Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Request for Information
21 — Info Technology

Proc Folder: 120401

Doc Description: Request for Information (CRFI) to replace MPLS contract

Proc Type: Request for Information

Date Issued	Solicitation Closes	Solicitation No	Version
2015-06-25	2015-07-30 13:30:00	CRFI 0210 ISC1500000002	1

BID RECEIVING LOCATION

BID CLERK
DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
2019 WASHINGTON ST E
CHARLESTON WV 25305
US

VENDOR

Vendor Name, Address and Telephone Number:

Shenandoah Telecommunications, Inc
PO Box 459
500 Shentel Way
Edinburg, VA 22824 681-205-4208

07/30/15 12:00:50
WV Purchasing Division

FOR INFORMATION CONTACT THE BUYER

Guy Nisbet
(304) 558-2596
guy.l.nisbet@wv.gov

Signature X Edward H McKay FEIN # 54-1162807 DATE 7/29/2015

All offers subject to all terms and conditions contained in this solicitation

VP-WIRELINE + ENGINEERING
SHENANDOAH TELECOMMUNICATIONS, INC.

FORM ID : WV-PRC-CRFI-001

1.1 EXECUTIVE SUMMARY

Shenandoah Telecommunications Inc (dba in WV as Shentel Communications and Shenandoah Cable) is a publicly traded company (NASDAQ:SHEN) that has been serving the Shenandoah Valley in VA since 1902 and the State of West Virginia since 1990. We offer a comprehensive suite of voice, data and video services for both residential, business, and government customers. Shentel first deployed fiber optic services in 1983, and we now manage over 4,500 miles of fiber throughout Virginia, West Virginia, Maryland and Pennsylvania. Shentel is headquartered in Edinburg, VA with local NOC operations and technical/support personnel, including over 70 technicians in WV and over 20 technicians within 60 miles of our WV service areas who can provide construction, splicing and other fiber services. Our vision is that every market where Shentel provides service shares the same level of telecommunication services found anywhere in the United States.

After acquiring several rural cable systems, Shentel invested over $100M to improve and expand our cable and fiber optic networks over the past 5 years. It is important to recognize that Shentel has the financial resources to support infrastructure upgrades and expansions. Shentel has upgraded several rural areas including McDowell County, WV, Buchanan, VA and Ronceverte, WV to provide fiber service directly to the home or business including cable, internet and voice services.

The Shentel team that will serve the State of West Virginia has many different components, but all share the same objective – to provide stellar quality products and services that exceed the State's expectations.

The account team will provide information and support before, during, and after the project's implementation.

The project management team ensures that all project objectives are met in a timely and efficient manner. The project manager assigned to the State of WV will be a single point of contact to ensure effective management, direction, administration, quality assurance and control of the project.

Shentel's data network and engineering teams will plan, design and engineer the network to support the needs of the State. After construction, they will test to ensure final deployment of all services to the State's complete satisfaction. Our team of engineering professionals will use their years of training and experience to design and deploy a custom solution to meet the needs of the State of WV.

Shentel's regionally based network operations center provides 24 x 7 x 365 proactive network support and monitoring and will escalate issues to the appropriate Shentel technical teams.

Shentel provides service to some of the more rural and geographically challenging areas of WV. We are confident that we are the premier provider of data network service in those areas and can deploy several different network typologies via fiber optic installation that will more than meet the needs of the State. One design that offers a significant technological and economic value to the State is to hub all the circuits within our service area to one point and then offer a primary and a secondary connection from that hub to one of the three designation sites for the State.

Shentel welcomes the opportunity to work with other telecom and cable companies to provide a multi-vendor solution for the State of WV. The willingness and capability to work with other vendors will be key to the successful deployment of multiple service providers for the State's data network.

1.2 INFORMATIONAL RESPONSES TO THE FIVE CONCERN AREAS

1.2.1 Network Architecture and Design

1.2.1.1 Statewide Transport Services

The Shentel team is well versed in the existing data transport types used by the State: Point-to-Point Private Line Services; Dedicated Ethernet and Multi-point Switched Services; Frame Relay Services; Asynchronous Transfer Mode Services; and Multi-protocol Label Switching (MPLS) Services. We have participated in both business and government technology transition from older technologies to an Ethernet based data delivery. Shentel complies with industry standards in design, construction, and implementation of Ethernet networks. We are currently finalizing plans to build fiber to the three State POP's in Charleston, Clarksburg, and Flatwoods, and Shentel already has fiber facilities in all three cities. Shentel is capable and willing to pass data traffic via network-to-network interfaces (NNI's) with vendors that are providing telecommunication services for other counties in WV. Attachment 1 is a summary of Shentel's data and voice service offerings.

1.2.1.2 Ethernet Transport for Counties

Attachment 2 provides a high level view of Shentel's fiber backbone network. It will provide the State with an idea of Shentel service areas. What is not shown on the map, is the depth of the local fiber in each of the service areas. We estimate that we are near net to a majority of the local, county, and state locations in our service areas. Shentel would make every effort to economically and efficiently reach as many of the required locations as possible. We offer the same type of service with the same quality to the small rural office as we do to the large international carriers.

1.2.1.3 Statewide IP Trunking and Related Services

Shentel provides standards based SIP trunking, PRI's, and other voice services in WV. We are capable of porting existing numbers and providing the required voice services within our service areas.

1.2.3.3 Statewide IP Trunking and Related Services
The same service and support infrastructure provided for statewide transport services applies to Statewide IP Trunking and Related Services.

1.2.4 Ethernet Transport at a County Level

1.2.4.1 Limited Coverage, Service Offerings, Redundancy, and Support Staff
Shentel provides the same level of service and support in our county service areas as we would to the backhaul network to the State's three designated POP's. Our service agreements and standards are the same throughout our network. Just as other carriers/providers will indicate, the greatest single point of failure is from the zero manhole or pole to a service location.

1.3 OTHER FACTORS TO CONSIDER IN TRANSITIONING TO A MULTI-VENDOR AWARD

Shentel believes the following factors should be considered by the State of WV when transitioning to a multi-vendor award:

- Interoperability between the various providers. Each network provider should provide services that are standards-based and meet the qualifications of the Metro Ethernet Forum (MEF) since the State plans to move to an Ethernet platform for voice and data.
- If the plan is to move to county based service, then the State will need to be prepared to receive 55 separate bills, even though a vendor may be providing service in multiple counties. Shentel would be willing to consider alternatives to provide the State a consolidated, efficient billing process.
- Respondents to the future MPLS replacement RFP's will be of varying size and sophistication, but the State should expect and demand a spirit of cooperation between all the chosen vendors. This cooperation should result in the ability to pass data and voice traffic from one area to another seamlessly.
  Consideration of financial strength will become an even more important criteria for the State as you look at potentially selecting providers, many of which will be regional in nature, on a county by county basis. Shentel looks forward to that evaluation as we feel this is one of our core strengths, enabling us to provide high service levels in rural markets just as we do in metro areas.

ATTACHMENT 1

High Speed Data Services

Ethernet Private Line (ELINE)

Ethernet Private Line (EPL) or ELINE provides an Ethernet Connection between two locations, and is an ideal replacement for frame relay or ATM services. This service also supports Service Multiplexed User Network Interfaces (UNI), which enables a single physical connection to Customer Premise Equipment (CPE) for multiple virtual connections. EPL service is a reliable, more flexible, higher bandwidth and cost effective alternative to traditional TDM Private Lines, Frame Relay or ATM Layer 2 VPNs and IP VPNs.

Ethernet Virtual Private Line (ELAN)

Whether your locations all over the state or three locations in the same town and there is a need to connect them as if they are all in the same building, Shentel's ELAN services can seamlessly network your locations using Ethernet User-to-Network Interfaces (UNI). Shentel's ELAN service enables entities to connect physically distributed locations across a Metropolitan Area Network (MAN) as if they are on the same Local Area Network (LAN). The service provides Virtual Local Area Network (VLAN) transparency and enables customers to implement their own VLANs without coordination with Shentel. It's also a cost-effective alternative to traditional hub and spoke network topologies, offering a more flexible and scalable network solution.

Broadband or Cable Modem Internet

Cable Modem Internet access easily takes on the demands of broadband hungry entities – especially those with multiple devices under one roof. Tablets, laptops and desktops can share bandwidth with speed to spare. This type of Internet access uses cable television infrastructure to provide network edge connectivity from Shentel to end users. Shentel currently offers speeds up to 50 Mbps downstream and 10Mbps upstream. There may be small locations within the State's structure that can be best served with this type of service when a full fiber build is not feasible. Broadband Internet service from Shentel uses a cable modem as a type of network bridge that provides data communication via coaxial infrastructure. Shentel offers both wired and wireless modems to best fit the individual need.

VOICE SERVICE

Session Initiation Protocol (SIP) Trunking

Session Initiation Protocol (SIP) trunking is the use of voice over IP (VoIP) to facilitate the connection of a private branch exchange (PBX) to the Internet. In effect, the Internet replaces the conventional telephone trunk, allowing an enterprise to communicate with fixed and mobile telephone subscribers worldwide. (SIP is an IETF standard for initiating interactive multimedia user sessions; a trunk is a line or link that can carry many signals at once, connecting major switching centers or nodes in a communications system.)

In order to take advantage of SIP trunking, an enterprise must have a PBX that connects to all internal end users, an Internet telephony service provider (ITSP) and a gateway that serves as the interface between the PBX and the ITSP. One of the most significant advantages of SIP trunking is its ability to combine data, voice and video in a single line, eliminating the need for separate physical media for each mode. The result is reduced overall cost and enhanced reliability for multimedia services.

With SIP trunking, subscribers can:

- Initiate and receive local calls
- Initiate and receive long-distance calls
- Make emergency calls (911)
- Access directory assistance
- Use fixed and mobile telephone sets
- Employ e-mail and texting
- Browse the World Wide Web.

Primary Rate Interface (PRI)

PRI-ISDN is the digital voice solution that supports PBX equipment by providing the ability to use voice, data, and packet data simultaneously over a T1 facility. It provides two-way trunks (in and out dialing); supports simultaneous voice and data calls; supports common call features such as Caller ID and Call Forwarding; and is compatible with most newer PBX equipment (equipment vendor should verify that the equipment is PRI capable).

IP Centrex

This service is designed for customers that want the features of an expensive PBX without the expense. All of the functionality of the PBX (features and routing capability) resides within the Shentel network. Shentel's IP Centrex is a turnkey solution. It is based on Session Initiation Protocol (SIP) which takes the routing intelligence from the PBX to the network. The service is efficient, cost-effective, and scalable.

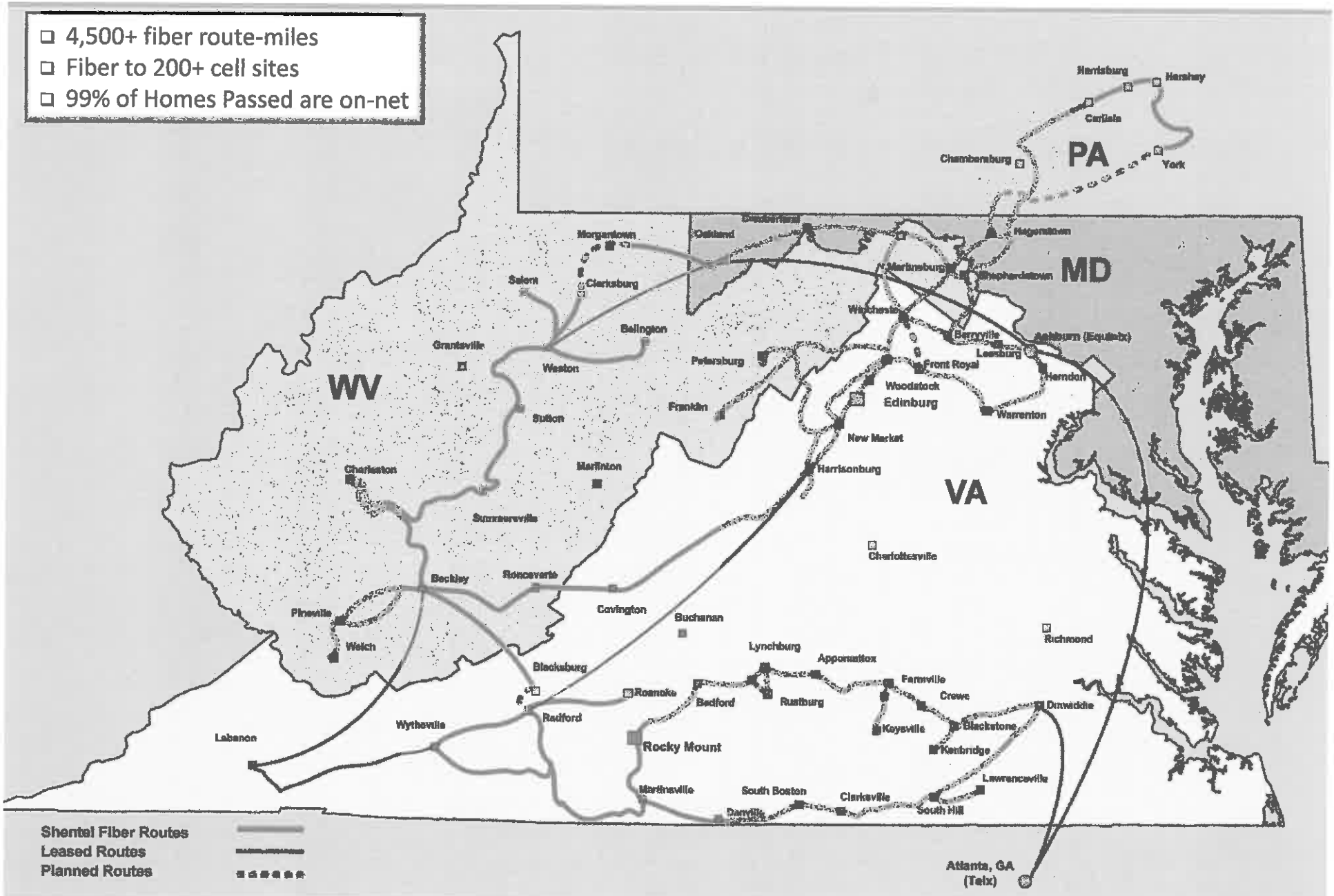
ATTACHMENT 2

Overview Map of Shentel's Network

SHENTEL®

Fiber Network

- 4,500+ fiber route-miles
- Fiber to 200+ cell sites
- 99% of Homes Passed are on-net



ATTACHMENT 3

Service Level Objectives

Shentel provides Service Level Objectives (SLO's) for its network and services, including availability, mean time to respond, mean time to restore and performance metrics. SLO's are standards that Shentel utilizes to measure performance, resilience and business continuity. Shentel makes every effort to ensure SLO's are continuously met by proactively monitoring, measuring and responding to requirements before they become issues that could potentially impact performance objectives.

Network/Service Availability

Network availability is a measurement of the percentage of total time that the service is operational when measured over a 30 day period. Service is considered "inoperative" when any of the following occurs:

(1) There is a total loss of signal for the service
(2) Output signal presented to the customer by Shentel does not conform to the technical specifications
(3) Customer is unable to pass signal over fiber

- Protected: Network/Service availability objective is 99.99 % upon receipt of a fault notification or from the time a trouble ticket is opened with the Shentel NOC.
- Unprotected: Network/Service availability is 99.9% upon receipt of a fault notification or from the time a trouble ticket is opened with the Shentel NOC.

Mean Time to Respond

Mean Time to Respond is the average time required for the NOC to begin troubleshooting a reported fault. The Mean Time to Respond objective is fifteen (15) minutes upon receipt of a fault notification or from the time a trouble ticket is opened with the Shentel Network Operations Center.

Mean Time to Dispatch (MTTD)

Mean Time to Dispatch is the average time required to have a Shentel Operations Technician at the customer's location. The MTTD is two (2) hours from the time a trouble ticket is opened with the Shentel Network Operations Center.

Mean Time to Restore/Repair (MTTR)

Mean Time to Repair is the average time required to restore service to an operational condition as defined by the technical specifications. The MTTR objective is six (6) hours for fiber optic facilities failure from the time a trouble ticket is opened with the Shentel Network Operations Center.

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: _____

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

[✓] Addendum No. 1	[ ] Addendum No. 6
[ ] Addendum No. 2	[ ] Addendum No. 7
[ ] Addendum No. 3	[ ] Addendum No. 8
[ ] Addendum No. 4	[ ] Addendum No. 9
[ ] Addendum No. 5	[ ] Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

SHENANDOAH TELECOMMUNICATIONS, INC.
Company

Edward H. McKay VP-WIRELINE + ENGINEERING
Authorized Signature

7/29/2015
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012