconnection stipulations ensure that this remains a neutral, wholesale network enterprise. Last Mile providers and anchor institutions are eligible purchasers of wholesale capacity, whether it is their primary, augment or redundant source of capacity. The intent is not to compete with incumbents or Last Mile providers, but rather to provide them with an abundance of capacity and connectivity options they can then cost-effectively provide for their customers.

The Financial Plan

Both a requisite for federal grant award and a primary objective for this study is the determination of the long-term sustainability of the network as a going concern. In order for the federal government to agree that an infrastructure project is worthy of investment, it must show a financial path to profitability and be able to sustain its operations over the long term. Projections for a five-year period were required in order to demonstrate sustainability.

To begin with, the overall budget (see Figure 16) identifies the capital costs required to build the proposed network. The capital costs, eligible for funding through grant award, is not in the sustainability equation but provides a glimpse at why the capital investment presents such a challenging barrier to entry for the Middle Mile.

The financial plan for the proposed network contemplates full grant funding for submitted (and eligible) capital costs. Project buildout is planned to take ten quarters to fully complete with 85% completion by year 2. Conservative subscriber acquisition rates have been used in order to ensure that the model would not reflect an overly optimistic view of the network's financial sustainability.

The following pages include the prospective financial statements that were developed to illustrate the viability and sustainability of the project, including the forecasted income statement, balance sheet and statement of cash flows.

Figure 16. General Budget for the Proposed Wireless Middle Mile Network

44. General Overall Budget

	Capital Budget Funding Source Breakdown						
Equipment Category	**Loan Request**	**Grant Request**	**Equity**	**Debt**	**Bonds**	**Other Funding /In Kind**	**Total**
Network & Access Equipment (switching, routing transport, access)		$12,242,500					**$12,242,500**
Outside Plant (cables, conduits, ducts, poles, towers, repeaters, etc.)		$6,289,576					**$6,289,576**
Buildings and Land - (new construction, improvements, renovations, lease)		$559,000					**$559,000**
Customer Premise Equipment (modems, set-top boxes, inside, wiring, etc.)		$6,270,000					**$6,270,000**
Billing and Operational Support Systems (IT systems, software, etc.)		$100,000					**$100,000**
Operating Equipment (vehicles, office equipment, other)		$1,191,000					**$1,191,000**
Engineering/Professional Services (engineering design, project management, consulting, etc.)		$3,216,000					**$3,216,000**
Testing (network elements, IT system elements, user devices, test generators, servers/computers, etc.)		$274,600					**$274,600**
Site Preparation						$868,000	**$868,000**
Other							**$-**
Total Broadband System		**$30,142,676**	**$-**	**$-**	**$-**	**$868,000**	**$31,010,676**

The detailed project costs in the Figure 17 spreadsheet indicate the specific areas of capital expense. A useful comparison to a typical fiber-based Middle Mile might be considered. Assume the 100 links budgeted have an average link span of 6 miles (it is closer to 7 or 8), and the conservative cost estimate for fiber is $200,000 per mile (before you connect users to it). Just for the physical network, the cost of the fiber-based Middle Mile network is roughly $120 million, compared to the turnkey project cost of just over $31 million for a wireless network. It is clear to see why more than 70% of all Middle Mile infrastructure being installed today is wireless.

Figure 17. Detailed Project Capital Costs of the Proposed Wireless Middle Mile Network

45. Detail of Project Costs (ATTACHMENT G)

Please complete the table below for the different equipment categories that will be required to complete the project. Each category should be broken down to the appropriate level for identifying unit costs.

Service Area or Common Network Facilities	Eligibility (Yes/No)	Unit Cost	No. of Units	Total Cost	Support of Reasonableness
Network & Access Equipment					
Switching	Y	$4,000	$168	$672,000	Switching equipment necessary to support Layer 2 Transport
Hot Spare Switching Kits	Y	$4,000	$17	$68,000	Switching equipment necessary to support Layer 2 Transport
Routing	Y	$5,900	$168	$991,200	Routing equipment necessary to support Layer 3 Transport
Hot Spare Routing Kits	Y	$5,900	$17	$100,300	Routing equipment necessary to support Layer 3 Transport
Transport	Y	$80,000	$5	$400,000	Transport to Outside Vendor Networks
Transport-Turnkey Microwave Links	Y	$73,500	$126	$9,261,000	Rapid Systems quote-Turnkey Microwave links Quote Ref #11644
Hot Spare Microwave Kits Transport	Y	$15,000	$14	$210,000	Hot spare for local replacement in inclement weather or electronics failure to maintain SLAs
IRU Backbone	Y	$9,000	$60	$540,000	Exclusive unrestricted use of backbone capacity
Other					
Outside Plant					
Cables					
Conduits					
Ducts					
Poles					
Towers	Y	$53,133	$72	$3,825,576	120 FT Towers
Repeaters					
Other	Y	$88,000	$28	$2,464,000	190 FT Towers
Buildings					
New construction					
Pre-Fab Huts	Y	$4,000	$110	$440,000	Supports 100 towers and 10 POPs
Improvements & Renovation	Y	$1,750	$68	$119,000	Site improvements for electrical, stabilization, air conditioning and other site requirements
Other					
Customer Premise Equipment					
Modems	Y	$25,000	$42	$1,050,000	Customer premise for 3 critical infrastructure facilities per county
Set Top Boxes					
Inside Wiring	Y	$10,000	$42	$420,000	Wire drops, electrician visits and site prep for 3 critical infrastructure facilities per county
Other	Y	$25,000	$192	$4,800,000	Critical Facility Microwave Links
Billing Support & Operations Systems					
Billing Support Systems	Y	$50,000	$1	$50,000	Billing software & operations support systems
Customer Care Systems	Y	$50,000	$1	$50,000	Customer service software & operations support systems
Other Support					

Service Area or Common Network Facilities	Eligibility (Yes/No)	Unit Cost	No. of Units	Total Cost	Support of Reasonableness
Operating Equipment					
Vehicles	Y	$78,000	$2	$156,000	Bucket Truck 4x4 construction and maintenance vehicle
Office Equip/Furniture	Y	$960,000	$1	$960,000	Primary NOC Control Center
Other	Y	$25,000	$3	$75,000	Virtual NOC Control Center
Professional Services					
Engineering Design	Y	$144,000	$9	$1,296,000	On site engineers for deployment and turn up approval, mapping, network design for CPE
Project Management	Y	$192,000	$8	$1,536,000	Construction Management/Inspection network provisioning/capacity management
Consulting	Y	$96,000	$4	$384,000	Site acquisition, permitting
Other					
Testing					
Network Elements	Y	$4,800	$2	$9,600	Intermapper license
IT System Elements	Y	$30,000	$1	$30,000	Workstations
User Devices	Y	$10,000	$2	$20,000	Digital meters/calibrating equipment
Test Generators	Y	$28,000	$1	$28,000	Spectrum analyzer
Lab Furnishings					
Servers/Computers	Y	$3,900	$10	$39,000	Test work stations
Servers/Computers	Y	$1,480	$100	$148,000	Test work stations
Other Upfront Costs					
County Land	Y	$10,000	$56	$560,000	In Kind Contribution from government
County Office Space	Y	$12,000	$14	$168,000	In Kind Contribution from government
Rights of Way	Y	$10,000	$14	$140,000	In Kind Contribution from government

Subscriber Estimates The subscriber estimates indicate an expectation of substantial capacity required to serve MyFlorida.net customers, transport services purchased by first responder and emergency service agencies, and provision of service to incumbents and local service providers—extending service more cost-effectively through the proposed network.

Figure 18. Broadband Subscriber Estimates for the Proposed Wireless Middle Mile Network

48. Broadband Subscriber Estimates (ATTACHMENT H)

PUBILC SECTOR SUBS	**Year 1 (2010)**				**Year 2**				**Year 3**				**Year 4**				**Year 5**			
(more entities, less bandwidth)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Transport Only																				
Net Add-ons			28	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Cumulative subscribers			28	34	40	46	52	58	64	70	76	82	88	94	100	106	112	118	124	130
Transport w/ Internet																				
Net Add-ons			42	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Cumulative Subscribers			42	50	58	66	74	82	90	98	106	114	122	130	138	146	154	162	170	178
TOTAL CUMULATIVE SUBS			**70**	**84**	**98**	**112**	**126**	**140**	**154**	**168**	**182**	**196**	**210**	**224**	**238**	**252**	**266**	**280**	**294**	**308**

PRIVATE SECTOR SUBS	**Year 1 (2010)**				**Year 2**				**Year 3**				**Year 4**				**Year 5**			
(less entities, more bandwidth)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Transport Only																				
Net Add-ons			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Cumulative subscribers			2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
Transport w/ Internet																				
Net Add-ons			8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cumulative Subscribers			8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76
TOTAL CUMULATIVE SUBS			**10**	**16**	**22**	**28**	**34**	**40**	**46**	**52**	**58**	**64**	**70**	**76**	**82**	**88**	**94**	**100**	**106**	**112**

PUBLIC/PRIVATE SECTOR	**Year 1 (2010)**				**Year 2**				**Year 3**				**Year 4**				**Year 5**			
(committed information rates)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Transport Only																				
Net Add-ons			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Cumulative Subscribers			2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
AGRREGATE CUMULATIVE			**82**	**104**	**126**	**148**	**170**	**192**	**214**	**236**	**258**	**280**	**302**	**324**	**346**	**368**	**390**	**412**	**434**	**456**

Public Sector Market Size		
Total MYFLN Subs	369	(State and Local Entities using Old PSTN State Network-See Main)
Total Non MYFLN Subs	276	(State and Local Entities not served by MYFL State Network and/or using other facilities)

Figure 19. Five-Year Income Statement for the Proposed Wireless Middle Mile Network

50. Pro-Forma 5-Year Financial Forecast and Assumptions - Income Statement (ATTACHMENT K)

		Forecast Period				
	Historical	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Revenues						
Network Service Revenues						
Transport-Public	-	$39,556	$125,048	$186,296	$247,544	$308,792
Transport-Private	-	$13,800	$82,800	$ 156,400	$230,000	$303,600
Internet-Public	-	$134,596	$409,640	$596,904	$784,168	$971,432
Internet-Private	-	$68,000	$299,200	$ 516,800	$734,400	$952,000
Transport with CIR	-	$15,000	$90,000	$170,000	$ 250,000	$330,000
Installation Revenues	-	$ 465,000	$1,590,000	$,470,000	$3,350,000	$4,230,000
Other Revenues	-	-	-	-	-	-
Total Revenues	**-**	**$ 735,952**	**$2,596,688**	**$4,096,400**	**$5,596,112**	**$7,095,824**
Expenses						
Government Authority Board Expenses		$ 75,000	$110,450	$111,964	$113,522	$115,128
General Manager	-	$110,400	$110,400	$ 110,400	$110,400	$110,400
WINS System/Network Manager	-	$439,000	$856,000	$ 856,000	$856,000	$856,000
Legal Counsel	-	$45,000	$60,000	$60,000	$60,000	$60,000
Other Operating Expense	-	-	-	-	-	$-
Total Expenses	**-**	**$ 669,400**	**$1,136,850**	**$1,138,364**	**$1,139,922**	**$1,141,528**
EBITDA	**-**	**$ 66,552**	**$1,459,838**	**$2,958,037**	**$4,456,190**	**$5,954,296**
Depreciation Expense-Plant, Property & Equipment	-	$2,916,516	$5,265,067	$5,456,476	$5,456,476	$5,456,476
Amortization/Depreciation Expense Capital Leases	-	$56,787	$156,787	$156,787	$156,787	$156,786
EBIT	**-**	**$(3,006,751)**	**$3,962,016)**	**$(2,655,226)**	**$(1,157,073)**	**$341,034**
Interest Expense - New RUS Debt	-	-	-	-	-	-
Interest Expense - Existing RUS Debt	-	-	-	-	-	-
Interest Expense - Non RUS Bank Loan	-	$30,000	$27,724	$25,311	$22,754	$20,043
Interest Expense - Capital Leases	-	$-	$59,593	$46,753	$32,628	$17,091
Income Before Taxes	**-**	**$(3,036,751)**	**$(4,049,333)**	**$(2,727,290)**	**$(1,212,455)**	**$303,900**
Property Taxes	-	-	-	-	-	-
Income Taxes	-	-	-	-	-	-
Net Income	**-**	**$(3,036,751)**	**$4,049,333)**	**$(2,727,290)**	**$(1,212,455)**	**$303,900**

Figure 20. Five-Year Balance Sheet for the Proposed Wireless Middle Mile Network

50. Pro-Forma 5-Year Financial Forecast and Assumptions - Balance Sheet (ATTACHMENT L)

		Forecast Period				
	Historical	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Assets						
Current Assets						
Cash	-	$15,000,736	$3,715,182	$5,156,625	$9,356,880	$15,055,244
Accounts Receivable	-	-				
Other Current Assets	-	-				
Total Current Assets	**-**	**$15,000,736**	**$3,715,182**	**$5,156,625**	**$9,356,880**	**$15,055,244**
NonCurrent Assets						
Plant, Property & Equipment	-	$16,320,558	$28,810,016	$30,070,676	$30,070,676	$30,070,676
Less: Accumulated Depreciation	-	$2,916,516	$8,181,583	$13,638,059	$19,094,535	$24,551,010
Net PPE	-	$13,404,042	$20,628,433	$16,432,617	$10,976,141	$5,519,666
Leased Plant, Property & Equipment	-	$783,934	$783,934	$783,934	$783,934	$783,934
Less: Accumulated Depreciation	-	$156,787	$313,573	$470,360	$627,147	$783,934
Net Leased PPE	-	$627,147	$470,360	$313,573	$156,787	$0
Other	-	-	-	-	-	-
Total Non-current Assets	**-**	**$14,031,189**	**$21,098,793**	**$16,746,191**	**$11,132,928**	**$5,519,666**
Total Assets	**-**	**$29,031,925**	**$24,813,975**	**$21,902,815**	**$20,489,808**	**$20,574,910**
Liabilities and Owners Equity						
Liabilities						
Current Liabilities						
Accounts Payable	-	-	-	-	-	-
Capital Leases	-	$128,407	$141,247	$155,372	$170,908	-
Current Portion-Proposed RUS Debt	-					
Current Portion-non RUS Debt (Bank Loan)	-	$40,210	$42,623	$45,180	$47,891	$50,764
Other Current Liabilities	-	-	-			
Total Current Liabilities	**-**	**$168,617**	**$183,870**	**$200,552**	**$218,798**	**$50,764**
Long-Term Liabilities						
Capital Leases	-	$467,527	$326,280	$170,908	-	-
Existing RUS Debt	-	-				
Proposed RUS Debt	-	-	-	-	-	-
Existing non-RUS Debt (Bank Loan)	-	$421,856	$379,233	$334,053	$286,163	$235,398
Total Long-Term Liabilities	**-**	**$889,383**	**$705,513**	**$504,961**	**$286,163**	**$235,398**
In Kind Contributions-Government	-	$868,000	$868,000	$868,000	$868,000	$868,000
Retained Earnings	-	-$3,036,751	-$7,086,084	-$9,813,374	-$11,025,829	-$10,721,929
Grant Funding	-	$30,142,676	$30,142,676	$30,142,676	$30,142,676	$30,142,676
Total Equity	**-**	**$27,973,925**	**$23,924,592**	**$21,197,302**	**$19,984,847**	**$20,288,747**
Total Liabilities and Owners Equity	**-**	**$29,031,925**	**$24,813,975**	**$21,902,815**	**$20,489,808**	**$20,574,910**

Figure 21. Five-Year Statement of Cash Flows for the Proposed Wireless Middle Mile Network

50. Pro-Forma 5-Year Financial Forecast and Assumptions - Statement of Cash Flows (ATTACHMENT M)

		Forecast Period				
	Historical	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Beginning Cash	-	-	$15,000,736	$ 3,715,182	$5,156,625	$9,356,880
Cash Flows from Operating Activities						
Net Income	-	$(3,036,751)	$ (4,049,333)	$(2,727,290)	$(1,212,455)	$303,900
Adjustments to Reconcile Net Income to Net Cash Provided by Operating Activities						
Add: Depreciation	-	$2,916,516	$5,265,067	$ 5,456,476	$5,456,476	$5,456,476
Add: Amortization		$156,787	$156,787	$ 156,787	$156,787	$156,787
Changes in Current Assets and Liabilities:						
Marketable Securities	-	-	-	-	-	-
Accounts Receivable	-	-	-	-	-	-
Inventory	-	-	-	-	-	-
Prepayments	-	-	-	-	-	-
Other Current Assets	-	-	-	-	-	-
Other Current Liabilities	-					
Non Current Liabilities	-					
Net Cash Provided (Used) by Operations	**-**	**$36,552**	**$1,372,521**	**$2,885,972**	**$4,400,808**	**$5,917,163**
Cash Flows from Financing Activities:						
Notes Receivable	-					
Capital Leases	-	$(188,000)	$ (128,407)	$ (141,247)	$ (155,372)	$ (170,908)
Notes Payable-Bank Loan	-	$462,066	$(40,210)	$(42,623)	$ (45,180)	$ (47,891)
Principal Payments	-	-	-	-	-	-
New Grant	-	$30,142,676	-	-	-	
Additional Paid-in Capital/In Kind Contributions	-	$ 868,000	-	-	-	
Additions to Patronage Capital Credits	-	-	--	-	-	--
Payment of Dividends	**-**	**-**		**-**	**-**	**-**
Net Cash Provided by Financing Activities	-	$31,284,742	$(168,617)	$(183,870)	$ (200,552)	$ (218,799)
Cash Flows from Investing Activities						
Capital Expenditures	-	$(16,320,558)	$(12,489,458)	$(1,260,660)	-	-
Amortizable Asset (Net of Amortization) Capital Leases	-	-	-	-	-	-
Long-Term Investments	**-**	**-**	**-**	**-**	**-**	**-**
Net Cash Used by Investing Activities	-	$(16,320,558)	$(12,489,458)	$(1,260,660)		-
Net Increase (Decrease) in Cash	-	$15,000,736	$(11,285,554)	$1,441,443	$4,200,256	$5,698,364
Ending Cash	**-**	**$15,000,736**	**$3,715,182**	**$ 5,156,625**	**$9,356,880**	**$15,055,244**

Notes To Financials

Revenues Revenues were determined based on two main customer groupings: public sector and private sector. Generally, the assumption was made that public sector subscribers will purchase lesser bandwidth, but in greater volume. Private sector subscribers will purchase more bandwidth in lower volume. Both of these customer groupings were categorized into the following revenue categories:

- Best Effort Transport Only (In-Net)
- Best Effort Transport & Internet (In-Net)
- Transport with CIR (Committed Information Rates)

The Full CIR were based on 10 Mbps dedicated unlimited in-network offering. Public sector revenues were discounted by 25% to allow for government discounted offerings.

In addition, installation revenues were included based on the aggregate number of subscribers utilizing a non-discounted rate for all customers.

Operating Expenses Government NFBA Board expenses are the costs associated with managing board function as they relate to board meetings, production of documents, recording and legal notice of documents and publication requirements.

The NFBA does not have any employees. All functions are provided on a contractual basis predicated on the management and operational needs of the authority. This includes management of the network, operations of the network and legal counsel.

General manager expenses relate to those costs associated with management and oversight of the NFBA assets and network operator. WINS System/Network manager expenses relate to those costs associated with day to day operation and technical management/oversight of the network.

Legal counsel expenses relate to those costs associated with the provision of legal counsel related to board functions and action, regular operations, and potential or problem issues for the NFBA.

Interest Expenses There are two categories of interest expenses: those related to the non-RUS bank loan and those related to the capital leases.

Property and Income Taxes The NFBA was formed as a legal entity and public body based on Florida Statute and Interlocal agreements between multiple Florida counties and cities. Since the broadband authority is a government entity, it does not pay property taxes or income taxes.

Accounts Receivable Due to time constraints, no determination was made as to accounts receivable. Since these proformas represent enterprise operations that do not exist, revenues were considered paid in full within 30 days. Therefore, no value was assigned to accounts receivable.

Capital Leases Asset and Liability The following items were considered capital leases: 1) Transport $400,000 (Transport to Outside Vendor Network) and 2) IRU Backbone $540,000 (Indefeasible Right of Use capacity).

Both of these leases are non-cancelable, and the lease term is equal to 75% or more of the estimated economic life of the leased property. The estimated economic life of the leased property totals six years, and the lease term for both of these items totals five years, or 83.3 % of the estimated economic life.

The depreciation period for both of these capital leases occurs over the term of the lease since the lease does not transfer ownership to the lessee. The implicit interest rate totals 10%.

FASB requires the following information to be disclosed in the lessee's financial statements or in the notes:

- The gross amount of the assets at each balance sheet date categorized by nature or function. This information may be combined with comparable information for owned assets.

- Future minimum lease payments as of the latest balance sheet date, in the aggregate and for each of the five succeeding fiscal years. Separate deductions for executory costs included in the minimum lease payments and for the amount of imputed interest necessary to reduce net minimum lease payments to present value.
- Assets recorded under capital leases and the accumulated amortization thereon shall be separately identified in the lessee's balance sheet or notes. Likewise, related obligations shall be separately identified as obligations under capital leases. Depreciation on capitalized leased assets should be separately disclosed.

Liabilities The terms of the bank loan are $500,000 over ten years at an interest rate of 6%.

Depreciation Methods The straight-line depreciation method was used for all plant, property and equipment (assets). The following describes the various useful life periods categorized by Attachment G areas:

Figure 22. Depreciation Schedule for Equipment

Depreciation Useful Lives:	
Network & Access Equip	5
Outside Plant	7
Buildings	5
Customer Premise Equip	5
Billing support & Op Sys	5
Op Equip	7
Prof Services	0
Testing	5
Other Upfront Costs	20

Method of Accounting These statements were prepared in accordance with Generally Accepted Accounting Principles (GAAP).

Sustainability Analysis

Contingent upon outside federal funding, the projected financial statements indicate that by the second year, the NFBA will become cash flow positive. By the fifth year, the NFBA is expected to be profitable and scaling efficiently, with enough positive cash flow to support a replacement program.

The capitalized Indefeasible Right of Use (IRU) contract permits capitalization of upstream capacity costs and is eligible to be covered under the Federal grant program. After the 10-year IRU, the capacity charges will revert to a yet-to-be-negotiated usage/interconnection charge, unless other structured arrangements are reached.

Risks to sustainability include much lower than anticipated subscription rates, extended deployment time frames, unavailability of equipment (or at substantially higher cost), failure to secure ample tower leases/locations to meet customer needs and failure to meet the reporting or performance requirements of the awarding federal agency. Any or all of these scenarios could affect sustainability of the network as an independent enterprise.

Mitigating the risks stated above require diligence and continued effort to maintain the enthusiasm and commitment to success in the region. Awareness of deployment progress and anticipation of active portions of the network will ensure available subscription opportunities won't be missed. Continued solicitation of in-kind asset contributions can substantially lower both capital and operating costs and accelerates provision of service.

Considering the leverage that may be provided through federal grant funding creates a uniquely strong operating position. Without grant funding, there would be little hope for an undertaking like this in such a

sparsely populated area. Provided the grant is awarded and all identified capital costs are deemed to be eligible, this is a strong and viable enterprise. Even allowing substantial room for varying subscription rates, proposed fees are well below what is currently available (where it is available) and, therefore, it must be considered a sustainable business model.

TECHNICAL FEASIBILITY

The technology to make the proposed wireless Middle Mile solution a reality in the North Central Florida RACEC region not only exists, but has been in use in various applications for many years and is proven reliable. Further, the desired performance standards will be met or exceeded:

- The network will provide linkable coverage to the entire 9,137 square-mile region.
- A minimum available bandwidth of 100 Mbps will be available at every customer connection point (customers may select smaller increments of 10Mbps) and up to 1Gbps per link.
- Multiple backbone points of connection will ensure redundant network access to the Internet. Ring and consecutive point architecture will allow increased density and path diversity.
- Carrier-grade services will be available throughout the network. Industry standards for availability and mean time to repair (MTTR) will be maintained.
- Direct Internet Access and transport will be available to anchor tenants and Last Mile providers.
- The network is scalable to meet increasing demand and enables a sustainable business model.
- The network is flexible in both design and growth, allowing customer needs to be met wherever they exist, not just where the point of connection happens to be.
- Costs to connect and for high-speed capacity are a fraction of today's costs and facilitate the business models of Last Mile providers.

As evidenced above, all of the technical performance parameters established by the federal broadband grant programs and by the NFBA, are fully addressed with the proposed network. Without a doubt, the network that has been proposed is not only technically feasible, but an efficient and comprehensive approach to ensuring the distribution of broadband capacity is available for Last Mile providers to deliver real broadband services throughout the region.

POLITICAL FEASIBILITY

In this context, as a wholesale provider, with a charter to connect all customers without discrimination, the single-purpose government entity created to pursue the federal broadband grant funding (the NFBA) is a most appropriate form of governance. Each county within the RACEC membership retains a seat on the NFBA board of directors, ensuring that all voices will be heard and that decisions will support policies to be rendered on regional priorities.

The demonstration of support in the creation process of the North Florida Broadband Authority was tremendous. A total of 22 local governments reached agreement within a span of a few weeks; commitment

and enthusiasm for empowering the region's residents, businesses and public agencies with the ability to leverage the power of abundant broadband capacity was simply astounding. Support for this pursuit was near unanimous, and the demonstration of political feasibility could not have been clearer.

Summary of Findings

This study began as an exploration into the feasibility of expanding broadband in the 14-county North Central Florida RACEC in preparation for application of federal grant funding. When the opportunity to pursue federal funding arose, the focus of the study shifted to more narrowly examine the most feasible solution in light of the parameters of the federal funding. This study analyzes the key elements of feasibility for deploying a Middle Mile broadband network and concludes that with access to capital funding, deploying a Middle Mile network is feasible, practical and necessary. A summary of the findings:

Technology Selection, Architecture and Performance Feasibility The suggested technology is proven reliable, and the design of the network has been certified by a network engineer. The technology is appropriate to the region as it meets immediate needs and is suitably flexible and mobile to accommodate future needs. The design is also cost-effective, a must for this economically depressed region. The network architecture is open and efficient, allowing for a range of Last Mile providers to purchase services. The proposed network also meets or exceeds the minimum federal standards.

Political Feasibility, Regional and Community Support The speed and efficiency with which the North Florida Broadband Authority, the entity established to apply for the federal funding and to manage the deployment and operation of the network, was established demonstrated nearly unanimous support from the political leaders, businesses and residents in the North Central Florida RACEC.

Financial Feasibility, Validity of Assumptions, Operationally Sustainable Contingent upon full grant funding, reasonable assumptions, valid cost estimates, positive cash flow and profitability are well within parameters for sustainable enterprise. The picture presented by the financial statements is clear. By the second year, the business becomes cash flow positive and by the fifth year, the enterprise is fully profitable and scaling efficiently, with enough positive cash flow to ably support a robust replacement program.

There is little argument that availability and access to reliable, high-speed Internet and other network connectivity is a critical infrastructure component necessary to attract new business and industry into the RACEC and to ensure that existing residents and businesses are competitive in today's state, national and global business and industrial environments. The expansion of publicly available broadband infrastructure in the RACEC is unequivocally a critical element for growth and long-term economic competitiveness.

Further, access to broadband is critical for this region not only because of the increased development, job and educational opportunities, but also from a public safety perspective as high-speed multi-megabit access can enhance such capacities as increased video surveillance or more reliable communication before, during and after natural disasters, such as hurricanes.

Creating, expanding and continually upgrading broadband Middle Mile and Last Mile infrastructure in this region will also benefit public sector services such as critical community facilities and community anchor institutions through enhanced access to information and technologies. The measure of broadband on a per capita basis will be an important factor in the region's ongoing economic recovery, stability and viability.

The broadband grant programs being administered through the Rural Utilities Service (RUS) and the National Telecommunications and Information Administration (NTIA), have opened the door to the realistic possibility that a solution to the "digital divide" in the North Central Florida RACEC might be feasible. As discussed in this study, the real question is whether the technology exists to build a Middle Mile network or whether there exists the political and community will to act decisively and move to action. The fundamental question was how to pay for it. Can a highly-efficient, high capacity network be designed so that the amount necessary was achievable? If so, and there is success in funding such a network, can that network sustain itself as a long-term operation? The answer is yes, contingent on federal funding.

References for Figures 1 - 13

Figure 1 Total Population and Density for Counties in the North Central Florida RACEC Area

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Figure 2 Total County Population and Gender Distribution for Counties in the North Central Florida RACEC Area

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Figure 3 Age Distribution by County for the North Central Florida RACEC Area

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Figure 4 Total Population and Ethnic Distribution by County for the North Central Florida RACEC Area & Figure 5 Mean of RACEC County Ethnic Distribution

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Figure 6 Population Growth in 200 and 2008 for Counties in the North Central Florida RACEC Area

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Figure 7 Total School Attendance and Change in Attendance Rates for North Central Florida RACEC Area

State of Florida, Department of Education, Education Information and Accountability Services. (2009). Table no. 4.27. Elementary and Secondary Schools: Number and Pupil Membership in the State and Counties of Florida, School Year 2008–09. Florida Statistical Abstract, 2009. (p. 156). Gainesville, FL.: Bureau of Economic and Business Research.

Figure 8 Percentage of Students Eligible for Free or Reduced Lunch for Counties in the North Central Florida RACEC Area

State of Florida, Department of Education, Education Information and Accountability Services. (2009). Table no. 4.28. Elementary and Secondary Schools: Students Eligible for Free/Reduced-price Lunch, 2008-09. Florida Statistical Abstract, 2009. (p. 157). Gainesville, FL.: Bureau of Economic and Business Research.

Figure 9 Graduation and Dropout Rates for Counties in the North Central Florida RACEC Area

State of Florida, Department of Education, Education Information and Accountability Services. (2008). High School Graduates and Dropouts: Graduation and Dropout Rates In the State and Counties of Florida, 2007–08. Florida Statistical Abstract, 2009. (p. 173). Gainesville, FL.: Bureau of Economic and Business Research.

Figure 10 Percentage of Students Ready for College in Core Subject Areas North Central Florida RACEC Area Compared to Statewide Rates

State of Florida, Department of Education, Education Information and Accountability Services. (2008). Readiness for College: Percentage of Students Entering College Who Tested Competent in Reading, Writing, and Mathematic Skills in the State and Counties of Florida, 2007–08. Florida Statistical Abstract, 2009. (pp. 178-179). Gainesville, FL.: Bureau of Economic and Business Research.

Figure 11 Percentage of the Statewide Average FCWI for Counties in the North Central Florida RACEC Area

University of Florida, Bureau of Economic and Business Research, Economic Analysis Program. (2007). Table no. 24.81. Wages: Comparative Relative Wage Index in the Counties of Florida, 2007. Florida Statistical Abstract, 2009. (p. 848). Gainesville, FL.: Bureau of Economic and Business Research.

Figure 12 Per-Capita Earnings for Counties in the North Central Florida RACEC Area and the Statewide Ranking of Each County

United States, Department of Commerce, Regional Economic Information System. (2007). Table no. 5.10. Personal Income: Per Capita Amounts on a Place-of-Residence Basis in the United States and in the State and Counties of Florida, 2003 through 2007. (pp. 191-192). Gainesville, FL.: Bureau of Economic and Business Research.

Figure 13 Total Labor Force and Unemployment Rates for Counties in North Central Florida RACEC Area

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Appendix A

CENSUS COMMUNITY RESULTS

Census Communities:

COUNTY	CDP	AREA	HH	POP	RURAL	REMOTE	BLOCKS	BB BLOCKS	= HH	UPTAKE *	% SERVED	STATUS	STATUS	** AREA	TOWERS	CRITICAL
Baker	"Other Areas"	570	5,019	15,374	815	0	815	151	3,493	1,805	36.0%	0	Underserved		2	
	Glen St. Mary	1	355	885	46	0	46	8	181	94	26.4%	0	Underserved			49
	Macclenny	14	2,218	6,000	191	0	191	76	1,449	749	33.8%	0	Underserved		1	
Bradford	"Other Areas"	267	6,193	17,856	582	0	582	177	4,853	2,508	40.5%	1	Served **	267		
	Brooker	2	186	470	36	0	36	5	100	52	27.8%	0	Underserved			
	Hampton	3	269	593	44	0	44	7	141	73	27.1%	0	Underserved		1	
	Keystone Heights	5	34	91	4	0	4	1	34	18	51.7%	1	Served **	5		102
	Lawtey	3	355	808	34	0	34	10	202	104	29.4%	0	Underserved		1	
	Starke	14	2,568	6,270	255	0	255	77	1,734	896	34.9%	0	Underserved			
Columbia	"Other Areas"	707	14,147	35,185	1,124	0	1,124	387	11,972	6,188	43.7%	1	Served **	707		
	Five Points	3	432	1,263	44	0	44	15	305	158	36.5%	0	Underserved			
	Fort White	26	732	1,710	62	0	62	11	582	301	41.1%	1	Served **	26		
	High Springs	17	441	964	2	0	2	2	441	228	51.7%	1	Served **	17		227
	Lake City	28	5,823	12,917	651	0	651	206	4,076	2,107	36.2%	0	Underserved		1	
	Watertown	13	1,771	3,922	134	0	134	53	1,303	673	38.0%	0	Underserved			
	White Springs	7	233	552	2	0	2	1	233	120	51.7%	1	Served **	7		
Dixie	"Other Areas"	752	6,083	11,392	1,297	50	1,347	109	3,340	1,726	28.4%	0	Underserved			
	Cross City	7	980	2,233	152	0	152	13	219	113	11.5%	0	Underserved		3	38
	Horseshoe Beach	0	299	202	33	6	39	0	0	0	0.0%	0	Underserved			
Gilchrist	"Other Areas"	308	4,581	11,374	382	0	382	189	3,928	2,030	44.3%	1	Served **	308		
	Bell	32	347	826	41	0	41	8	268	139	39.9%	0	Underserved		1	
	Fanning Springs	3	171	304	18	0	18	9	124	64	37.5%	0	Underserved			55
	Newberry	2	2	7	1	0	1	1	2	1	51.7%	1	Served **	2		
	Trenton	9	805	1,926	146	0	146	37	423	219	27.2%	0	Underserved		1	
Hamilton	"Other Areas"	482	2,996	6,584	687	0	687	122	1,978	1,022	34.1%	0	Underserved			
	Jasper	17	1,180	4,898	193	0	193	33	433	224	19.0%	0	Underserved			75
	Jennings	13	382	992	62	0	62	7	115	59	15.6%	0	Underserved		1	
	White Springs	6	408	853	65	0	65	9	128	66	16.2%	0	Underserved		1	
Jefferson	"Other Areas"	579	3,934	9,035	357	2	359	112	2,453	1,268	32.2%	0	Underserved		2	87
	Monticello	23	1,317	3,867	209	0	209	61	806	417	31.6%	0	Underserved		1	

Census Communities:

COUNTY	CDP	AREA	HH	POP	RURAL	REMOTE	BLOCKS	BB BLOCKS	= HH	UPTAKE *	% SERVED	STATUS	STATUS	** AREA	TOWERS	CRITICAL
Lafayette	"Other Areas"	541	2,212	5,846	855	4	859	59	1,047	541	24.5%	0	Underserved			34
	Mayo	5	448	1,176	149	0	149	6	68	35	7.8%	0	Underserved		2	
Levy	"Other Areas"	1,109	7,155	15,323	1,598	26	1,624	306	4,999	2,584	36.1%	0	Underserved			178
	Andrews	14	510	1,089	50	0	50	19	444	229	45.0%	1	Served **	14		
	Bronson	4	392	871	53	0	53	15	241	125	31.8%	0	Underserved			
	Cedar Key	8	730	842	1	127	128	5	91	47	6.4%	0	Underserved		3	
	Chiefland	5	969	2,055	179	0	179	33	400	207	21.3%	0	Underserved		1	
	East Bronson	39	1,034	2,453	198	0	198	58	844	436	42.2%	1	Served **	39		
	East Williston	11	435	1,059	30	0	30	11	263	136	31.2%	0	Underserved			
	Fanning Springs	13	385	775	40	0	40	14	288	149	38.7%	0	Underserved			
	Inglis	7	874	1,631	86	0	86	36	626	324	37.0%	0	Underserved			
	Manattee Road	32	1,169	2,256	81	0	81	42	894	462	39.5%	0	Underserved			
	Otter Creek	13	98	171	41	0	41	1	28	14	14.8%	0	Underserved			
	Williston	15	1,223	2,965	179	0	179	63	815	421	34.4%	0	Underserved		1	
	Williston Highlands	49	1,110	2,305	383	0	383	73	752	389	35.0%	0	Underserved			
	Yankeetown	12	486	655	51	0	51	9	233	120	24.8%	0	Underserved			
Madison	"Other Areas"	650	5,197	11,272	975	0	975	145	2,957	1,528	29.4%	0	Underserved			113
	Greenville	20	488	1,180	73	0	73	7	48	25	5.1%	0	Underserved		1	
	Lee	4	254	581	41	0	41	7	129	67	26.2%	0	Underserved			
	Madison	26	1,897	5,700	265	0	265	49	746	386	20.3%	0	Underserved		1	
Putnam	"Other Areas"	675	24,986	50,287	4,021	0	4,021	941	17,121	8,849	35.4%	0	Underserved			326
	Crescent City	3	903	1,883	129	0	129	35	382	197	21.9%	0	Underserved		1	
	East Palatka	5	628	1,794	73	0	73	22	364	188	30.0%	0	Underserved		1	
	Interlachen	8	893	2,013	264	0	264	57	530	274	30.7%	0	Underserved		2	
	Palatka	18	5,431	12,647	620	0	620	236	3,988	2,061	38.0%	0	Underserved		1	
	Pomona Park	4	500	926	69	0	69	16	320	165	33.1%	0	Underserved			
	Welaka	8	529	873	82	0	82	6	225	116	22.0%	0	Underserved			
Suwannee	"Other Areas"	674	12,394	27,173	1,075	0	1,075	475	10,362	5,355	43.2%	1	Served **	674		165
	Branford	5	345	740	127	0	127	12	48	25	7.2%	0	Underserved		1	
	Live Oak	12	2,940	6,931	338	0	338	107	1,628	841	28.6%	0	Underserved			

Census Communities:

COUNTY	CDP	AREA	HH	POP	RURAL	REMOTE	BLOCKS	BB BLOCKS	= HH	UPTAKE *	% SERVED	STATUS	STATUS	** AREA	TOWERS	CRITICAL
Taylor	"Other Areas"	1,033	6,133	11,419	1,612	100	1,712	150	3,754	1,940	31.6%	0	Underserved			80
	Perry	15	3,513	7,837	492	0	492	123	2,133	1,102	31.4%	0	Underserved		6	
Union	"Other Areas"	218	2,339	10,074	316	0	316	72	1,470	760	32.5%	0	Underserved			44
	Lake Butler	7	968	2,307	171	0	171	41	427	221	22.8%	0	Underserved		1	
	Raiford	16	197	501	25	0	25	1	16	8	4.2%	0	Underserved			
	Worthington Springs	4	232	560	26	0	26	3	149	77	33.2%	0	Underserved			
Grand Total		**9,197**	**154,258**	**357,523**	**22,437**	**315**	**22,752**	**5,152**	**104,146**	**53,826**	**34.9%**		**16.7%**	**22.5%**	**38**	
										NOFA Rule:	Max 40%		Max 25%	Max 25%	Min 1	

Appendix B

SURVEY SUMMARY NOVEMBER 12, 2009

NFEDP Feasibility Study 2009 - Connectivity Survey - Business/Residential

1. Background Information:

	Response Percent	Response Count
Contact Name:	98.6%	73
Company:	37.8%	28
Address:	97.3%	72
Address 2:	18.9%	14
County:	**100.0%**	**74**
State:	**100.0%**	**74**
ZIP/Postal Code:	**100.0%**	**74**
Country:	89.2%	66
Email Address:	91.9%	68
Phone Number:	82.4%	61
answered question		**74**
skipped question		**0**

2. What is the name of the company that provides your Internet connection? If there is more than one Internet Service Provider please include all providers.

	Response Count
	71
answered question	**71**
skipped question	**3**

3. How many providers could you choose from when you subscribed to your current provider?

	Response Percent	Response Count
Currently no Internet service	5.4%	4
One (1)	**54.1%**	**40**
Two (2)	25.7%	19
Three (3)	10.8%	8
Four (4) or more	4.1%	3
answered question		**74**
skipped question		**0**

4. How does your home or business connect to the Internet? Please check the type of connection that applies to you.

	Was this an option from service provider?	I have this service.	Response Count
No Internet Connection	**87.5% (7)**	25.0% (2)	8
Shared T1 Line	**75.0% (3)**	25.0% (1)	4
T1 or DS-1 Line	**83.3% (5)**	33.3% (2)	6
Integrated Services Digital Network (ISDN)	**100.0% (2)**	0.0% (0)	2
T3 or DS-3 line	**75.0% (3)**	50.0% (2)	4
Digital Subscriber Line (DSL)	54.5% (18)	**78.8% (26)**	33
Cable Modem	57.1% (8)	**85.7% (12)**	14
Wireless Network (2G/3G/4G)	66.7% (6)	**77.8% (7)**	9
Satellite or Microwave	**58.3% (7)**	**58.3% (7)**	12
		Other (please specify)	10
		answered question	**61**
		skipped question	**13**

5. If you know the advertised/contracted Internet connection speed for downloading documents, please check the fastest speed that applies.

	Response Percent	Response Count
Less than 200 Kbps	18.9%	7
200 Kbps to 512 Kbps	8.1%	3
512 Kbps to 1.5 Mbps	**29.7%**	**11**
1.5 Mbps (DS-1 or T1)	8.1%	3
2 Mbps	21.6%	8
10 Mbps or greater	13.5%	5
answered question		**37**
skipped question		**37**

6. Please go to the following Web site (http://www.speedtest.net/) and let us know what speeds you actually test.

	Response Percent	Response Count
Download Speed	**100.0%**	**41**
Upload Speed	**100.0%**	**41**
Ping Time	95.1%	39
answered question		**41**
skipped question		**33**

7. To the best of your knowledge, how much do you currently pay for all of you Internet access PER MONTH? Please note, this might include two or more types of charges including the following: Local Access, DIA (Direct Internet Access), Port Charge, etc.

	Response Percent	Response Count
Less than $100	**72.1%**	**44**
$100 - $500	13.1%	8
$501 - $1000	3.3%	2
$1001 - $2000	1.6%	1
More than $2000	0.0%	0
Not Sure	9.8%	6
answered question		**61**
skipped question		**13**

8. If you know what applications you or your organization need/would like to have, please select the appropriate level below.

	Response Percent	Response Count
Not Sure	**30.9%**	**17**
256 Kbps to 512 Kbps	0.0%	0
512 Kbps to 1.5 Mbps	12.7%	7
1.5 Mbps (DS-1 or T1) to 5 Mbps	20.0%	11
5-10 Mbps	10.9%	6
Greater than 10Mbps	14.5%	8
100 Mbps or higher	10.9%	6
answered question		**55**
skipped question		**19**

9. What factors(s) are important enough to consider increasing the speed of your Internet connection? Please indicate all reasons that apply.

	Critical	Very Important	Some Value	No Value	Don't Know	Rating Average	Response Count
Availability of greater speed	38.5% (20)	**50.0% (26)**	9.6% (5)	1.9% (1)	0.0% (0)	3.25	52
Affordability/Value	**68.5% (37)**	25.9% (14)	3.7% (2)	0.0% (0)	1.9% (1)	3.66	54
Reliability of service	**77.8% (42)**	20.4% (11)	1.9% (1)	0.0% (0)	0.0% (0)	3.76	54
Security of service	**61.5% (32)**	28.8% (15)	7.7% (4)	1.9% (1)	0.0% (0)	3.50	52
Enabling new applications	28.6% (14)	**42.9% (21)**	24.5% (12)	2.0% (1)	2.0% (1)	3.00	49
Value-added business operations	**28.6% (14)**	24.5% (12)	24.5% (12)	10.2% (5)	12.2% (6)	2.81	49
Would not upgrade current service	4.8% (2)	11.9% (5)	21.4% (9)	**33.3% (14)**	28.6% (12)	1.83	42
					answered question		55
					skipped question		19

10. Do you think that the North Florida Broadband Authority is doing the right thing by bringing open access Middle Mile Infrastructure to the RACEC?

	Response Percent	Response Count
Yes	**89.1%**	49
No	10.9%	6
answered question		55
skipped question		19

Appendix C

SURVEY SUMMARY NOVEMBER 19, 2009

NFEDP Feasibility Study 2009 - Connectivity Survey - Non-Profit/Government

1. Background Information:

	Response Percent	Response Count
Contact Name:	96.8%	60
Organization/Agency:	93.5%	58
Address:	91.9%	57
Address 2:	21.0%	13
County:	**100.0%**	**62**
State:	98.4%	61
ZIP/Postal Code:	98.4%	61
Country:	95.2%	59
Email Address:	88.7%	55
Phone Number:	93.5%	58
	answered question	**62**
	skipped question	**0**

2. What is the name of the company that provides your Internet connection? If there is more than one Internet Service Provider please include all providers.

	Response Count
	48
answered question	**48**
skipped question	**14**

3. How many providers could you choose from when you subscribed to your current provider?

	Response Percent	Response Count
Currently no Internet service	4.8%	3
One (1)	**62.9%**	**39**
Two (2)	16.1%	10
Three (3)	11.3%	7
Four (4) or more	4.8%	3
answered question		62
skipped question		0

4. How does your home or business connect to the Internet? Please check the type of connection that applies to you.

	Was this an option from service provider?	I have this service.	Response Count
No Internet Connection	50.0% (4)	**62.5% (5)**	8
Shared T1 Line	**72.7% (8)**	63.6% (7)	11
T1 or DS-1 Line	**75.0% (9)**	58.3% (7)	12
Integrated Services Digital Network (ISDN)	**71.4% (5)**	57.1% (4)	7
T3 or DS-3 line	**100.0% (6)**	50.0% (3)	6
Digital Subscriber Line (DSL)	**88.2% (15)**	52.9% (9)	17
Cable Modem	**78.6% (11)**	50.0% (7)	14
Wireless Network (2G/3G/4G)	64.3% (9)	**71.4% (10)**	14
Satellite or Microwave	**100.0% (6)**	33.3% (2)	6
		Other (please specify)	6
		answered question	35
		skipped question	27

5. If you know the advertised/contracted Internet connection speed for downloading documents, please check the fastest speed that applies.

	Response Percent	Response Count
Less than 200 Kbps	5.9%	1
200 Kbps to 512 Kbps	17.6%	3
512 Kbps to 1.5 Mbps	**47.1%**	**8**
1.5 Mbps (DS-1 or T1)	23.5%	4
2 Mbps	0.0%	0
10 Mbps or greater	5.9%	1
answered question		17
skipped question		45

6. Please go to the following Web site (http://www.speedtest.net/) and let us know what speeds you actually test.

	Response Percent	Response Count
Download Speed	**92.9%**	**13**
Upload Speed	**92.9%**	**13**
Ping Time	**92.9%**	**13**
answered question		14
skipped question		48

7. To the best of your knowledge, how much do you currently pay for all of you Internet access PER MONTH? Please note, this might include two or more types of charges including the following: Local Access, DIA (Direct Internet Access), Port Charge, etc.

	Response Percent	Response Count
Less than $100	28.6%	10
$100 - $500	14.3%	5
$501 - $1000	2.9%	1
$1001 - $2000	2.9%	1
More than $2000	2.9%	1
Not Sure	**48.6%**	**17**
answered question		**35**
skipped question		**27**

8. If you know what applications you or your organization need/would like to have, please select the appropriate level below.

	Response Percent	Response Count
Not Sure	**51.4%**	**18**
256 Kbps to 512 Kbps	0.0%	0
512 Kbps to 1.5 Mbps	2.9%	1
1.5 Mbps (DS-1 or T1) to 5 Mbps	14.3%	5
5-10 Mbps	0.0%	0
Greater than 10Mbps	11.4%	4
100 Mbps or higher	20.0%	7
answered question		**35**
skipped question		**27**

9. What factors(s) are important enough to consider increasing the speed of your Internet connection? Please indicate all reasons that apply.

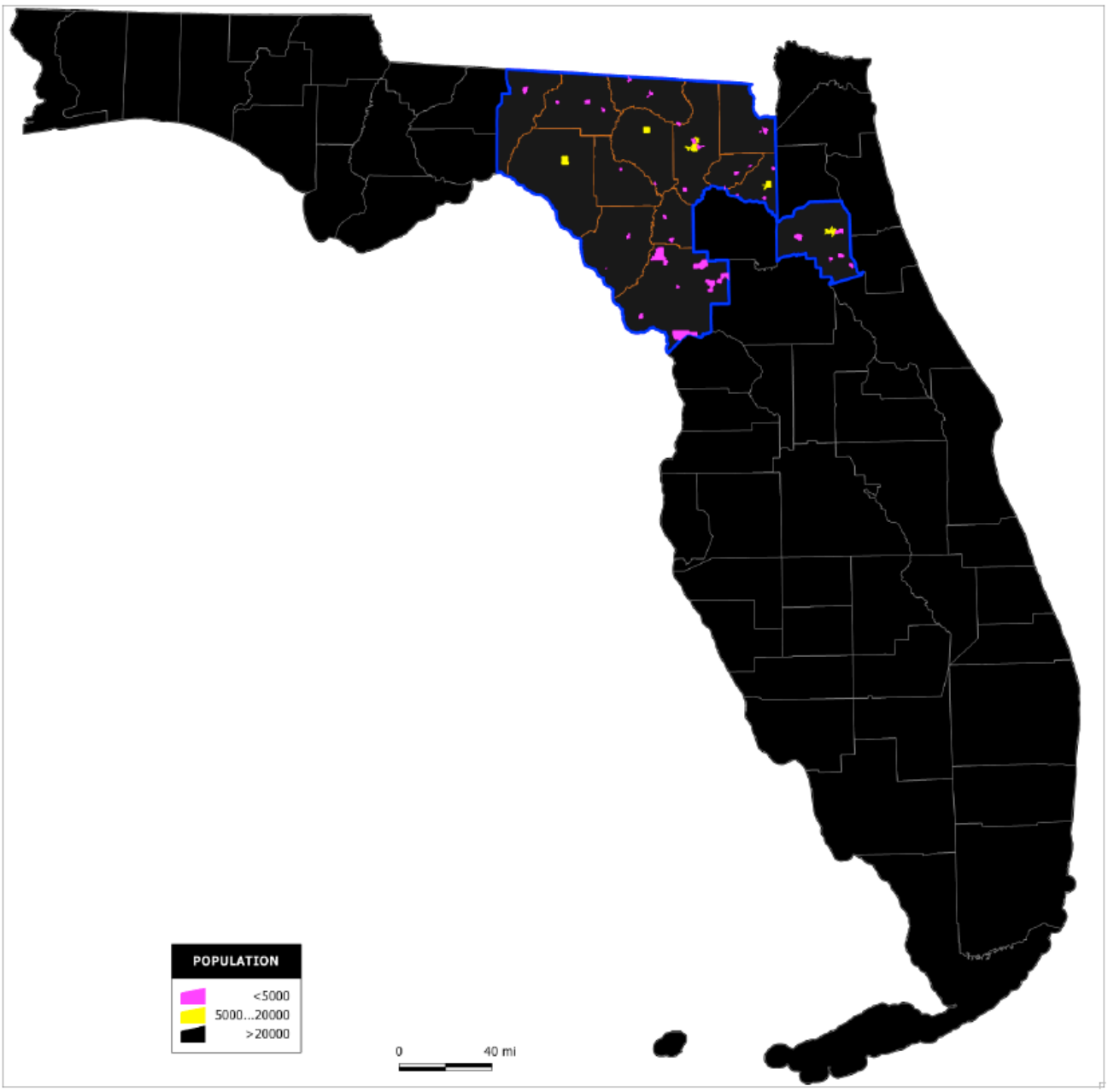
	Critical	Very Important	Some Value	No Value	Don't Know	Rating Average	Response Count
Availability of greater speed	**55.9% (19)**	38.2% (13)	0.0% (0)	0.0% (0)	5.9% (2)	3.59	34
Affordability/Value	**57.1% (20)**	25.7% (9)	2.9% (1)	2.9% (1)	11.4% (4)	3.55	35
Reliability of service	**80.0% (28)**	11.4% (4)	0.0% (0)	0.0% (0)	8.6% (3)	3.88	35
Security of service	**82.4% (28)**	8.8% (3)	0.0% (0)	0.0% (0)	8.8% (3)	3.90	34
Enabling new applications	**43.8% (14)**	31.3% (10)	6.3% (2)	3.1% (1)	15.6% (5)	3.37	32
Value-added business operations	**36.4% (12)**	24.2% (8)	18.2% (6)	3.0% (1)	18.2% (6)	3.15	33
Would not upgrade current service	7.7% (2)	19.2% (5)	11.5% (3)	7.7% (2)	**53.8% (14)**	2.58	26
					answered question		**35**
					skipped question		**27**

10. Do you think that the North Florida Broadband Authority is doing the right thing by bringing open access Middle Mile Infrastructure to the RACEC?

	Response Percent	Response Count
Yes	**91.4%**	**32**
No	8.6%	3
	answered question	**35**
	skipped question	**27**

Appendix D

DEMOGRAPHIC MAPS


POPULATION
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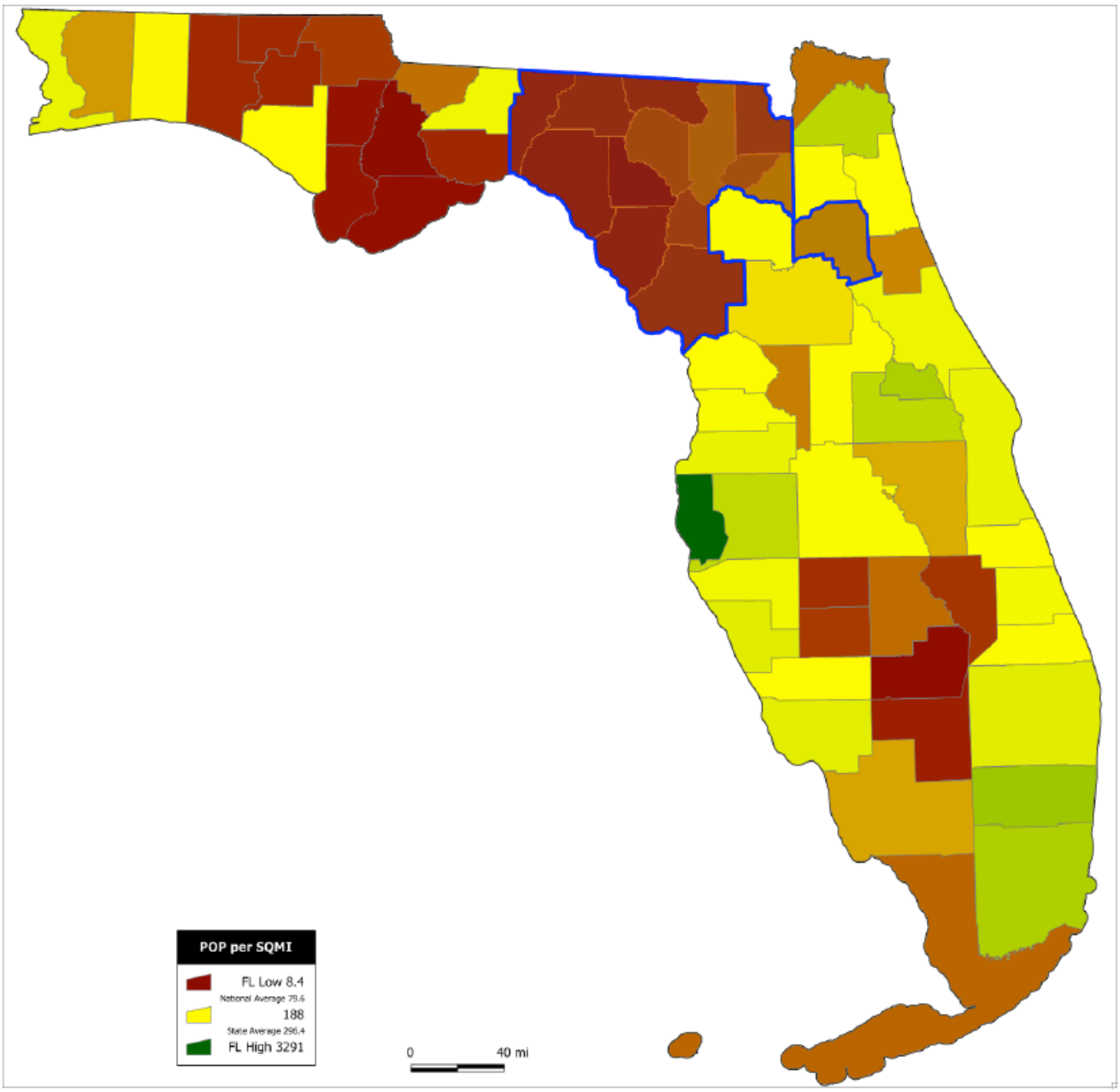
5000...20000
>20000
0
40 mi


POP per SQMI
FL Low 8.4
National Average 79.6
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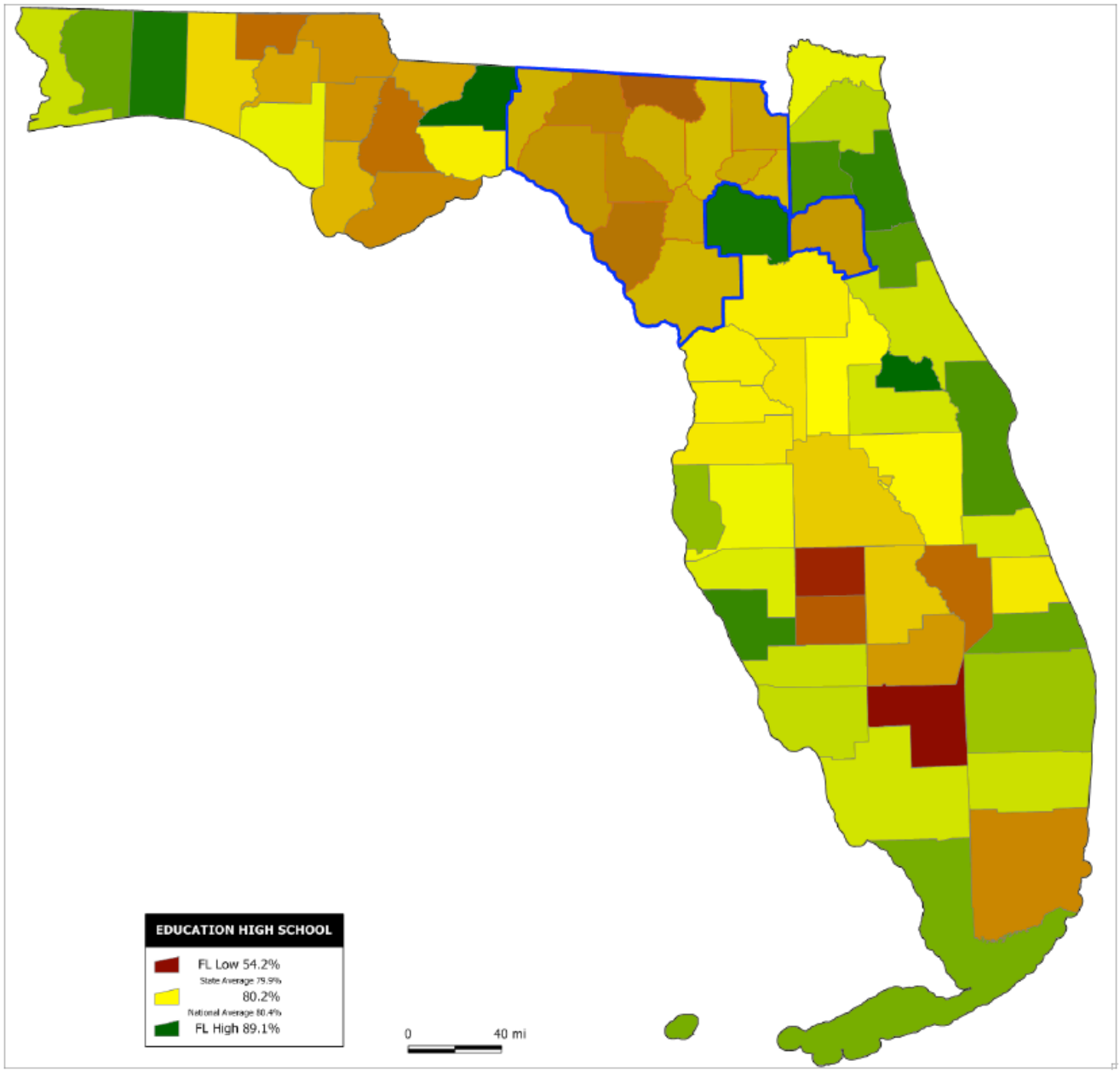
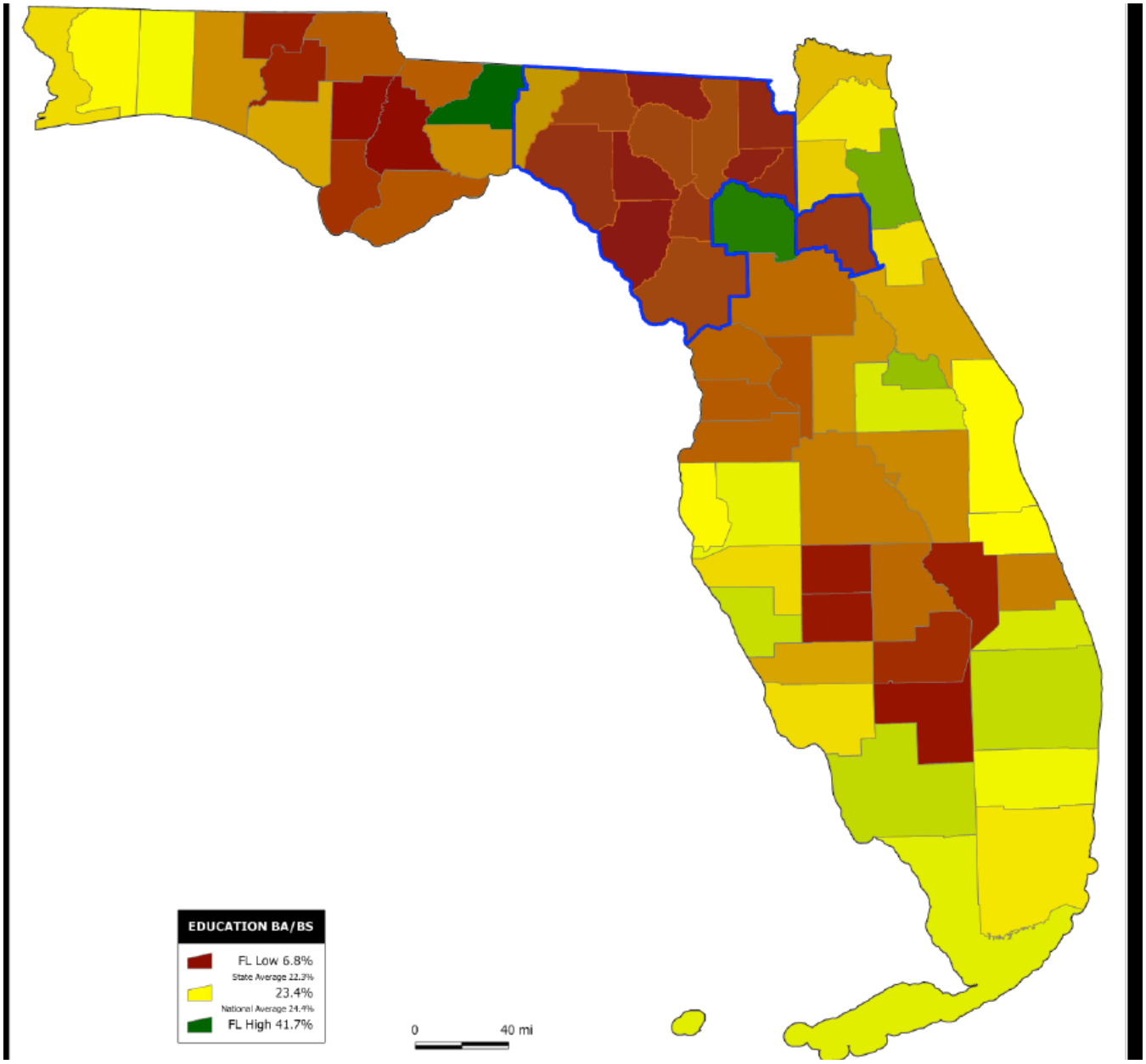
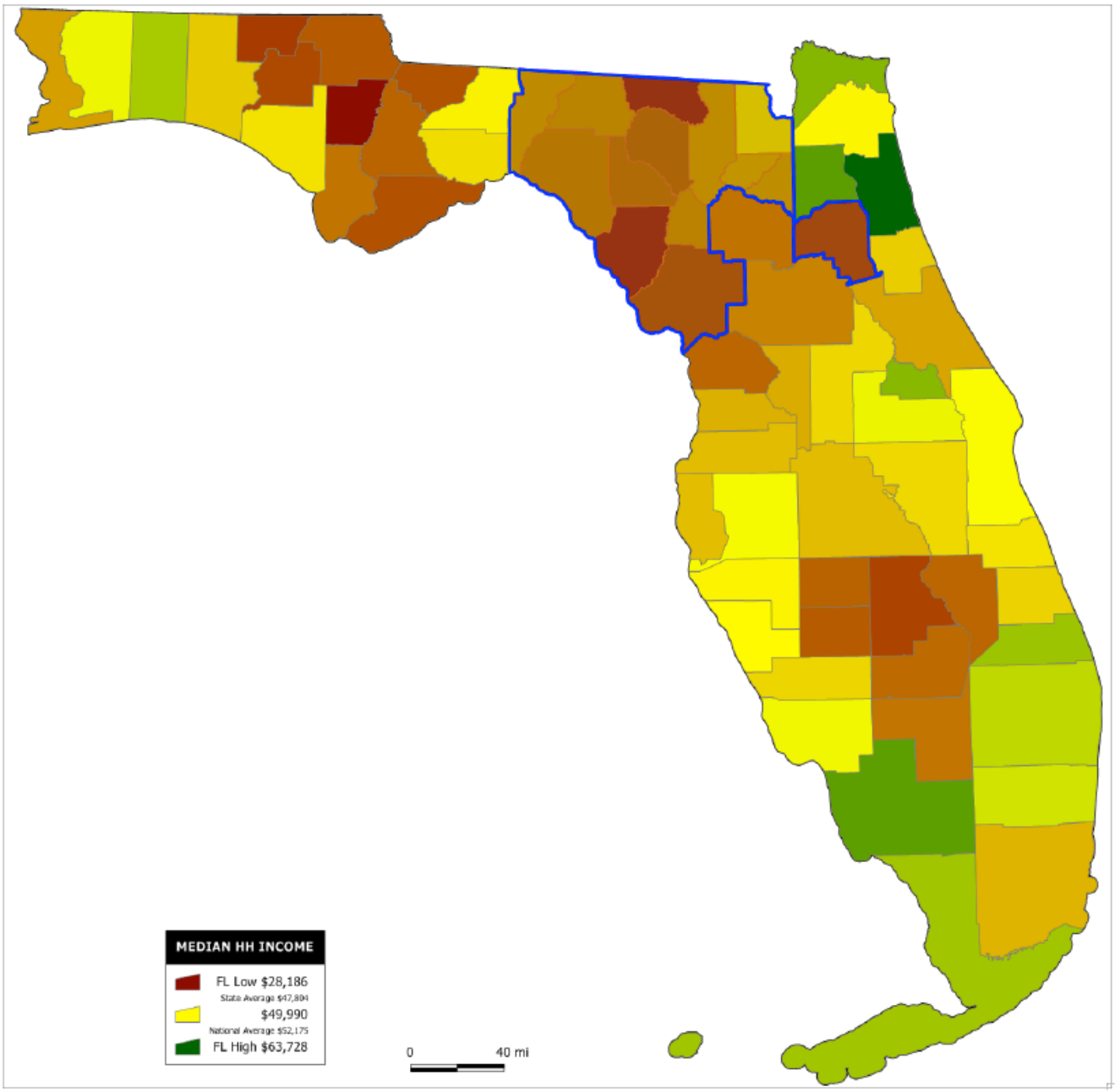
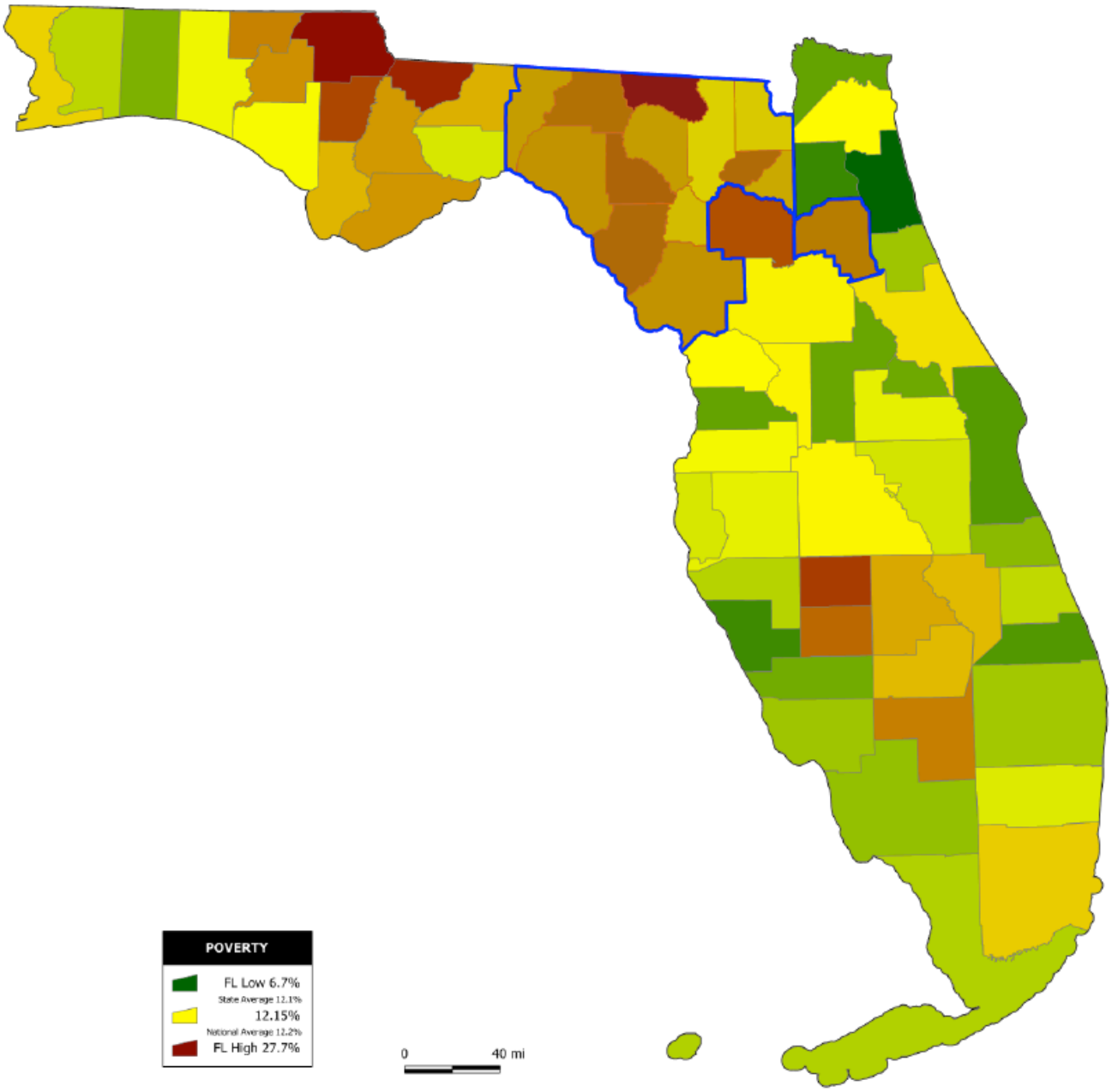
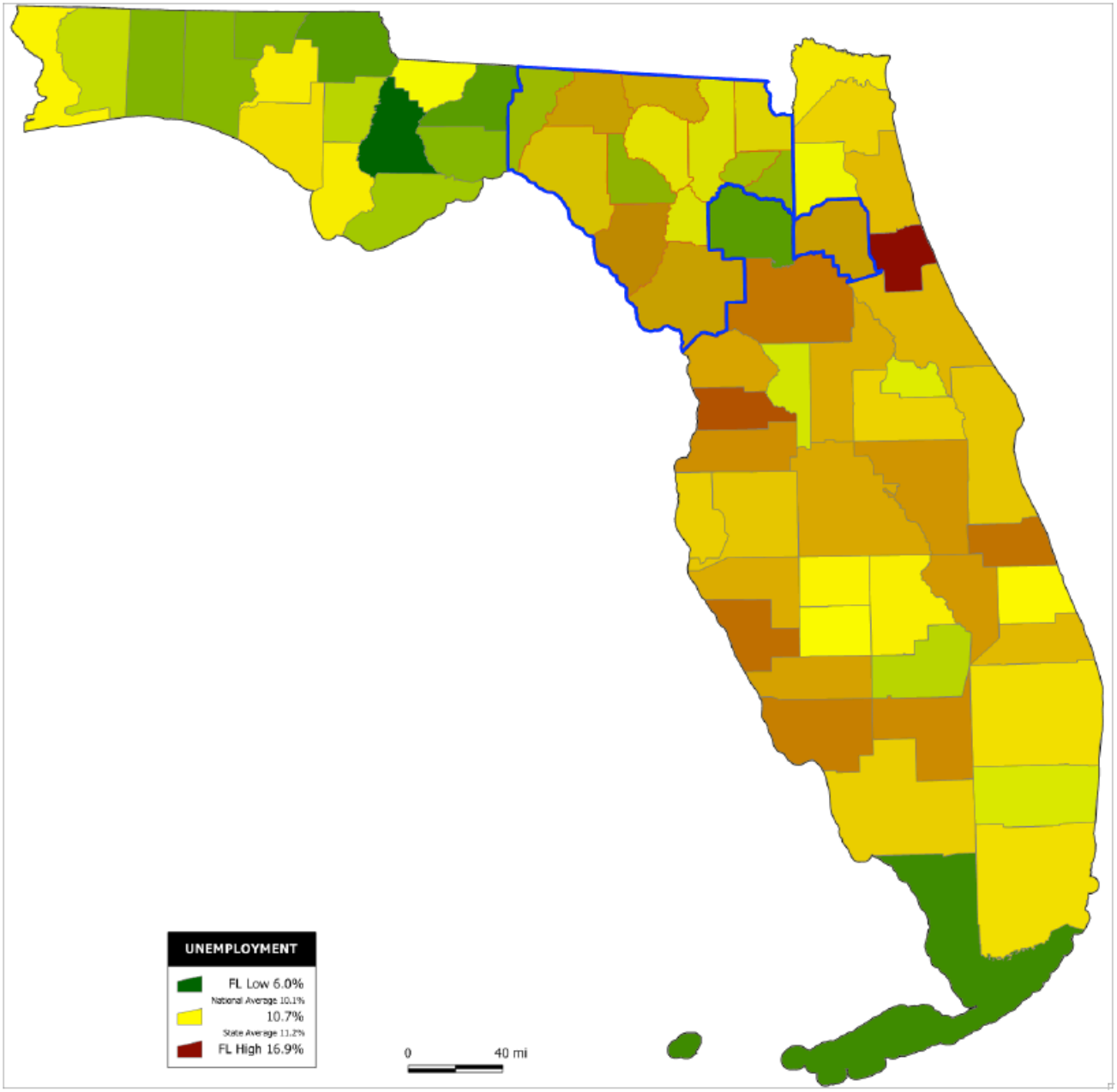
State Average 296.4
FL High 3291
0
40 mi


EDUCATION HIGH SCHOOL
FL Low 54.2%
State Average 79.9%
80.2%
National Average 80.4%
FL High 89.1%
0
40 mi


EDUCATION BA/BS
FL Low 6.8%
State Average 22.3%
23.4%
National Average 24.4%
FL High 41.7%
0
40 mi


MEDIAN HH INCOME
FL Low $28,186
State Average $47,804
$49,990
National Average $52,175
FL High $63,728
0
40 mi


POVERTY
FL Low 6.7%
State Average 12.1%
12.15%
National Average 12.2%
FL High 27.7%
0
40 mi

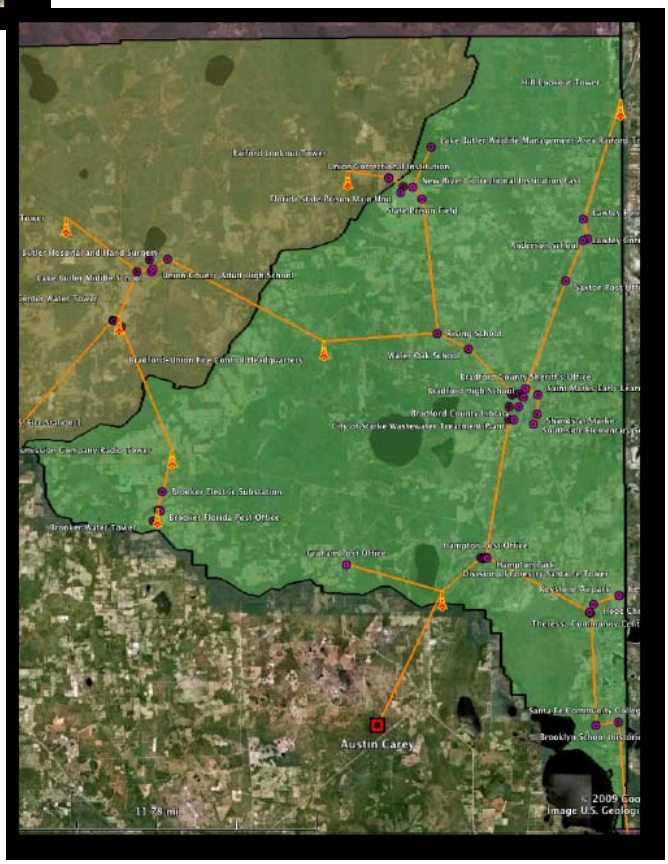

UNEMPLOYMENT
FL Low 6.0%
National Average 10.1%
10.7%
State Average 11.2%
FL High 16.9%
0
40 mi

Appendix E

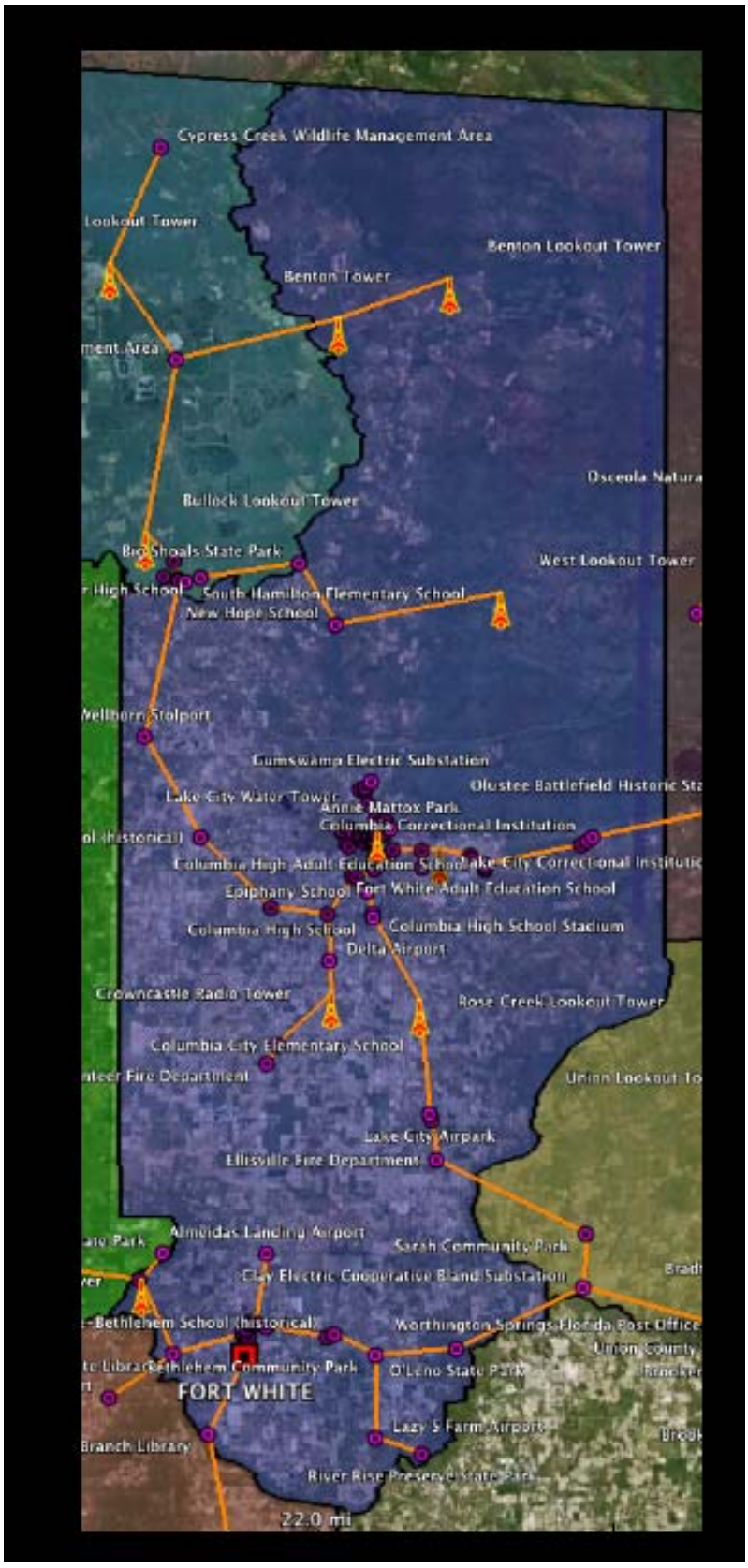
COUNTY-BY-COUNTY NETWORK DIAGRAMS

Baker County

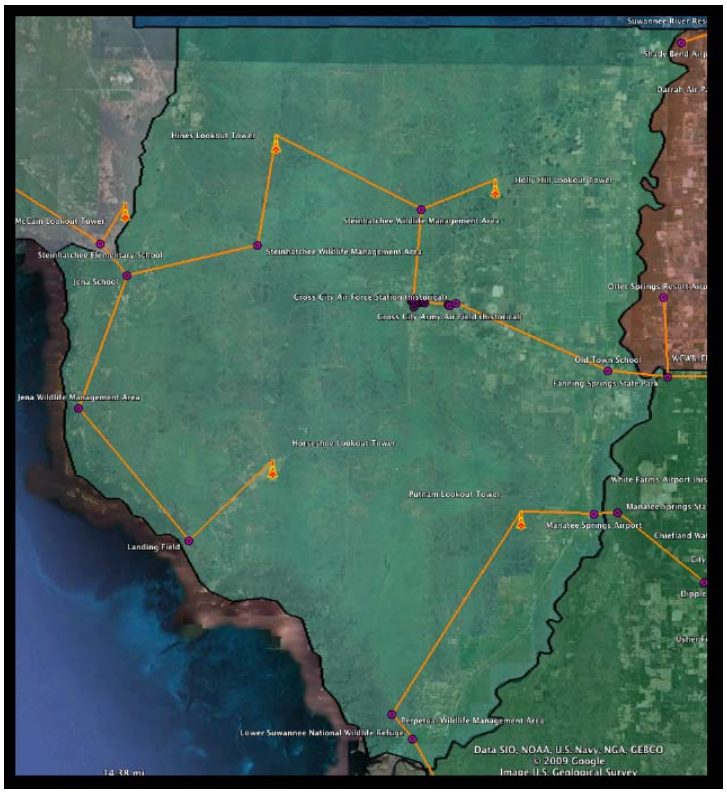
Bradford County



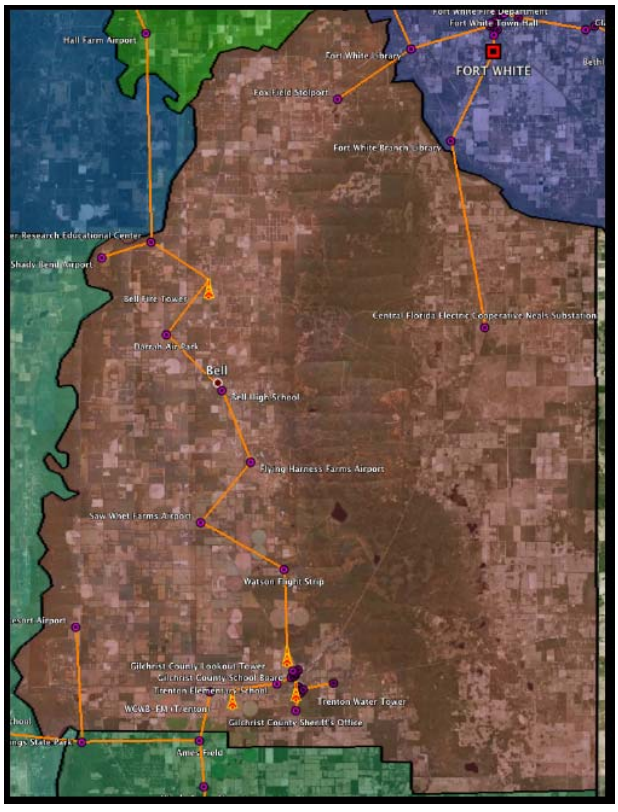
Columbia County



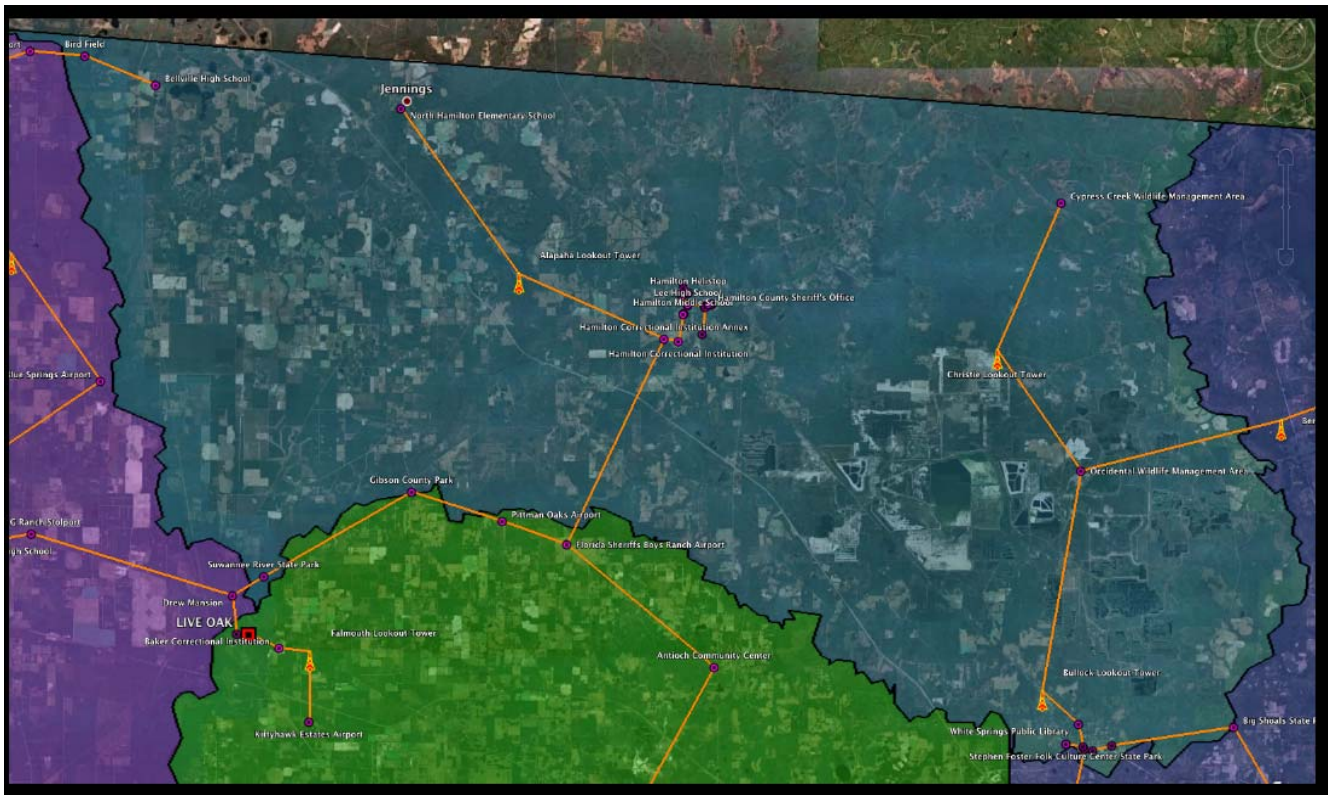
Dixie County



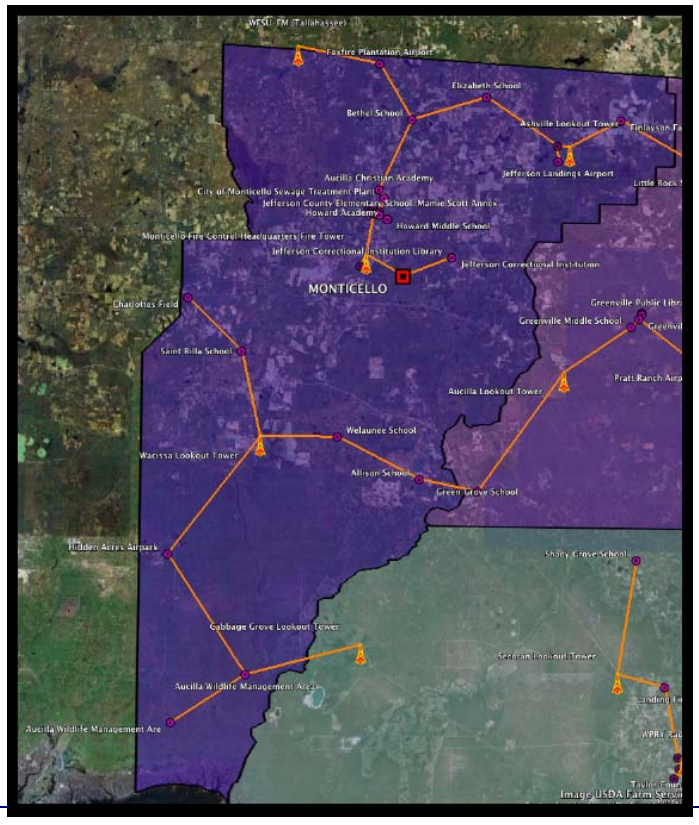
Gilchrist County



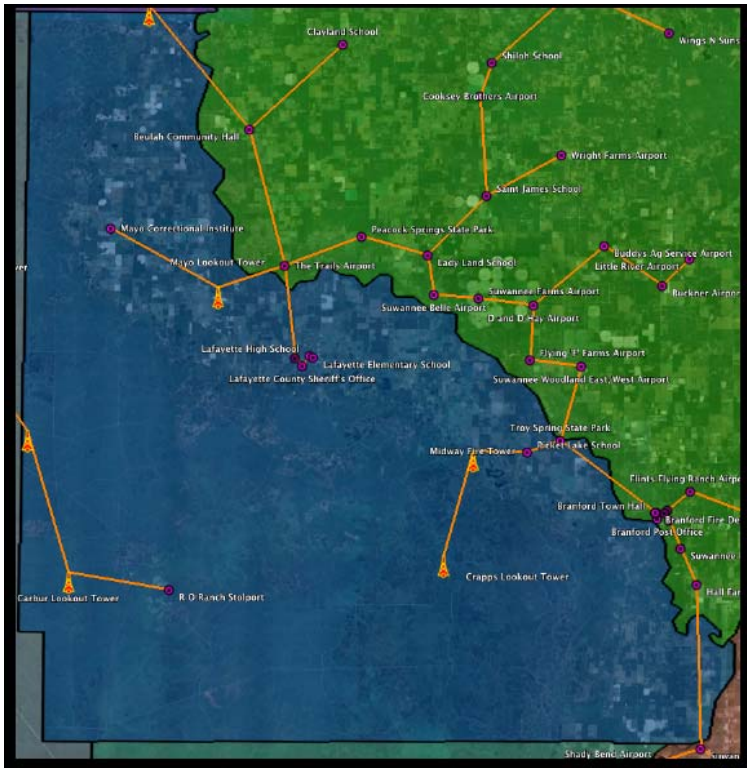
Hamilton County



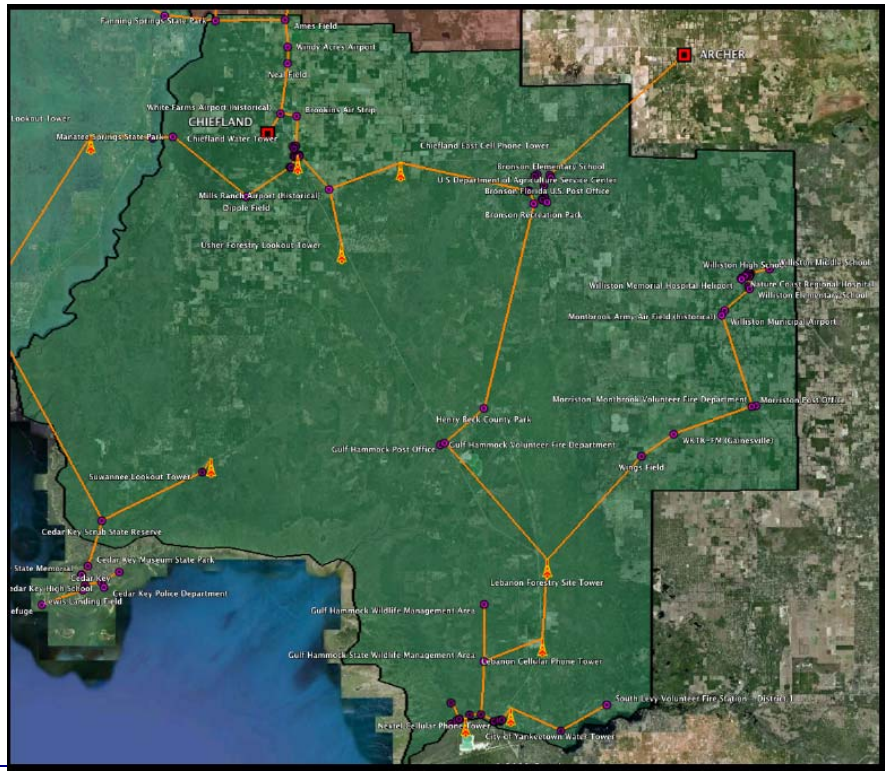
Jefferson County



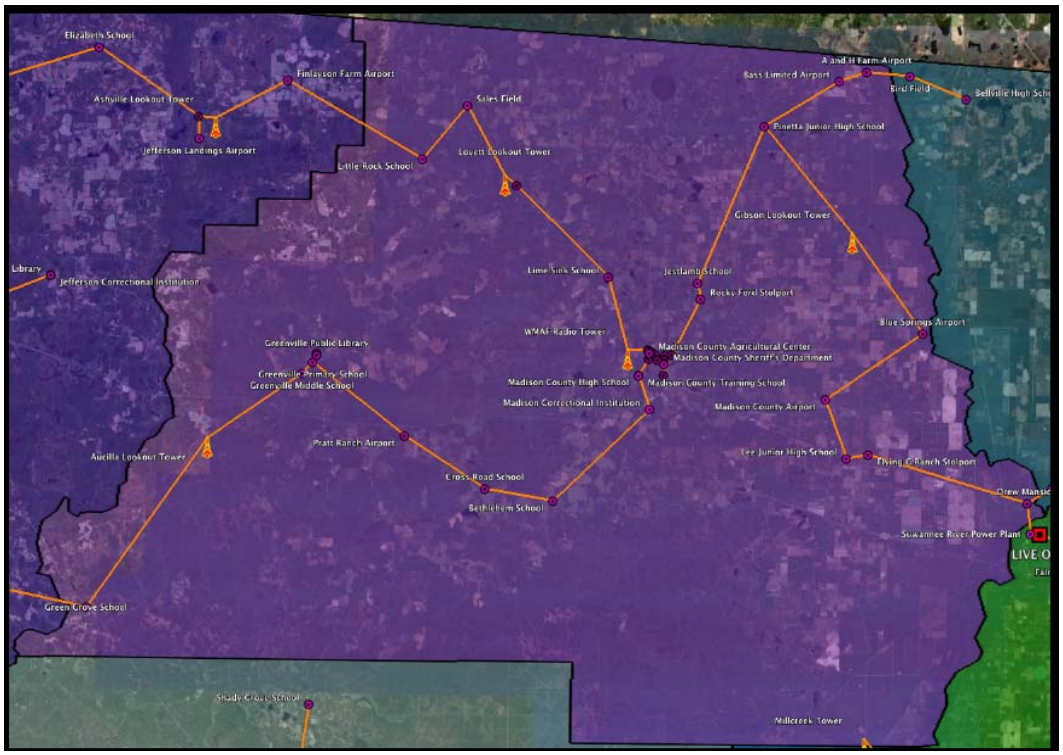
Lafayette County



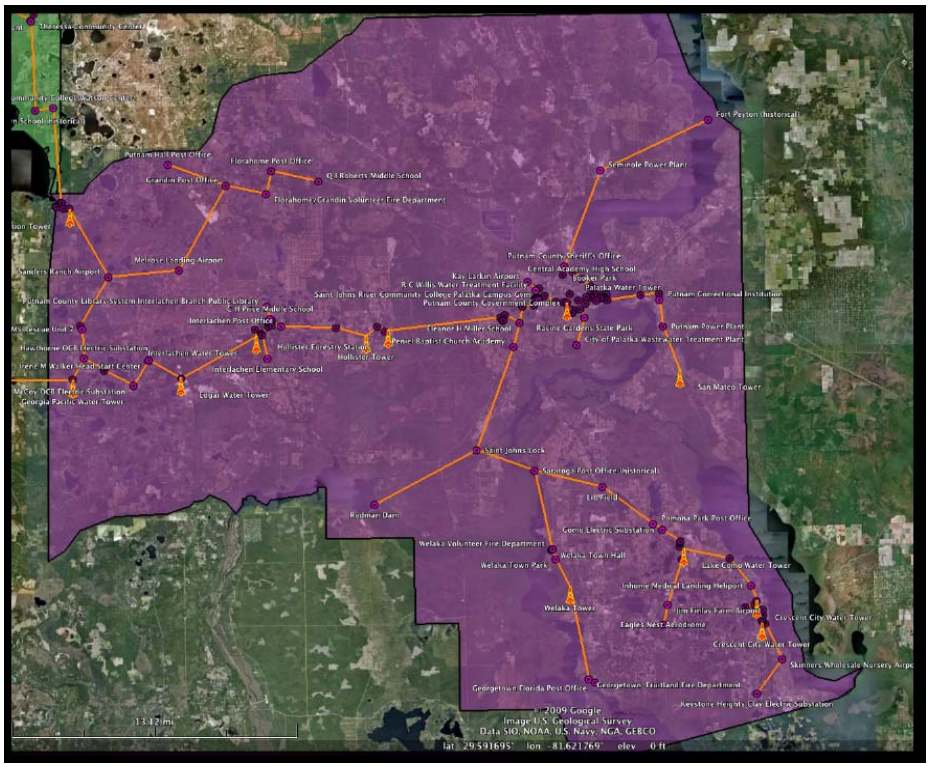
Levy County



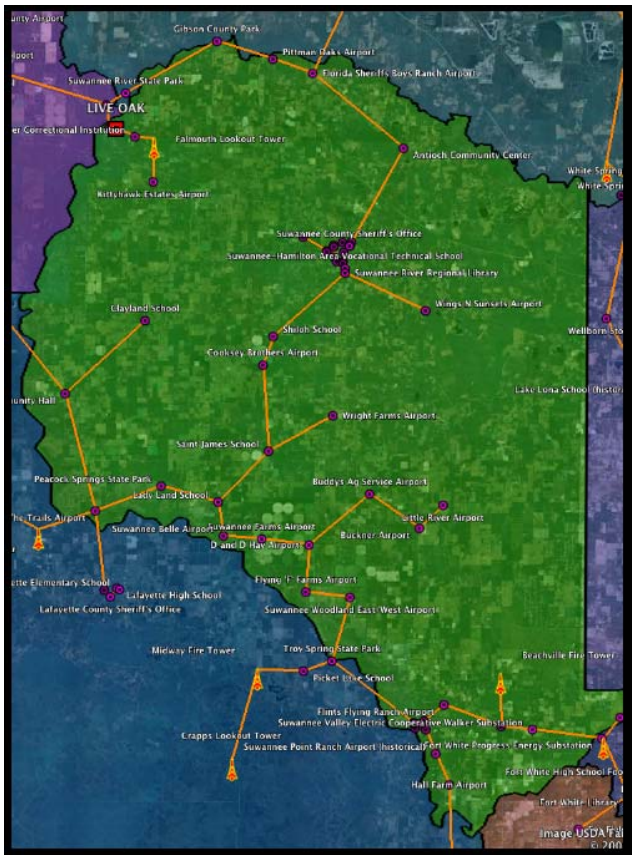
Madison County



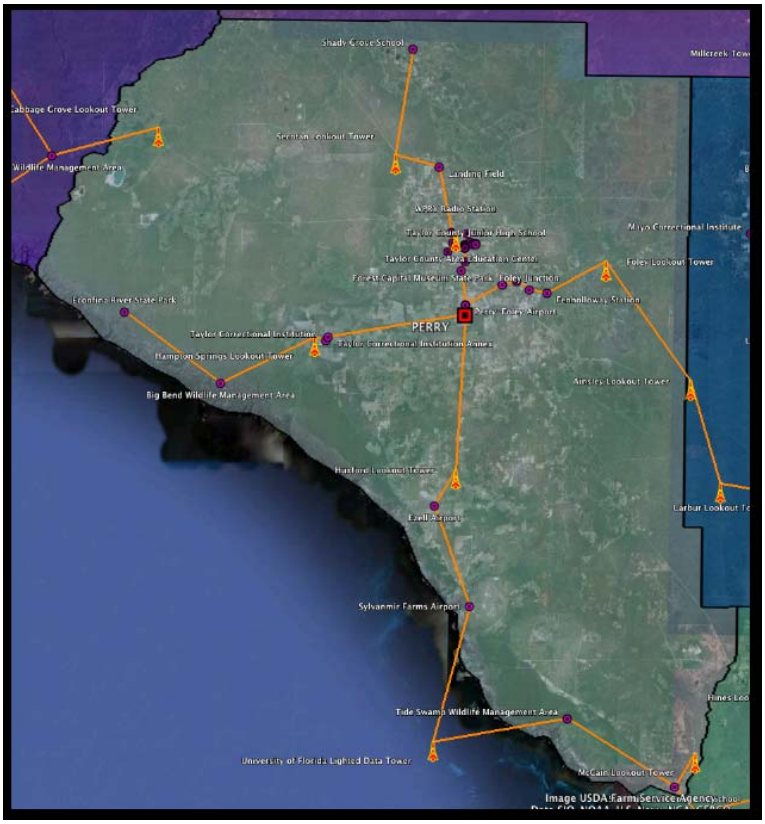
Putnam County



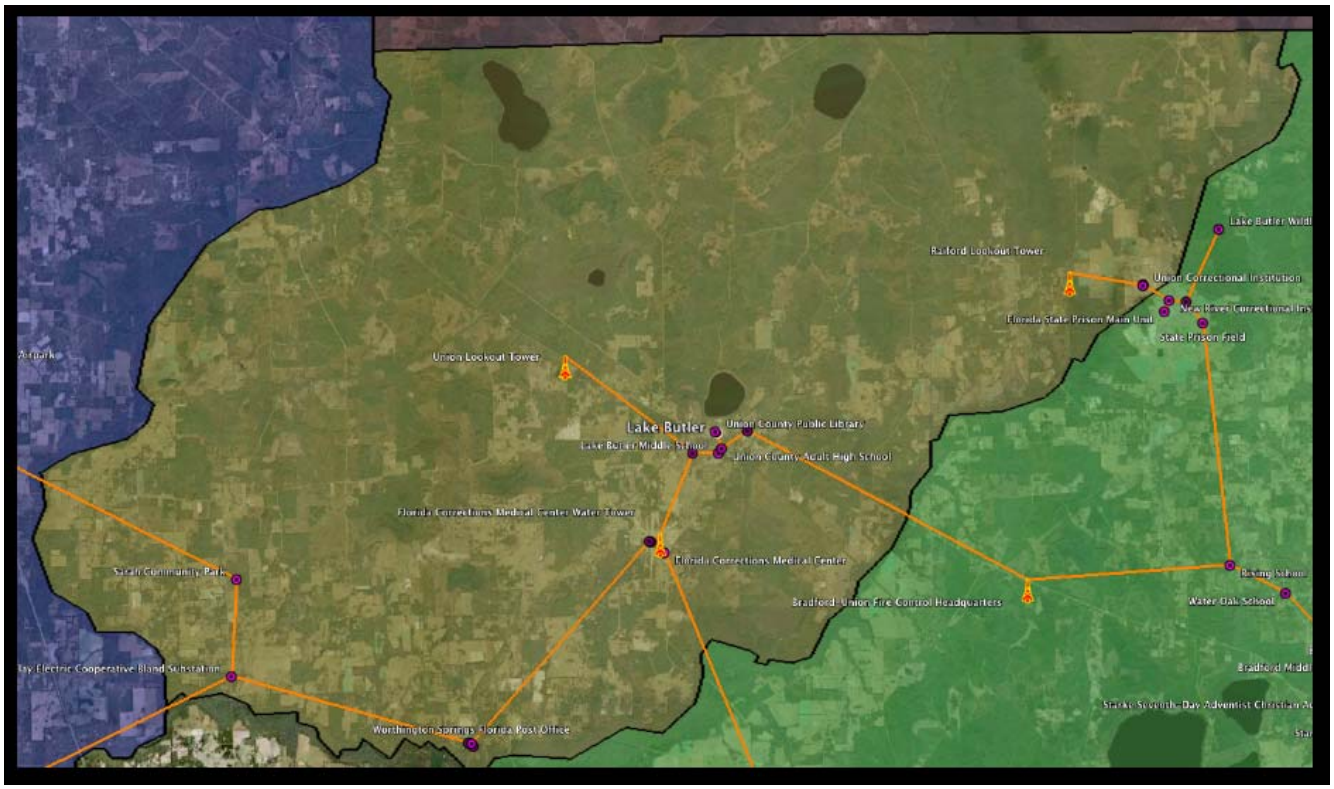
Suwannee County



Taylor County



Union County



Appendix F

MYFLORIDA.NET CUSTOMERS

18. Middle Mile Benefits - Target Strategic Institutions (MYFLN Connections

Service Area Name: North Florida RACEC

AGENCY	SPEED (Mbps)	CURRENT
Dept Of Military Affairs	100	Ethernet
Dept Of Corrections	45	Fractional TDM
Lake City Community College	33	Ethernet
St Johns River Community College	33	Ethernet
Jac - State Courts Info Svcs	21	Ethernet
Dot	15	Ethernet
North Florida Community College	15	Ethernet
Department Of Community Affairs	12	Ethernet
Sjrwmd	12	Ethernet
Dcf	6	Ethernet
State Courts Info Services	6	Fractional TDM
State Courts Info Services	6	Fractional TDM
State Courts Info Services	6	Fractional TDM
Department Of Health	3	Fractional TDM
Dcf	3	Fractional TDM
Dcf	3	Fractional TDM
Sfcc - Santa Fe Comm College	3	Fractional TDM
Dept Of Corrections	3	Fractional TDM
Fl Dept Of Veterans Affairs	3	Fractional TDM
Partnership For Strong Families	3	Fractional TDM
Dept Of Health	3	Fractional TDM
Department Of Health	3	Fractional TDM
Department Of Health	3	Fractional TDM
Department Of Health	3	Fractional TDM
N Fl Workforce Dev Board	3	Fractional TDM
Department Of Health	3	Fractional TDM
Department Of Health	3	Fractional TDM
Department Of Health	3	Fractional TDM
Department Of Health	2	Ethernet
Department Of Health	2	Ethernet
Department Of Health	2	Ethernet
Department Of Health	2	Ethernet
Dcf	1.5	Ethernet
Dcf	1.5	Ethernet
Partnership For Strong Families	1.5	Ethernet
Doacs	1.5	DSL
Dept Of Health	1.5	DSL
Doacs	1.5	DSL

AGENCY	SPEED (Mbps)	CURRENT
Doacs	1.5	DSL
Fdle Cjnet	1.5	Fractional TDM
Fin	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Dept Of State	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Health	1.5	Fractional TDM
Doacs	1.5	Fractional TDM
Fdle	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Florida Interoperability Network	1.5	Fractional TDM
Bradford County Sheriff Office	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Auditor General	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fin	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of State	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Mfn - Florida Interoperability Network	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Supervisor Of Elections	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fin	1.5	Fractional TDM
Fdle - Cjnet Former 56K Sites	1.5	Fractional TDM
Dept Of Environmental Protection	1.5	Fractional TDM
Mcco	1.5	Fractional TDM
Dept Of Environmental Protection	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM

AGENCY	SPEED (Mbps)	CURRENT
State Courts Info Services	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Supervisor Of Elections	1.5	Fractional TDM
Dot Its	1.5	Fractional TDM
B73/Xjl*46/1_Mnti_Monticello Tag Agy	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Lafayette County 911	1.5	Fractional TDM
Fin	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Dept Of State	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Fdle Cjnet	1.5	Fractional TDM
Dept Of Environmental Protection	1.5	Fractional TDM
Dcf	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Fdle - Cjnet	1.5	Fractional TDM
Mcco	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Supervisor Of Elections	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
N Fl Workforce Dev Board	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Dhsmv - Fhp	1.5	Fractional TDM
Madison County E911	1.5	Fractional TDM
Mfn - Florida Interoperability	1.5	Fractional TDM
Partnership For Strong Families	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Fdle	1.5	Fractional TDM
Dot	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dhsmv - Fhp	1.5	Fractional TDM
Fdle -Cjnet Former 56K Sites	1.5	Fractional TDM
Dept Of Highway Safety And Motor Vehicl	1.5	Fractional TDM

AGENCY	SPEED (Mbps)	CURRENT
Palatka Police Department	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Military Affairs	1.5	Fractional TDM
Community Partnership For Children	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fl House Of Representatives	1.5	Fractional TDM
Florida Dept Of Juvenile Justice	1.5	Fractional TDM
Doe - Vocational Rehab	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
State Attorneys Ofc	1.5	Fractional TDM
Doacs	1.5	Fractional TDM
Doacs	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Dept Of Military Affairs	1.5	Fractional TDM
Doe - Vocational Rehab	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Supervisor Of Elections	1.5	Fractional TDM
Suwannee County Bocc	1.5	Fractional TDM
Dcf	1.5	Fractional TDM
Doacs	1.5	Fractional TDM
Dhsmv	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Taylor County Bocc	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Agriculture	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Florida Association Of Court Clerks	1.5	Fractional TDM
Fdle-Cjnet	1.5	Fractional TDM
Dept Of Corrections	1.5	Fractional TDM
Pride Enterprises	1.5	Fractional TDM
Pride Enterprises	1.5	Fractional TDM
Pride Enterprises	1.5	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM

AGENCY	SPEED (Mbps)	CURRENT
Fin	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Florida Dept Of Juvenile Justice	0.768	Fractional TDM
Dept Of Environmental Protection	0.768	Fractional TDM
Fin	0.768	Fractional TDM
Doacs	0.512	Fractional TDM
Dept Of Agriculture	0.512	Fractional TDM
Fl Dept Of Ag	0.512	Fractional TDM
Apalachee Center Inc	0.512	Fractional TDM
Doacs	0.512	Fractional TDM
Apalachee Ctr Inc	0.512	Fractional TDM
Doacs	0.512	Fractional TDM
Doacs	0.512	Fractional TDM
Doacs	0.512	Fractional TDM
Apalachee Center Inc	0.512	Fractional TDM
Fl Dept Of Ag	0.512	Fractional TDM
Doacs	0.512	Fractional TDM
Pride Enterprises	0.512	Fractional TDM
Fdle-Fdle	0.256	Fractional TDM
Fdle-Fdle	0.256	Fractional TDM
Dept Of Health	0.256	Fractional TDM
Dot Survey And Mapping	0.064	Fractional TDM