

Peoples Telephone Company

West Tennessee Community Broadband Project

Request for Proposal

Fiber Construction Project - Materials

Response: Respondents are not entitled to rely on any verbal clarification or response from anyone in connection with this RFP. Respondents should send inquiries or quotes for materials to Matthew Berry at MBerry@tec.com. Final RFP due by May 31, 2023.

Description of Project: The proposed funded service areas cover approximately 40 square miles of Benton, Carroll and Henry counties in west Tennessee. This project will bring approximately 104.5 miles of core fiber to some of the most rural areas of Tennessee and make high speed broadband available to approximately 828 locations (and an additional 183 unfunded locations), per the desktop review and satellite imagery, through fiber to the home technology.

Note: The Benton county portion is under construction and this RFP is only for the remaining 93 miles in Henry and Carroll counties.

Detailed Description of Existing Operations: Standards based, RUS approved, technology is used, and the network has been constructed using RUS standard construction practices. PTC currently has 131 remote concentrators (Adtran TA5000) positioned throughout its network. PTC is serving all of these remotes with fiber to the node (FTTN).

Each central office and remote has been upgraded beginning in 2019 and through the 2021 budget cycle as unfunded. The access equipment has already been upgraded to take the network from 1 GB core to 10 GB on all fiber fed COTs and remote upgrades were ongoing in 2020 and 2021. Approximately 97% of the census blocks included in the serving area are utilizing the existing copper plant. Utilizing ADSL2+ and VDSL2 technology in the remotes, this copper plant is being bonded, where there is enough copper available, to provide 25.0/3.0 broadband service up to 8,000 feet of the remote concentrators. Each serving remote has been constructed with carrier grade DC power plants and batteries with at least 8 hours of backup in the event of a long-term power outage. All sites are monitored by remote alarm systems and alarms are responded to 24X7 by on-call and network operations center (NOC) personnel. If the commercial power were to be affected for an even longer period, TEC can provide longer-term temporary power via fixed or portable generators as necessary. A detailed disaster recovery plan is on file and updated annually.

Approximately 3% of the census blocks included inside the service area are being served by a fiber to the home network design. The equipment strategy for any expansion project is to leverage existing fiber and continue it to deploy a Gigabit Passive Optical Network (GPON) Fiber to the Home (FTTH) solution using the Adtran TA5000 platform. Customers served via GPON have access to an aggregate of 2.4 Gbps bandwidth in the downstream direction and 1.2 Gbps upstream from the Optical Network Terminal (ONT) at their home through distributed optical splitters to the serving remote Optical Line Terminal (OLT).

This GPON capacity will easily scale to provide Gigabit service for these customers. However, if more bandwidth were to be required, NG-PON2 or XGS-PON at 10 Gbps or Point to Point 10 Gbps connections or higher could be deployed on an as-needed basis over the proposed Fiber optic cable.

Latency within the proposed Adtran FTTH equipment ranges from microseconds to around 3-5ms, depending on location and distance from the master node.

The middle mile architecture for this project will utilize high-capacity transport rings and redundant link aggregation interfaces for a highly scalable and redundant network. The network will utilize a redundant 100 Gbps (scalable to higher speed on some links and lower on others) transport ring comprised of carrier grade ADTRAN and Cisco Ethernet aggregation switches (or equivalent) with full layer 2.5 and MPLS capabilities. Each optical light terminal is connected in a redundant fashion to different parts of the transport ring(s). Redundant core routers, in physically diverse locations, will provide the paths out of the local and middle mile network to the external IXP network. This diverse and redundant pathing of the transport to the interexchange points delivers a robust network that will ensure maximum uptime and minimal latency.

The middle mile / backhaul architecture leverages existing networks, using primarily a Layer 2 architecture. All transport is fiber-based. In the access aggregation portion of the network, individual 10 to 100 Gbps links are aggregated using 802.1ax Link Aggregation and G.8032 Ethernet Ring Protection Switching (ERPS) to interconnect the RTs and connect them to the core network. 100G transport links connect the access rings to the LecNet headend in Jackson, MS. A centralized network operations center (NOC) is located in Jackson, MS and operated by a TEC subsidiary, LecNet. TEC has 100 GB redundant transport routes from the company to the NOC. TEC's Internet peering connections and routers are monitored by the NOC personnel and two upstream providers, Cogent and AT&T, to ensure redundancy and adequate bandwidth and IP addresses are available to our broadband customers. TEC also peers at 350 East Cermak (Chicago) and 56 Marietta (Atlanta) via multiple CSpire 10 Gbps transit links. Additionally, TEC hosts Netflix and Akamai caching servers at the NOC in order to minimize streaming congestion on the network. In total, TEC has 50 Gbps of internet transport and transit bandwidth, with the ability to scale it higher as bandwidth usage grows. This network facilitates excellent response times across the network with minimal latency.

Detailed description of the proposed project: The strategy for this expansion project is to leverage existing fiber and continue building a network using a fiber to the home architecture utilizing passive optical networking (PON) technology and topology. The fiber plant will be designed to provide a fiber for every location passed and engineered for a 32:1 split ratio with ample spare fiber for growth in the area. The network equipment deployed will be the ADTRAN TA5000 with dual-function GPON/XGS-PON line cards, which will allow cost-effective deployment of GPON (2.5G) today while allowing a seamless overlay of XGS-PON (10G) as needed in the future.

PTC intends to provide Gigabit performance services utilizing GPON and XGS-PON technologies over fiber at the end of the project construction. GPON (ITU-T standard G.984) is capable of subscriber speeds of 1Gbps symmetrical, while XGS-PON (ITU-T Recommendation G.9807.1) is capable of subscriber speeds of 10 Gbps symmetrical.

The build out timeline and turn up of customers is a one-year period for this project. This proposed design will deploy single mode fiber optic cables constructed utilizing RUS approved construction techniques. Aerial fiber construction will utilize existing poles under a current pole attachment agreement with the local electric cooperative in the proposed service area.

Buried or bored fiber will be placed in existing previously disturbed public rights-of-ways. To provide a more secure reliable fiber footprint all the buried fiber will be placed at a minimum depth of 36 inches unless other depths are required by the affected highway, railroad, municipalities, or other authorities. The two methods of underground construction that will be utilized are predominately plowing with a 1.25" pipe for fiber and directional boring utilized when road or stream or other types of crossings are required. Directional boring will also be utilized when it is not possible to plow or boring is more feasible construction. Along the buried fiber route, flush-mounted handholes will be deployed with the proposed fiber being accessible at each location. This will allow for easy access to the network and makes future expansions more economical and feasible.

Vendors must provide quotes on the entire quantity per material line item, must note expected delivery date, note if material is American made and if vendor is woman or minority owned (manufacturers noted are preferred, but other quality manufacturers will be considered):

Request for Proposal for Fiber Construction Materials					
Project	Manufacturer	Vendor Part No.	Requirements	Description	Quantity Needed
West Tennessee Community Broadband Project	Corning Optical Communications LLC	012EC5-1410QD53	American Made	Reel - 12 - Loose Tube	5 - 10K REELS
West Tennessee Community Broadband Project	Corning Optical Communications LLC	048EC5-1410QD53	American Made	Reel - 48 - Loose Tube	19 - 10K REELS
West Tennessee Community Broadband Project	Corning Optical Communications LLC	096EC5-14100D53	American Made	Reel - 96 - Loose Tube	22 - 10K REELS
West Tennessee Community Broadband Project	Corning Optical Communications LLC	144EC5-14100D53	American Made	Reel - 144 - Loose Tube	9 - 10K REELS
West Tennessee Community Broadband Project	Corning Optical Communications LLC	288EV5-14100D53	American Made	Reel - 288 - Loose Tube	1 - 10K REEL
West Tennessee Community Broadband Project	Channell/GlasMasters	Vendor Part No. Varies (Tier 22 Polymer Concrete)	American Made	HAND HOLE 48"X30"X36" SPLIT LID	7
West Tennessee Community Broadband Project	Channell/GlasMasters	Vendor Part No. Varies (Tier 22 Polymer Concrete)	American Made	HAND HOLE 48"X30"X36"	7
West Tennessee Community Broadband Project	Channell/GlasMasters	Vendor Part No. Varies (Tier 22 Polymer Concrete)	American Made	HAND HOLE 36"X24"X36"	420
West Tennessee Community Broadband Project	Channell/GlasMasters	Vendor Part No. Varies (Tier 22 Polymer Concrete)	American Made	HAND HOLE 18"X11"X18"	198
West Tennessee Community Broadband Project	Corning Optical Communications LLC	SCA 9T-24-086CP	American Made	24" AERIAL PASS THRU CLOSURE WITH 8 OPTI-TAPS	11
West Tennessee Community Broadband Project	Corning Optical Communications LLC	SCA 9T-34-086CP	American Made	34" AERIAL PASS THRU CLOSURE WITH 8 OPTI-TAPS	4
West Tennessee Community Broadband Project	PREFORMED LINE	COYTD 919B 6	American Made	19" BURIED BUTT SPLICE CLOSURE WITH 6 OPTI-TAPS	409
West Tennessee Community Broadband Project	PREFORMED LINE	COYTD 928B 6	American Made	28" BURIED BUTT SPLICE CLOSURE WITH 6 OPTI-TAPS	9
West Tennessee Community Broadband Project	Commscope	FOSC 450-B6-	American Made	24" BURIED BUTT SPLICE CLOSURE WITH NO OPTI-TAPS	3
West Tennessee Community Broadband Project	Commscope	FOSC 450D	American Made	30" BURIED BUTT SPLICE CLOSURE WITH NO OPTI-TAPS	2