

Alabama Broadband Accessibility Fund  
2021 Grant Application and Guide



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**2021 Grant Application Guidelines**

An application workshop will be held at 10:00 A.M. on Monday, November 9, 2020. The meeting will be held virtually. To join the meeting, make sure that you have signed up to be on the Broadband Alabama Mailing List which can be found at <https://adeca.alabama.gov/Divisions/energy/broadband> and you will receive instructions on how to join. An online version of the workshop and questions and answers from the workshop will be posted on the Alabama Department of Economic and Community Affairs (ADECA) website after the workshop, at <http://adeca.alabama.gov/broadband>.

Applications shall be submitted in PDF format by email to [broadband.fund@adeca.alabama.gov](mailto:broadband.fund@adeca.alabama.gov). Applications will be accepted starting on November 9, 2020. Completed applications must be submitted by 11:59 PM, CST, on February 8, 2021. Any applications received after the deadline will not be considered. All applications must be complete; however, ADECA reserves the right to contact applicants for additional information and/or clarifications. All applications received will be posted on ADECA's website at <http://adeca.alabama.gov/broadband>.

Existing service providers shall have from February 9, 2021 through March 23, 2021 to file objections to the eligibility of the proposed projects. All objections must be filed by email to [broadband.fund@adeca.alabama.gov](mailto:broadband.fund@adeca.alabama.gov) and must include verifiable documentation to support the challenge.

An applicant may submit more than one application; however, each project must have a separate application and budget. Each project must stand alone in meeting the Alabama Broadband Accessibility Fund program requirements.

Eligibility

An eligible applicant is a non-government entity that is a cooperative, corporation, limited liability company, partnership, or other private business entity that provides broadband service.

Funding

Projects must be completed within two years of the effective date of the grant agreement. The grant will be in the form of a reimbursement of eligible costs up to the award amount in the grant agreement. Providers' grants shall be paid within 30 days upon ADECA receiving written certification of the completion of the project and evidence of compliance with the terms of the grant as prescribed by ADECA. ADECA shall condition the release of any grant funds on operational testing, when possible, to confirm the level of service proposed in the grant application. Such regulations shall not exceed in degree or differ in kind from testing and reporting requirements imposed on the grant recipient by the Federal Communications Commission, as adjusted for the service specifications in the ADECA grant agreement.

All projects will be scored based on the established rating criteria. The criteria can be found at <http://adeca.alabama.gov/broadband>. Those eligible projects receiving the highest scores will be selected for funding. The number of projects funded will be determined by the funds available and the

total amount of requests made. ADECA may request amended projects and/or offer reduced grant participation.

ADECA shall ensure that Not less than 40% of funds appropriated for grants be utilized in unincorporated areas of the state. Further, grants awarded for middle mile and anchor institution projects shall not exceed 40% of the total funds appropriated for grants on an annual basis. Individual grant awards will be for projects in unserved areas, and may not exceed the lesser of 35 percent of the project cost, or \$1,500,000 for projects that will be capable of transmitting broadband signals at or above the minimum service threshold.

### Definitions

END USER. A residential, business, institutional, or government entity that uses broadband services for its own purposes and does not resell such broadband services to other entities. An internet service provider (ISP) and mobile wireless service provider are not an end user for the purposes of this act.

MIDDLE MILE PROJECT. A broadband infrastructure project that does not provide broadband service to end users or to end-user devices.

MINIMUM SERVICE THRESHOLD. A connection to the Internet that provides capacity for transmission at an average speed per customer of at least 25 megabits (25 Mbps) per second downstream and at least three megabits (3 Mbps) per second upstream.

RURAL AREA. Any area within this state not included within the boundaries of any incorporated city or town having a population in excess of 25,000 inhabitants, according to the last federal census.

UNSERVED AREA. Any rural area in which there is not at least one provider of terrestrial broadband service that is either: (1) offering a connection to the Internet meeting the minimum service threshold; or (2) is required, under the terms of the Federal Universal Service Fund or other federal or state grant, to provide a connection to the Internet at speeds meeting the minimum service threshold by March 28, 2023.

**APPLICANTS MUST USE THE FOLLOWING APPLICATION FORM, COMPLETE IT IN ITS ENTIRETY, AND LABEL ATTACHMENTS AS INSTRUCTED. FAILURE TO DO SO, MAY RESULT IN A LOSS OF POINTS.**

**2021 Grant Application**

Applicant Information

Project Name: **Hale County CBRS Phase 1**

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Legal Name of Entity: **Mediacom Southeast LLC**

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Mailing Address: **1 Mediacom Way, Mediacom Park, NY 10918**

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Name and Title of CEO: **Rocco Commisso, CEO**

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Name and Title of Contact: **Christopher Lord, Sr. Manager, Government Relations**

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Phone Number and Email of Contact: **850.737.0098, clord@mediacomcc.com**

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Note: All successful applicants will be required to complete and submit the Beason-Hammon Alabama Taxpayer and Citizen Protection Act Certification, submit a complete copy of their E-Verify Memorandum of Understanding (MOU), complete and submit the State of Alabama Disclosure Statement, complete and submit the Signatory Authority Form, and register in the State of Alabama Accounting and Resource System (STAARS).

A. Project Description

**This section is worth up to 25 points. Up to an additional 10 bonus points may be available to applicants adequately demonstrating the criteria listed in number seven (7) below. Points will be awarded based on verifiable information only.**

Please complete the project description sections below. Any additional documentation can be included in an attachment file titled Attachment A, Project Description.

1. A discussion of the area served including boundaries, number of households, businesses, and any community anchors (libraries, schools, police and fire stations, hospitals, etc.). This response shall also identify if the project area is located within an unincorporated area and provide information regarding how the area meets the definition of rural (US Census data). Please complete the following table.

Number of Households to be Served	653
Number of Businesses / Industries to be served	0
Number of Community Anchors to be served	0

- A. Please see Appendix A for full details on service area.
2. A discussion of the technology to be deployed (fiber, cable, DSL, etc.). Additionally, include a discussion of future usage projections and the ability to upgrade.

- A. Please see Appendix A-1 for a full discussion on the technology, upgradability, and future usage projections.
3. A discussion of internet speeds, service tier and pricing levels, data caps, etc.
    - A. Please see Appendix A for a full breakdown on speeds, service tiers, and pricing levels.
  4. A preliminary technical evaluation of the project that is certified by an engineer. This evaluation should document the ability of the proposed infrastructure to provide the minimum speeds required to all potential customers in the project area. The evaluation shall also include a project cost estimate, project schedule and timeline to include a completion date of no more than two years, and maps showing the proposed project area. Furthermore, the evaluation should demonstrate how promised speeds will be delivered consistently to the project area, show how the network will work using the proposed equipment, and demonstrate how the backhaul will be provided. **Maps shall be in .shp, .kml, or .kmz formats.**

Additionally, maps shall clearly show area eligibility (unserved areas and rural areas). Generally, applicants may establish that an area is unserved by using the ADECA Broadband map showing unserved areas (<http://adeca.alabama.gov/broadband>). However, applicants are strongly encouraged to conduct a field review. If an area shown as unserved on ADECA's map but becomes served prior to the execution of the grant agreement, the project may not be eligible for funding. **An applicant will be required to receive approval from ADECA for methodology prior to submitting an application. Generally, the methodology will include testing or documentation at both ends of a street in question. A map showing all test sites must be included in the application.**

- A. Please see Appendix A-1 for a full breakdown on technical evaluations and mapping.
5. A discussion of the operator's technical and managerial capabilities to complete the project within two years of the effective date of the grant award. Please be aware that grants shall be conditioned on project completion within two years of awarding of the grant. If a recipient fails to complete a project within the two-year deadline due to reasons other than delay caused by a government entity, ADECA may revoke the grant in its entirety.
    - A. Please see Appendix A
  6. A discussion of the applicant's average pole attachment rates charged to an unaffiliated entity (does not apply to a utility as defined under Section 37-4-1 (7)a).
    - A. Mediacom currently does not own any poles in the state of Alabama and does not charge pole attachment rates.

7. A discussion of the applicant's plan to use vendors and subcontractors that have been certified as a Minority Business Enterprise by the Alabama Minority Business Enterprise program and/or certified by another government entity as being a Disadvantaged Business Enterprise. Please be advised if an applicant chooses to claim consideration under this criterion, a quarterly report documenting activities will be required.
  - A. For this project Mediacom will not utilize any outside vendors or subcontractors that have been certified as a Minority Business Enterprise by the Alabama Minority Business Enterprise program and/or certified by another government entity as being a Disadvantaged Business Enterprise.
  
8. A discussion of Middle Mile Projects (if applicable). The applicant shall demonstrate that the project will connect other service providers eligible for grants under this section with broadband infrastructure further upstream in order to enable such providers to offer broadband service to end users; provided that eligible projects under this subdivision may include projects in (i) an unserved area or (ii) a rural area that does not meet the definition of an unserved area but otherwise meets the requirements of this section, for which the grant applicant demonstrates, by specific evidence, the need for greater broadband speeds, capacity, or service which is not being offered by an existing service provider. An example of specific evidence can be found in the Alabama Broadband Accessibility Fund Frequently Asked Questions.
  - A. This is not a middle mile project, so this question is not applicable.
  
9. A discussion of hospital, public school, public safety, or economic development projects that do not meet the definition of unserved area, but otherwise meets the requirements of the program (if applicable). The applicant must demonstrate by specific evidence, the need for greater broadband speeds, capacity, or service which is not being offered by an existing service provider. Specific evidence may include documentation such as letters from local hospitals, public schools, and public safety institutions. An example of specific evidence can be found in the Alabama Broadband Accessibility Fund Frequently Asked Questions.
  - A. This question does not apply to this project.

B. Application Budget

**This section is worth up to 25 points. Points will be awarded based on verifiable information only.**

For the table, please complete the shaded boxes. The unshaded boxes will populate automatically. If you are unable to use the formulas in the table, use the following formulas to calculate the percentages: i) 65 percent of total project cost is calculated by multiplying the total project cost by .65, ii) 35 percent of total project cost is calculated by multiplying the total project cost by .35. The total grant amount cannot exceed the lesser of 35 percent of total project costs, or \$1,500,000. If federal funds are involved in the project, please see number 4 below.

Total Project Cost	\$144,572.00
65% of Total Project Cost (minimum match)	\$93,971.80
35% of Total Project Cost (grant maximum)	\$50,600.20
<b>Total Grant Amount Requested (not to exceed \$1.5 million)</b>	<b>\$50,600.20</b>

Please complete the project budget sections below. Any additional documentation can be included in an attachment file titled Attachment B, Project Budget.

- A. Itemize eligible project expenses. Generally, eligible expenses will be limited to construction and construction related costs of broadband infrastructure. For the table below, please complete the shaded boxes. The unshaded boxes will populate automatically. Operating expenses will not be eligible expenses. Any additional expenses associated with the project, but not part of the grant budget, should be included in the narrative.

Budget Item	Total Cost	Grant	Match
Engineering/Design	\$10,000.00	\$3,500.00	\$6,500.00
Materials	\$94,572.00	\$33,100.20	\$61,471.80
Labor	\$25,000.00	\$8,750.00	\$16,250.00
Construction/Installation	\$15,000.00	\$5,250.00	\$9,750.00
Other (Please Specify)	\$0.00	\$0.00	\$0.00
<b>Total</b>	<b>\$144,572.00</b>	<b>\$50,600.20</b>	<b>\$93,971.80</b>

- B. A discussion of the applicant's necessary financial resources to:

- i. sustain service to the project area (business model); and

ii. provide adequate project financing (additional documentation may be requested by ADECA).

- A. Please see Appendix B for narrative and details.
- C. A discussion of any partners or subcontractors associated with the project's deliverables including but not limited to adoption, deployment, and service delivery. Please describe each party's role in the project.
  - A. Please see Appendix B for details on partners and subcontractors.
  - D. A discussion of any funds associated with the project. Please explain if the following provisions apply to your project:
    - A. Projects to serve unserved areas in which the grant applicant is either or both: (i) an existing or future service provider which has or will receive support through federal universal service funding programs designed specifically to encourage broadband deployment in an area without broadband access; or (ii) an existing or future service provider which has or will receive other forms of federal or state financial support or assistance, such as a grant or loan from the United States Department of Agriculture.
    - B. Any award of state funds under this act, when combined with other forms of state or federal support or assistance dedicated to the project, other than interest-bearing loans, may not exceed 60 percent of the total project costs.
- A. This grant does not leverage any federal funds.

C. Other Program Priorities

Please answer each of the following questions either “yes” or “no.” For each “yes” answer, please provide a brief narrative and any supporting documentation in an attachment labeled Attachment C, Other Program Priorities. Any claims that cannot be verified will receive zero points in our scoring system. “No” answers will receive zero points in our scoring system. **“Yes” answers (that can be verified) will receive up to 10 points.**

Does this project seek to leverage grant funds through private investment?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C
Will this project be an extension of existing infrastructure?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C
Does this project serve locations with demonstrated community support?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C
Will this project serve the highest number of unserved homes, businesses, and community anchor points for the least cost?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C
Does this project emphasize the highest broadband speeds?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C
Will this project provide material broadband enhancements to hospitals located in rural areas?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C
Will this project support local libraries in this state for the purpose of assisting the libraries in offering digital literacy training pursuant to state library and archive guidelines?	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	If yes, include an explanation and documentation in a file titled Attachment C=

Is the applicant a certified Minority Business Enterprise under the Alabama Minority Business Enterprise Program? Or is it certified under another Disadvantaged Business Enterprise Program?

YES

NO

If yes, include an explanation and documentation in a file titled Attachment C

D. Certifications

1. The applicant certifies that it is a non-governmental entity.
2. The applicant certifies all new customers served as a result of this project will have access to an internet connection that provides a capacity for transmission at an average speed per customer of at least 25 Mbps download and at least 3 Mbps upload.
3. The applicant certifies that all new customers served as a result of this project are not located within the boundaries of any incorporated city or town having a population in excess of 25,000 inhabitants, according to the last federal census.
4. The applicant certifies that it has the technical and managerial capabilities to complete the project within two years of the effective date of the grant agreement.
5. The applicant certifies that the area to be served does not have at least one provider of terrestrial broadband service that is either: (1) offering a connection to the Internet meeting the minimum service threshold; or (2) is required, under the terms of the Federal Universal Service Fund or other federal or state grant, to provide a connection to the Internet at speeds meeting the minimum service threshold by March 28, 2023.

Certification	
I the undersigned am authorized to obligate my entity and enter into agreements for my organization. I understand that the above certifications do not guarantee funding and a grant agreement will be executed prior to project funds being expended. I further understand that if the above statements cannot be verified, no grant funds will be awarded under this program. Finally, to the best of my knowledge the above certifications are true and correct.	
Signature of Applicant: <i>Paul Pecora</i>	Date: <i>2/8/21</i>
Title of Applicant: <i>VP, ACEA Operations</i>	

For more information regarding the Alabama Broadband Accessibility Fund, please send questions to Chris Murphy at [broadband.fund@adeca.alabama.gov](mailto:broadband.fund@adeca.alabama.gov), or call (334) 242-5292 between the hours of 8:00 a.m. to 4:00 p.m., Monday through Friday.

## Appendix A

1. A discussion of the area served including boundaries, number of households, businesses, and any community anchors (libraries, schools, police and fire stations, hospitals, etc.). This response shall also identify if the project area is located within an unincorporated area and provide information regarding how the area meets the definition of rural (US Census data). Please complete the following table.

Number of Households to be Served	648
Number of Businesses / Industries to be served	0
Number of Community Anchors to be served	0

1A. The Hale County CBRS Phase 1 project proposes to serve areas in the Town of Greensboro, AL and the unincorporated area outside of the Town in Hale County, Alabama. This meets the definition of a rural market by definition as the Town of Greensboro has less than 25,000 residents and the county areas are unincorporated. The build estimates providing service to 648 residential locations in the coverage area with speeds at minimum of 25/3 Mbps. We do not have solid estimates on any community anchors, but we anticipate those being a part of this grant area.

3. A discussion of internet speeds, service tier and pricing levels, data caps, etc.

3A. This project will offer three packages, based upon location to the fixed wireless tower. All customers will have access to the 25/3 package at a minimum. We will offer higher 50/5 and 100/10 packages in most areas. The pricing listed in the chart below is our standard, non-promotional pricing. Our packages will have a data allowance, but more data can be purchased if that is needed by the subscriber.

Service Tier	Speeds	Standard Pricing	Data Allowance
25/3 Fixed Wireless	25 Mbps DL / 3 Mbps UL	\$69.99/month	400 GB
50/5 Fixed Wireless	50 Mbps DL / 5 Mbps UL	\$89.99/month	1000 GB
100/10 Fixed Wireless	100 Mbps DL / 10 Mbps UL	109.99/month	2000 GB

5. A discussion of the operator's technical and managerial capabilities to complete the project within two years of the effective date of the grant award. Please be aware that grants shall be conditioned on project completion within two years of awarding of the grant. If a recipient fails to complete a project within the two-year deadline due to reasons other than delay caused by a government entity, ADECA may revoke the grant in its entirety.

### Mediacom Communications Corporation

Applicant, Mediacom LLC, is a wholly owned subsidiary of Mediacom Communications Corporation (“MCC”). MCC is the fifth largest cable operator in the U.S., serving almost 1.4 million residential and business customer relationships in smaller markets primarily in the Midwest and Southeast. MCC offers a wide array of information, communications and entertainment services to households and businesses, including video, high-speed data (“HSD”), phone, and home security and automation. Through Mediacom Business, MCC provides scalable broadband communications solutions to commercial and public sector customers of all sizes and sells advertising and production services under the OnMedia brand.

Mediacom’s cable systems are owned and operated through operating subsidiaries owned by Mediacom LLC and those of Mediacom Broadband LLC, another wholly owned subsidiary of MCC. As of September 30, 2020, Mediacom’s cable systems served approximately 663,000 video customers, 1,425,000 HSD customers and 599,000 phone customers, aggregating 2,687,000 million primary service units (“PSUs”) and 1,429,000 residential and business customer relationships.

MCC is a privately-owned company. An entity wholly owned by Rocco B. Commisso and related parties is the sole shareholder of MCC, a C corporation. Mr. Commisso founded MCC in 1995 and has served as its Chairman and Chief Executive Officer ever since. MCC manages Mediacom LLC pursuant to management agreements with our operating subsidiaries.

### Mediacom LLC Subscriber Statistics

As of September 30, 2020, Mediacom LLC’s subsidiaries operated cable systems served approximately 302,000 video customers, 644,000 HSD customers and 271,000 phone customers, aggregating 1,217,000 PSUs and 645,000 residential and business customer relationships.

### Services

MCC offers video, HSD and phone services to residential and small- to medium-sized business (“SMB”) customers over our hybrid fiber and coaxial cable network and provides fiber-based network and transport services to medium- and large-sized businesses, governments and educational institutions. We also sell advertising to local, regional and national advertisers on television and digital platforms.

Our services are typically offered on a subscription basis to residential and SMB customers, billed in advance, with a one-time installation fee and monthly rates and related charges that vary according to the level of service taken, whether the services are sold as a “bundle” or on an individual basis, and charges associated with equipment taken by customers. Residential customers generally have the option of paying on a month-to-month basis, or signing a contract to obtain more favorable rates, subject to a fee upon early cancellation.

### Network Technology

Mediacom's services are delivered through a fiber-rich, technologically advanced, route-diverse network that consists of a national backbone; large-scale, centralized platforms; regional networks and headends; neighborhood nodes; and last-mile connectivity to customer homes or businesses. We utilize an IP ring architecture that minimizes service outages through its redundant design, and our network operations center supports and continuously monitors our network. We believe our network infrastructure provides several advantages over most of our competitors, including significantly more bandwidth capacity, greater reliability and higher quality of service.

Mediacom's national backbone is connected to leading carriers, with a presence in several major carrier hotels, and allows us to introduce new services across all our markets and realize greater economic efficiencies and scale. Our national backbone connects centralized platforms that control video content delivery, HSD and phone services, provisioning, customer care and email, and provides access to several aggregation and exchange points in our regional networks to ensure network redundancy and enhanced quality of service.

Our traditional last-mile connectivity is delivered through Mediacom's hybrid fiber and coaxial ("HFC") network, transporting content via laser-fed fiber-optic cable by regional networks and headends to local nodes, and by coaxial cable from these nodes to our customers. We have installed back-up power supplies that are intended to allow our services to continue to be available in the event of a commercial power outage. For certain business customers that have high-capacity requirements, we extend fiber-optic cable from the node site directly to the customer's premise.

HSD customers continue to rapidly increase the amounts of bandwidth they consume, largely driven by increased usage of OTT video, and we expect their bandwidth usage to grow. To provide additional network capacity to facilitate meaningful bandwidth consumption increases, we have deployed multiple tools to recapture bandwidth and optimize our network, including the conversion of substantially all of our video delivery network to "all-digital" technology, freeing up spectrum that was previously used to deliver analog video signals that require more capacity. We have also transitioned substantially all of our HSD delivery to DOCSIS 3.1, allowing us to use our bandwidth in a more efficient manner. These bandwidth reclamation and optimization efforts and capital investments have enabled progressive increases in the speeds of our HSD service packages, culminating in the current availability of 1 Gbps downstream speeds to substantially all of our markets.

For areas such as Hale County, where fiber build out is not always applicable due to population density and economic factors, Mediacom plans to deliver the last-mile connectivity via Fixed Wireless. Our fixed wireless details and network infrastructure details can be found in Appendix A-1.

Mediacom's future plans revolve around the cable industry's recently announced development of a 10 gigabit network, which has been named 10G. The 10G platform will enable symmetrical residential internet speeds of up to 10 Gbps and will be a substantial enhancement of our

existing DOCSIS platform, greatly improving latency, reliability and security. In the future, we expect to make the necessary investments in our network to begin testing 10G, which would position us to meet the future anticipated needs of a fully connected community.

### Community Relations

We are dedicated to fostering strong relations with the communities we serve and believe our local involvement strengthens the awareness and favorable perception of our brand. We support local charities and community causes in our markets with scholarships, events and campaigns to raise funds and supplies for persons in need, and in-kind donations that include production services and free airtime on cable networks. Mediacom LLC provides free video service to over 1,200 schools and free HSD service to over 40 schools, and also provided free video service to almost 2,400 government buildings, libraries and not-for-profit hospitals, nearly 200 of which also receive free HSD service.

### Franchises

Mediacom LLC serves 884 communities under non-exclusive franchises granted to us by local or state governmental authorities. Many of the provisions of local franchises are subject to federal regulation under the Communications Act of 1934, as amended (the "Cable Act"). Our franchises typically impose numerous conditions, including requirements around construction of the cable network in certain of the franchise areas; customer service requirements; the broad categories of programming required; the provision of free service to schools and other public institutions; and the provision and funding of public access channels. Many of the provisions of local franchises are subject to a fee based on gross revenues of specified cable services that we typically pass through directly to the customer.

**Alabama Grant – Hale County**  
**Project Overview**  
**Appendix A-1**

**February 2, 2021**

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ACRONYM

<b>Acronym</b>	<b>Expression</b>
BBU	Baseband Unit
BFD	Bidirectional Forwarding Detection
CBRS	Citizens Broadband Radio Service
CPE	customer premises equipment
DSCP	Differentiated Services Code Point
eBGP	External Border Gateway Protocol
eNB	eNodeB
EPC	Evolved Packet Core
FRR	Fast Reroute
FWA	Fixed Wireless Access
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
LFA	Loop Free Alternate
LLD	Low Level Design
LTE	Long Term Evolution
MPLS	Multiprotocol Label Switching Protocol
OSPF	Open Shortest Path First Protocol
PAL	Priority Access License
QoS	Quality of service
RAN	Radio Access Network
SAS	Spectrum Access System
SIP	Session Initiation Protocol
VLAN	Virtual Local Area Network

## 1. High Level Summary of Project

The applicant, Mediacom Communications (“Mediacom”), intends to provide broadband service to unserved areas of Hale County outlined in the attached .shp file by constructing a new Fixed Wireless Access (FWA) network. Mediacom intends to utilize 4G LTE (Long Term Evolution) technology in the Radio Access Network (RAN) with Evolved Packet Core (EPC) to provide coverage to portions of the unserved areas in Hale County, Alabama where it holds CBRS PAL licenses.

Below is a summary of the FWA product as last mile access:

- Fixed Wireless: using 3.5 GHz band/CBRS spectrum.
  - Mediacom will employ an Evolved Packet Core (“EPC”) infrastructure for data transport and control information. EPC manages the eNodeB (“RRH/BBU” or Massive MIMO) and customer CPE.
  - The design of last-mile network deploys 3x120° antennas and it can go to 6x60° antennas to cover all surrounding areas.
  - Point to Multipoint (“P2MP”) using PAL CBRS spectrum or GAA CBRS spectrum with LTE core.
  - 3-layer topology approach, consistent with existing network, will be used: Core, Aggregation and Access.

## 2. Overall Network Design

Figure 2 below illustrates Mediacom High-Level architecture for Fixed Wireless Access network using Priority Access License (PAL) Citizens Broadband Radio Service (CBRS) spectrum (3550 - 3650 MHz) and LTE core for last mile access network.

Mediacom plans to utilize existing towers in the unserved areas to install its CBRS-based radios and antennas and use fiber backhaul between those towers and its distribution network. Since the availability of towers and water tanks is limited in much of rural areas, Mediacom will build 40 -120 ft monopole in those areas to install its radios and antennas. In this case, Mediacom will use Microwave technology with frequency band 5GHz -18 GHz to connect the new build poles to existing towers in order to be connected to distribution network via fiber backhaul.

The delay in backhaul and core network is in the range of 5-10ms depends on distance.

The speed in backhaul network reaches 200Gbps and up to 1 Tbps in core network. The speed in last mile reaches up to 100Mbps in downlink and 10 Mbps in uplink. The speed is up to 10Gbps in middle mile layer. The delay in last mile and middle mile (CBRS and Microwave) will vary based on distance but will support the latency tier requirement ( $\leq 100$  ms).

Deploying a Spectrum Access System (SAS) is required as a frequency coordination system to manages the CBRS spectrum in the 3.5 GHz band.

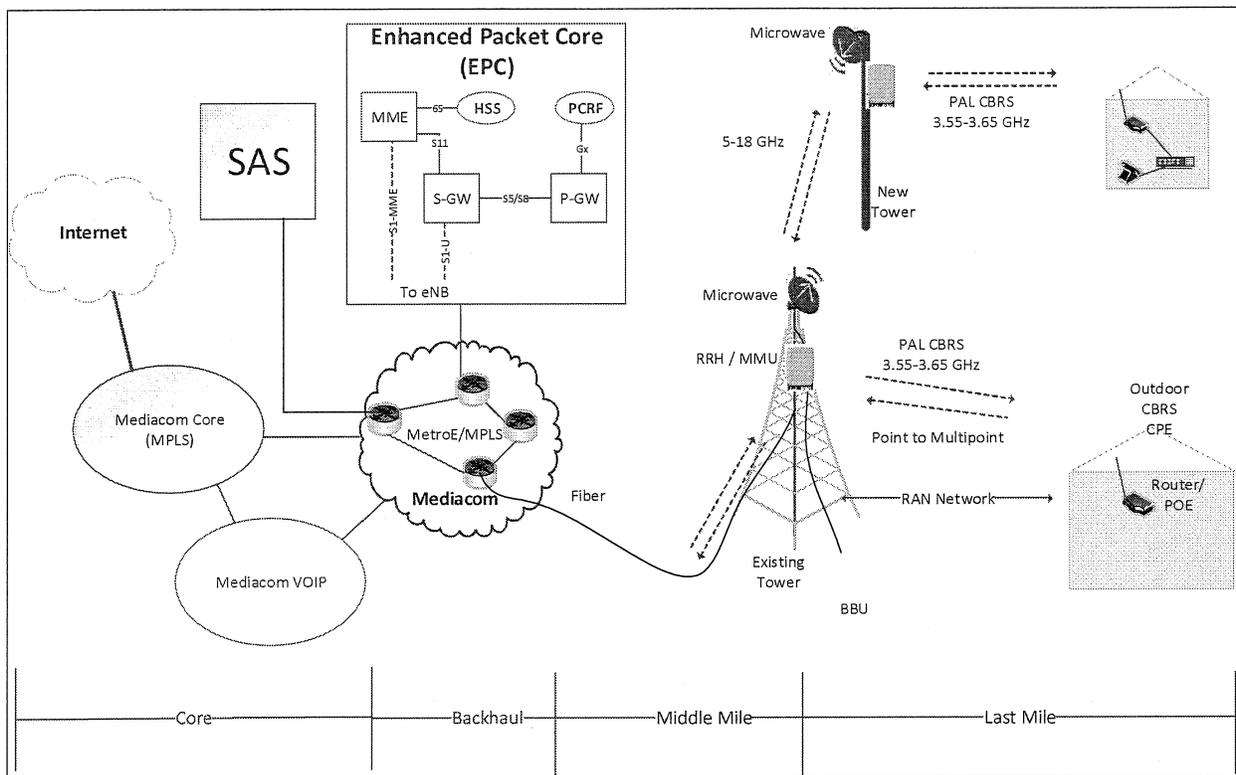


Figure 1 Solution Architecture of Mediacom FWA

## 2.1. Last Mile Network

Mediacom will build a new Point-to-Multipoint wireless RAN network using LTE-based core and CBRS PAL spectrum to deliver broadband service between customers’ homes and eNodeB (eNB) radios. eNBs will communicate to Baseband Unit (BBU) via CPRI protocol.

The outdoor CBRS customer premises equipment (CPE) uses IPv4/IPv6 protocols for broadband service.

### 2.1.1. Link Budget of RAN network (100Mbps DL/10Mbps UL)

- LTE CBRS 20MHz carriers
- Grant cell edge target:
  - 100Mbps DL/10 Mbps per 40MHz carrier
- UE Tx power lowered by 3dB to account for 2 CA
- LNF Margin calculated for single server model, 90% area probability and 10dB Std Dev
- DL/UL load: 50%
- RSRP targets:
  - Radio 4408: -101.6dBm
  - AIR6488: -109.7dBm

GRANT - CBRS FWA 4408 50/5 - 20MHz carriers			GRANT - CBRS FWA 6488 50/5 - 20MHz carriers		
	UL SCH	DL SCH		UL SCH	DL SCH
# Carriers	1	1	# Carriers	1	1
UE/BS Tx Output Power	20.0 dBm	33.0 dBm	UE/BS Tx Output Power	20.0 dBm	23.4 dBm
EIRP /Carrier		50.0 dBm	EIRP /Carrier		47.5 dBm
# RBs / Carrier	92	100	# RBs / Carrier	92	100
Tx power per Resource Block	0.4 dBm	13.0 dBm	Tx power per Resource Block	0.4 dBm	3.4 dBm
Resource Block Bandwidth	180 kHz	180 kHz	Resource Block Bandwidth	180 kHz	180 kHz
Bit Rate	5,121 kbps	73,896 kbps	Bit Rate	7,615 kbps	51,209 kbps
SINR	3.8 dB	14.8 dB	SINR	12.6 dB	14.7 dB
Sensitivity per RB	-113.1 dBm	-99.7 dBm	Sensitivity per RB	-104.3 dBm	-99.7 dBm
UE Antenna Gain	14.5 dBi	14.5 dBi	UE Antenna Gain	14.5 dBi	14.5 dBi
BS Antenna Gain	17.5 dBi	17.5 dBi	BS Antenna Gain	24.1 dBi	24.1 dBi
Jumper + Feeder Loss	0.5 dB	0.5 dB	Jumper + Feeder Loss	0.0 dB	0.0 dB
UE Cable Loss	0.0 dB	0.0 dB	UE Cable Loss	0.0 dB	0.0 dB
Building Penetration Loss (BPL)	0.0 dB	0.0 dB	Building Penetration Loss (BPL)	0.0 dB	0.0 dB
Wall Loss Adjustment	0.0 dB	0.0 dB	Wall Loss Adjustment	0.0 dB	0.0 dB
Foliage Loss	0.0 dB	0.0 dB	Foliage Loss	0.0 dB	0.0 dB
Car Penetration Loss	0.0 dB	0.0 dB	Car Penetration Loss	0.0 dB	0.0 dB
Body Loss	0.0 dB	0.0 dB	Body Loss	0.0 dB	0.0 dB
Other Losses	0.0 dB	0.0 dB	Other Losses	0.0 dB	0.0 dB
LNF Margin	8.0 dB	8.0 dB	LNF Margin	8.0 dB	8.0 dB
Interference Margin	1.7 dB	0.9 dB	Interference Margin	1.7 dB	0.2 dB
Pathloss	135.3 dB	135.3 dB	Pathloss	133.6 dB	133.6 dB

Figure 2 Link Budget for RAN network (100Mbps / 10 Mbps)

2.1.1.2.Link Budget of RAN network (50Mbps DL/5Mbps UL)

- LTE CBRS 20MHz carriers
- GRANT cell edge target:
  - 50Mbps DL / 5Mbps UL per 40MHz carrier
- UE Tx power lowered by 3dB to account for 2 CA
- LNF Margin calculated for single server model, 90% area probability and 10dB Std Dev
- DL/UL load: 50%
- RSRP targets:
  - Radio 4408: -106.8dBm
  - AIR6488: -118.0dBm

GRANT - CBRS FWA 4408 25/2.5 - 20MHz carriers			GRANT - CBRS FWA 6488 25/2.5 - 20MHz carriers		
	UL SCH	DL SCH		UL SCH	DL SCH
# Carriers	1	1	# Carriers	1	1
UE/BS Tx Output Power	20.0 dBm	33.0 dBm	UE/BS Tx Output Power	20.0 dBm	23.4 dBm
EIRP /Carrier		50.0 dBm	EIRP /Carrier		47.5 dBm
# RBs / Carrier	92	100	# RBs / Carrier	92	100
Tx power per Resource Block	0.4 dBm	13.0 dBm	Tx power per Resource Block	0.4 dBm	3.4 dBm
Resource Block Bandwidth	180 kHz	180 kHz	Resource Block Bandwidth	180 kHz	180 kHz
Bit Rate	2,560 kbps	47,834 kbps	Bit Rate	3,440 kbps	25,602 kbps
SINR	-1.4 dB	10.2 dB	SINR	4.3 dB	6.5 dB
Sensitivity per RB	-118.3 dBm	-104.3 dBm	Sensitivity per RB	-112.6 dBm	-107.9 dBm
UE Antenna Gain	14.5 dBi	14.5 dBi	UE Antenna Gain	14.5 dBi	14.5 dBi
BS Antenna Gain	17.5 dBi	17.5 dBi	BS Antenna Gain	24.1 dBi	24.1 dBi
Jumper + Feeder Loss	0.5 dB	0.5 dB	Jumper + Feeder Loss	0.0 dB	0.0 dB
UE Cable Loss	0.0 dB	0.0 dB	UE Cable Loss	0.0 dB	0.0 dB
Building Penetration Loss (BPL)	0.0 dB	0.0 dB	Building Penetration Loss (BPL)	0.0 dB	0.0 dB
Wall Loss Adjustment	0.0 dB	0.0 dB	Wall Loss Adjustment	0.0 dB	0.0 dB
Foliage Loss	0.0 dB	0.0 dB	Foliage Loss	0.0 dB	0.0 dB
Car Penetration Loss	0.0 dB	0.0 dB	Car Penetration Loss	0.0 dB	0.0 dB
Body Loss	0.0 dB	0.0 dB	Body Loss	0.0 dB	0.0 dB
Other Losses	0.0 dB	0.0 dB	Other Losses	0.0 dB	0.0 dB
LNF Margin	8.0 dB	8.0 dB	LNF Margin	8.0 dB	8.0 dB
Interference Margin	1.7 dB	0.3 dB	Interference Margin	1.7 dB	0.0 dB
Pathloss	140.5 dB	140.5 dB	Pathloss	141.9 dB	141.9 dB

Figure 3 Link Budget for RAN network (50Mbps / 5 Mbps)

2.1.3.Link Budget of RAN network (25Mbps DL/3Mbps UL)

- LTE CBRS 20MHz carriers
- GRANT cell edge target:
  - 25Mbps DL / 3Mbps UL per 40MHz carrier
- UE Tx power lowered by 3dB to account for 2 CA
- LNF Margin calculated for single server model, 90% area probability and 10dB Std Dev
- DL/UL load: 50%
- RSRP targets:
  - Radio 4408: -109.6dBm
  - AIR6488: -123.2dBm

GRANT - CBRS FWA 4408 12.5/1.5 - 20MHz carriers			GRANT - CBRS FWA 6488 12.5/1.5 - 20MHz carriers		
	UL SCH	DL SCH		UL SCH	DL SCH
# Carriers	1	1	# Carriers	1	1
UE/BS Tx Output Power	20.0 dBm	33.0 dBm	UE/BS Tx Output Power	20.0 dBm	23.4 dBm
EIRP /Carrier		50.0 dBm	EIRP /Carrier		47.5 dBm
# RBs / Carrier	92	100	# RBs / Carrier	92	100
Tx power per Resource Block	0.4 dBm	13.0 dBm	Tx power per Resource Block	0.4 dBm	3.4 dBm
Resource Block Bandwidth	180 kHz	180 kHz	Resource Block Bandwidth	180 kHz	180 kHz
Bit Rate	1,536 kbps	40,064 kbps	Bit Rate	1,536 kbps	14,416 kbps
SINR	-4.2 dB	7.5 dB	SINR	-0.9 dB	1.3 dB
Sensitivity per RB	-121.2 dBm	-107.0 dBm	Sensitivity per RB	-117.8 dBm	-113.1 dBm
UE Antenna Gain	14.5 dBi	14.5 dBi	UE Antenna Gain	14.5 dBi	14.5 dBi
BS Antenna Gain	17.5 dBi	17.5 dBi	BS Antenna Gain	24.1 dBi	24.1 dBi
Jumper + Feeder Loss	0.5 dB	0.5 dB	Jumper + Feeder Loss	0.0 dB	0.0 dB
UE Cable Loss	0.0 dB	0.0 dB	UE Cable Loss	0.0 dB	0.0 dB
Building Penetration Loss (BPL)	0.0 dB	0.0 dB	Building Penetration Loss (BPL)	0.0 dB	0.0 dB
Wall Loss Adjustment	0.0 dB	0.0 dB	Wall Loss Adjustment	0.0 dB	0.0 dB
Foliage Loss	0.0 dB	0.0 dB	Foliage Loss	0.0 dB	0.0 dB
Car Penetration Loss	0.0 dB	0.0 dB	Car Penetration Loss	0.0 dB	0.0 dB
Body Loss	0.0 dB	0.0 dB	Body Loss	0.0 dB	0.0 dB
Other Losses	0.0 dB	0.0 dB	Other Losses	0.0 dB	0.0 dB
LNF Margin	8.0 dB	8.0 dB	LNF Margin	8.0 dB	8.0 dB
Interference Margin	1.7 dB	0.2 dB	Interference Margin	1.7 dB	0.0 dB
Pathloss	143.3 dB	143.3 dB	Pathloss	147.1 dB	147.1 dB

Figure 4 Link Budget for RAN network (25Mbps / 3 Mbps)

2.1.4.RAN network – RF Design - LLD

Figures 3 through 5 below illustrate the low-Level Design (LLD) for Alabama state. Also, attached are KMZ file and excel sheet for more details.

	Total Sites	Existing Towers	New Towers	Total Sectors	Radio 4408	AIR6488
Hale County Phase 1	1	1	0	3	1	2

Figure 5 RF Design – Number of Towers

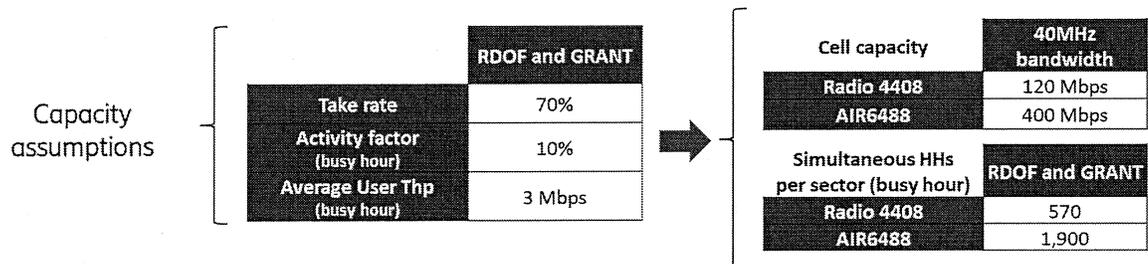


Figure 6 RF Capacity Assumption

Last Mile Network Redundancy:

No redundancy paths in the last-mile. Some existing middle-mile transports have redundant paths, but many do not. The Applicant intends to provide redundant paths as deep in the middle-mile network as possible, leveraging its existing paths. The Core network has (and will have for fixed wireless access) diverse paths to external Internet/phone services.

## 2.2. Middle Mile / Backhaul Network

Figure 2 above shows that eNBs will be connected to distribution network via fiber. The BBU uses L2 ethernet VLANs Point-to-Point(P2P) to connect to Mediacom routers in the distribution network. Mediacom uses MPLS, OSPF, IPv4/IPv6, BFD to connect distribution network and core network.

The radios installed on new towers will be connected to the near existing tower via microwave using IEEE 802.11 standards 5 GHz – 18 GHz spectrum. Then, the traffic goes from the microwave to router in distribution network using L2 ethernet VLANs. In the distribution layer, Mediacom deploys failover detection mechanism using end to end BFD with RSVP TE via Free Alternate (LFA) Fast Reroute (FRR) Protocols.

## 2.3. Core Network

Mediacom's existing hierarchical network (Access, Aggregation and Core layers) can access the content and websites for the whole Internet via AS 30036 utilizing eBGP and its owned IP space to multi-homed transit providers. Core network uses end BFD with RSVP TE via Free Alternate (LFA) Fast Reroute (FRR) Protocols to provide network redundancy.

## 2.4. Operation of the Network

Mediacom does not currently manage the network by over-subscription ratios. Instead, it manages the network through capacity trending and performance monitoring. Capacity trends are measured and reported internally as well as in cooperation with a CableLabs member group to give the Applicant a view of the industry's capacity trends as a whole in the U.S. and internationally. The Applicant applies the trending to its network upgrade plans each year and adjusts accordingly to any variations from the trends. Should the Applicant become a winning bidder, it will develop an over-subscription ratio reporting schema that complies with the FCC's Report and Order. See Rural Digital Opportunity Fund; Connect America Fund, Report and Order, FCC 20-5 (rel. Feb. 7, 2020).

- When last-mile RAN network reaches a weekly 95th percentile of 75% or more, via either transmit or receive traffic, for 3% of the measurements over that time period, the Applicant will begin a network infrastructure upgrade targeting completion before utilization reaches 90% for 3% of weekly measurements. The infrastructure upgrades may be done by either (a) adding more tower/radio sites for increased density, (b) adding more radios to existing tower sites by reducing the degree of coverage for each, e.g., change from 3x120° RRH antennas to 6x60°, (c) acquiring more spectrum, e.g., GAA on a licensed-by-rule basis.

- When middle-mile, core network or ISP transit reaches a weekly 95th percentile of 60% or more (measured in 5-minute increments), via either transmit or receive traffic, the Applicant will begin a network infrastructure upgrade targeting completion before a 90% 95th percentile is reached.
- The Applicant directly connects to some ASNs and CDNs that it considers its Internet peers. The Internet peers are managed by the same 60% 95th percentile upgrade trigger above, but in addition the Applicant regularly meets with these peers at NANOG conferences (3 times/year) to trend and predict future performance, especially any events that could trigger abnormal spikes or network upgrades that could shift traffic.
- Mediacom deploys Quality of Service model using Differentiated Services Code Point (DSCP)/ IEEE 802.1P/ IP Precedence values in the IP network aggregation and core layers. See Figure 6 below.

FC / Queue	IP-PREC/EXP	Traffic Type
BEST-EFFORT (be)	0 (000)	Best Effort IP Traffic
NON-REAL TIME (af11)	1 (001)	CB Ethernet (basic)
INTERACTIVE (af21)	2 (010)	(CB Ethernet – Priority Data)
REAL TIME (af31)	3 (011)	CB RT/Premium Ethernet Services
VIDEO (af41)	4 (100)	Mediacom Real Time Video Traffic
NETWORK-CONTROL (nc1)	6 (110)	Network Control Protocol Traffic (BGP/OSPF)

Figure 7 QoS Model

### 2.5. Network Performance

- Mediacom uses a suite of tools to monitor and track network availability and performance from its own 24x7x365 Network Operation Center. The NOC is responsible for monitoring all network infrastructure used to deliver its Video, Data, and Phone services. The Applicant uses proven ITIL practices as baseline for all processes within the Network Operation Center’s 6 verticals of Event Management, Change Management, Problem & Performance Management, Tools and Development, IP Operations, and Carrier Operations.
- Platforms leveraged by the NOC for network reporting and mentoring include, but are not limited to, Netcool, Remedy, SolarWinds, Cacti, Metaview, Emperix, Cisco EPNM, Ciena One Control, CommScope NXT, and Intraway QX Probes. These tools and others allow for the Applicant’s successful monitoring, reporting, and triaging of networks and services it delivers and would be used for the Mediacom’s proposed network.

### 2.6. Project Plan

The following is the initial schedule for the project:

- Network design:
  - Start: Upon Grant Approval
  - End: June 2021
  - Includes RF design, identifying areas of interest for new sites.

- Site Acquisition: Start 1Q21; End 2Q21
  - Start: Upon Grant Approval
  - End: June 2021
  - Includes gathering potential site candidates within the areas of interest identified by RF design.
  
- Pre-Construction: Start 2Q21; End 4Q21
  - Start: Upon Grant Approval
  - End: December 2021
  - Once a final site candidate has been selected, this phase includes gathering RFPs from vendors that would build the site and negotiating contracts with them.
  
- Construction: Start 4Q21; End 4Q22
  - Start: October 2021
  - End: December 2022
  - Includes building the sites.
  
- Drive Testing/Site Integration and Deployment: Start 4Q22; End 1Q23
  - Includes integrating sites into our network and testing sites to ensure they meet RF design requirements.

**Professional Engineer Certification**

I, the undersigned, hereby certify the following:

- I am Vice President, Business Engineering, of Mediacom Communications Corporation.
- I hold a PhD degree in \_Electrical Engineering from the Graduate Center of City University of New York.
- I have over 23 years' experience in research, design, testing, development and deployment of LTE, Wireless, Carrier Ethernet, IP/MPLS, SONET, WDM, WiFi, switching & routing, MEF services, Performance Monitoring, SDN, NFV and Virtualized Networks.
- I have reviewed the network diagram and certify that the network is capable of delivering, to at least 95% of the required number of locations in the relevant state, broadband service that meets the requisite performance requirements.

Fuad Alnajjar

Vice President, Business Engineering

Mediacom

\*\*\*\*\*END\*\*\*\*\*

## **Appendix B**

1. A discussion of the applicant's necessary financial resources to:
  - a. sustain service to the project area (business model); and
  - b. provide adequate project financing (additional documentation may be requested by ADECA).

Applicant, Mediacom LLC, is a wholly-owned subsidiary of Mediacom Communications Corporation ("MCC"). MCC is the fifth largest cable operator in the U.S., serving over 1.4 million residential and business customer relationships in smaller markets primarily in the Midwest and Southeast. MCC offers a wide array of information, communications and entertainment services to households and businesses, including video, high-speed data ("HSD"), phone, and home security and automation. Through Mediacom Business, MCC provides scalable broadband communications solutions to commercial and public sector customers of all sizes, and sells advertising and production services under the OnMedia brand.

MCC's cable systems are owned and operated through operating subsidiaries owned by Mediacom LLC and those of Mediacom Broadband LLC, another wholly-owned subsidiary of MCC. As of September 30, 2020, MCC's cable systems served approximately 663,000 video customers, 1,425,000 HSD customers and 599,000 phone customers, aggregating 2,687,000 million primary service units ("PSUs").

MCC is a privately-owned company. An entity wholly-owned by Rocco B. Commisso and related parties is the sole shareholder of MCC, a C corporation. Mr. Commisso founded MCC in 1995 and has served as its Chairman and Chief Executive Officer ever since. MCC manages Mediacom LLC pursuant to management agreements with our operating subsidiaries.

Mediacom is the 5<sup>th</sup> largest cable television company in the United States with revenues of more than \$2 billion and free cash flow of over \$400 million annually. Mediacom's capital contribution to this project will be funded out of cash reserves and will not need to be separately financed. As evidenced by Mediacom's full year results for 2019, the company is in a strong financial position. Highlights of Mediacom's full year results for 2019 include:

- Revenues were \$2,031.2 million, reflecting a 3.8% increase from the prior year
- Adjusted OIBDA was \$808.0 million, reflecting a 8.5% increase from the prior year
- Capital expenditures were \$296.6 million, compared to \$333.7 million in the prior year
- Free cash flow was \$418.9 million, compared to \$319.5 million in the prior year
- Net leverage ratio of 2.70x, compared to 3.07x at December 31, 2018
- Interest coverage ratio of 8.73x, compared to 8.12x at December 31, 2018
- Ending net debt of \$2,185.3 million, a \$101 million reduction from December 31, 2018

Additional information about the strength of Mediacom's financial position can be found at the following links:

Link to news release about Mediacom's full years results for 2019:

<https://mediacomcommunicationscorporation.gcs-web.com/static-files/479b7f26-4bb0-46ad-91f4-fe24523a8c71>

Link to Mediacom LLC financial reports:

<https://mediacomcommunicationscorporation.gcs-web.com/Earnings/Mediacom-LLC-Reports>

Link to Mediacom Broadband LLC financial reports: <https://mediacomcommunicationscorporation.gcs-web.com/Earnings/Mediacom-Broadband-Reports>

- C. A discussion of any partners or subcontractors associated with the project's deliverables including but not limited to adoption, deployment, and service delivery. Please describe each party's role in the project.

We will utilize contractors for deployment and installation. At this time, we have not made a final decision on which contractor to use but we have narrowed the search down to two different firms. We will either be using OnTech or PerfectVision.

OnTech is a service installation company based out of Denver, Colorado. They are professionally trained and experienced contractors who are fully licensed and insured.

PerfectVision is a service installation company based out of Little Rock, Arkansas. They are a professional trained and experienced contractor company who is fully licensed and insured.

Both of these companies meet our high-quality standard and are capable of meeting the requirements that have been set forth by our company for this project as well as the requirements for the grant.

## Appendix C

1. Does this project seek to leverage grant funds through private investment?

Mediacom is a privately-owned company; thus all of our projects utilize private funds. In this project, private funds will be utilized for all costs outside what the grants provide.

2. Will this project be an extension of existing infrastructure?

Yes, Mediacom has existing fiber in the Hale County area and the fixed wireless towers will be fed from the existing fiber. If there are areas where we do not own the fiber, we will lease the fiber from existing providers.

3. Does this project serve locations with demonstrated community support?

Yes, service has been requested by residents in the Hale County area numerous times. The community has demonstrated that they are in need of broadband services and want to see a broadband provider expand into the unserved locations of the county.

4. Will this project serve the highest number of unserved homes, businesses, and community anchor points for the least cost?

With this project, we will work to provide service to a large number of unserved homes that are currently built in the Hale County area for the lowest cost possible.