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Arizona Broadband Development Grant

1. Overview

Spectrum Pacific West, LLC, ("Spectrum") makes this application in response to the Arizona Commerce Authority's Request for Proposals ("RFP"). Spectrum is a subsidiary of Charter Communications, Inc. ("Charter"). Charter is a leading connectivity company and cable operator providing superior broadband, voice, video, and mobile services under the brand name Spectrum to more than 32 million customers across 41 states. Together with its 96,000 employees nationwide, Charter is driving innovation and growing economies from coast to coast and in communities big and small.

Charter has invested nearly [redacted] in infrastructure and technology nationally over the last five years as part of its long-term commitment to expanding broadband access across urban, suburban and rural areas to connect more Americans. From 2018-2020 alone, Charter extended its network to reach an additional 2.5 million new homes and businesses across the country, about a third in rural areas.

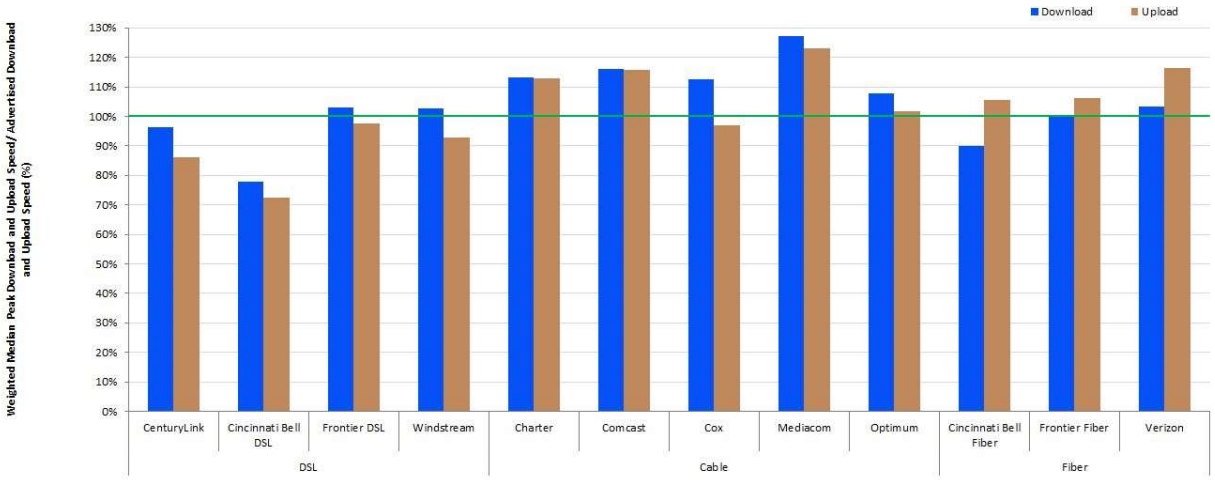
Charter has also recently announced [redacted] investment to connect more than a million currently-unserved, mostly rural families and small businesses to reliable broadband service with speeds of up to 1 gigabit per second, including adding significant resources to its construction department focused solely on adding approximately 115,000 miles of new network infrastructure to its more than 750,000 existing miles. This investment will be offset by approximately [redacted] to Charter in the Federal Communication Commission's Rural Digital Opportunity Fund ("RDOF") program.

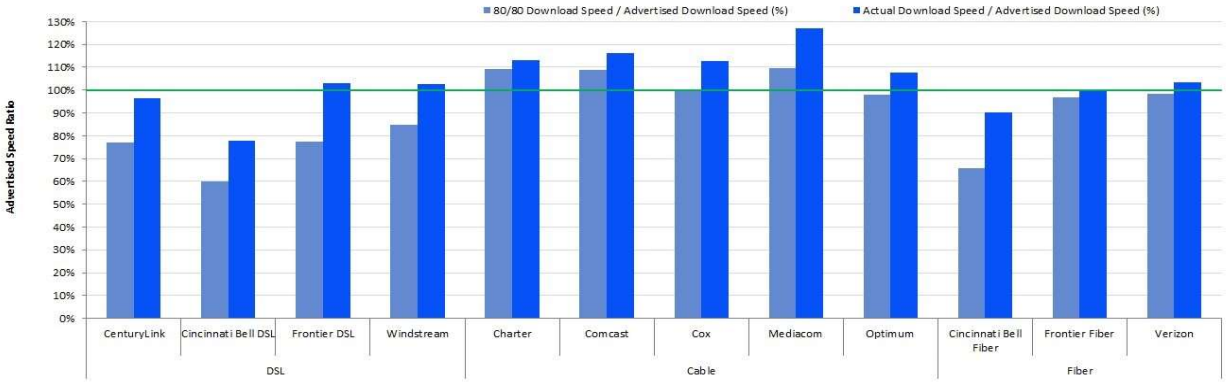
In Arizona, Spectrum (and its predecessor companies) has operated, developed, and managed cable systems for decades and has fully deployed DOCSIS-based hybrid fiber coax ("HFC") and Fiber-to-the-Premises ("FTTP") technology throughout its existing service area capable of delivering Gigabit speed broadband service to our customers in the state. Across our current Yuma County footprint, Spectrum provides a standard 200 Mbps residential broadband service, an additional tier of 400 Mbps, and our Spectrum Internet Gig product which provides speeds of up to 1 Gigabit. All network extensions under this project will be full FTTP builds capable of delivering all of our current speeds, as well as our TV, Voice, and Mobile products.

We are proud of the speeds we are able to deliver over our network. In fact, the most recent Federal Communications Commission[1] broadband report highlighted how Spectrum Internet outperformed its fiber broadband competitors in terms of speed delivered and consistent performance.
Spectrum exceeded 100% of our advertised upload and download speeds during peak times on all speeds measured as indicated in the chart below.

[1] Federal Communications Commission. "Eleventh Measuring Broadband America Fixed Broadband Report." December 31, 2021.

[redacted] [redacted] [redacted]





Charter's network is designed to meet and exceed the needs of its customers. In fact, Charter's commitment to service quality resulted in Multichannel News naming Charter as Operator of the Year for 2020, and U.S. News and World Report's 2021-2022 "Best Rural Internet Service Providers" survey ranked Spectrum as #1 for the best rural service.[3]

Charter's unparalleled commitment to service quality was especially evident in response to the pandemic. When the pandemic forced tens of millions of Americans to work and learn from the safety of their homes beginning in March 2020, Charter's broadband network provided a critical lifeline to help keep our economy moving, students engaged and families connected. Our network met the traffic surge and the biggest stress test that the internet had ever faced. We continued to perform well despite higher levels of peak bandwidth usage. We accomplished all this while making adjustments to how and

[33] U.S. News and World Report, Best Internet Providers for Rural Areas (July 8, 2021), https://www.usnews.com/360-reviews/internet-providers/best-rural

where we worked in response to COVID protocols. Meeting the challenge that the pandemic created was helped by years of continued investment and upgrading of our network to stay ahead of consumer demand.

Charter's network architecture is fully scalable and will continue to exceed customer demand for both downstream and upstream performance. In fact, Charter just recently completed initial lab testing that demonstrated a capability for speeds greater than 8.5 Gigabit downstream and 6 Gigabit upstream over current infrastructure using advanced technology that is currently in development.[2]

Spectrum will use the same network deployment and operational procedures in the project areas that Charter has currently successfully employed across the country. These practices include documented and thoroughly tested methods of managing network performance, managing service issues at a network and customer level, and coordinating change management with minimal or no disruption to customers.

In addition to our broadband services, all customers and potential customers added under this proposal will have access to Spectrum's high-quality products, services and customer-friendly policies, including our high-value Spectrum pricing and packaging structure, Spectrum Mobile, the nation's fastest growing, cost-effective mobile product, Spectrum Internet, Spectrum TV, and Spectrum Voice offerings. Today, Spectrum services offer no data caps, no modem fees, no annual contracts with high-quality service provided by U.S. based, insourced employees. Our commitment to serving customers and exceeding their expectations is the bedrock of Charter's business strategy and it's the philosophy that guides its 96,000+ employees.

In addition to our commitment to customers, we also have a commitment to the communities we serve. To increase adoption and access to technology, Charter offers philanthropic support to community organizations and in 2020 doubled its yearly commitment to the Spectrum Digital Education Grant program, which provides computers, digital education classes and technology labs and has benefited more than 56,000 people across 17 states and Washington, D.C., since 2017. In 2021, we made two donations totaling [redacted] to the YES Fund for Kids and the School Tuition Association of Yuma through the State's tax credit program.

2. Project Description and Timeline

All locations included in this project will be constructed using FTTP to the identified unserved and underserved households in Yuma County, Arizona. The proposed project consists of Southern Yuma

[2] https://www.businesswire.com/news/home/20220105005407/en/Charter-and-Vecima-Demonstrate-Long-TermHFC-Network-Future-with-Multi-Gigabit-DOCSIS-4.0

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County, serving the identified 232 unserved and underserved households and small businesses to the South and Southeast of Yuma's International Airport. ("Project").

Spectrum's FTTP deployment is relevant and suitable for remote learning and remote working, offering very high bandwidth and low latency service attributes that accommodate numerous members of a household or small business simultaneously using bandwidth-intensive applications, such as video conferencing, telemedicine, video streaming, gaming, virtual or augmented reality sessions, and numerous other applications.

Additional services that will be available to Spectrum Internet customers include, but are not limited to, anti-virus security protection and in-home WiFi. As an added benefit of its FTTP network, Spectrum will also be in a position to offer competitive video, voice and mobile services in the Project area. As the market demands faster speeds, Spectrum expects to meet the needs of our customers by continuing to upgrade our network.

To summarize, Spectrum identified a total of 232 locations that are unserved or underserved in the Project area. These unserved and underserved addresses were found using a cross reference of Fixed Broadband Deployment Data from the FCC's Form 477 Data and a list of taxable properties by address in Yuma County provided by the Yuma County Tax Assessor's Office. This Project will consist of approximately 23.4 miles of new fiber through both aerial and underground deployment.

[redacted]

[redacted]

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[redacted]

3. Description of Technology and Scalability:

Spectrum will provide wireline broadband internet to the project area using FTTP via an Ethernet Passive Optical Network ("EPON") architecture, hereafter referred to as FTTP EPON, architecture. This FTTP EPON architecture is a standardized model that is currently operated by Charter across the country, engineered and managed to meet 1 Gbps downstream speeds, 500 Mbps upstream speeds, and latency of less than 100 milliseconds[3].

Spectrum's FTTP EPON architecture offers the highest customer quality in last mile solutions. In addition to very low levels of signal loss of a propagating light signal, fiber networks are immune to ingress noise. Additionally, fiber networks have very few active (i.e. powered) components in the network, lowering expected maintenance and increasing reliability. Spectrum expects to meet the needs of our customers by continuing to upgrade our network. Charter's national and uniform infrastructure scales to ensure consistency and quality throughout its network, whether in rural or urban areas.

The FTTP EPON architecture will also enable Spectrum to meet, and substantially exceed, all latency requirements for the Project area. The most recent Measuring Broadband America report released on January 4, 2021 tested latency over Charter's HFC network using DOCSIS technology confirmed Charter is achieving latency of 26 milliseconds. Charter anticipates the same or lower latency with the FTTP EPON architecture deployed in the project area due to fewer active components in the path used in this architecture.

Spectrum's FTTP EPON facilities in the Project area, will be connected to pre-existing upstream Spectrum hub locations, which, in turn, are connected to Charter's national core network backbone. While Spectrum will be building a new last mile FTTP network in the Project area, this last mile network will be connected to Spectrum's existing robust and scalable network tiers, which are already in place and ready for growth. Spectrum augments its capacity through normal operating procedures, and these procedures will extend to the proposed Project area seamlessly.

[3] Recognizing the importance of fast, reliable service for community institutions, Charter also offers 10 Gbps symmetrical speeds to large businesses, schools, libraries, hospitals, and other important community institutions through customized dedicated builds by its Spectrum Enterprise business organization. The present application and proposed budget not include the costs of such customized builds; however, Spectrum's network presence in the project area would better position the company to make such offers available.

[redacted]