PROJECT NARRATIVE

Project Description & Timeline

Fort Mojave Telecommunications, Inc. (FMTI) is a tribally owned telecommunications corporation that provides Internet services to tribal and non-tribal customers in Mohave County, AZ. Founded in 1988, Fort Mojave Telecommunications, Inc., is an equal opportunity employer and federally regulated incumbent local exchange carrier with a mission to upgrade and enhance the quality of voice, data, and Internet services for the residents and businesses in the Community. The Fiber-to-the-Premise (FTTP) project proposed in this FY2022 Arizona Broadband Development Grant application is located in Mohave County (Census tract numbers: 04015950001, 040159520021), classifying it under the Rural infrastructure construction category. The total project cost proposed by FMTI is [redacted], with [redacted] being requested grant funding from ABDG-Rural for construction, installation, and improvement of broadband services. FMTI is registered in the federal system for award management (www.SAM.gov) but does not have any pending applications for federally funded grants.

CT&T a Palmetto Engineering and Consulting (PEC) will serve as the consultant providing engineering services that include grant preparation, infrastructure design, and budgeting. CT&T Engineering employs over 200 employees and professional engineers (PE) on staff are licensed 36 states including Arizona. As an engineering consulting firm, they have applied for and awarded numerous state and federal broadband grants and have worked with tribal entities for more than 30 years. The proposed FTTP project is scheduled to be completed within two years (see Appendix A).

The Nature of Improvements

FMTI proposes to improve broadband services in the Topock and Golden Shores communities with a Fiber-to-the-Premise network. FMTI currently provides some residents in the proposed areas with fixed wireless services with plans to expand existing FTTP infrastructure into these regions; however, expansion has not been financially feasible. FMTI will be installing 41.87 miles of fiber optic cable while passing 1,781 locations. This FTTP project will deploy Next-Gen XGS-PON (10G PON) technology which can provide up to 10 Gbps symmetrical (download/upload speeds) throughput to the premise. The proposed network will connect to FMTI's existing 10 GB fiber ring that connects to geo-redundant core routers that connect to the Internet from two 10 GB Direct Internet Connections (DIA) (See Appendix B). Core routers are connected by fiber link running IBGP, so if one DIA goes down, the opposing router will continue to route traffic for both DIA providers. Redundancy is also provided by fiber route path diversity. For example, if a fiber is cut to Point of Presence (POP) along the Phoenix, AZ route, then all traffic will reroute north to Las Vegas.

Users in the proposed service area will move from an infrastructure supported by a fixed wireless point-to-multipoint network to a FTTP infrastructure supported by a Calix E7-2 10 GB fiber ring. The fixed wireless network is not configured as a mesh, so every point-to-point microwave backhaul shot represents a single point of failure. From a FTTP network, bandwidth can be increased or decreased on demand for residents, businesses, and anchor institutions. The fixed wireless access points currently in use connect 40 customers per 90-degree sector and packages offered to customers are 20 Mbps down/3 Mbps up. Given that 1,781 passings were found in Topock and Golden Shores and if only 50% of potential customers subscribed, then two fixed wireless access points could only connect 80 customers. This would leave 810 rural subscribers unserved. Coverage of existing fixed wireless in Topock and Golden Shores does not cover the entirety of the proposed service area (See Appendix C). Some residents of Topock and Golden Shores have access to ADSL, but distance limitations of copper causes signal degradation and decreases available bandwidth. This has resulted in stifling speed tests of 6

Mbps down/1 Mbps up. FTTP networks provide exponentially higher speeds (10 GB up/down) than copper and wireless networks and are not susceptible to interference, signal loss, and distance limitations.

Users periodically experience downtime due to the harsh environment and unreliable power sources in the area where fixed wireless equipment operates. FMTI's fiber-to-the-premise infrastructure equipment operates in data centers designed from Tier 4 architecture standards and is completely fault tolerant. Networks that operate from these standards typically have a designed uptime of 99.995% (26.3 minutes of downtime annually, mainly unnoticed by users).

How the Proposed Project Addresses the Broadband Needs of the Area(s) that it Serves

The two proposed funding areas are currently underserved with no access to Internet speeds of 25/3 Mbps or greater. Based on broadband mapping provided by the FCC, residents of proposed areas do not currently have access to high-speed broadband from a fiber infrastructure (See Appendix D). The objectives of these projects work toward accelerating infrastructure construction goals supported by this grant. Proposed infrastructure will not only provide services at 10 GB speeds, but also install "future proof" infrastructure that will provide economical upgradability for the foreseeable future. High speed broadband is vital to the wellbeing and quality of life for these rural communities. Implementation of this network infrastructure project greatly increases telework opportunities and telehealth access, just to name two. It creates entrepreneurship possibilities for the members of the community, enabling them to remain in the community while having equal job opportunities to those in developed metropolitan areas.

Key Metrics in Funding Area

The proposed funding area for this project will span across the towns of Topock and Golden Shores in Mohave County, AZ. The average household size in this area is 1.49. Multiplying that number by 1,751 households approximates the total population to be 2,608. There are 23 businesses included, and there are seven anchor institutions, including a U.S. Postal Service Office, the Mohave County Library, the Topock Elementary School, and the Golden Shores Fire Department. This project will require a total of 41.87 miles of fiber. This includes approximately 7 miles of middle mile fiber that connects these communities to FMTIs existing 10 Gbps fiber ring.

Key Metrics	
Anchor Institutions	7
Households	1751
Businesses	23
Total Premises	1781
Population	2608
Miles of Fiber	41.87

The Anticipated Economic Development Benefit Achieved by Construction

Broadband is key to the future of economic development, health, public safety, public works, and education across the rural communities. This new infrastructure will provide the capability for first responders to employ technologies and applications to address critical safety concerns, realize significant economic and time savings, and achieve work process efficiencies. Broadband connectivity

will give residents in remote areas access to hybrid, virtual, distance, and online educational opportunities, both during pandemic periods and non-pandemic times. It will also allow rural residents to participate more broadly in existing and emerging telehealth programs, bringing services to those that are not currently able to access them. Remote areas such as the proposed area do not have the same access to capital as high-density municipalities, which makes funds from this grant vital for the advancement, sustainability, and quality of life improvements. With the realization of this project, these two communities can flourish in ways not possible now, enabling them to compete with fewer constraints in a contemporary world.

When comparing FMTI rates with nationwide averages provided by a 2022 Urban Rate Survey conducted by the Wireline Competition Bureau (Bureau) and the Office of Economics and Analytics (OEA) (together, Bureau/OEA), FMTI offers more affordable rates with higher broadband speeds for less. In addition, FMTI participates in the Affordable Connectivity Program (ACP), which is a temporary emergency federal government benefit program to assist customers in the purchase of internet access. The ACP is available to residential customers and will provide a nontransferable, enhanced discount of [redacted].

National Speed	Nation Average	FMTI Speed	FMTI Cost
100/20	$105.67	100/100	[redacted]
250/25	$120.12	250/250	[redacted]
500/50	$124.20	500/500	[redacted]
1000/100	$134.65	1GB/1GB	[redacted]

An analysis was compiled to assess the financial feasibility of the Arizona Village / Mojave Valley project that is being applied for under the Arizona Broadband Development Grant Program. The project was evaluated, as outlined in the attached assumptions, financial analysis, and financial forecast. The main areas of focus were on the buildout timeline as related to the cumulative penetration rates.

We have assumed that the main buildout, as required by the grant, would take place over a two-year period. The Company is estimating a 50% take rate of the total customer passings of 1,781 premises. We assumed an additional 5% penetration over years three through five for a cumulative five-year penetration rate of 65%.

Average Revenue per User (ARPU) was also calculated using the preliminary customer pricing plans and estimated take rates. The ARPU used for our financial feasibility is calculated at [redacted].

After all factors were entered into our model the results were very encouraging. The initial build cost would be [redacted], of which were grant funds of [redacted] and a Company supplied cash matching of [redacted]. The project is estimated to generate nearly [redacted] in gross customer revenues with the addition of 1,158 new customers. These additional customer revenues, when added to the current operations of FMTI show strong operating margins and Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA) totaling [redacted].

Overall, after preparing, reviewing, and analyzing the broadband grant project, the return on investment for the Company would be positive. The project would also provide for additional customer growth,

positive cash flows and financial stability for the Company as a whole. And with company growth, economies of scale will be reached that will enable the ability to consider options such as lowering package prices or providing additional economic benefit to customers unable to afford a broadband connection at their home.

Location of New Fiber

The fiber routes will consist of buried fiber in previously disturbed existing right of way. Buried fiber is preferred, as it provides a natural barrier of protection from the elements, as well as natural disasters, such as fire and other extreme weather factors. All buried fiber will be installed in an appropriately sized ductile, allowing pulls for splicing or any potential emergency repairs, in the event of a breech. Hand-holes are typically installed at critical junctures, such as river crossings, major highway corridors, and at a minimum every five thousand feet. All hand-holes contain additional length of the main transport fiber, allowing the ability to pull slack between sections for emergency repairs. Optical budgets compensate for all fiber splices in the design aspect, allowing for additional or emergency splices when required. See the image below for our proposed fiber routes withing the communities, as well as the distribution fiber traveling north on Hwy 1 to existing infrastructure in Arizona Village Central Office.

The file (attached to this documentation): Topock Golden Shores Design.kmz has been created with multiple layers, providing an overview of the project plan. Opening this file (typically in Google Earth) provides a reasonable visual representation of the serving area. Clicking on the right-pointing arrow immediately to the left of the radio-button (or check-box) will expand the layers as below. You can explore further for any granular detail as desired.

- ☐ Design *(Checking this box enables all layers)*
  - ☐ AZ Address Points *(Enables all identified address points)*
  - ☐ Proposed PON *(Enables proposed PON Cabinet locations)*
  - ☐ Proposed Fiber *(Enables proposed fiber routes)*
  - ☐ Proposed Serving Areas *(Enables the general PON serving area boundaries)*
  - ☐ Fort Mohave Tribal Lands *(Enables Census-provided Tribal boundaries)*
  - ☐ Census_Blocks_2013_04_AZ *(Enables Census-provided tract & block information)*

Stated Commitment to Operate and Maintain the Network for Five Years Upon Project Completion

FMTI plans to fully operate and maintain the network proposed in this grant for more than five years upon the completion of the improvements. Additionally, FMTI will continually monitor and improve the network to ensure that all residents, businesses, and anchor institutions receive an inclusive, equitable, and competitive network that sets these communities up for future success. The projected take rate is 50% by the end of year two escalating 5% per year to 65% by the end of year five.

The Party or Parties That Will Perform the Infrastructure Construction

FMTI has a reputation of prioritizing FTTP projects within their existing service areas. FMTI resisted the allure of cheaper wireless alternatives because the technology would quickly become outdated with ever-increasing demand for more bandwidth at every premise. As a result, FMTI now offers fiber internet to 100% of their existing service area. Throughout this process, FMTI has worked with numerous contractors on FTTP projects. For Topock and Golden Shores, quotations for work will be received from credible contractors with proven track records. All contractors will be properly licensed and insured. In addition, Palmetto Engineering and Consulting (PEC) will oversee the construction from start to finish. The PEC team is committed to providing high-quality, cost-effective telecommunications engineering and construction services at every stage of a project. PEC's primary areas of expertise include the following:

- Network Planning.
- Outside plant design, staking, and construction surveillance.
- Central office equipment planning, specifications, development, assistance with bidding, and acceptance testing.
- Rights of way services.
- Installation and cutover.
- Project management.

The Intended Uses of the ABDG Rural Funds in Respect to the Construction or Planning

The funds received through the ABDG will be used to enhance the connectivity for the unserved and underserved premises within Topock and Golden Shores, AZ communities in order to bridge the current digital divide being experienced by the residents. The intention is for the grant to partially fund the establishment of broadband infrastructure that will enhance the speed, redundancy and reach of high-speed internet at reasonable cost to consumers in rural communities. All grant funds will be used for costs associated with activities directly related to the construction, installation, or improvement of broadband infrastructure during the term of an ABDG-Rural award. Funds will not be used for non-construction related items that include, but are not limited to:

- Administrative costs associated with applying for ABDG funds or managing a ABDG grant award.
- Post-construction maintenance costs.
- Costs of construction that occurs before the date of an executed Agreement.
- Contingency fees.
- Network or company acquisitions.
- Sales and marketing.
- Permit fees.

The Specific Information Required Under Section 1.4

The proposed funding areas are both considered unserved or underserved in their entirety. The proposed FTTP network will exceed speeds of 100/100 Mbps and capable of supporting maximum speeds of 10 GB symmetrical to every premise. Businesses and anchor institutions will access a reliable and scalable network offering bandwidth on demand. Within 24 months of the award date, FMTI will provide these speeds to the intended beneficiaries of the project at costs that are lower or substantially equal to urban areas.

A Timeline for Completion of the Infrastructure Improvements

See Appendix A for a Gannt Chart displaying the timeline to completion for the project.

Cash Match Contribution to be Provided

FMTI will utilize general funds match portion of the project. Funds will be utilized in the initial phase of the project to order materials and facilitate engineering pending the initial grant disbursement. The total project cost is estimated to be [redacted]. The requested grant funding is [redacted] FMTI will commit a 20% match to the project of [redacted]. The matching funds will be in place at the commencement of the project.

Project Description and Timeline – Development

The Nature and Scope of the Project

FMTI will deploy Fiber-to-the-Premise (FTTP) broadband infrastructure supplying a minimum of 10 GB symmetrical service using XGS-PON to rural communities in Mohave County, Arizona. The funded service area includes 1,781 premises and a population of 3,922 within the two city limits of Topock and Golden Shores. There are seven anchor institutions in the PFSA, including two churches, VFW Post 6306, a U.S. Postal Service Office, the Mohave County Library, the Topock Elementary School, and the Golden Shores Fire Department. There are 23 businesses in the PFSA. Topock and Golden Shores are small towns with a median age of approximately 60 years old. The towns lie between Bullhead City and Lake Havasu City and southeast of Needles, California, on the California–Arizona border. Topock is known for being a boating town as well as being home to the Old Trails Arch Bridge, which used to be the old Route 66 bridge. Topock is also the site of one of Pacific Gas & Electric (PG&E)'s compression stations on its super-rich natural gas pipeline from Texas to San Francisco completed in 1930.

FMTI is working towards comprehensive community enhancement that includes households, businesses, and community institutions. The availability of FTTP service will give residents in Topock and Golden Shores access to a plethora of new information and resources regarding employment, job training, education, health care, and business opportunities, as well as additional sources of news,

entertainment, and activities. The availability of high-speed broadband service is an essential prerequisite for attracting new businesses to the area, as well as for permitting existing local businesses to expand the markets in which they sell their goods and services and in which they purchase necessary resources. The students and citizens living in the PFSA will be able to fully utilize the resources in their towns within the PFSA. This community would greatly benefit from the proposed broadband project. Students living in the PFSA do not currently have access to adequate internet bandwidth for school resources, online classes, or research options that otherwise would be available. As part of the project and ongoing community support, FMTI will continue to work with local volunteer fire departments, home school organizations, and telemedicine options to address the needs of the rural community. We believe equal opportunity and access to broadband services will provide the education and resources necessary for equal opportunity and inclusive connectivity. FMTI is prepared to start the FTTP project in Topock and Golden Shores immediately.

Type of Technology to be Utilized

XGS-PON was designed as a "future-proof" solution that supports advances of end user technology without upgrading the entire network infrastructure. This project minimizes operating expenses by limiting the amount of equipment to maintain and replace. XGS-PON networks do not require powered devices between the central office and the premise. XGS-PON consist of Optical Line Terminals (OLT), optical splitters, and Optical Network Terminals (ONT). Fiber cable (24 to 288 strand fiber cable depending on passing quantity) splits (1x32) from an OLT and terminates into an ONT. From a support standpoint, this ONT offers zero-touch service activation and unmatched network analytics and visibility. The utilized OLT will be a commercial grade environmentally hardened modular platform that can be deployed in a central office or at a remote location. Its modular architecture is scalable and protects carrier investments by preventing equipment obsolescence. Services can then be transported on a per wavelength basis, using only a single fiber uplink to aggregate and transport multiple services whether for residential triple play, mobile backhaul or business Ethernet services. The platform supports flexible traffic management; Ethernet flow mapping, prioritization, tagging; and versatile management options which are required to respond to the demand for premium services

Type of Construction to be Undertaken (Aerial or Underground)

Construction methods shall be buried only for this project. If specific cases arise, aerial may be substituted due to terrain difficulty or other obstacles that prevent buried construction. The grant application cost includes 41.87 route miles of fiber. FMTI will ensure compliance with all cabling and construction techniques, standards, and specifications as published by industry bodies. Construction techniques shall use a variety of methods, inclusive of:

1. Vibratory Plow
2. Horizontal Directional Drilling (HDD) (BM61(x)D; BM61(x)DR)
3. Rock Saw and Pneumatic Hammer (BM71)
4. Aerial (only if buried becomes impractical)

Qualifications of the Vendors/Contractors

As stated above, FMTI has contracted with numerous licensed, bonded, and insured professional telecommunication companies for previous FTTP projects within their existing service areas. While quotations for work will be received from multiple companies, the likely candidate for the job will be Teracom. Teracom Services, LLC is a licensed, bonded, insured, and certified Veteran Owned Business specializing in all aspects of Telecommunication Professional Services, OSP Infrastructure, Inside Plant Infrastructure, Data Center Construction, and Commercial Electrical Services to include Solar and EV

Charging Station. Teracom provides extensive in-house expertise, allowing them to be a true turnkey provider. Less than 5% of their revenue is generated using sub-contractors, and their training facilities provide extensive hands-on training for their technicians. Their company boasts a history of seven years without a loss time injury. They hold licenses in Arizona, are registered in the federal system for award management (www.SAM.gov), maintain a [redacted] of credit at Alerus Bank, and hold adequate umbrella, professional liability, pollution liability, and general liability insurance.

Engineering Analysis

PEC has an expert staff to assist clients in the planning, design, and development of reliable data integration solutions. Their engineering team is committed to providing innovative, cost-effective services that results in business operation efficiencies. PEC is a professional engineering firm holding licensure in 40 states, including Arizona. They employ approximately 200 employees and have worked with tribal entities for more than 30 years. PEC will be charged with planning, designing, engineering, construction, and oversight of the ABDG infrastructure enhancement project.

Project Approach

Upon being awarded funding through the Arizona Broadband Development Grant, the project will enter multiple phases of operation including initiation, project planning, project execution, and project closing. The initiation phase includes obtaining needed authorizations, permits, environmental clearance, and quotations from contractors. The project planning phase consists of developing the project management plan and all relevant project documents to establish the project scope of work necessary to achieve objectives. Project planning integrates all aspects necessary to execute the work required throughout the project lifecycle. The project execution phase includes all the processes necessary to complete the work defined in the project management plan. The project execution consists of coordinating people and resources, as well as integrating and performing project activities as specified in the project management plan. The project closing phase consists of executing the processes necessary to finalize all activities and formally complete the project obligations. This may include inspections, closing out procurements, archiving documents, and finalizing grant reporting as needed.

Background of the Project

The FTTP network will utilize the existing FMTI infrastructure to deliver the voice, data and video services to customers in the PSFA. FMTI currently offers FTTP to all subscribers within its existing territory and is conveniently located to expand services quickly into the proposed areas. The existing core network uses dynamic host configuration protocol (DHCP) for Internet Protocol (IP) address management and shall use DiffServ where required for traffic management and quality of service. The core network also hosts FMTI's Commercial Internet Firewalls and SPAM blockers, thus allowing for protection from denial of service (DoS) attacks as well as non-malicious user behavior. Solarwinds is used for alarming, analytics, network management and automated message alerting. Law enforcement activities are accommodated using the equipment's CALEA features.

Key Metrics in Funding Area

The proposed funding area for this project will span across the towns of Topock and Golden Shores in Mohave County, AZ. The average household size in this area is 1.49. Multiplying that number by 1,751 households approximates the total population to be 2,608. There are 23 businesses included, and there are seven anchor institutions, including a U.S. Postal Service Office, the Mohave County Library, the Topock Elementary School, and the Golden Shores Fire Department.

Key Metrics	
Anchor Institutions	7
Households	1751
Businesses	23
Total Premises	1781
Population	2608
Miles of Fiber	41.87

Way in Which the Project Will Improve Redundancy and Reliability

Topock and Golden Shores currently experience poor, slow, inconsistent, and unreliable internet. Our broadband infrastructure project would not only correct these problems, but the residents and businesses would be able to enjoy connections that rival offerings in major metropolitan areas. FMTI's existing network infrastructure is Geo-Redundant and fiber paths are diverse. Central and Remote Offices that support FTTP networks are climate controlled and powered by DC powerplants with battery string and generator backup.