BEFORE THE PUBLIC SERVICE COMMISSION OF THE STATE OF MISSOURI

In the Matter of the Application of TurboNet Technologies, Inc. d/b/a TurboNet for Designation as an Eligible Telecommunications Carrier	))))	**File No. DA-2021-0394**

ORDER DIRECTING NOTICE, SETTING INTERVENTION DEADLINE, AND DIRECTING STAFF TO FILE A RECOMMENDATION

Issue Date: May 10, 2021 Effective Date: May 10, 2021

On May 10, 2021, TurboNet Technologies, Inc. d/b/a TurboNet filed an application for designation as an Eligible Telecommunications Carrier. The Commission will direct its Data Center to issue notice of the application, set a deadline for requests to intervene, and direct the Staff of the Commission to file a recommendation.

THE COMMISSION ORDERS THAT:

1. The Commission's Data Center shall send notice of this application to all local exchange carriers certificated to provide service in Missouri.

2. Requests to intervene shall be filed with the Commission no later than May 25, 2021.

3. The Staff of the Commission shall file a recommendation no later than June 1, 2021.

4. This order shall be effective when issued.

BY THE COMMISSION

Morris L. Woodruff
Secretary

Ronald D. Pridgin, Regulatory Law Judge,
by delegation of authority pursuant
to Section 386.240, RSMo 2016.

Dated at Jefferson City, Missouri,
on this 10th day of May, 2021.

BEFORE THE MISSOURI PUBLIC SERVICE COMMISSION

Application of TurboNet Technologies, Inc.	)	
for Designation as an Eligible	)	
Telecommunications Carrier	)	File No. _____

TurboNet Technologies, Inc. Application for Designation
As an Eligible Telecommunications Carrier and Request for Waiver of 20 CSR 4240-4.017

COMES NOW TurboNet Technologies, Inc. dba TurboNet ("TurboNet") and respectfully requests the Commission enter an Order granting this Application to designate TurboNet as an Eligible Telecommunications Carrier ("ETC") pursuant to 20 CSR 4240-31.016 for specific census blocks under the provisions of 47 CFR 54.201(d) to receive federal universal service support through the Rural Digital Opportunity Fund ("RDOF"), for the provision of broadband internet access, broadband-voice bundled, and voice only offerings. TurboNet does not seek to participate in the Lifeline program at this time. The service area contains 3 census block groups in Lafayette County, Missouri, as follows:

State Abbr	County	CBG
MO	Lafayette	291070902003
MO	Lafayette	291070902004
MO	Lafayette	291070902005

The RDOF rules require provisional auction winners to seek ETC status by June 7, 2021 and TurboNet respectfully requests expeditious action on this application. For the reasons stated below, designating TurboNet as an ETC is consistent with statutory and regulatory requirements and is in the public interest.

In support of this application, TurboNet states as follows:

1. TurboNet is a Fiber and Wireless Internet Service Provider in the State of Missouri. TurboNet is a Missouri S-Corp company in good standing registered to do business under the name TurboNet (see **Exhibit A**), with its principal place of business located at 109 S 10th St. Lexington, Missouri 64067, and it can be reached as follows: telephone – 660-259-4705, website- www.myturbonet.com. Contemporaneously with the filing of this application, TurboNet has filed to register as a provider of iVOIP with this Commission.

2. All inquiries, correspondence, communications, pleadings, notices, orders, and decisions relating to this matter should be directed to:

   Carl J. Lumley, #32869
   Curtis, Heinz, Garrett & O'Keefe, PC
   130 S. Bemiston, Suite 200
   St. Louis, Missouri 63105
   Telephone: (314) 725-8788
   Facsimile: (314) 725-8789
   Email: clumley@chgolaw.com

   Mark Webb
   TurboNet
   Telephone: (660) 259-4705
   Cell: (660) 221-2892
   Email: mewebb@myturbonet.com

3. TurboNet's key management includes:

   Mark Webb, President

   Keith Jones, CIO

   Brad Grafton – Director of Outside Plant

4. As an RDOF recipient, TurboNet will offer low latency broadband service as both a stand-alone service and bundled with voice service.
5. TurboNet does not have any pending action or final unsatisfied judgements or decisions against it from any state or federal agency or court which involve customer service, rates, which action, judgment, or decision has occurred within three years of the date of this application.
6. TurboNet does not have any annual reports or assessment fees that are overdue to the Commission. TurboNet is compliant in all reporting and assessments requirements.
7. No matter has been brought in the last ten years by any state or federal regulatory or law enforcements agency against any of the individuals, entities, managers, or directors associated with TurboNet involving fraud, deceit, perjury, stealing or the omission or misstatement of material fact in connection with a commercial transaction.
8. TurboNet will comply with the ETC requirements established by the Missouri Public Service Commission and the FCC. TurboNet's commitment., specifically includes satisfaction of all applicable consumer protection standards and service quality standards as required by 47 CFR 54.202(a)(3). TurboNet has been a Wireless and Fiber Internet service provider in Missouri since 2005 and accordingly has a demonstrated track record of such compliance.
9. As described below, TurboNet certifies that it will provide the following services that are supported by universal support mechanisms.

Voice Telephony – TurboNet will meet this requirement by providing voice communications services connected to the PSTN. TurboNet will be legally

responsible for dealing with customer problems, meeting quality of service guarantees, and meeting universal service obligations. TurboNet will offer VOIP services bundled with qualifying broadband services throughout its proposed ETC designated serving area at rates reasonably comparable to rates in urban areas. This service will include minutes of use for local service, and access to emergency service, via E-911 where available.

Broadband Internet Access Services – TurboNet Internet service will provide the capability to transmit data to and receive data from all or substantially all Internet endpoints. TurboNet will offer low-latency Internet service at actual speeds of 1Gbps downstream and 50Mbps upstream with no data caps throughout the area where TurboNet is designated ETC.

10. TurboNet will provide these services consistent with applicable PSC and FCC rules. TurboNet has not obtained any waivers from the FCC. TurboNet's RDOF Application is attached hereto as **Exhibit B.**
11. TurboNet will provide these VOIP and broadband services over a Fiber to the Home facilities-based network owned by TurboNet in its ETC designated area.
12. TurboNet will advertise the availability of these services throughout its ETC designated area using media of general distribution in a manner designed to reach those likely to qualify for such services. TurboNet agrees to comply with all form and content requirements, if any, promulgated by the FCC and this Commission in the future and required of all designated ETCs.

13. TurboNet will construct and manage its network and provision services in a manner that allows it to remain functional in emergency situations; including those that cause power outages. TurboNet has multiple, diverse connections to the Internet that allow it to handle spikes in traffic, including those resulting from emergency situations.
14. TurboNet's request for designation as an ETC in the requested ETC service area is in the public interest. Despite Incumbent Local Exchange Carriers previously receiving high-cost support for these areas, these census blocks are unserved or underserved with broadband internet access availability and granting ETC status will lead to the availability of high-speed broadband internet access services in the ETC designed area.
15. Granting TurboNet ETC status will serve the public interest by ensuring TurboNet is eligible to receive high-cost support. This funding will be used to advance the FCC's goal of deploying VOIP and broadband networks in rural high-cost areas, ensuring rural consumers, in particular low-income consumers, businesses, and anchor institutions benefit from access to high-speed broadband service.
16. Applicant seeks waiver of rule 20 CSR 4240-4.017 for good cause to avoid a delay of 60 days to make this filing and accelerate the introduction of its services and declares that it has had no communication with the office of the Commission within the prior 150 days regarding any substantive issue likely to be germane to this proceeding.
17. For the reasons stated above, TurboNet respectfully requests: (i) an expeditious Order designating the Company as an ETC in Missouri for the purpose of being eligible to receive federal funding pursuant to the FCC's RDOF program; (ii) waiver of 20 CSR 4240-4.017 and (iii) such other relief as this Commission deems to be just and equitable.

STATE OF MISSOURI)
) SS
COUNTY OF LAFAYETTE)

Affidavit

I, Mark Webb, a natural person, do hereby sweat and affirm that I am an officer of TurboNet Technologies, Inc. the applicant in the above Application ("Applicant"), and that the information and statements contained in this application are true and correct to the best of my knowledge and belief.

By signing this form, I hereby certify that neither I, nor any other members of this filing party, has had communications with a Commissioner, Commissioner Advisor, Regulatory Law Judge, member of the General Counsel or any member of their support team in the 150 days prior to the filing date of this application regarding any substantive issue included in this filing.

Mark Webb

Subscribed and sworn to before me this 7th day of May, 2021.

Taylor Megan Grafton
Notary Public

Taylor Megan Grafton
Notary Public - Notary Seal
State of Missouri
Lafayette County
My Commission Expires March 20, 2025
Commission #17746325

Respectfully submitted,

/s/ Carl J. Lumley

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Attorney for TurboNet Technologies, Inc.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of this document was emailed to the parties listed below on this **10th** day of May, 2021

/s/ Carl J. Lumley

General Counsel
Missouri Public Service Commission
P.O. Box 360
Jefferson City, Missouri 65102
gencounsel@psc.mo.gov

Office of Public Counsel
P.O. Box 2230
Jefferson City, Missouri 65102
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APPENDIX A

Auction 904 Short-Form Application Operational Questions

Operational History

1. Has the applicant previously deployed consumer broadband networks (Yes/No)?

   Yes

   If so:

   a. Provide the date range when broadband service was offered and in which state(s) service was offered. Specify dates for each state.

      TurboNet started service in Missouri July of 2005.

   b. Provide an estimate of how many subscribers are currently served in each state. (If the applicant is no longer providing service in any state, estimate the number of customers that were served at the beginning of the last full year that the applicant did provide service.)

      Currently 330 subscribers in the state of Missouri.

   c. What services (e.g., voice, video, broadband Internet access) were or are provided in each state?

      TurboNet currently provides broadband internet access services with speeds up to 1 Gbps in Missouri.

   d. List any data-usage limit (data cap) used as part of existing broadband access services.

      Not applicable. No data-usage limits are used.

   e. What specific technologies and network architecture are used for last-mile; middle-mile/backhaul; and internet interconnections?

TurboNet uses a combination of fiber and wireless technologies for last-mile access. The last-mile wireless access network uses a number of different products for access points and subscriber modules, all non-licensed in the 2.4Ghz, 3.65Ghz and 5.8Ghz spectrums. The last-mile fiber network uses GPON FTTP architecture which is compliant with the ITU-T G.984 GPON standard.

TurboNet uses a combination of fiber and wireless technologies for middle- mile/backhaul. Leased fiber with Bluebird Network includes bandwidths of 500Mbps and 10Gbps. TurboNet also owns its own fiber in parts of its backhaul network. Wireless backhaul uses unlicensed 5Ghz spectrum with bandwidth links sized to accommodate end-point traffic demands.

Internet interconnections are transported via 802.3 Gigabit Ethernet fiber from Worldwide Technologies' upstream partner to the core network. The company currently has a 10Gbps internet connection with Bluebird Network in Missouri.

f. What are the deployed voice technologies and how are these voice services implemented?

Currently, the Applicant does not provide voice services.

Proposed Network(s) Using Funding from Auction 904

Answer for each state the applicant selected in its application:

2. Network Infrastructures:

   a. Briefly describe from a high-level network perspective which network architectures and technologies will be used in the applicant's proposed deployment. If there are variations by state, region, or other criteria, describe each network or location.

The Applicant is intending to utilize a combination of Fiber-to-the-Premise (FTTP) and fixed wireless technologies to provide the proposed services.

The applicant's wireless networks will be licensed fixed wireless point-to-point (PTP) backhaul and last mile unlicensed fixed wireless point-to-multipoint (PTMP) extended from TurboNet's existing fiber-to-PTP wireless backhaul network which serves customers in the company's current serving area.

The FTTP network will employ Gigabit Passive Optical Network (GPON) technology in a centralized splitter topology in order to create a generic Optical Distribution Network (ODN) allowing the Outside Plant (OSP) to be technology agnostic and capable of switching access technologies, such as from GPON to Active Ethernet or future technology, as requirements and technologies evolve over time.

   b. Last-mile: What are the relevant topologies, technologies and protocols and the corresponding industry standards for the last-mile network infrastructure

in the applicant's proposed deployment?

100/20 Mbps broadband service will be delivered to customers via a GPON FTTP architecture which is compliant with the ITU-T G.984 GPON standard. The physical fiber network will be based on the optical requirements to effectively implement a G.984 GPON network, utilizing centralized OLT and splitter locations feeding ONT units via single-mode fiber to the home or business. A 32-way split will be used at each OLT port. Multiple OLT ports and splitters will be placed at each PON location. Each PON will utilize Class C+ optics and will be limited to a 20 km distance. An IEEE 802.3 Gigabit Ethernet fiber link will be used for backhaul from each OLT location to the core network. The network placed in service will be capable of supporting 1GigE connections to all customers. Broadband internet services are offered from the FTTH network via an Optical Network Unit (ONU) with either a Cat 5e or Wi-Fi technology connecting customer devices.

For 50/5 Mbps service, TurboNet will capitalize on its existing Missouri wireless network by upgrading the services on a subset of its towers as well as add new towers to serve the proposed area. We will densify the network, upgrade backhauls, and increase the fiber points of presence to achieve the applicable performance tiers. To achieve 50Mbs service offering in select areas, we will rely on 2.4GHz, 3.65GHz, and 5Ghz, and small cell millimeter-wave technology where frequency is available and application is warranted.

The proposed last mile fixed wireless network will utilize various solutions and vendors depending upon specific application needs to support 50 Mbps/5 Mbps service. Multi-User MIMO increasing the spectral efficiency to more than 40 bps/Hz. This equipment is capable of a frequency range of 5150-5925 MHz with a Channel Width of 5, 10, 15, 20, 30, 40 and 80 MHz. This equipment follows several relevant standards and protocols which includes, IEEE 802.3, IEEE 802.1ad, IEEE 802.1q, IPv4, UDP, TCP, IP, ICMP, Telnet, SNMP, HTTP, FTP, HTTPS, SNMP v3, FIPs-197 128-bit AES, 256-bit AES. The unlicensed equipment has theoretical throughput of 450 - 550mbps in a 20MHz channel with real-world experiences showing 200-300mbps. All solutions will easily support 50 Mbps/5 Mbps low latency service.

The proposed fixed wireless equipment will have a latency < 35 ms. When combined with the backhaul/network latency of 3-5 ms. the overall combined user latency will typically be in the 25-50 ms. range.

The proposed fixed wireless vendors support industry standard voice codecs (G.711, G.722, and G.729) that will be utilized to meet the minimum MOS requirements.

c. Middle-Mile/Backhaul: What are the relevant topologies, technologies and protocols and the corresponding industry standards for the middle-mile/backhaul network infrastructure in the applicant's proposal?

The middle mile/backhaul network is comprised of a core data network and a transport backhaul network. The transport backhaul network ties wireless access points back to the core network through a combination of fiber and wireless transport mediums.

The transport backhaul network is design in a hub and spoke topology with several

diverse paths added to provide redundant connections back to the core data network. The transport medium is a combination of fiber and fixed licensed wireless connections.

TurboNet intends to utilize unlicensed microwave links in the 5, 60,70 and 80GHz spectrum to meet the Auction 904 service commitments along with fiber connections in various points throughout the network. Additional licenses may be required and license applications for these microwave links have not been submitted to the FCC at this time. The microwave link applications will be filed in a timely fashion to fall within the implementation schedule that TurboNet is submitting with the long form application.

d. Internet Access: What are the relevant topologies, technologies and protocols and the corresponding industry standards for the Internet access network infrastructure in the applicant's proposal? This is the connection to major IXPs, transit providers, etc.

The new network will leverage existing upstream provider. Internet interconnections are transported via 802.3 Gigabit Ethernet fiber from Worldwide Technologies' upstream partner to the core network. The company currently has 2-10Gbps internet connections with the Bluebird Network in Missouri.

e. Gigabit Performance Tier: Special care must be taken to describe the above portions of the network, especially last-mile, when service providers propose to bid in the Gigabit performance tier. For example, if an applicant proposes to use DSL to offer Gigabit service, wire lengths, wire quality & capability, protocols, vendor devices and other factors must be detailed. Additionally, fixed wireless providers proposing to bid in the Gigabit performance tier must pay special and careful consideration in answering the questions in 4(e) below on Network Performance.[40]

Not Applicable. The applicant is not proposing Gigbit Performance Tier in any of the anticipated bidding CBGs.

f. If the applicant is proposing to use non-standard technologies and protocols, the applicant should identify which vendor(s) and product(s) are being considered and provide links to the vendors' websites and to publicly available technical specifications of the product(s).[41]

Not applicable. TurboNet currently uses and plans to use industry standard technologies and equipment from industry recognized vendors.

3. Voice Services:

a. Briefly describe the anticipated system(s) that will be used to provide voice services to the applicant's subscribers, including a standalone voice service. Examples of such solutions could include: (1) internally designed and operated; (2) provided by a Managed Voice Service Provider; or (3) or an OTT (Over-The-Top) solution available to subscribers via the applicant. If the applicant is considering multiple solutions, provide information on each one and identify possible vendors or service providers.

TurboNet plans to offer VoIP provided by a Managed Voice Service Provider. A wholesale VoIP service provider will be selected with a proven track-record of providing managed wholesale VoIP services that meet the MOS standards required by the FCC along with quality and support standards demanded by TurboNet.

If the applicant plans to use an internally designed and operated system, provide specific information on any existing voice system the applicant operates.

Not applicable. Applicant will utilize the voice system operated and designed by Managed Voice Service Provider.

b. If the applicant plans to implement a new system to meet these requirements, provide specific information on the technology, standards, latency, planned QoS, architecture; design; protocols; equipment; vendors; public switched telephone network (PSTN) interconnections (links, speed and to whom you interconnect); capacity (projected peak call rates versus total projected subscribers); reliability and availability design and procedures; and the applicant's specific plans to control, manage, monitor, and recover/repair/troubleshoot outages. If any of these issues are addressed in response to the other questions in this Appendix, it is permissible to cross-reference that information here.

Applicant is not implementing a new system to meet these requirements, instead using a Managed Voice Service Provider's hosted Interconnected VoIP platform over Applicants network.

4. Network Performance:

a. Can the applicant demonstrate that the technology and the engineering design will fully support the proposed performance tier, latency and voice service requirements for the requisite number of locations during peak periods (Yes/No)?

Yes, the applicant can demonstrate that its technology and engineering design will fully support its commitment to achieve its proposed tier, latency and voice service requirements for all eligible locations during peak periods of the day.

[40] Gigabit performance tier applicants, as all other applicants, are encouraged to provide concise and sufficiently detailed answers, both quantitative and qualitative, in addition to supportive documentation that demonstrates how the applicable performance tier and latency requirements could be met.

[41] If technical specifications for the non-standard technologies are not available on a vendor's website, technical documents may be submitted with the application.

b. Briefly describe the capabilities of the network technologies that will enable performance tier (speed and usage allowance), latency and (where applicable) voice service mean opinion score (MOS) requirements to be met. This can include traffic management, Quality of Service, over-building/scalability, using equipment that easily allows upgrades and other techniques.

A 2.5 GPON network delivered over a FTTH architecture utilizing a 1x32 Passive split is fully capable of meeting the proposed speed, performance and latency tiers and can also deliver high quality voice service. The voice service offered is a high quality SIP based voice service. The equipment used in the proposed GPON network will comply with the ITU-T G.984 GPON standard. All equipment used to uplink data will be supported by the IEEE 802.3 Gigabit Ethernet standard. The physical plant will be designed for compliance with these standards. Both broadband internet access and voice services will be delivered over the same GPON network and gigabit Ethernet connections for backhaul incorporating products that only comply with the standards mentioned above. With the technical capability to delivery Gigabit service, 100 Mbps service with less than 100ms round-trip latency during peak periods will be easily achieved.

The wireless network is designed to meet the 50/5 Mbps and 25/3 Mpbs performance tier by using industry-leading technology by industry-recognized vendors. These products have been field-proven to support to meet the proposed speed, performance and latency tiers and proven to also deliver high quality voice service.

Voice service mean opinion score (MOS) requirements will be met by use of an industry recognized Managed Voice Services to support voice service which comply with the IETF RFC 3261 SIP standard. The networks are designed for low latency. Carrier grade voice protocols, including SIP, are supported along with industry standard voice codecs (G.711, G.722, G.729) that exceed minimum MOS requirements.

All equipment is highly scalable and easily upgradable if the need for additional bandwidth is required.

c. For both broadband and voice services, state the target or design peak period over-subscription ratio(s) for the last-mile, middle-mile/backhaul and Internet interconnection that will be used. Additionally, describe the basic assumptions and calculations that will be used in determining these ratios.

For broadband peak usage over the GPON last-mile network, ITU-T G.984 standard

specifies the use of optical wavelength division multiplexing (WDM) so a single fiber can be used for both downstream (toward the subscriber) capacity of 2.488 Gbps and an upstream (toward the network) capacity of 1.244 Gbps that is shared among users. A laser on a wavelength (λ) of 1490 nm transmits downstream data. Upstream data transmits on a wavelength of 1310 nm. GPON is often referred to as having 2.5Gbps capacity. Techniques like DBA (dynamic bandwidth allocation) are included in the GPON standard to enable subscribers to get more effective bandwidth upstream when needed, freeing up unused bandwidth for other subscribers. This statistical multiplexing technology gives the 2.5Gbps PON a much higher effective throughput upstream and enables service providers to provide oversubscribed service to all subscribers on the PON with minimal congestion impacts. We plan to use a 32-way splitter at each OLT, offering a sustained 78 Mbps capacity with zero oversubscription. An engineering guideline that allows 32x 100 Mbps services on a 2.5G GPON would result in an effective 1.3:1 oversubscription (32x 100M / 2.5G). The applicant will monitor utilization on the GPON network and the OLT network interface using a 75% percentage of capacity used as a trigger to make upgrades or changes to the network.

For wireless last-mile locations, serving customers at 25 Mbps service level could be oversubscribed at 12:1. For 50Mbps service, oversubscription may be as high as 15:1. This is due to the fact that at lower speeds, a higher percentage of the service is being used on average for video services. For example, two HD video streams would require approximately 10Mb to stream. Since Video is the largest contributor to Internet usage, the oversubscription on a 10Mb service would leave little room for additional services in the home while two video streams are served. However, at a 50Mb connection, two video streams would use less than 10% of the service offering. Because it is difficult for the common user to max out a 50Mb connection, the over subscription rate is easier to manage. For assurances of quality service, the applicant will generally plan to use a 15:1 oversubscription rate on the last-mile of the wireless network for all performance tiers.

For broadband peak usage over wireless network, the applicant intends to install all of its middle-mile/backhaul using 1.2 Gbps links. Due to the scattered distribution of eligible locations within the Census Block Groups of interest, the applicant will be able to ensure all customers in the relevant Census Block Groups access to the full bandwidth speeds that the applicant bid in the Auction, based on a contention ratio of 1:3 during peak usage hours. By using only the latest generation microwave technologies in its design, and specifically targeting eligible locations as provided by the FCC, the Applicant can ensure that the network will be suited to meet its commitments to customers and will not be hampered by network bottlenecks.

Upstream data is interconnected and transported via IEEE 802.3 Gigabit Ethernet fiber from our upstream partners to our core network. Combined with bandwidth demands from our existing customers and the new proposed network, we expect 10 Gbps will offer ample upstream bandwidth to support proposed tiers of service to 100% of the requisite number of locations located in the Census Block Groups of interest. We will continue to monitor usage during peak usage periods and will

increase upstream capabilities based on need.

The following documentation can be made available to support the performance tier, latency, voice service requirements for the number of locations identified in the bidding areas for the state:

- Network Diagrams
- Propagation Studies
- Link Budgets
- Backhaul design map and specifications
- Spectrum availability and channel plan
- Capacity Plan
- Equipment Specifications

d. What general rules-of-thumb will be used to determine if any portion of the network infrastructure needs to be improved, upgraded or expanded to ensure the network is able to meet the required speed, latency and where required voice quality? For example, taking action when (1) when middle-mile link average peak period load is greater than 70%; when a link peak period load exceeds 95% more than 10 times; when a router's average peak period processing utilization exceeds 70%; when an Internet access link load exceeds 75% for a specified time period; when call setup, call drop, call completion rates meet or exceed applicant targets.

Internet access, middle-mile link bandwidth, and subscriber performance is constantly monitored. When system demand in Internet access or middle-mile bandwidth exceeds 75% of capacity requirement, action is taken to increase bandwidth. As needed, the applicant will densify the network by addition of last-mile equipment, upgrade backhaul equipment, increase the fiber points of presence, or boost source bandwidth to achieve the applicable performance tiers.

e. For fixed broadband wireless access and satellite networks, describe how the proposed frequency band(s) and technology attributes, for both last mile and backhaul, will achieve the performance tier(s)[42] and latency requirements to all locations for both broadband and voice services. Specifically, describe how the planned frequency bands, base station configuration, including, for example, point-to-point, point-to-multipoint or mesh architectures, and customer premise equipment (CPE), channel bandwidths minimal requirements,[43] traffic assumptions,[44] and propagation assumptions,[45] and calculations yield sufficient capacity to all the planned locations.

The performance tiers and usage allowances for the various proposed fixed wireless equipment from Mimosa and Siklu are:

- Model Mimosa #B5: Up to 1 Gbps throughput, unlimited usage allowance, Latency 3 milliseconds (ms)
- Model Siklu #EH600: Up to 1.5 Gbps throughput, unlimited usage allowance, Latency 2 milliseconds (ms)
- Model Siklu #EH710: Up to 2 Gbps throughput, unlimited usage allowance, Latency 2 millisecond (ms)

Links to vendor specification sheets.

Siklu.com

Mimosa.co

5. Network Buildout: Can the applicant demonstrate that all the network buildout requirements to achieve all service milestones can be met (Yes/No)?

   Yes, the applicant will be able to demonstrate that all of its network buildout requirements to achieve all of its voice and broadband service milestones can be met.

   The applicant will be required to submit a detailed project plan in the long-form application if it is named as a winning bidder. Describe concisely the information that the applicant would make available in such a detailed project plan.

   The applicant has built and is currently operating networks using similar equipment and architecture to provide the proposed services. The applicant will make available a formal network design that will include systems diagrams for all auction-supported systems. The applicant is developing pricing from past projects to ensure costs remain within budget for this project. The applicant has worked with a variety of vendors and maintained a good working relationship with them. The applicant will utilize in-house talent augmented by outside engineering and construction companies to assist in this effort. All equipment planned is commercially available today with reasonable lead times. The applicant will provide a list of contractors, vendors, and integrators as well as pricing quotes to confirm budget numbers and develop a full set of plans and specifications that would support any project associated with this auction. The application will be prepared to demonstrate this ability through the delivery of an engineering plan that includes, but is not limited to, the following data:

   - System Designs for Proposed GPON and Wireless Networks
   - Network Diagrams
   - Propagation studies

- Capacity Analysis
- Link budgets for backhaul and last mile
- Sector planning to accommodate take rates over time
- Network monitoring systems and procedures for bandwidth shaping, usage demand
- Rights of way acquisition
- Project Plan with milestones and GANTT charts indicating deployment timelines

6. Network Equipment, Consultants and Deployment Vendors: For the proposed performance tier and latency combination(s), can the applicant demonstrate that potential vendors, integrators and other partners are able to provide commercially available and fully compatible network

[42] All the performance tiers have both downstream and upstream speed requirements. An applicant must demonstrate how the requirements for both the downstream and upstream speeds could be met.

[43] Channel bandwidths minimal requirements must be provided for both base station or access point and CPE and their pertinent technology and protocols.

[44] Traffic assumptions must include peak hour(s), network loading, oversubscription ratio, estimated maximum number of subscribers, and monthly usage per subscriber.

[45] For example, provide specific assumptions pertinent to planned frequency bands including, but not limited to, allowable path distances, availability, and propagation loss categories, such as foliage and rain. For base station (access point) coverage, provide information on the treatment of forward path, reverse path, and non-line of sight scenarios.

equipment/systems, interconnection, last mile technology and CPE that will meet the performance tier(s) and latency performance requirements at a cost consistent with applicant's buildout budget and in time to meet service milestones (Yes/No)?

Yes, the applicant will be able to demonstrate that all potential vendors, integrators, and other contractors will be able to provide commercially available and fully compatible equipment, systems, interconnection, last mile and subscriber technology and equipment at a cost consistent with applicant's budget.

Describe concisely the information and sources of such information that the applicant could make available to support this response.

The applicant has built and is currently operating networks using similar equipment and architecture to provide the proposed services. They are utilizing pricing from past projects to ensure that they remain within budget for this project. They have worked with a variety of vendors and maintain a good working relationship with them. These vendors include equipment suppliers, wireless crews, fiber crews, and engineering firms. All equipment that the applicant plans to use is commercially available today with reasonable lead times. The applicant will provide a list of contractors, vendors, and integrators as well as pricing quotes to confirm budget numbers and develop a full set of plans and specifications that would support any project associated with this auction.

The following list outlines the supporting documentation that may be provided:

- Specification sheets from all manufacturers
- Equipment manufacturer technology road maps
- Copies of existing contracts and agreements for critical vendor relationships
- As-Built Fiber Infrastructure and Tower Infrastructure maps
- Fiber Maps
- Tower Maps
- Co-lo facility maps
- Project ROI and budgetary guidelines

7. Network Management:

   a. Briefly describe the method(s) that will be used to monitor, operate, problem resolution, provision and optimize the network and associated services such as voice. Identify if the proposed solution is internally developed and operated; expands existing systems; uses a third-party network management provider; or is some variant or combination of these methods.

We currently use the Mimosa Cloud Network monitoring system to monitor our Backhaul links.
We use the UNMS monitoring system to monitor our customer premise

equipment.
Both systems Notify us if there is an outage.

b. Remember to include how voice operations will be monitored, operated, problems resolved, provisioned and optimized as appropriate.

We have monitoring on our VOIP Server using PRTG Network Monitoring program

c. If the applicant will expand existing network management systems, describe how the current system provides successful operations.

We'll use the same systems as we expand

d. If the applicant will use a third-party network management provider, identify any providers the applicant is currently considering.

Not applicable. The applicant will not be using a third-party network management provider.

e. If the applicant will develop, deploy and operate a new system can the applicant demonstrate that it can provide internally developed operations systems for provisioning and maintaining the proposed network including equipment and segments, interconnections, CPE and customer services at cost consistent with applicant's buildout budget and in time to meet service milestones (Yes/No)?

Not applicable. The applicant will be using its existing system.

If not, can the applicant demonstrate that potential vendors, integrators, and other partners are able to provide commercially available and fully compatible operations systems and tools for provisioning and maintaining the proposed network at cost consistent with applicant's buildout budget and in time to meet service milestones (Yes/No)?

Yes. The applicant will be using its existing system and any expansion will simply include upgrade to current software licenses.

Describe concisely the information and sources of such information that the applicant could make available to support these responses.

The applicant can readily provide information regarding their existing network operations, services provisioning, system maintenance, CPE maintenance, and customer service.

8. Satellite Networks: If the applicant is using satellite technologies, identify which satellites would be used, and describe concisely the total satellite capacity available, that is, capacity that is not currently in use for existing subscribers. In addition, describe how the proposed network will achieve the performance tier(s) and latency requirements to all planned locations in a mass-market consumer service.

The applicant is not proposing the use of satellite technologies.

STATE OF MISSOURI

John R. Ashcroft
Secretary of State

CERTIFICATE OF GOOD STANDING

I, John R. Ashcroft, Secretary of State of the STATE OF MISSOURI, do hereby certify that the records in my office and in my care and custody reveal that

TurboNet Technologies, Inc.

00662010

A Missouri entity was created under the laws of this State on 5/24/2005, and in Good Standing, having fully complied with all the requirements of this office.

IN TESTIMONY WHEREOF, I hereunto set my hand and cause to be affixed the GREAT SEAL of the State of Missouri. Done at the City of Jefferson, the 6th day of May, 2021.

Secretary of State

Certification Number: CERT-IN80977

STATE OF MISSOURI

John R. Ashcroft

Secretary of State

CORPORATION DIVISION

CERTIFICATE OF CORPORATE RECORDS

TurboNet

X00715427

I, John R. Ashcroft, Secretary of State of the State of Missouri and Keeper of the Great Seal thereof, do hereby certify that the annexed pages contain a full, true and complete copy of the original documents on file and of record in this office.

IN TESTIMONY WHEREOF, I hereunto set my hand and cause to be affixed the GREAT SEAL of the State of Missouri.

Done at the City of Jefferson, the 05/10/2021

Secretary of State

Certification Number: CERT-IN81455

State of Missouri

Robin Carnahan, Secretary of State

File Number: 200603890062
X00715427
Date Filed: 02/07/2006
Expiration Date: 02/07/2011
Robin Carnahan
Secretary of State

Registration of Fictitious Name

This fictitious name filing shall expire 5 years from the date filed unless a renewal filing is submitted within 6 months prior to the expiration date.

This information is for the use of the public and gives no protection to the name being registered. There is no provision in this Chapter to keep another person or business entity from adopting and using the same name. (Chapter 417, RSMo)

The undersigned is doing business under the following name, and at the following address:

Business name to be registered: **TurboNet**

Business address: **7 Creekview Bend**

City, State and Zip Code: **Lexington MO 64067**

If all parties are jointly and severally liable, percentage of ownership need not be listed.

Name of Owners, Individual or Business Entity	Street and Number	City and State	Zip Code	If listed, Percentage of ownership must equal 100%
Worldwide Technologies, Inc.	7 Creekview Bend	Lexington MO	64067	100%

In Affirmation thereof, the facts stated above are true:

(The undersigned understands that false statements made in this filing are subject to the penalties of a false declaration under Section 575.060, RSMo)

Mark Webb — **President**

(Authorized Signature) — *(Authorized Party Relationship)*

STATE OF MISSOURI

OFFICE OF THE PUBLIC SERVICE COMMISSION

I have compared the preceding copy with the original on file in this office and I do hereby certify the same to be a true copy therefrom and the whole thereof.

WITNESS my hand and seal of the Public Service Commission, at Jefferson City, Missouri, this 10th day of May, 2021.

Morris L. Woodruff
Secretary

Digitally signed by MOPSC
DN: CN=MOPSC, O=MOPSC, OU="", E=kim.happy@psc.mo.gov, C=US
Reason: I attest to the accuracy and integrity of this document
Location: Cole County, Missouri
Date: 2021.05.10 15:56:19-05'00'
Foxit PhantomPDF Version: 10.1.1

MISSOURI PUBLIC SERVICE COMMISSION

May 10, 2021

File/Case No. DA-2021-0394

Missouri Public Service Commission
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Jefferson City, MO 65102
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TurboNet
Carl J Lumley
130 S. Bemiston, Ste. 200
St. Louis, MO 63105
clumley@chgolaw.com

Enclosed find a certified copy of an Order or Notice issued in the above-referenced matter(s).

Sincerely,

Morris L Woodruff

Morris L. Woodruff
Secretary

Distributed to all Local Exchange Carriers Certificated to Provide Service in Missouri.

Recipients listed above with a valid e-mail address will receive electronic service. Recipients without a valid e-mail address will receive paper service.