Arizona Commerce Authority

Arizona Broadband Development Grant (ADBG) - Rural

Graham County Regional Broadband Project

Project Narrative

1. Project Description and Timeline

Nature of the Improvements

Valley Connections, LLC (VALLEY), proposes to build out a fiber-optic network which would enable VALLEY to offer internet services to Graham County residents and businesses in the communities of Bryce, Eden, and Fort Thomas. The proposed backbone infrastructure is comprised of constructing approximately 8.25 miles of backbone fiber and utilizing 3.25 miles of VALLEY's existing backbone fiber infrastructure [redacted]. The proposed last-mile infrastructure is comprised of constructing approximately 65.5 miles of last-mile fiber infrastructure. Total proposed fiber infrastructure constructed is 73.75 miles.

[redacted]

The project design is a 100% fiber optic network; therefore, the design and performance of this system reflects advantages available with state-of-the-art, carrier-grade advanced technologies operating at multi-gigabit rates.

Unlike optical fiber networks typically designed by other providers in the area, the network design for the VALLEY system will make fiber available to every customer location and can offer carrier-grade service at speeds of up to 400 Gbps upon request. The result is a best-in-class, optical fiber network that will ensure that residents within the Bryce, Eden and Fort Thomas areas have access to broadband services of ***at least*** 100/25 Mbps.

The proposed broadband solution consists of optical fiber cables, placed aerially or underground, dependent on the terrain and utility pole availability. In areas where the placement is underground, new conduit will be installed and the optical fiber cables will be placed inside the conduit. In areas where the placement is aerial, the network will be deployed using existing poles (joint use), with all-dielectric self-supporting optical fiber cable (ADSS) in the available space between the neutral conductor and the telecom space.

Two new optical fiber networks will be constructed: a core network and an access network. The core and access networks are configured and controlled through Software Defined Network capabilities, which improve network availability, operational efficiencies, and reduce total cost of ownership. While the active Core and Access network components are currently configured for 10 Gbps/1 Gbps traffic rates, it is worth noting that this capacity exists only within the active electronic components and not the fiber infrastructure itself. The fiber has virtually limitless bandwidth and, with future replacement of the active network components, could readily support higher traffic rates including 40 Gbps and 100 Gbps.

The Core Network: The core network facilities will be a 288-count optical fiber cable, extended from VALLEY's existing fiber infrastructure in the Thatcher area, terminating at a new communications cabinet to feed the Bryce, Eden and Fort Thomas areas.

The full profile of MEF 3.0 Carrier Ethernet services (Access EPL, Access EVPL, EP-LAN, EVP-LAN, EP-Line, EVP-Line) and MPLS-TP transport services (with future support for the newly-defined segment routing) will be available from the core network on Day one, while advanced optical capability such as Wave Division, Multiplexing (WDM), Reconfigurable Optical Add-Drop Multiplexing (ROADM) as well as Optical Transport Networking (OTN) can be added to the same core network platforms to support additional revenue streams in the future.

The Access Network: The access network will consist of distributed, passive optical networking architectures operating at the minimum data rate of 10 Gbps, symmetrically. The access network is comprised of three tiers of network.

- Tier-1 holds the drop facilities which extend from an area drop closure to the customer premises, terminating at an outside interconnection point. The drop closure can support up to 6 drops to customer premises and are placed aerially or underground, as determined by the network design for each area. All drop facilities contain two optical fibers: one active and one in reserve. Where warranted, drop cables containing up to 12 fibers can be economically provided as required.
- Tier-2 comprises the distribution facilities that connect Fiber Distribution Hubs (FDHs) to the drop closures. These hubs distribute the optical power of the OLT platforms, as received by feeder cables, to the drop closures.
- Tier-3 contains the outside plant facilities that interconnect the OLT platform housed within the CO, to the Tier-2 FDHs. Optical Line Terminal (OLT) platforms that provide access capability to every customer premise are placed as needed based upon network design.

Fiber to the Home/Business (FTTH/B): VALLEY proposes to deploy Fiber-to-the-Home (FTTH) or Fiber-to-the-Business (FTTB). The FTTH/B distribution areas will utilize XGS-PON technology (10G/10G symmetrical service) and will also support NG-PON2 (40 Gbps/40 Gbps symmetrical service over Time and Wavelength Division Multiplexing -TWDM) with nothing more than a change of the optics in the OLT port.

With all passive optical networks, the PON data rate is allocated across a number of users who efficiently share that bandwidth. An XGS-PON network can support up to 128 subscribers. However, in the interest of future growth in demand, VALLEY has used a 1:32 OLT/ONT split in the access network design.

Historical data was used to price construction costs as VALLEY has recently constructed fiber projects in some of its other service territories using both underground and aerial methods. VALLEY would bid out the project and utilize a well-established fiber optic contractor for the project. VALLEY also will ensure the contractor and any sub-contractors and vendors are licensed and bonded in accordance with Arizona laws and have sufficient experience designing and

constructing fiber networks. Valley will also ensure that all procurement requirements are followed as outlined in the grant announcement.

Stated Commitment to Operate and Maintain the Network

VALLEY is committed to providing quality products and services and will oversee all aspects of the project throughout construction. Our in-house project manager will verify that all facets of work meet our quality control guidelines, by working closely with the contractor responsible for construction. Once construction has commenced VALLEY will implement a maintenance plan. All aspects of the facilities undergo continuous inspections and are routinely monitored and evaluated to ensure optimal performance. Monitoring includes assessments of electronics, data collection and deficiency tracking.

As a local Internet provider already committed to serving Graham County residents and businesses, VALLEY is committed to constructing, operating, and maintaining the proposed fiber optic network for a term of not less than 5-years upon completion of the project.

Timeline

Upon notification of grant award, VALLEY would immediately file all necessary permits for the project, as well as place orders for materials. Once permits and materials are received, VALLEY would put the project out to contractor bid and commence the project within 45-days of contractor award. It is anticipated that once the project commenced the buildout would take 180 – 220 days to complete.

Match Contribution

VALLEY will commit to utilizing existing backbone infrastructure to enhance the project, as well as commit to a [redacted] in the amount [redacted], which would be used to assist with the build of the new backbone infrastructure required and would be expended prior to seeking reimbursement from ABDG for the remainder of the eligible project costs. The ABDG Rural funds would be used to construct the remainder of the proposed fiber optic network.

In addition to the [redacted], the Graham County Board of Supervisors approved a resolution to commit [redacted] of the county's allocation of American Rescue Plan Act (ARPA) funds to support VALLEY's broadband project. Graham County is also committed to assisting VALLEY with obtaining permits for right of ways and other permitting requirements. VALLEY and Graham County BOS resolutions documenting their financial commitments to the project are included as attachments.

The total match committed to the proposed project [redacted]

How the proposed project addresses the broadband needs of the area served

The focus of the proposed project is on the three communities of Bryce, Eden and Fort Thomas. The main area where service will be provided is a portion of Census Tract 04009961100. The fiber extension from Thatcher through Central is 04009961201. Bryce and Fort Thomas are identified as Census Designated Place (CDP) and Eden is considered an unincorporated community. The total population served in this project is 7,820, comprised of 2,663 residential units, 26 small businesses and 6 community anchor institutions. The area north of the Gila River

also has many key agricultural businesses that would benefit from the availability of high speed broadband. These agri-businesses can utilize precision agriculture applications that are so important in today's agriculture industry to produce crops more efficiently and conserve water.

The proposed project is desperately needed in the Bryce, Eden and Fort Thomas communities because these areas are considered unserved and underserved.

According to the FCC Fixed Broadband Deployment Map no carrier has deployed broadband services that meet the minimum acceptable download/upload speeds of 25Mbps/3Mbps respectively in the Bryce, Eden, Fort Thomas areas of Graham County. Therefore, this area is considered an unserved area for purposes of the Arizona Rural Broadband Development Grant.

These communities were selected for the proposed project because it is cost prohibitive for a carrier to bring high speed broadband to the area due to the high cost and the low population density in these communities. There is no return on investment (ROI) for a carrier to offer service; therefore, they are not willing to develop the area without some kind of subsidy from government resources.

Broadband Now shows only wireless and satellite options available in the Fort Thomas/Bryce area and one fixed wireless solution available in the Eden area with a download speed of 15Mbps. This grant award will allow VALLEY to deploy an affordable fiber based broadband service with speeds of up to 1Gbps.

The proposed project area currently has no wired or fiber network and has a serious lack of capacity due to reliance on satellite and wireless links, which are unable to deliver the reliability, band width and speed necessary. Separately, the businesses and residents lack access to bandwidth at affordable rates that is needed for them to conduct business and provide for access to the internet. Because of the extremely remote nature of the project area, it is highly unlikely that this project can or will be built in the foreseeable future. Without the infrastructure this project will bring to the region the residents will continue to be unserved and the businesses will be severely limited.

VALLEY proposes to leverage a recently built fiber network in and around Thatcher, Arizona and extend the network by building approximately 73.75 miles of new fiber both buried and aerial that will connect a large part of the unincorporated areas of Graham County, north of the Gila River, that are currently either unserved or underserved by any connected services. This network would include the areas of Safford Bryce Road, Bryce Eden Road, Eden, and Fort Thomas. These areas currently have no wired internet connection and are only served by very unreliable and expensive satellite and point to multi-point wireless networks that are very slow and inadequate. The average download speed in Fort Thomas is 12.17 Mbps. This is 93.4% slower than the average in Arizona and 782.5% slower than the national average. Fort Thomas is the 244th most connected city in Arizona and Eden is 245th according to Broadband Now's website. *The community of Eden is listed as the "Worst Connected" community in Arizona.*

The fiber would be extended from the Thatcher area North along Reay Lane to Norton Road then West to Highway 70. From there it would extend along Highway 70 to the town of Pima where it would proceed North Crossing the Gila River at the Pima Bridge on Bryce Eden Road. The line would then extend both East and West along Safford Bryce Road and Bryce Eden Road respectively to cover all the residences and businesses in the area and then extend West into the Eden area where there is a substantial area of scattered agriculture related business and residences. The line would then proceed West back over the river via the Eden bridge to Highway 70 again. From there it would proceed West along Highway 70 approximately 5 miles to the Fort Thomas area, where there are several businesses, a fire station and a fairly substantial residential area that are in desperate need of reliable internet access. There is also a K-12 school in Fort Thomas that serves the San Carlos Reservation as well as the local residents. The school is currently served through other sources from another direction but could potentially benefit from the redundancy this project would provide.

Anticipated Economic Development Benefit

COVID 19 has severely impacted Graham County like other rural counties in Arizona. There have been 9,264 positive cases reported and 159 deaths due to COVID. It is estimated that 1 in 4 residents of Graham County have been infected with COVID. There has been a 73% increase in cases over the first two weeks in January 2022. The impact of COVID on this rural community has been significant. Schools, public safety and health care institutions are overwhelmed. In demand telemedicine services are limited because of the lack of adequate and reliable broadband. Small businesses also have all been negatively affected by the pandemic and without reliable and affordable broadband, these businesses have little options to support their business.

High speed internet that is reliable and affordable is a “game changer” for small rural communities. Small businesses that were once limited to a small store front and customers that live in the area, can expand their reach and serve a broader customer base. One thing that COVID has shown us is that we can work remote and be productive. The ability to attract and retain residents and businesses will require adequate broadband as a foundation.

Because of the availability of land, this area of the county is growing and is in real need of broadband infrastructure that will support both residential and business growth. The county’s largest employer, Freeport McMoRan Copper and Gold is also located in this area, and while they do currently have internet access via their own private network, they would benefit from the redundancy this fiber build could potentially offer them. This Freeport Mine is perhaps the most important economic driver in the region and any slowdowns or shutdowns due to loss of connectivity are devastating to the local economy.

The county jail and the municipal airport are also North of the river as well as ancillary businesses that support the mine. These entities would also benefit from this network and in the case of the mine, the jail and the airport the potential redundancy this project could provide.

Demographic Data

Graham County is located in the southeastern part of Arizona. The population of Graham County is just over 38,500 residents based on the 2020 Census which makes it the third-least populated county in Arizona. The 2010 Census data reported a population of 37,220. There has only been an increase in population of 1,313 over the last 10 years! A major hinderance to growth in the area is the lack of broadband to support residents, small businesses, education, public safety and health care.

The average per capita personal income in Graham County is $31,895. This is considerably less than the U.S. average per capita personal income of $56,490. Graham County's per capita income is 55% lower than the national average. With 30% of the population 18 years old or under, the future of the children in Graham County is bleak. Among the population 25 and older only 15% have a bachelor's degree or higher. Approximately 26% of the population are at or below the federal poverty line. The unemployment rate in the area is 8.3%, which is substantially higher than the state average of 4.7%.

The largest employer of Bryce residents is Freeport McMoRan with 300 residents employed at the mine. The residents in the community of Eden are mainly employee in the farming industry. The Fort Thomas area employees several residents in the government and education sector including a U.S. Post Office.

The proposed project would serve a population of approximately 7,800 people, which is roughly seventeen percent of the county population.

Demographic Data by Community	Bryce	Eden	Ft Thomas
Number of Households	1216	971	476
Number of Businesses	12	5	9
Number of Anchor Institutions	2	1	3
Total Population	3578	2932	1310

Demographic Data by County	Graham County
Education Attainment	
High School or Higher	59.60%
Bachelor's Degree or Higher	15.20%
Below Poverty Level	22.60%
Median Household Income	$51,353
Unemployment Rate	8.30%
Covid Rate	23.05%
Opportunity Zones	Yes

Organizational Capability

Eligible Applicant - Valley Connections LLC and Graham County Partnership

Valley Connections LLC (VALLEY) is a Competitive Local Exchange Carrier that began providing fiber-based services to both residential and business customers in the Willcox, AZ and Safford, AZ markets since 2005. VALLEY has invested in their own fiber infrastructure in both markets and does not rely on purchasing or reselling facilities from the incumbent local exchange carrier. In addition to providing competitive local exchange services in Willcox and Safford, VALLEY provides Ethernet Transport, Dedicated Internet Transport, and other progressive telecommunications services to rural markets in southeastern Arizona and southwestern New Mexico.

VALLEY is a wholly owned subsidiary of Valley Telephone Cooperative, Inc. (VTC), a rural incumbent local exchange carrier that was founded in 1962 to provide telephone service in the most remote areas of southeastern Arizona and southwestern New Mexico. In addition to the fiber infrastructure within the communities of Willcox and Safford, the VALLEY organization has its own fiber network that spans between Tucson, Arizona and El Paso, Texas, following along the southern borders of Arizona and New Mexico. This fiber network connects all of Valley's serving areas and allows for diversification of traffic if one side of the network is compromised. As a telecommunications provider VALLEY's practices are guided by the National Electrical Code, the National Electrical Safety Code and all other applicable Federal, State or Municipal laws, codes, regulations, or ordinances in place at the time of construction to maintain compliance with industry standards.

VALLEY is committed to offering superior service and reliability to all of their customers as they continue to expand their fiber footprint. VALLEY's current customers include several large back haul providers, medical professionals using telemedicine, along with our schools, libraries, and government agencies. Valley's headquarters is located in Willcox, AZ with staff that live, work, and have a vested interest in the communities served.

<u>VALLEY Team</u>

Steven Metts – Chief Executive Officer
Steven has been employed with Valley for 16 years. Prior to Valley, he was employed by telecommunications consulting firms and other telecommunications companies. His tenure in the telecommunications industry is 35 years.

Kristi Lee – Chief Operations Officer
Kristi has been employed with Valley her entire career and will celebrate 30 years of service with the organization in April. Kristi's experience in the telecommunications industry spans across customer service, billing, accounting, and she currently oversees all outside plant departments. Kristi specializes in project management.

Troy Judd – Chief Financial Officer
Troy has been employed with Valley for 21 years and oversees all financial aspects of the operation as well as Customer Service and Marketing. Prior to joining Valley, Troy was employed with the telecommunications division of the auditing firm Bolinger, Segars, and Gilbert & Moss.

Heath Bowen – Operations Manager
Heath has been employed with Valley for 31 years. He performs and oversees design and engineering services on FTTH, DSL broadband data, TDM Optical transport, Fiber duct and fixed

wireless telecommunication facilities. He is also responsible for setup and maintenance of all hardware and software of our Broadband Network, L2/L3, Transport, soft switch and general network services such as DHCP, DNS, FTP, Email, Firewalls, circuit provisioning, SNP & Syslog

Participation in federal programs that provide low-income subsidies

VALLEY voluntarily participates in federal programs that provide low-income subsidies to families such as the National Affordable Connectivity Program (ACP) that was implemented in January 2022 by the Federal Communications Commission (FCC). This program offers subsidies to low-income residents providing [redacted] towards broadband service for qualifying households. Prior to the ACP, VALLEY voluntarily participated in its predecessor, the National Emergency Broadband Benefit program (EBB), which new enrollment in expired December 31, 2021.

VALLEY also created the Discounted Access for Student Homework (DASH) program. The DASH program was created in house and is intended to provide data services for distance learning. Eligible households who qualify for the program are not committed to contracts and receive free equipment and installation. The service is provided for [redacted], the package provided is up to 100mbps or the fastest speed available in their serving area. The internet service is filtered to comply with the Children's Internet Protection Act (CIPA). Eligibility is open to families with K-12 children who are enrolled in one of the following government programs: Supplemental Nutrition Assistance (SNAP), Supplemental Security Income (SSI), Federal Public Housing Assistance (FPHA) or through Annual Income Verification.

VALLEY is currently developing a metered low-income plan that will be ready for launch in the first quarter of 2022. [redacted].

2. Project Description and Timeline – Development

For Graham County and its local communities to successfully execute its economic plan and achieve its future economic goals, high speed broadband must be available and affordable to support business development, health care advancements and improve higher education opportunities in the area.

Future business development is limited without necessary infrastructure including high speed broadband. The proposed fiber infrastructure is future proof and has the capacity to add residences and businesses to its network.

In the future, VALLEY would be able to provide FTTH/B services to additional communities, such as Central and Pima along the fiber backbone route. The timeline for those projects would be based on a ROI model and customer interest. Once the Bryce, Eden, and Fort Thomas areas are completed, VALLEY would research the feasibility of the Central and Pima builds.

The community of Pima has a population of 2,698 according to the 2020 Census. The population has grown by 13% since the last Census data. Pima is along Hwy 70 and is a prime area for broadband expansion once the initial project is completed.

Central is a Census Designated Place (CDP) with a population of 758 according to the 2020 Census. Central is located between Thatcher and Pima. With the fiber infrastructure in place through this proposed project, service to Central and Pima could be addressed in a Phase II project.

Type of construction to be undertaken (aerial or underground)
Like the proposed project, the proposed future development would be both aerial and underground dependent on terrain and utility pole availability.

Qualifications of the vendors/contractors
VALLEY would bid out the project and utilize a well-established fiber optic contractor for the project. VALLEY also will ensure the contractor and any sub-contractors and vendors are licensed and bonded in accordance with Arizona laws and have sufficient experience designing and constructing fiber networks. Valley will also ensure that all procurement requirements are followed as outlined in the grant announcement.

Engineering analysis
Engineering analysis will be completed by VALLEY staff once the project is determined viable. The proposed future development would depend on community impact and funding available will dictate this.

Number of households, businesses and anchor institutions served
These numbers are estimates based on structure counts in the towns and data on the number of businesses within the towns:

Number of households served: Pima – 1,211; Central – 301
Number of anchor institutions served: Pima – 7; Central – 1
Number of businesses served: Pima – 15; Central – 8

Ways in which the project will improve redundancy and reliability if any
There are no other fiber providers in the proposed service area. Installation of the proposed fiber will provide the ultimate in reliability for these communities.

3. Other Project Outcomes

The proposed project to deliver fiber to the Bryce, Eden, Fort Thomas areas of Graham County which will support and enhance economic development, community resiliency, educational and healthcare advancements, and public safety. VALLEY's proposed design will deploy new fiber to deliver speeds of up to 1Gbps over the fiber network.

The proposed project will enable the residents and businesses of Graham County to receive affordable broadband services. VALLEY's residential and business rates are shown in the table

below. The rates are comparable to other areas and VALLEY offers subsidies to reduce the cost of service for low-income families.

Residents	Businesses
100Mbps/25Mbps at [redacted]	100Mbps/50Mbps at [redacted]
300Mbps/50Mbps at [redacted]	300Mbps/100Mbps at [redacted]
500Mbps/75Mbps at [redacted]	500Mbps/150Mbps at [redacted]
1Gbps/100Mbps at [redacted]	1Gbps/200Mbps at [redacted]

The proposed project will connect the fiber build in Thatcher, Arizona to the currently underserved areas of rural Graham County. The availability of fiber in the area will improve redundancy and reliability for the county.

This project is contingent on grant funding to construct and would otherwise not be built without the grant support.