C. Project Narrative

C. 1. Project Description and Timeline

Provide a detailed description of the infrastructure improvements for which funding is requested, including:

The nature of the improvements

The Arizona Commerce Authority ABDG funds will be used to create a vendor neutral Internet Point-of-Presence (POP), Internet Exchange Point (IXP) HUB, Cloud and Colocation Facility in Payson AZ to provide broadband dependability, enhance connectivity, digital infrastructure, and digital services in Payson, the surrounding Rim Country communities, and across Northeast Arizona.

How the proposed project addresses the broadband needs of the area(s) that it serves

This facility will create redundant network access points for northeast Arizona ensuring that the underserved populations, including Native American Tribes in northeast Arizona, will have access to self-healing resilient, redundant internet service and enhanced connectivity. This will help overcome the lack of access to dependable, highspeed internet service which is a primary factor limiting economic growth in rural and tribal communities.

If approved for funding, site acquisition will be initiated within 30 days, and our civil, infrastructure, and architectural engineering firms will be engaged within 60 days. In the event ABDG funding appears eminent, we will begin expending funds per the attached Gantt Chart and anticipate permitting to be complete and construction to begin within 120 days with targeted completion at the end of 24 months.

	Primary Beneficiaries	Secondary Beneficiaries
Number of Anchor Institutions Served**	64	unknown
Number of Households Served	21240	45248
Number of Businesses Served	872	1282
Total Population***	39211	57561

**Portions of Coconino, Gila, Apache, and Navajo Counties

***See Exhibit A, Census Tracts, attached in Section H.

The anticipated economic development benefit achieved by construction of such improvements

With anticipated completion by July 2024. Creating this IXP /NAP will significantly increase connectivity and enhance economic development and community wellbeing in these rural, underserved areas in northeast Arizona. The current lack of dependable, ultra-high-speed broadband service has created high and unsustainable societal costs in the region, especially within our underserved populations. These current costs from lack of dependable resilient rural broadband include: 1) reduced economic development and vitality; and 2) lack of access to equivalent high-quality healthcare (service interruptions and insufficiencies have caused undesirable and dangerous outcomes, as well as fatalities, in our region); and 3) reduced educational and career opportunities. Utilizing the National Chamber of Commerce economic development multiplier and HHS rural statistical health outcome aggregates, the projected total positive economic, healthcare and education benefits of implementing this Internet Exchange Point Hub are projected to be $29,560,000 over 10 years. Measuring lives saved during emergencies or putting a value on those that have actually been lost in the past by internet interruptions is uncalculatable.

Total miles of fiber to be installed (if applicable)

n/a

Location of new fiber (aerial, underground, or both)

n/a

Stated commitment to operate and maintain the network for a minimum of five (5) years upon completion of the improvements

MHA Foundation has a multi-year, multi-million dollar track record of supporting and enhancing broadband in Northern Gila County. If funded, the Foundation and its subsidiary Rim Country Educational Foundation, LLC (grant co-applicants) have committed to the operation and maintenance of the facility for the required duration.

The party or parties that will perform the infrastructure construction (if known)

MHA Foundation and its predecessor organizations have been involved in the promotion of healthcare, education and public welfare in Rim Country for over six decades. We are the largest non-profit in rural Arizona with tens of millions in assets. We use the revenue from our capital investments to promote the public welfare by incentivizing expenditures in projects that benefit the community. Over the past five years MHAF has provided millions of dollars to promote broadband expansion in Rim Country, including incentivizing Sparklight to bring its new fiber trunkline connection down from the northeast.

The new Sparklight fiber has dramatically increased the availability of ultrahigh speed broadband (10x – up to 1,000mb/sec). Issues of dependability and redundancy remain, as demonstrated in the past few weeks when Sparklight's fiber was cut and out of service due to a traffic accident. Although those served by CenturyLink/ Lumen were not affected, that portion of town served by Sparklight was. Even though the two major carriers have recently developed a mutual backup agreement, switching and recovery is technical, labor intensive and slow. Having a computer-controlled Internet Exchange Point (IXP) would resolve a fiber interruption/ outage like this one seamlessly and would then be able to easily switch back when the fiber cut is repaired.

The intended uses of the ABDG Rural/Urban funds in respect to the construction or planning

1) We will design, implement and build a facility to house the Internet Exchange Point (IXP) Hub and Point of Presence (POP) command and control NAP at the location identified on the attached map. Locating a regional facility in Payson will enhance connectivity, digital infrastructure, and digital services. An Access, Distribution and Backbone IXP and POP will allow creation of redundant network access points (NAP) for the northeast Arizona middle-mile service providers.

2) We will create an instantaneous computer-controlled fiber backup switching system to enhance dependable regional access and distribution through an IXP /NAP for northeast Arizona. This will enhance connectivity for our underserved populations by providing a self-healing dependable, resilient, redundant middle-mile broadband inter-connection. The proposed HUB will be built at the location

where all of the current regional fiber carrier's lines plus the future APS fiber transverse our property. This allows interconnection for multiple current and future service providers (Sparklight, APS, CenturyLink-Lumen, North Texas Fiber, Suddenlink-Altice). Additionally, as another project outcome, Valley based businesses have expressed interest in storing data at a Payson location for disaster recovery. As another project outcome, this colocation facility could also provide local storage for content providers like Netflix and others to stream, rather than forcing their traffic onto the congested wide-area links crossing the vast distances between our communities.

3) In consultation with middle mile carriers, we work to develop a cost sharing and cost containment process that will financially reward those who produce significant improvements for end user outcomes (less interruptions/ total down time).

4) Concurrently, a cell tower location has been announced for a fifth generation T-Mobile Tower on this site. Over the past few months, proof-of-concept demonstrations have shown cellphone and Wi-Fi speeds as high as **240-360mb/sec** can be delivered wirelessly to remote locations that currently do not have access to fiber in Rim Country. By providing expanded backhaul bandwidth, the POP will allow wireless carriers to dramatically expand access to ultrahigh speed broadband to homes and businesses located in areas unreachable with fiber.

We propose building this facility to house the (IXP) and (POP) command and control NAP at the location indicated on the attached map. This will require construction of a 7,200 square foot building with additional space for expansion. Substantial civil and infrastructure engineering will be required to provide access and the infrastructure needed to locate the facility at the confluence of our regional carriers' fiber trunklines. Locating it near Whisper Ridge and the location of the announced new T-Mobile high tech cell tower will facilitate design and operation of the POP. Since the convergence of the three major MIDDLE MILE carriers occurs on OUR property.

Because we are building in a forested area, we anticipate using insulated brick wall construction with metal roofing. Utilities will be underground with power supplied by APS along their prior approved routing. Water will be supplied by the Town of Payson and municipal sewer by Green Valley Water District. UPS and backup power supplied by a Caterpillar Diesel Generator will insure continuous operability even during general power outages. The building will be served by an all-weather collector road which will provide uninterrupted access. The 253-acre parcel is owned by RCEA. They and their management partner RCEF are participants in this proposal. There is ample room for expansion and growth.

If accepted for funding, this proposal will provide the region with its first dependable, redundant and resilient broadband. This first-of-a-kind reliable, ultrahigh speed internet loop (ring) will benefit public safety and promote healthcare and economic development and other quality-of-life benefits in Payson & across parts of northeast Arizona.

The specific information required under Section 1.4 (to the extent relevant)

As referenced in the attached Digital Payson and Town of Payson support letter all local service providers, as well as the community at large, support this proposal. Current Internet backhaul providers like CenturyLink-Lumen and Sparklight, near future providers like APS and North Texas Fiber, and wireless providers like T-Mobile and Verizon, are all supportive of having this vendor neutral IXP as the primary Network Access Point (NAP) for their internet.

This solution will provide access to technologically resilient solutions generally not available in rural communities. Because of the large distances between rural communities and the remote and rugged

terrain through which the middle mile cabling must cross, the potential for four-legged squirrels (and often two legged ones!) causing a fiber break is unacceptably high. Forest fires also pose an additional risk to fiber cable. Multiple long duration outages have been common in the past and although bringing an additional carrier (Sparklight) has been helpful, it did not solve the problem caused by an individual carrier's fiber being cut or interrupted in a remote location. The lack of a universal redundant backup still exists.

This proposed solution using the IXP / NAP will serve to mitigate the impact of exposure to the interruptions in service that our region has experienced by allowing a command-and-control system to instantly sense the nature and extent of a fiber interruption and to seamlessly switch the load to an alternate predetermined backup carrier's fiber. Providing our middle-mile carriers an opportunity for redundant backup pathways will reduce the cost and environmental impact of each carrier having to lay additional miles and miles of cabling through Arizona's vast forests to achieve the same resulting benefits of both resiliency and redundancy.

A timeline for completion of the infrastructure improvements

See Exhibit B, attached

The description should also describe the amount of the cash "match" contribution to be provided, including:

The timing of such match

MHA Foundation has had a significant impact and role in not only healthcare and education but in bringing high speed broadband to our area. Working with the Arizona Commerce Authority, we have provided financial and technical support for regional broadband carriers. With millions successfully provided to incentivize private carriers, we have an unmatched proven track record with projects like this.

MHA Foundation is the largest non-profit in the region with a net worth in excess of [redacted] (see attached financial statement) and public benefit expenditures in excess of [redacted] in northern Gila County. Our mission is focused on health, healthcare and education. Each is inextricably tied to the quality, dependability and accessibility of ultrahigh speed broadband services. Our goal is to provide the "yeast – not the whole loaf of bread!" We have accomplished that by being willing to put our funds and resources into a project as the FIRST expenditures – thereby building support and confidence in the overall project's success. If approved for ACA ABDG funding, we are willing to commit to the same arrangement – we will contribute our matching funds first, to cover the initial costs, per the attached budget expenditure chart, before drawing on the ABDG approved funds.

As a point of reference, to induce Cable One (Sparklight) to build the trunkline from Holbrook to Payson, MHA Foundation hand delivered a check directly to them for [redacted] in October 2018, long before construction began or even permits had been secured.

We do not currently have, nor have we applied for any other federally funded grants nor subgrants for this broadband project, nor are we even aware if any such grants exist or even are available.

[redacted]

The identity of any sources other than the applicant who are responsible for such match or portions thereof

n/a

The nature of the commitment by the Applicant or other parties to deliver the match including whether such commitment is in writing and binding in all circumstances

See Exhibit C, attached under Item E. Documentation Commitments.

This section must also explain the circumstances why, in the absence of ABDG-Rural/Urban funding, the proposed project would not proceed within the same time frame or would not otherwise be as effective in advancing the objectives of the Program.

The proposal outlined in this ABDG-Rural grant request's unique approach to solving the rural broadband redundancy and dependability challenge will not succeed without substantial outside funding. From a business prospective, each carrier is faced with the same ROI challenge. Even though providing redundant and dependable broadband is great for the end user and the community, it does little to increase the income for the carriers. Since the IXP provides redundancy for all participants, the larger carriers could conclude that it would disproportionately help their competitors. Without ABDG funding triggered by our millions in matching contributions, any effort to build an IXP for northeast Arizona is doomed to failure.

C.2. Project Description and Timeline – Development (required)

Project Narratives must include a "Project Description and Timeline – Development" section which must include a detailed description of relevant future development that is intended to be benefited by the proposed infrastructure improvements, including, as applicable, a Gantt chart timeline for such development

This section should also identify, to the extent known:

The nature and scope of the project

Arizona Public Service has been concurrently working to get a fiber bundle connection along its route from Phoenix to St. Joseph for the last few years. With the exception of a short distance where they are waiting on permits from the Tonto National Forest, they should complete that fiber connection sometime in the next year. When complete, their connection to the Payson Internet Exchange Point (IXP) hub would provide them with redundancy and at the same time provide our other broadband end users increased resiliency and quadruple redundancy. Three fiber connections going in three separate directions would have to be cut simultaneously to lose service.

Over the past year, the Digital Payson Working Group has brought together all of the wired and wireless providers in the area. Through their efforts (in which we participate), they have been able to make great strides forward by opening lines of communication and by articulating joint efforts. Their efforts have brought the expertise and resources of both wired and wireless providers together to address mutual concerns. Their organizing efforts coupled with our financial resources have made this collaborative proposal possible.

Another project outcome may be the future development of a scalable Regional Whisper Ridge Data Center as discussed above. Type of technology to be utilized

Type of construction to be undertaken

Civil, Infrastructure & Architectural engineering
Brick Building Housing IXP
Access & Infrastructure
Redundant Power Supply
Point of Presence Interface, Computer Servers & Equipment

Qualifications of the vendors/contractors

Not yet selected.

Engineering analysis

Engineering analysis was completed as part of an earlier comprehensive investigation. In the summer of 2021, proof of concept was completed between carriers in the region.

Project approach

Goal 1) We will design, implement and deploy the Internet Exchange Point (IXP) hub to serve northcentral and northeast Arizona. The IXP Hub will house the diagnostic and command and control systems and switches. This includes the equipment, standardized diagnostic tools, redundant backup power and the software and ultrahigh speed internet switching gear required to operate a state-of-the-

art IXP and a Point-of-Presence (POP). The IXP Hub / POP will be operated by a coop management team comprised of the primary carriers utilizing the Hub and POP.

Justification:

Universally reliable broadband access, although socially and politically desirable, is ***not currently available*** *in rural Arizona. The obstacles to accomplish the goal of universally accessible broadband services are numerous. Perhaps one of the most daunting is the rugged and remote nature of the geography across much of rural Arizona. Towns and communities are generally far apart with relatively low populations. The topography between towns, especially in northern Arizona, is rugged and often rocky and inclement weather can be a hurdle. Traversing federal forest lands also poses significant permitting challenges.*

Systems need to be designed and implemented to minimize the number of miles of broadband fiber cabling required to serve rural communities. This proposed solution can greatly reduce unneeded, redundant proprietary trunk lines crisscrossing large swaths of rural Arizona.

Finally, the time required to manually switch the internet load from a disabled carrier's cut fiber line to the backup carrier is significant. Ultra-high speed diagnostic equipment capable of sensing a fiber interruption and switching the load to the best available alternative in real time is critical for an IXP to be successful and is a core part of this grant proposal.

Goal 2) We will implement an ultra-high speed internet load diagnostic command and control, computerized system that allows for better wireless carrier service, especially during holiday and weekend usage when peak use can exceed 250-1,000 times normal use. The POP will improve these functions for each wireless carrier, balancing loads while maintaining their competitive independence.

Justification:

Because of the recreational allure of our forested high country to those from the Valley of the Sun, wireless carriers also face significant challenges in northeast Arizona. As many as a quarter million visitors can impact the area on holiday weekends, putting incredible pressure on their finite resources. Peak time load sharing through the IXP, and POP could reduce traffic congestion dramatically.

Because coverage is needed across wide geographic distances and with a difficult topography across northern Arizona the POP can provide improved communication via high-capacity spectra previously unavailable in rural areas throughout the Payson and Star Valley area.

The IXP/ POP can also provide improved communications for Gila County and the Towns of Payson and Star Valley. This could improve police, fire, emergency vehicles and administrative services.

Goal 3) Create an ultrahigh speed intranet & internet system providing a professionally assisted internet routing service center for real-time security, time sensitive public safety services and broadband connectivity for businesses that require a high degree of dependability.

Justification:

Because of the potential for growth in business opportunities in Northern Gila County, a highly dependable, reliable broadband service will allow for recruitment of new businesses supporting high paying jobs and produce granular economic growth.

The pandemic has spawned many stay-at-home jobs and business opportunities. Implementing this system will open the door for many new high paying jobs in the community. To take advantage of this opportunity, it is critical to have dependable, redundant, ultrahigh speed broadband services available 24/7.

Background of project

MHA Foundation and its predecessor organizations have been involved in the promotion of healthcare, education and public welfare in Rim Country for over six decades. We are the largest non-profit in rural Arizona with tens of millions in assets. We use the revenue from our capital investments to promote the public welfare by incentivizing expenditures in projects that benefit the community. Over the past five years MHAF has provided millions of dollars to promote broadband expansion in Rim Country, including incentivizing Sparklight to bring its new fiber trunkline connection down from the northeast.

The new Sparklight fiber has dramatically increased the availability of ultrahigh speed broadband (10x – up to 1,000mb/sec). Issues of dependability and redundancy remain, as demonstrated in the past few weeks when Sparklight's fiber was cut and out of service due to a traffic accident. Although those served by CenturyLink/ Lumen were not affected, that portion of town served by Sparklight was. Even though the two major carriers have recently developed a mutual backup agreement, switching and recovery is technical, labor intensive and slow. Having a computer-controlled Internet Exchange Point (IXP) would resolve a fiber interruption/ outage like this one seamlessly and would then be able to easily switch back when the fiber cut is repaired.

Population to be served

There are a host of unmet Broadband needs in rural Arizona. Having the Internet Exchange Point (IXP) hub will enhance connectivity and dependability of service to approximately 96,000 of a total of 232,000 citizens throughout our region.

Figure 1: **Population, Income and Insurance Data** Source: US Census, *American Fact Finder*

	Gila	La Paz	Coconino	Navajo	Apache	Graham	Greenlee	Cochise Cruz	Santa	*Totals*
Population	53597	20489	134421	107449	71518	37220	8437	131346	47420	611897
Total Households	20247	10472	44276	34891	18669	10973	3327	49834	12794	205483

	Primary Beneficiaries	Secondary Beneficiaries
Number of Households Served	21240	45248
Number of Anchor Institutions Served**	64	unknown
Number of Businesses Served	872	1282
Total Population***	39211	57561

**Portions of Coconino, Gila, Apache, and Navajo Counties

***See Exhibit A, Census Tracts attached

Ways in which the project will improve redundancy and reliability, if any

The Internet Exchange Point (IXP) will create a physical hub location in Payson where the Broadband fiber pathways for all middle-mile trunk fiber carriers serving northeast Arizona come together – including CenturyLink/ Lumen, Sparklight, Altice/ Suddenlink and Arizona Public Service. This will reduce the overall costs for providing universal redundant and resilient fiber for each regional carrier by providing instant backup service for each if (or when) they experience a trunk fiber cut or interruption of service. With the risk of forest wildfires, as well as natural and man-caused outages increasing, having an emergency backup is becoming increasingly important in our internet-connected world. Whether it is business, healthcare, education, local government, tribal enterprises or public safety, having resilient, redundant ultrahigh speed broadband service is critically important.

C.3. Other Project Outcomes

In addition to insufficient internet speed, Northern Arizona internet customers struggle with interruptions in service caused by cut or damaged fiber optic trunk lines – especially when the fiber is cut or damaged in remote forest locations. Presently, locating a severed or damaged connection(s) and facilitating repairs in remote locations results in hours to days without communication connectivity for the region. Even if the break occurs along a roadway, it can be dozens of miles from the nearest repair technician. Long blackout periods create a huge problem in our internet dependent world. Stakeholders in Rim Country and Northern Arizona have experienced communitywide periods without access to banking services, credit card transactions or cell phone service, 911 service, home phone or cable tv or even landline telephone service. Fire, police and public safety services have suffered, causing at least one fatality in the region due to lack of communications services during an outage. Even though short interruptions can cause havoc with computer and security systems, these long interruption in service are catastrophic for business. Having each separate regional carrier build fiber rings in different direction throughout northeast Arizona might solve the problem -- but at an unacceptably high cost.

The Internet Exchange Point (IXP) hub will accomplish the same redundancy and resiliency but at a substantially lower cost for all carriers. The hub will be built at a location where all of the current regional fiber carrier's lines transverse our property. The facility proposed in this grant request is adjacent to new T-Mobile tower infrastructure (currently in the engineering phase of development). The permanent Colocation Facility will be built to house the Internet Exchange Point (IXP) and allow computer assisted backup and switching services to mitigate outages by switching loads between the middle mile providers. This will allow the facility to provide interconnection for multiple service providers (APS, CenturyLink-Lumen, North Texas Fiber, Sparklight, Suddenlink-Altice). Additionally, for disaster mitigation and recovery purposes, Valley-based businesses have expressed interest in utilizing an off-site data center located in Payson. The colocation facility would also provide local storage for content providers like Netflix and others to stream, rather than forcing the traffic onto the wide-area links causing significant congestion.

Type	Project	Applicant	GEOID
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04001970200
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04005001500
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000100
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000200
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000301
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000302
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000400
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000500
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000600
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000700
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000800
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013000900
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013001000
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013001100
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013001200
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013001300
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013940200
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04013940400
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017940100
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017940301
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017940302
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017961300
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017961700
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017962500
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017963300
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017963400
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017963700
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017963800
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017964201
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017964202
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017964800
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017964900
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017965200
Rural	Northeast Arizona Colocation Fac	MHA - Sparklight	04017965300