

Augusta County, Virginia

Wireless Facilities Telecommunications Analysis For Wireless Voice and Broadband Services

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Executive Summary

Over the past two decades, local governments and municipalities across the nation have been inundated with requests to construct new facilities, primarily in the form of tall towers, to support a growing market for wireless telecommunication applications. The wireless services being provided is termed Personal Communication Services (PCS) and commonly include voice, texting, and wireless internet. These services play an important and vital role in many personal and business applications.

The Telecommunications Act of 1996 mandates that localities cannot prohibit development of towers and other equipment but provides a great deal of latitude in formulating plans and policies which address issues associated with their development. The challenge facing most localities is to develop a plan which complies with the requirements of the Telecommunications Act of 1996, while at the same time adequately addressing the issues and concerns of the citizenry.

In the fall of 2011, The Atlantic Group was contracted to assist the county in developing a Wireless Facilities Analysis with respect to the siting of towers for areas of poor or no service. This analysis represents a comprehensive review and analysis of: the existing infrastructure, gaps in coverage, carrier needs, propagation, interference, topography, and air navigation facilities.

The existing trend of subscribers abandoning their land line phones for wireless technology will continue. Personal Digital Devices (PDAs), laptops, and tablets have become the new devices of choice for high speed broad band for internet access, full motion video, voice, picture, and applications that interface with homes, buildings, automobiles and other devices. Wireless has become the expanded medium for the future.

In this study, the consultant, The Atlantic Group has identified current gaps in 3-G services and has evaluated the geographic areas of the County. The determination is: for Augusta County to be able to service current poorly served areas and anticipate future 4-G services, the county should help facilitate these needs through a plan that will address this issue.

This analysis addresses the potential tower sites that will service the new 4-G networks.

Based upon this review, it is determined that the existing infrastructure is not capable of meeting most of the future needs of voice and texting services. In addition, wireless broadband must be supplemented with additional tower structures. Through utilization of existing structures and upgrades to equipment, voice and texting services may grow, however in order to provide wireless Broadband, the existing infrastructure must be supplemented by additional tower structures. In areas where structures don't currently exist, Potential Commercial Tower Development Areas or PCTDAs have been identified as areas where tower development is needed.

The consultant has identified twenty-one (21) rural villages and areas where the existing tower structures would not provide high speed service to the areas for Broadband internet usage for 4th Generation wireless services.

As a result of expanding 4G data and voice services, incoming wireless 9-1-1 calls for emergency services will be enhanced significantly.

The consultant recommends that twenty-one (21) new Potential Commercial Tower Development Areas be established due to the lack of wireless service.

It should be noted however that any new development in these areas would have to conform to the applicable ordinances governing tower siting.

George N. Condyles, IV

President – The Atlantic Group of Companies, Inc.

Glossary of Terms

AGL – Above Ground Level – the height above ground as measured from the ground to the top of the structure.

AMSL - Average Mean Above Sea Level - equal to the sum of the AGL and GE.

Broadband- The ability to transmit and receive voice and data services greater than

5 Mbit per second of transmission service speed.

Examples: Voice, internet access, full motion video, messaging, functional applications.

BTA - Basic Trading Area.

CDMA – Code Division Multiple Access

Co-location – The sharing of space on a structure to support multiple carriers.

Dial-up Service- The speed related to a standard telephony speed of 14.7 kb/s using a standard modem of transmission and reception.

FAA – Federal Aviation Administration.

FCC – Federal Communication Commission.

GE – Ground Elevation.

GSM - Global System Mobile Communication (see review of Wireless Technology).

Guyed Lattice Tower – Lattice tower that is supported by wire cables.

LEC – Loop Exchange Carrier – a communications company licensed to provide local exchange service for telephony service providers.

LTE - Long Term Evolution of Equipment

Mini/Micro Cell - Small structure, typically less than 80' AGL, used to fill "gaps" in coverage.

Monopole – Cylindrical structure, erected vertically, used to mount antennae.

MSA - Mobile Service Area.

MTA – Metropolitan Trading Area.

MW – Microwave – digital service licensed by the FCC for the transmit and receive of compressed voice data. Microwave systems are used to transmit large amounts of data, from point to point, over greater distances than traditional broadcast systems.

Propagation – The physical principle of the energy emitted through broadcasting a frequency as it relates to transmission, power, ASML, antenna gain and transport loss.

Typically shown via color pallet with corresponding signal strength.

PCTDA – Potential Commercial Tower Development Area.

PDA - Personal Digital Device

RSA - Regional Service Area.

Rx - Receiver - a wireless radio device that receives a broadcast from a transmission device allowing the broadcast circuit to be completed.

Self – Supporting Structure – Either a monopole or lattice design tower that is free-standing and requires no additional support.

SMR – Specialized Mobile Radio – two-way paging system used to transmit and receive. SMR systems designate a specific narrow band channel to broadcast and receive, thus creating a "secure" communication channel.

TDMA - Time Division Multiple Access (see review of Wireless Technology).

Topographic Study – How the terrain and other land forms and natural features impact the transmission and receipt of radio waves.

Tx – Transmitter - a wireless radio device that broadcasts a signal to be received by a specific receiver device.

Wireless Internet – The provision of internet services through specialized devices over a wireless network.

Wireless Technology Definitions

3G - 3rd Generation of Technology-is a generation of standards for mobile phones telecommunication services fulfilling the International and mobile specifications bν the International Telecommunications-2000 (IMT-2000) Telecommunication Union. Application services include wide-area wireless voice telephone, mobile Internet access, video calls and mobile TV, all in a mobile environment. Several telecommunications companies market wireless mobile Internet services as 3G, indicating that the advertised service is provided over a 3G wireless network. Services advertised as 3G are required to meet IMT-2000 technical standards. including standards for reliability and speed (data transfer rates). To meet the IMT-2000 standards, a system is required to provide peak data rates of at least 200 kbit/s (about 0.2 Mbit/s). However, many services advertised as 3G provide higher speed than the minimum technical requirements for a 3G service. Recent 3G releases, often denoted 3.5G and 3.75G, also provide mobile broadband access of several Mbit/s to smartphones and mobile modems in laptop computers.

4G – **4**th **Generation of Technology**- is the fourth generation of cellular wireless standards. It is a successor to the 3G and 2G families of standards. In 2009, the ITU-R organization specified the IMT-Advanced (International Mobile Telecommunications Advanced) requirements for 4G standards, setting peak speed requirements for 4G service at 100 Mbit/s for high mobility communication (such as from trains and cars) and 1 Gbit/s for low mobility communication (such as pedestrians and stationary users).

The world's first publicly available LTE service was opened in the two Scandinavian cities of Stockholm (Ericsson and Nokia Siemens Networks systems) and Oslo (a Huawei system) on 14 December 2009. One of the key technologies for 4G and beyond is called Open Wireless Architecture (OWA), supporting multiple wireless air interfaces in an open architecture platform.

A 4G system is expected to provide a comprehensive and secure all-IP based mobile broadband solution to laptop computer wireless modems, smartphones, and other mobile devices. Facilities such as ultra-broadband Internet access, IP telephony, gaming services, and streamed multimedia may be provided to users.

Cellular- Refers to communications systems, especially the Advanced Mobile Phone Service (AMPS), that divide a geographic region into sections, called cells. The purpose of this division is to make the most out of a limited number of transmission frequencies. Each connection, or conversation, requires its own dedicated frequency, and the total number of available frequencies is about 1,000. To support more than 1,000 simultaneous conversations, cellular systems allocate a set number of frequencies for each cell. Two cells can use the same frequency for different conversations so long as the cells are not adjacent to each other. The second analog system in operation in the United States is Extended Advanced Mobile Phone System (EAMPS) that has currently replaced AMPS as the US standard. Narrowband AMPS is the third and existing cellular system in operation in the US. It has three times as many voice channels as EAMPS with no loss of signal quality.

All three systems have forty-two (42) control channels that are for setting up calls; the remaining channels are for voice conversations. All three systems are also analog systems. The systems are listed in chronological order and are backward compatible; that is, the infrastructure is designed so that older phones work on the newer systems.

PCS- Short for Personal Communications Service, the U.S. Federal Communications Commission (FCC) term used to describe a set of digital cellular technologies being deployed in the United States. Personal Communications System (PCS) includes Code Division Multiple Access (CDMA), Global System Mobile Communication (GSM), and North American Time Division Multiple Access (TDMA), also called IS-136). Two of the most distinguishing features of PCS systems are that they operate at the 1900 MHz frequency range and that they are completely digital.

CDMA- Short for Code Division Multiple Access, a digital cellular technology that uses spread-spectrum techniques. Unlike competing systems, such as GSM, that use time-division multiplexing (TDM), CDMA does not assign a specific frequency to each user. Instead, every channel uses the full available spectrum. Individual conversations are encoded with pseudo-random digital sequence. CDMA is a military technology first used during World War II by the English allies to foil attempts at jamming transmissions. The allies decided to transmit over several frequencies, instead of one, making it difficult for the Germans to pick up the complete signal. Because Qualcomm Inc. created communications chips for CDMA technology, it was privy to the classified information. Once the information became public, Qualcomm claimed patents on the technology and became the first to commercialize it.

TDMA- Short for Time Division Multiple Access, a technology for delivering digital wireless service using time-division multiplexing (TDM). TDMA works by dividing a radio frequency into time slots and then allocating slots to multiple calls. In a way, a single frequency can support multiple, simultaneous data channels. TDMA is used by the GSM digital cellular system.

GSM- Short for Global System Mobile Communications, one of the leading digital cellular systems. GSM uses narrowband TDMA, which allows eight simultaneous calls on the same radio frequency. GSM was first introduced in 1991 and is available in over 100 countries and has become the de facto standard in Europe and Asia.

SMR- Short for Specialized Mobile Radio-Two-Way, and thus used to transmit and receive. This technology takes basic two-way radio and designates a specific Narrowband channel to broadcast and receive, thus creating a "secure" channel for communication.

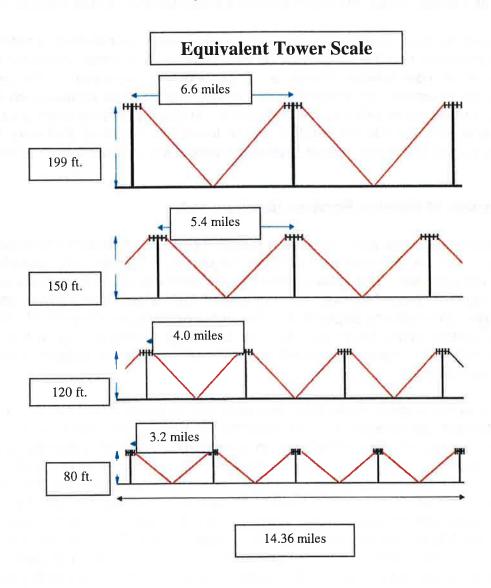
MW- Short for Microwave, this is a medium of communication licensed by the Federal Communications Commission as services used for the transmit and receive of compressed voice and data. These systems typically are direct point-to-point

transmissions that large amounts of information may be sent over longer distance verses a short broadcast. This technology typically is in digital form.

LTE – Long Term Evolution Derived as a strategy of digital communications equipment that evolve as technology evolves in the wireless network. Phrase is coined by Verizon and other major wireless carriers as to the ability to upgrade from 3G- to 4G equipment.

Internet- The electronic medium by which information may be uploaded or downloaded to a degree in which it may be reviewed, manipulated and used for recreational and commercial applications. This technology is typically sent via a wire Local Exchange Carrier (LEC) network. However, the technology is available for the deployment of a wireless network.

Equivalent Tower Scale- The modeling of tower heights in relationship to coverage areas. These models are for estimating demand for towers.



WIRELESS FACILITIES TELECOMMUNICATIONS ANALYSIS AUGUSTA COUNTY

INTRODUCTION

The objective of the <u>Wireless Facilities Telecommunications Analysis</u> is to identify areas currently not served or underserved by wireless carriers and to provide a framework of potential tower sites under the County's development review process as set forth in the Augusta County Zoning Ordinance. The Goals of The Wireless Facilities Telecommunications Analysis are to address citizen and industry needs as it relates to telecommunication infrastructure. Wireless 4-G broadband communications provide a valuable service to the public as well as to the enhancement of Public Safety.

While there are six (6) Land Mobile Radio or LMR service providers in the County, (See Exhibit 4.0), there are several other technologies such as Wi-Fi and "Hot Spot" services that are offered at a limited basis, but could expand if tower facilities would become available.

In order to provide service within a region, a company needs to establish a network of antenna sites. New antennas may be co-located on existing towers or other structures or may require the placement of new towers. Because of the existing providers in the area, there are possibilities for co-location on these towers. Space that may be available on existing towers often is not considered by other carriers interested in adding service to an area. The County's consultant and staff provide information on all towers in the area that may host additional antennas as part of the tower review application process to ensure that all existing towers are utilized.

The Technology of Wireless Services (Background)

Most personal wireless services operate in a similar fashion. A portable communication device receives from, and, in the case of a portable telephone, transmits radio signals to an elected antenna or antenna set. The area covered by an antenna set is commonly referred to as a "cell." The signal is routed to switching equipment that selects the channel and monitors the signal strength. In telephone applications, the signal normally is connected to the conventional or "land line" public telephone system or Loop Exchange Carrier (LEC). If the communication device is moving, the signal is passed on to an antenna in an adjoining cell and the call continues uninterrupted.

For services which require more than one antenna to serve a large area, such as wireless telephone service, an effective system requires an engineered grid or network of antennas mounted on towers or other structures in a pattern somewhat resembling a honeycomb. Depending on the technology used, the height of the tower, the position of the antenna, topography, vegetation and other factors, the cell size can vary from less than a mile to several miles across. The wireless provider seeks to locate antennas spaced just far enough apart to provide the coverage needed. If the antennas are too close, the signal overlap can cause interference problems and the capacity of the system suffers. If the antennas are too far apart, gaps or holes are created in the coverage pattern which can result in signals being "dropped" as a user moving beyond the range of the antenna transmitting and receiving the signal.

Also, each cell can handle only a finite number of data at one time. As the signal traffic becomes too congested, additional cells are required to provide additional system capacity. The grid of cells just described constitutes the signal coverage pattern for a single PCS provider. Multiple providers are already operating or preparing to operate in the Augusta County area with more expected in the next year. See list on Exhibit 4.0.

The evolution of simple first generation or 1-G <u>voice</u> service has grown into 2-G digital voice to 3-G mobile voice and data. With the advent of 4th generation or 4-G, the wireless carriers are providing mobile broadband services. Broadband services are both expanded data and enhanced voice service. Broadband is understood that it is expanded voice and data services.

Broadband service can be delivered via a "wire" service delivery such as from the cable franchised company or from the local telephony company if this service is offered in a specific geographic area. While wire based networks are bound to cable facilities, wireless broadband is not. Because wireless uses radio technology as its service delivery medium, companies such as Verizon, Sprint, NTelos, AT&T, etc. have wireless subsidiaries to provide service to the subscribers in a mobile format.

Cell Site Opportunity

The Telecommunications Act established a role for three parties in the future development of wireless communications services: the communications industry, the FCC, and local government. Within the confines of FCC licensing, administration and local government regulation of land use and zoning, each provider is free to design its own network or system. Wireless communication services providers are not treated as public utilities or franchises but rather are competitors in an open market. Although the free market approach is intended to result in the best communications services for the least cost, it will also result in an increase in the number of wireless communications antennas and towers. However, the free market approach also permits the service providers to choose to locate in the more populated areas that often leaves the sparsely population areas of a locality with little or no coverage.

The following is a general category of sites that could be used for tower locations and/or colocations of antennas provided the location, siting and design standards of the Augusta County Zoning Ordinance are met.

Existing Communication Towers

Presently, <u>over seventy-eight (78) structures</u> capable of supporting antenna are in place throughout the county. Co-location opportunities exist on many of these sites.

The summary on Table #1 on the following pages lists existing and several approved (but not yet constructed) antenna sites throughout Augusta County and several miles across the county border into adjoining counties. Sites in neighboring counties are identified because of their potential to provide coverage along the borders and into Augusta. Sites are identified by an ATC Case Number, Structure Owner, Location, Tower Height, Latitude/Longitude Coordinates, and the amount of serviceable co-location positions (Slots) available. Sites identified by an asterisk are under either existing or under construction are scheduled to be constructed within the year. Each site can be found on the map presented in Exhibits 4.1/4.2/4.3/4.4. (pg. 40).

INVENTORY OF ANTENNA SUPPORT STRUCTURES

The map in Exhibit 4.1. identifies the location of antenna support structures in Augusta County either supporting or capable of supporting commercial antennas. Proposals that have received County zoning approval but have not yet been constructed are plotted. Additionally, antenna support structures located near the border in adjacent counties were also included. Structures are identified by site ID (e.g., Augusta = A: A-001).

A variety of support structures are being utilized in the County to mount antennas. This includes traditional self-support lattice towers, steel monopoles, and guyed towers. Additionally, antennas are mounted on power transmission towers, grain silos and wood poles. The following identification system was used to identify the structure type:

Inventory Logic Table

Site ID	Structure Type
A-0XX	Self-Support Lattice Tower, Water Tank, Steel Monopole or Guyed Tower
A-2XX	Power Transmission Tower/Pole
A-3XX	Grain Silo
A-4XX	Wood Pole

Table #1.

CNINI	OLO INTINE	LUCEIMI	l Jpro	300	9001	See all the see	100		
Crown	Mirit Spring	CR 694 MINT SPRING, VA	MP	Z	38°3′ 40.22″	79.7.4.73	195	1828	4
Crown	Stuarts Draft	1557 WHITE HILL ROAD	da M	z	38*2"25.3"	79°3′24.4"	195	1698	4
Crown	Kiser E	2761 HERMITAGE ROAD	GLAT	1016890	38-06-55.6N	78-54-55.5W	240,	1519	4
VEPCO	Bear Den Mt.	SKYLINE DRIVE	Lattice	1016962	38-03-59-0N	78-47-56.0W	78	27.56	4
VEPCO	Burketown	SUB. PT. 696	Lattice	1016969	38-18-51.0N	78-58-14.0W	195,	1227	4
Crown	Fairfield	BTWN RT. 81 & RT. 64 SE	MP	1017043	37-53-48.0N	79-15-59.0W	185	1888	4
SHENVAECOP	Churchville/Haag	INT. RT 612 & RT 742	Lattice	1017072	38-12-8.0N	79-04-33.0W	375	1588	4
Tower Assets Newco	Craigsville	1911 CRAIGMONT DRIVE	ΜP	1017557	38-10-59.4N	79-05-22.1W	.091	1625	4
WWC,LLC	KingsburyiLockeridge	2160 JEFFERSON HWY.	Lattice	1017558	38-05-37.7N	78-57-05.3W	530.	1385	4
Crown	Graenville	4256 OLD GREENVILLE RD.	AN P	z	38°1'33.97"	79 8 29.8	195	1715	4
Crown	Overnite	1450 SOUTH DELPINE AVE.	MP	z	38° 2′ 56.0°	78°54'26.9"	190.	1375	4
Crown	Doomis/Swan	982 ROCKFISH RD.	ΜP	z	38+7"11.7"	78° 52' 5.7"	195'	1322	4
Crown	Tinkling Spring	57 CONSTRUCTION LANE	₽₩	z	38° 5' 3,78"	78 • 59' 55.94"	195	1392	4
Easy Radio, Inc.	Buffalo Gap	SR 703 & RT. 42	GLAT	1017916	38-10-55.0N	79-13-33.0W	460	1661	4
Crown	Middle River	2724 CHURCHVILLE AVE.	d N	z	38°12'25.0"	79°7'31.0"	195	1610	4
ClearChannel	WKC	SR 795 & SR 1007	GLAT	1018285	38-05-13.6N	78-54-45.4W	.087	1292	z
Clear Channel	WKC	SB 795 & SB 1007	GLAT	1018286	38-05-13.6N	78-54-43.1W	.082	1292	z
Clear Channel	WKC	SR 795 & SR 1007	GLAT	1018287	38-05-12.1 N	78-54-40.7W	280,	1292	z
ClearChannel	WKC	SR 795 & SR 1007	GLAT	1018288	38-05-10.4N	78-54-39.0W	.082	1292	z
Clark Broad, CO: WKDW	WKDW	291 WOODLEE RD.	GLAT	1018290	38-05-41.0	78-54-41.0	280,	1272	z
Columbia Network Svc.	Little North Min.	LITTLE NORTH MOUNTAIN	GLAT	1018299	38-02-35.7 N	79-19-41.5W	185	1688	2
Crown	Frog Pond/Shover	154 GUERNSEN LANE	МР	z	38°9' 42.6"	79°7'35.2"	195	1311	4
New Life Ministries-WNLR	New Life	RT.250 2 MILE SE	GLAT	1018648	38-12-39.0N	79-07-52.0W	392	1614	z
Crown	Churchville	3490 CHURCHVILLE AVE.	MP	z	38° 13' 4.4"	79.9'6.0"	195'	1305	4
Verizon	Weyer's Cave	1.4 MILES WEST - NORTHWEST	GLAT	1029676	38-17-44.0N	78-55-43.0W	185	1509	4
CPW-NTELOS	Jefferson Street	JEFFERSOPN STREET, WAYNESBORO	MP	1054987	38-09-14:0N	79-04-43.0W	182	1765	4
Crown	Staurton South	1899 GREENVILLE AVE. STAUNTON	MP	1055053	38-06-35.2N	79-4-13.7W	185	1240	4
CPW-NTELOS	Venora	4801 LEE HWY. VERONA	MP	1055054	38-11-35.0	79-00-50.0	185.	1585	4
Crown	Route 2	ROUTE 2, STAUNTON	МР	1055095	38-02-29.5N	79-07-34.1W	185	1390	4
Crown	Brand	ROUTE 250 FISHERSVILLE	ΝP	z	38° 6' 47.9"	79 0 29.5	195.	1280	4
CPW-NTELOS	Shendoah	1150 SHENANDOAD DRIVE, WYNESBORO	MP	1059432	38-03-20.0N	78-56-4:0W	185	1259	4
Crown	Willamson	463 INDUSTRY ROAD	MP	z	38°5 25.94*	78°52'28.0"	190,	1140	4
SHENNAECOP	Mt. Crawford	US 11 & VA HWY, 257	MP	1204046	38-21-55.4N	78-56-24.1W	80,	1454	-
VEPCO	Fishersville	RT. 250 WEST WAYNESBORO	MP	1205737	38-05-37.4N	78-57-00.0W	.9g	2200	-
Crown	Buffalo Ridge/Swoope	1011 LITTLE CALF PASTURE HWY SW	MP	1206510	38-09-36.8N	79-16-22.6W	185	1113	4
Shen. Valley Reg. Airport	Airport	77 AVIATION CIRCLE	Lattice	1208166	38-15-35.4	78-54-5.0W	30	1959	-
Crown	Rt.2548.Rt.608	1081 HERMIAGE ROAD	MP	z	38°9'23.651"	78° 57' 2.913"	195'	1271	4
Crown	Veroria	RT. 254 & RT. 608	Lattice	1208222	38-09-25.2N	78-57-1.7W	150'	1900	4
Crown	Stuart's Draft	COAL ROAD, STUARTS DRAFT	GLAT	z	37°59°3.69°	79°4′34.1°	180,	1830	4
Crown	Spottswood	559 SPOTTSWOOD ROAD	MP	Z	37°57'56.48"	79°11'40.11"	190,	1509	4
Clear Channel Comm.	Clear Channel	271 WOODLEE ROAD	Lattice	1220049	38-10-32.5N	79-04-11.1W	240,	1439	z
Crown	McDonalds	216 A UGUSTA WOODS DRIVE	ď	1220646	38-7-18.5N	79-2-10.1W	185	1246	4
Crown	Wondarly	299 MOUNTAIN CAVE ROAD, GROTTOES	MP	1225540	38-14-10.7N	78-50-41.0W	185	1302	4
Creation	Washington Caro	765 DICES FERRY ROAD	MD	1226582	38.17.44.2N	NO SE AN OW	105	4740	4

Augusta County - Inventory of Towers, Silos. Power Mounts, Land, and Water Tanks

A-046 Chemo Chardwise 6.84 HAMEE WIRT 0.14 T N 507-14/24/5 79-14 A-046 SBA Chrinoparie FREST MADLE Ligh 1275668 30-5-0-14/1 7-15-0-14/1	# GLO	Uwner	STENAME	Location	ed/i	FCC#	FREEDOB	FOUGIFIDE	AGE	49	Siors
SBA Changuelin 190 CHMOLIARIN ROAD IAP 1225668 84-67-004 US Colletar Donard Changonile FERTA NENALE IAP 1225668 88-45-70 M US Colletar Donard Fort High School 118 IMORNINGS/DE LANE Lattice 11286891 88-45-70 M American American American American American 1128689 88-45-70 M American American American American American 11286891 88-45-70 M 89-45-30 M American American Anterior American	A-045	Crown	Churchville	438 HANKEY MTN.	GLAT	Z	38*14*22.45"	78,11,36,15"	190,	1362	4
Cown Cagewile FRST AVENUE MP 128822 38-457,0N US Cellular Davis SOUTH DAVIS RADIO MP 1,28822 38-457,0N US Cellular Libris 1,400 MP N 38-45,0N American Afrita 6649, Man Man 416 BROADHEAD RADIO MP N 38-45,00N American Afrita 6649, Man Man 6649, MAN MAN 1660 14876 N 38-45,00N American Afrita 6649, MAN MAN 6649, MAN MAN 1660 14876 N 166-65,00N Verban FOLD READ RADIO MP N 166-65,00N 166-65,00N N N 166-65,00N Verban FOLD READ RADIO MP N 166-65,00N N 166-65,00N 166-65,00N N 166-65,00N	A-046	SBA	Chinquadin	190 CHINOLIAPIN ROAD	MP	1230688	38-02-34.9N	79-19-44.8W	105	1481	2
US Cellular Davis SOUTH DAVIS ROAD MP 7285572 575-R2N	A-047	Crown	Craigsville	FIRST AVENUE	MP	1233586	38-4-57.0N	79-22-47.7W	180'	1863	4
Cown Fort High School 181 MCNANUSSIDE LANE Lattice 128699 194-15-19 AN Anmichan Kelip Min/lish 418 BRADINEAD RAAD Lift N 97-92-25 BN Anmichan Afrain 654 MILLOW SPOUT ROAD Latte 17-92-25 BN Anmichan F. Definance 97-94 WILLOW SPOUT ROAD Latte 17-96-25 BN Anmichan F. Definance 97-94 WILLOW SPOUT ROAD Latte 17-96-25 BN I. Toward Chimora 165 CFRINCHARE Latte 17-96-25 BN I. Toward Chimora 165 CFRINCHARE Latte 17-96-25 BN I. Toward Chimora 165 CFRINCHARE Latte 17-96-25 BN Vertacin Medinals Shings 27-14 LITILE CALF PASTURE ROAD MP 17-96-25 BN Vertacin Medinals Shings 27-14 LITILE CALF PASTURE ROAD MP 17-96-25 BN Vertacin Medinals Shings 27-14 LITILE CALF PASTURE ROAD MP 17-96-25 BN Vertacin Medinals Shings 27-14 LITILE CALF PASTURE ROAD MP 17-96-26 BN	R-048	US Cellular	Davis	SOUTH DAVIS ROAD	ďΝ	(238372	37-54-8.5N	79-16-19.2W	125'	1472	တ
Annerican Keay Marulish 416 BROADHEAD ROAD MP N \$7.59.22.BSN Anminon Afran GOAS HOWARDSVILLE ROAD MP N 96-0-56.00M Anminon Afrancian FL Definance 165 CPM/CNAS MITCHONLONE Lattice N 96-0-56.00M Variant Criman 165 TROKEL GAP ROAD MP N 96-0-56.00M SBA MAMIniay 2 165 TROKEL GAP ROAD MP 1785246 96-0-56.00M Gebal Towar Co Port Republic 7229 LATAMER ROAD GLAT 1785240 96-0-56.00M Westion Westion VARIANTINE ROAD MP 1785240 96-0-56.00M Westion Westine Sorm 1250 LATAMER ROAD MP 1756240 96-1-56.00M Westine Sorm Verdin Westine Sorm 114 MITTER CALL PASTURE ROAD MP 1756240 96-1-56.00M Westine Sorm Verdin MATTER CALL PASTURE ROAD MP N 1756240 96-1-56.00M Westine Sorm Westine Sorm CTITOWARD ARMAN SORM	A-049	Crown	Fort High School	181 MORNINGSIDE LANE	Lattice	1248991	38-15-19.9N	78-58-20.4W	185	1886 8	4
American Afron GOAS HOWARDSVILE ROAD MP N 38-6-38,08N Verezon Verezon F. Delinotre 975 WILLOW SPOUT ROAD Latiba N 38-14-58,07N SBA MASCINIOR 165 CPRIOCHA STATION LAME Latiba 1,500 GES,30N 38-02-52,7N SBA MASCINIOR 165 CPRIOCHA STATION LAME MP 1,552,500 38-02-52,7N Towardo Port Repoble 7729 LATAMER ROAD MP 1,552,500 38-02-52,7N Verezon Wejer's Care 1,4 KAN WEST MP 1,552,500 38-17-42,4A Towardo Appare Spane 1,1 KAN WEST MP 1,552,500 38-17-42,4A Verezon Wejer's Care 1,5 KAN WEST MP 1,255,000 38-17-42,4A Verezon Appare Spane 1,1 KIN WEST MP 1,255,000 38-17-42,4A Verezon Appare Spane 1,1 KIN WEST REET Lattree 1,255,000 38-17-42,4A Verezon Welcon 1,2 KIN WEST REET Lattree 1,2 KIN WEST REET 1,2 KIN WEST REET<	A-050	American	Kelly Mtn / Mish	418 BROADHEAD ROAD	dN	Z	37-59-22.85N	79-10-56.96W	197	2365	4
American F. Definance 97 8 W LLOW SPOUT ROAD Lattce 150660 18-04-56.30TM SBA Vergon Crimnya 165 CFMICARS FINION LANE Lattce 120660 18-02-56.30TM SBA Toward FRENDEL GAP ROAD LAT 1355240 18-02-52.17T Toward Pert Regulate 7729 LATAMER ROAD LAF 126529 18-02-52.17T Vergon Vergon Weigers Carie 1-4 KAW WEST - MAEST LAF 126529 18-02-52.14T Vergon Weigers Carie 1-14 KAW WEST - MAEST LAF 126529 18-02-52.14T Vergon Anguest Springs 2114 UTITE CALF PASTURE ROAD LAF 18-02-52.14T Vergon Anguest Springs 2114 UTITE CALF PASTURE ROAD LAF 18-02-52.14T Vergon Anguest Springs 2114 UTITE CALF PASTURE ROAD LAF 18-02-52.14T Vergon Chapita 2525 LYMOTANI ROAD LAF 1724 172 28-02-52.14T Vergon Weigerston Weigerston Argent Contract Argent Contract Argent Contract<	A-051	American	Afton	6043 HOWARDSVILLE ROAD	MP	Z	38-0-38:09N	78-53-10.68W	112'	1650	က
Weiton Crimora 166 CPRINCINARE Liatice 1280660 36.09-66.30 M SBA MANTINEZ 166 TRONICL GAP DOLD MP N 36-26.30 M GRADAI Cower Port Republic 779 LATAMER ROAD MP 156241 38-19-36.64 M GRADAI Tower Craggorile HOLLOW LANE MP 1562619 38-19-36.64 M Weizon Weizon Weizon Augusta Springs 2114 LITTLE CALF PASTINE ROAD MP 156540 38-19-36.84 M VSP Chapin CHAPIN ALINCTION N. MAIN STREET Lattre 126570 38-19-30.34 M 38-19-50.34	A-052	American	Ft Definance	375 WILLOW SPOUT ROAD	Lattice	z	38-14-33.07N	78-59-23.06W	,001	1200	2
SEA MeXining 2 riss TRONEL CAP ROAD MP N 36.2.2.2.7.V TowerCo. Port Republic 7279 LATAMER ROAD GLAT 1556249 38-10-36.RN Varian Weizen Under Schiel 14 KIM WEST MEST MP 1556219 38-2.5.RN Varian Weizen August Springs 2114 LITTLE CALF PASTURE ROAD MP 155649 38-17-24.AN Verian August Springs 2114 LITTLE CALF PASTURE ROAD MP 155649 38-17-24.AN War August Springs 2114 LITTLE CALF PASTURE ROAD MP 155649 38-17-12.AN War August Springs 2114 LITTLE CALF PASTURE ROAD MP 155649 38-17-13.AN WAS And Sohn 1558 BWKEPH HILL ROAD MP 155649 38-17-12.AN WAS And Sohn 1558 BWKEPH HILL ROAD MP 155640 38-17-17.AN WAS And Sohn 1558 BWKEPH HILL ROAD MP 157-17.AN 38-17.17.AN WAS ORDAIN WAG 1700 MWKEPH MARKEPH HILL ROAD MP	A-053	Verizon	Crimora	166 CRIMORA STATION LANE	Lattice	1260660	38-08-56.3N	78-50-58.1W	1961	2855	4
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Global Tower Craigsville HOLLOW LANE MP 1265219 36-25.8N Verizon Verizon Meyer's Care 1,4 KM WEST- MWEST MP 126509 36-716.1N Verizon Augusta Springs 2114 LITTLE CALE PASTURE ROAD MP 126509 36-716.1N Verizon Wertzon MANT Solon 382 SCENIC ROAD MP 126509 36-16.1N VSBA Mont Solon 1255 BUNKER HILL ROAD MP 1755040 38-16.50.3N VSBA MACAMIN CARMOR 1275 BUNKER HILL ROAD MP 1755090 38-14.71.1N NATORITOR MALCAMIN CARMOR 187 SR 101 MISS MP 1724172 38-14-6.11 ANTORNIA ANTORNIA 187 SR 101 MISS MP 1727050 38-14-6.11 Beacon Verizon Stratucke VART 255 Likr Pump Rid MP N 38-15-53.0N Verizon Atlan Ryban Cochard Land Control MP N 38-15-53.0N Verizon Atlant Honthess 1100 Chard 1100 Chard 1	RHess	TowerCo	Port Republic	7279 LATAMER ROAD	GLAT	1263243	38-19-36.6N	79-49-31.3	100.	2744	63
Verizon Wilgers Carie 1.4 KM WEST- MMEST MP 1.555407 39-17-42.AI TowerCo Augusta Springs 2114 LITTLE CALF PASTURE ROAD MP 1.255099 38-7.16.1N Verizon Werton Mont Solon 392-2 SCENIC ROAD MP 1.255040 38-19-50.SM VSBA Mont Solon 1.2550 BUNKER HILL ROAD MP 1.255011 38-19-50.SM VNELCAR MAL Cawlord SPR 999 Lattice 1.256012 38-19-20.SM NTELCS Wagnesborr SR 101 MTSO MP 1.27472 38-20.SIA Global Tower Lyndhurst 2894 LYNDH/MST ROAD Lattice 1.269042 38-2-50.SIA CTIT Towers Wagnesborr 2704FWINDURST ROAD MP 1.27472 38-2-50.SIA Beaconn Wingreston 7750 ALF MOUNTAIN ROAD Lattice 1.20642 38-2-50.SIA Verizon Afton Afton Rystanton Afton Afton Afton N 38-2-20.SIA Verizon Accah Sherinadional Afton	A-056	Global Tower	Craigsville	HOLLOW LANE	MP	1265219	38-2-25.9N	79-20-7.9W	180,	1302	4
TownerCo Augusta Springs 2114 LITTLE CALF PASTURE ROAD MIP 1265069 38-7-16.1N Verzon Verzon Mort Solon 3962 SCENIC ROAD MIP 1265040 38-19-40.3N VSP Chapin CHAPIN JUNCTION-N MAIN STREET Latice 1268911 38-19-40.3N NRL Comm. Towers M. Crawford SR 101 MTSO MP 127172 38-19-40.3N NRLLOS Wagnesborn SR 101 MTSO MP 127172 38-19-40.3N OTI Towers Wagnesborn 782 CALF MOUNTAIN ROAD Lattice 1280492 38-15-65.8 OTI Towers Wagnesborn 782 CALF MOUNTAIN ROAD Lattice 128049 38-15-65.8 OTI Towers Wagnesborn 782 CALF MOUNTAIN ROAD Lattice 128045.6 38-11-10.3 Verzon Afron Afron Ryal Orbard Land corp. MP N 38-15-65.8 Verzon Sinerondo Lake Miller Howatche Miller Latin Grottees MP N 38-15-62.5 Verzon Sinerondo Lake Miller Horst Latin Road 100-0	A-057	Verizon	Weyer's Cave	1.4 KN WEST, NWEST	d#	1265447	38-17-42.4N	78-55-44.5W	185'	1792	#
Yeizon Mont Solon 3952 SCENIC ROAD MP 1265740 38-19-8.5.N SEA Mont Solon 1255 BUNKER HILL ROAD MP N 38-19-49.13N VSP Chapin Chapin CHAPIN JUNCTION. N. MAIN STREET Lattice 1268901 38-19-49.13N NTELOS Wagnesborn SR 101 MTSO MP 127172 38-10-45.1N ATELOS Wagnesborn SR 101 MTSO MP 127172 38-10-45.1N GIDIAT Tower Lynchurst 289-11/NDHURST ROAD IAP N 38-10-45.1N GIDIAT Tower Wagnesborn 785 SALFA MOUNTAIN ROAD Lattice 1200422 38-10-45.1N AVEZO Verzon Afributst 285 Litra Pump Rot. MP N 38-15-58.8 Verzon Afributst 285 Martie Valley Rd. Lattice 1700-92.2 38-15-58.8 Verzon Afributst 281 Infamational Lane MP N 38-15-52.5 Verzon ACSA Harriston Road 1585 Martie Hill Road MP N 38-220 </td <td>A-058</td> <td>TowerCo</td> <td>Augusta Springs</td> <td>2114 LITTLE CALF PASTURE ROAD</td> <td>d/h</td> <td>1266089</td> <td>38-7-16.1N</td> <td>79-17-6.4W</td> <td>185</td> <td>1417</td> <td>च</td>	A-058	TowerCo	Augusta Springs	2114 LITTLE CALF PASTURE ROAD	d/h	1266089	38-7-16.1N	79-17-6.4W	185	1417	च
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VSP Chapin CHAPIN JUNCTION. N. MAIN STREET Lattice 1288311 38-08-55.0N NAt. Comm. Towers Mr. Crawford SR 989 Lattice 1268096 38-21-47.1N NTELOS Wagnesboro SR 101 MTSO MP 1274172 38-20.5N Gbbal Tower Lyndhurst 2894 LYNDHURST ROAD LATT 1279360 38-138.2N GD CTI Towers Wagnesboro 763 CALF MOUNTAIN ROAD Lattice 1280492 38-138.2N GENDAI Tower Lyndhurst 225 Lifer Pump Rd. MP N 38-15-56.8 Wagnes Care 3251 Lyndhurst Rd. MP N 38-15-56.3 Verizon Afran Robertield 55 Marche Valley Rd. Lattice TRD 38-13-00.0 Afran Afran Robertield 55 Marche Valley Rd. MP N 38-13-00.0 Afran Shervalloop Intil Lane 28 International Lane MP N 38-13-00.0 ACSA Hamiston Road Shervalloop ACSA Hamiston Road ACSA	RH:060	SEA	Mont Solon	1255 BUNKER HILL ROAD	dN I	z	38-19-49.13N	78-52-16.25	175	1640	4
NAIL Comm. Towers M. Crawlord SR 989 Lattice 1258096 38-21-47.1N NTELOS Waynesborn SR 101 MFSO MP 1274172 38-20.5N Global Tower Lynchurst 2894 LYNDHURST ROAD MP 1279360 38-138.2N CTI Towers Waynesborn 7753 CALF MCUNTAIN ROAD Lattice 1279360 38-138.2N Beacon Waynesborn 7753 CALF MCUNTAIN ROAD Lattice 1279360 38-138.2N Werzon Werzon Werzon Afron SS Martie Valley Rd MP N 38-12.6S Verzon Afron Afron Royal Orchard Land corp. MP N 38-12.6S Verzon Afron Afron Royal Orchard Land corp. MP N 38-12.6S Verzon Afron Royal Orchard Land corp. MP N 38-12.6S Verzon Afron Royal Orchard Land corp. MP N 38-12.6S Shervalo Intil Lane 105-10140000 Lattice N 38-12.6Z	A-061	γSP	Chapin	CHAPIN JUNCTION- N. MAIN STREET	Lattice	1268311	38-09-55.0N	79-18-49.7W	140.	4110	z
NTELOS Wagnesboro SR 101 MTSO MP 1274172 38-3-20.5N	RH062	Nat. Comm. Towers	Mt. Crawford	SR 989	Lattice	1268908	38-21-47.1N	78-54-43.9W	180,	1137	4
Gibbal Tower Lyndhuist 2894 LYNDHUIST ROAD MP 1279360 38-1-38.2N CTI Towers Waynesboro 759 CALE MOUNTAIN ROAD Lattice 1280492 38-1-38.1N Beacon Waynesboro 35 Sulher Pump Rd. MP N 38-1-56.8 Vericon Deerfield 95 Martile Valley Rd. Lattice TBD 38-11-10.3 Vericon Sherondo Lake/Miller Howardsville Tumpike MP N 38-13-10.3 Vericon Sherondo Lake/Miller Howardsville Tumpike MP N 38-11-10.3 ATAT Grothoes Int.I Lane 28 International Lane MP N 38-15-8.2 Shervalloop Int.I Lane 28 International Lane MP N 38-16-0.0 ACSA Snead Snead 1155 Usike Hill Road MP N 38-20.2 ACSA Harriston Poad 250 Troxel gap road GLAT N 38-235.2 Crown Lamer 1382 Naw Hope rd., Staurton MP N 38-295.2	A-063	NTELOS	Waynesboro	SR 101 MTSO	MP	1274172	38-3-20.5N	78-56-4.6W	190,	1294	4
CTI Towers Waynesbron 753 CALF MOUNTAIN ROAD Lattice 1230492 38-3-54.0N Beacon Weyers Cave 95 Suffer Pump Rd. MP N 38-15-56.8 Global Tower Lynchrust 3251 Lynchrust Rd. MP N 38-11-10.3 Verizon Afron Rhyal Orthard Land corp. MP N 38-11-10.3 Verizon Afron Rhyal Orthard Land corp. MP N 38-23 Verizon Shervasilcop Infl. Lane 199 Taker Rd Grottoes MP N 38-23 Shervasilcop Infl. Lane 28 Infermational Lane MP N 38-23 ASA Shervasilcop Infl. Lane 28 Infermational Lane MP N 38-262 WVPT Elikts Kob Infl. Catipasture HWY Lattice N 38-10-00 ACSA Snead 1553 White Hill Road MP N 38-235.2 Cown Lamer Lamer 1382 New Hope rd., Staurton MP N 38-235.2	A-064	Global Tower	Lyndhurst	2894 LYNDHURST ROAD	MP	1279360	38-1-38.2N	78-57-21.7W	190,	1315	4
Bearon Wegens Care 95 Suter Pump Rd. MP N 38-15-56.8 Global Tower Lyndhurst 3251 Lyndhurst Rd. MP N 38-13-10.3 Verizon Afron Boerfield 95 Martle Valley Rd. Lettree TBD 38-11-10.3 Verizon Afron Rhyal Orchard Land corp. MP N 38-229 Verizon Sherondo Laker Miller Howardsville Tumpke MP N 38-11-10.3 Verizon Afraf Grottoes 139 Teter Rd. Grottoes MP N 38-15.8.5 Afraf Filicitor Filicitor 420 Round Hill MP N 38-16.0 ACSA Sinead 1055 Little Calipasture HWY Lattise N 38-10.0 ACSA Almeriston Road 1055 Utivas Igap road GIAT N 38-25.2 Cown Laner Laner Laner N 38-26.2 1 Cown Crown Laner Laner Assurton MP N 38-25.2	A-065	CTI Towers	Waynesboro	763 CALF MOUNTAIN BOAD	Lattice	1280492	36-3-54.0N	78-48-14.0W	7.5	2681	,
Global Tower Lynchurst 3251 Lynchurst Bd. MP N 38-138.196 Verizon Deerfield 95 Marble Valley Pd. Lattbe TBD 38-11-10.3 Verizon Afton Boyal Orchard Land corp. MP N 38-229 Verizon Sherondo Laker Miller Howardsville Tumpike MP N 37-59-23 Affal Grottoes 139 Teter Rd. Grottoes MP N 37-59-23 Shervallcop Int.I Lane 28 International Lane MP N 38-16-25 WVPT Ellicis Kob 1065 Little Calipasture HWY Lattbe N 38-10-00 ACSA Harriston Road 305 Harriston road WAP N 38-220 Columbia Net. Gas Crown Laner 1382 New Hope rd., Staurton MP N 38-255 Crown Laner Laner 1382 New Hope rd., Staurton MP N 38-255	A-056	Beacon	Weyers Cave	95 Sulfer Pump Rd.	MP	z	38-15-56.8	78-52-8.38W	150'	1,142	ო
Verizon Deerfield 95 Marble Valley Rd. Lattice TBD 38-11-10.3 Verizon Afran Afran Royal Orchard Land corp. MP N 37-59-29 Afran Sherondo Laker Miller Howardsville Turrpike MP N 37-59-23 Shervalloop Inf. Lane 28 Infemational Lane MP N 38-18-25 VAVPT Ellikots Kob 1065 Little Calipasture HWY Lattice N 38-10-0.0 ACSA Snead 1563 White Hill Road MP N 38-220 ACSA Harriston Road 305 Harriston road Water Tank N 38-220 Columbia Net. Gas Crown Laner 1382 New Hope rd., Staurton MP N 38-267 Crown Laner Laner 1382 New Hope rd., Staurton MP N 38-287	A-067	Global Tower	Lyndhurst	3251 Lyndhurst Rd.	МP	Z	38-1-38.196	78-57-21.75	195	421	4
Verizon Afton Royal Orchard Land corp. MP N 38-229 Verizon Sherondo Lake/Miller Howardsville Tumpike MP N 37-59-5.31 AT&T Grottoes 139 Teter Rd. Grottoes MP N 38-15-8.25 Shervalkorp Int.l Lane 28 International Lane MP N 38-15-8.25 WVPT Elliots Kob 1065 Little Calipasture HWY Lattice N 38-16-0.0 ACSA Snead 1563 White Hill Road MP N 38-20 ACSA Harriston Road 305 Harriston road Water Tank N 38-20 Columbia Nat. Gas Crown Lanier 1382 New Hope rd., Staurton MP N 38-283.7 Crown Lanier Isasz New Hope rd., Staurton MP N 38-283.7	A-068	Verizon	Deerfield	95 Marble Valley Rd.	Lattice	TBO	38-11-10.3	78-24-38.0W	285	2202.	5
Verizon Sherondo Lake/Miller Howardswille Tumpike MP N 37-59-5.31 AT&T Grottoes 139 Teter Rd. Grottoes MP N 38-15-8.25 Sherwalkop Int.I Lane 28 Infemational Lane MP N 38-15-8.25 WVPT Ellicts Kob 1065 Little Calipasture HWY Lattice N 38-10-00 ACSA Snead 1563 White Hill Road MP N 38-220 ACSA Hamiston Road 300 Hamiston noad Water Tank N 38-235 Columbia Nat. Gas Creatysville 760 Troxel gap road GLAT N 38-35.2 Crown Lamer Lamer 1382 New Hope nd., Staunton MP N 38-285.7	A-069	Verizon	Afton	Royal Orchard Land corp.	MP	Z	38-2-29	78-52-11.63W	195	1775	4
AT&T Grottoes 139 Teter Rd. Grottoes MP N 38-15-825 Shervallcop Int.l Lane 28 International Lane MP N 38-18.2 Local TV Round Hilf/Stuarts Draft 420 Round Hilf N 38-10-00 WVPT Ellifots Kob 1065 Little Catifpasture HWY Lattice N 38-10-00 ACSA Snead 1563 White Hill Road MP N 38-220 ACSA Harriston Road 309 Harriston road Water Tank N 38-235 Coldumbia Net. Gas Cragisville 760 Troxel gap road GLAT N 38-287 Crown Lamer 1382 New Hope rd., Staurton MP N 38-287	A-070	Verzon	Sherondo Lake/Miller	Howardsville Turnpike	MP I	z	37-59-5.31	78-59-14.62W	195'	1483'	4
Shervalkop Int.l Lane 28 International Lane MP N 38-5.12 Local TV Round Hilf/Stuarts Draft 420 Found Hilf Lattice N 38-36.2 WVPT Elikots Kob 1065 Little Calipasture HWY Lattice N 38-10-00 ACSA Snead 1563 White Hill Road IMP N 38-220 ACSA Harriston Road 306 Harriston road Water Tank N 38-220 Columbia Nat. Gas Cragisville 760 Troxel gap road GLAT N 38-2-35.2 Crown Lamer 1382 New Hope rd., Staurton MP N 38-9-28.7	A-071	AT&T	Grottoes	139 Teter Rd. Grottoes	MP	Z	38-15-8.25	78-49-10.96	195'	1203'	4
Local TV Round Hill/Stuarts Draft 420 Found Hill Lattise N 38-36.2 WVPT Elliets Kob 1065 Little Califpasture HWY Lattise N 38-10-0.0 ACSA Snead 1563 White Hill Road MP N 38-2-0 Columbia Net. Gas Cragsville 760 Harriston road Water Tank N 38-2-35.2 Columbia Net. Gas Cragsville 760 Troxel gap road GLAT N 38-2-35.2 Cown Larner 1382 New Hope rd., Staurton MP N 38-2-35.2	A-072	Sherrvallcop	Int.! Lane	28 International Lane	MP	Z	38-6-18.2	79-413.4	100,	1520'	લ
WVPT Elkots Kob 1065 Little Calipasture HWY Lattice N 38-10-00 ACSA Snead 1563 White Hill Road IMP N 38-220 ACSA Harriston Road 305 Harriston road Water Tank N 38-230 Columbia Net. Gas Cratics/ille 750 Troxel gap road GLAT N 38-235.2 Crown Lamer 1382 New Hope rd., Staurton MP N 38-928.7	A 073	Local TV	Round Hill/Stuarts Craft	420 Found Hill	Lattice	Z	38-3-6.2	79-1-42	120'	1481	-
ACSA Snead 1569 White Hill Road MP N 38-2-20 ACSA Harriston Road 305 Harriston road Water Tank N 38-7-38 Columbia Net. Gas Cradgoville 760 Troxel gap road GLAT N 38-2-35.2 Crown Lamer 1382 New Hope rd., Staurton MP N 38-9-28.7	A-074	WVPT	Elliots Kob	1055 Little Calipasture HWY	Lattice	z	38-10-0.0	79-18-51.85	40,	4439	-
ACSA Harriston Road 309 Harriston road Water Tank N 38-7-38 Columbia Net. Gas Craigsville 760 Troxel gap road GLAT N 38-2-35.2 Crown Lamer 1382 New Hope rd., Staurton MP N 38-9-28.7	A-075	ACSA	Snead	1563 White Hill Road	MP	z	38-2-20	79-3-20	140.	1641	2
Columbia Net. Gas Craigsville 750 Troxel gap road GLAT N 38-2-35.2 Crown Lamer 1382 New Hope rd., Staurton MP N 38-9-28.7	A-076	ACSA	Hamiston Road	306 Harriston road	Water Tank	Z	38-7-38	79-4.36	90	1582	2
Crown Lamer 1382 New Hope rd., Staurton MP N 38-9-28.7	A:077	Columbia Net. Gas	Cragsville	760 Troxel gap road	GLAT	Z	38-2-35.2	79-19-40	199,	2760	4
A-050	A-078	Crown	Lamer	1382 New Hope rd., Staunton	MP	z	38-9-28.7	79-0-41	195	1362	4
A-090	A-079	The second second second									
	A-080										

Potential Sites for Co-Location of Antennas

1. Power Transmission Line Towers

Virginia Power Company has several large power transmission corridors which cross the County in which power mounts could be added to serve as telecommunications facilities. These corridors consist of easements and right-of-ways and combined are over several miles in length. These corridors offer many opportunities for co-location of transmission towers and communications antennas. Virginia Power has worked closely with the telecommunications industry in facilitating co-location of transmission towers and communication antennas, as well as, co-location within its right-of-way.

2. Buildings

Antennas can be mounted on the roofs or sides of buildings. While most buildings in the County are less than 35' tall, there are some structures that are taller and could be used for colocation opportunities.

3. Churches

Many churches in the County present the wireless provider with the potential for locating antennae inside of existing steeples or of building a steeple for a church that does not presently have one. The church community may welcome these suggestions, as it provides a source of income for a non-profit organization.

4. Public Sites

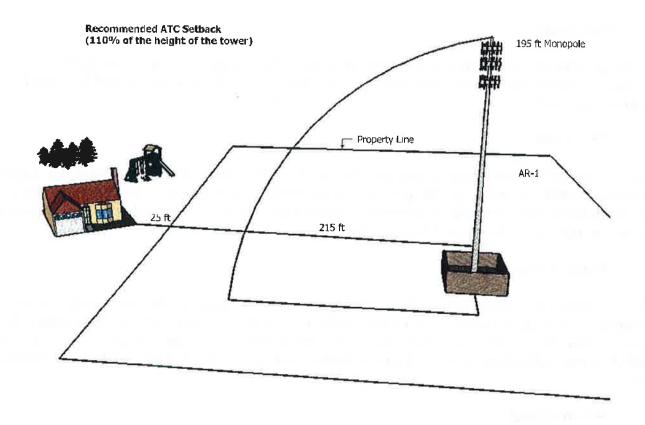
The governmental sites within the County that may be appropriate for siting commercial wireless communications facilities include selected fire stations, libraries, landfills, post offices, water tanks and other public facilities. These facilities are often large enough to allow sufficient separation from surrounding residential uses or are located adjacent to industrial land use.

5. Private Land

Although the use of existing facilities is to be preferred to the construction of new ground-mounted facilities, there are opportunities for the development of freestanding mounts on private land. In particular, there are several acres of land zoned for industrial use that could be used for new tower locations.

Structural Hazards

The structural hazards associated with wireless facilities include the potential collapse of the antenna mount and the potential of equipment or debris falling from the structure. Tower structures are constructed to BOCA National Building Code Standards and can withstand hurricane force winds up to 110 mph. Structures are also designed to collapse into themselves if there is a failure. In response to potential hazards, some local governments designate a "fall zone" around the base of the antenna mount. These are generally exposed as distance-to-height ratios. The County of Augusta Zoning Ordinance currently requires fall zone setbacks.



New Construction in PCTDA

The purpose of this analysis is to identify areas of the County with little or no service of wireless voice or broadband and to identify potential sites that would fill in the gaps of the current service and address the next generation (4G) services.

Twenty one (21) Potential Commercial Tower Development Areas (PCTDAs) are identified in the analysis as areas suitable for future tower development. (Table 2.) These have been identified as a "community" site generically to that area and not specifically to any individual property. Any property that is within a one (1) mile radius of the Latitude and Longitude of the PCTDA site indicated on the maps may be suitable for a tower site. The mark on the map is the center for a 1-mile radius to locate a potential tower site. (See PCTDA site maps pages 19-39 and Exhibit 4-1.)

These sites were selected from a study of the existing structures, the propagation analysis that results from existing 3rd Generation of 3G service, and the movement by all carriers to provide 4G service within the next few years.

When studying the county, topography becomes a major factor. Because of ridgelines, valleys, roads and community locations, the topography becomes a major concern. If you look at most of the rural areas where service is not currently adequate, most are located in areas where topography is a challenge.

The lack of service begins with 3G service but 4G service will be provided for when the carrier co-locates the new equipment for 4G on the proposed 21 towers and the existing tower sites that they occupy. Wireless broadband can be transmitted from a 3G network, however the 4G equipment will provide greater bandwidth and more users.

These sites in Table 2 are representative and not in any order of priority, meaning that a tower of the specified height built within a 1 mile radius will provide the signal indicated per carrier. These locations are approximate and should not be considered as an absolute. All tower site PCTDA will follow all existing submittals to the Department of community Development.

Potential Communications Tower Development Areas

Table #2

PCTDA	Name	Latitude	Longitude	AGL.
1	West Augusta	38-16-34.5	79-18-22	195'
2	Marble Valley	38-7-55.0	79-25-32.5	195'
3	Summerdean	38-4-29.0	79-15-24.2	195'
4	Middlebrook	38-3-2.8	79-12-52	195'
5	Deerfield	38-8-3.9	79-25-26.2	285'
6	Stokesville	38-21-6	79-8-52	195'
7	Todd Lake Rec.	38-21-53.2	79-12-25.7	195'
8	Camp May Flather	38-21-57.1	79-9-51.8	195'
9	Stribling Springs	38-18-26.3	79-10-31.2	195'
10	Parnassus	38-17-39.4	79-07-5.1	195'
11	Moscow	38-19-12.5	79-5-33.7	195'
12	Spring Hill	38-15-27	79-2-56.8	195'
13	Roman Road	38-16-58.1	79-00-52.9	195'
14	Centerville	38-20-22.1	79-00-9.3	195'
15	Arbor Hill	38-6-11.5	79-9-29.4	195'
16	Sherando	37-56-34.8	78-57-48.1	195'
17	Crimora	38-10-22.7	78-50-50.5	195'
18	New Hope	38-11-57.3	78-54-11.3	195'
19	Steeles Tavern	37-55-34.7	79-11-53.7	195'
20	Stoney Creek	37-59-11.8	79-6-57.4	195'
21	Rivermont /Lake Road	38-0-27.8	79-1-38.4	195'

Any proposal to construct a new tower in one of the twenty-one (21) PCTDAs is not exempted from being processed through the normal County Zoning review process. The purpose of this review is to ensure conformance with applicable ordinances and standards. The basic steps and information required in order to process an application for new tower construction is described below.

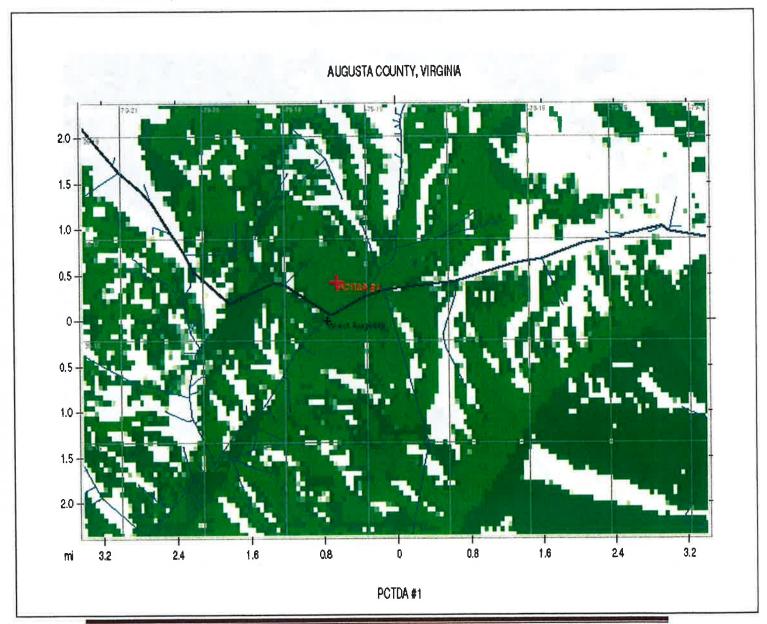
Potential Commercial Tower Development Area

PCTDA SITE #: 1.

NAME: West Augusta

Latitude: 38-16-34.5 **Longitude:** 79-18-22

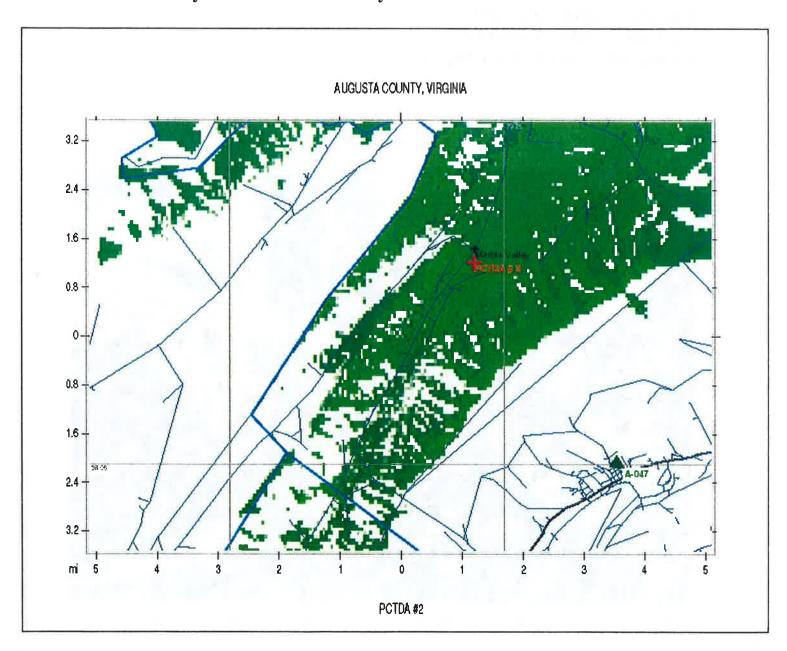
Height of Tower: AGL: 195'
Co-Location Slots Available: 5
Community Served: West Augusta



PCTDA SITE #2.

NAME: Marble Valley

Latitude: 38-7-55.0N Longitude: 79-25-32.5 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Marble Valley

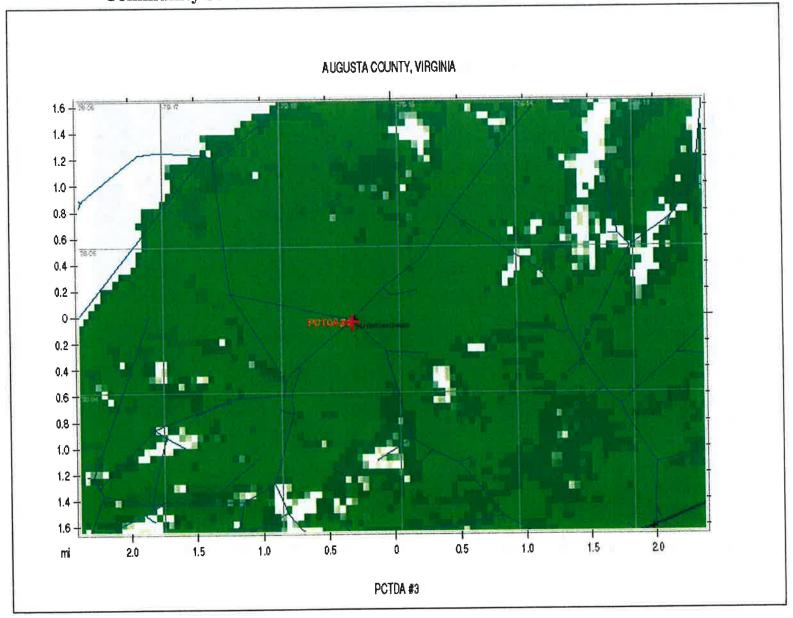


PCTDA SITE: #3.

NAME: Summerdean

Latitude: 38-4-29N

Longitude: 79-15-24.2 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Summerdean

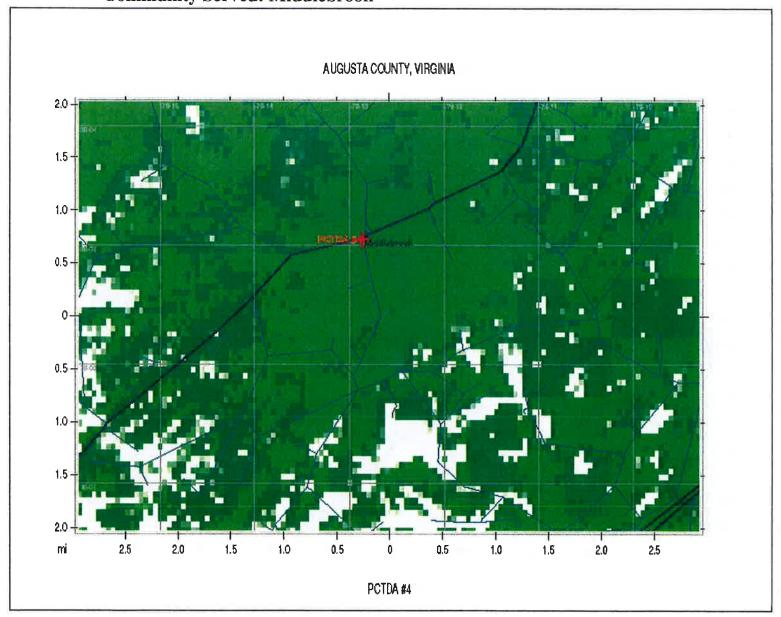


PCTDA SITE #4.

NAME: Middlebrook

Latitude: 38-3-2.8 N Longitude: 79-12-52 W

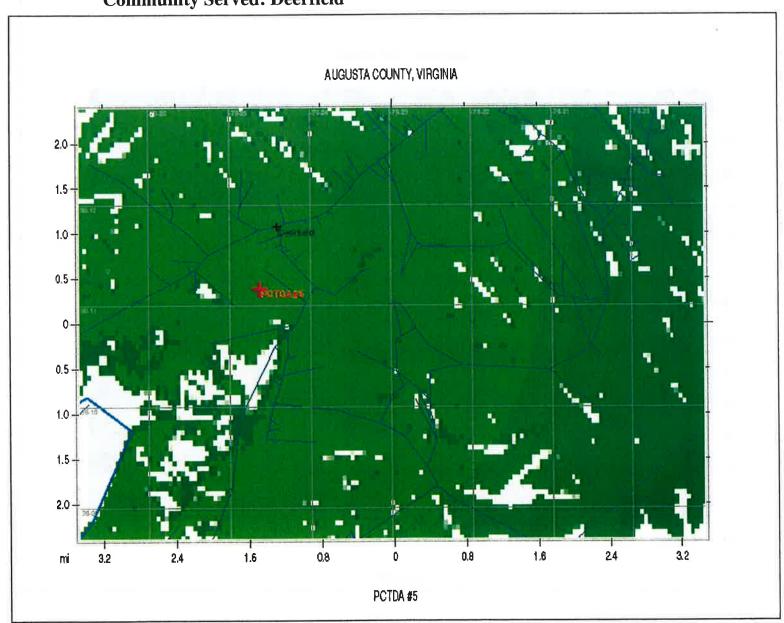
Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Middlebrook



PCTDA SITE #: 5.

NAME: Deerfield

Latitude: 38-8-3.9 N Longitude: 79-25-26.2 W Height of Tower: AGL: 285' Co-Location Slots Available: 5 Community Served: Deerfield

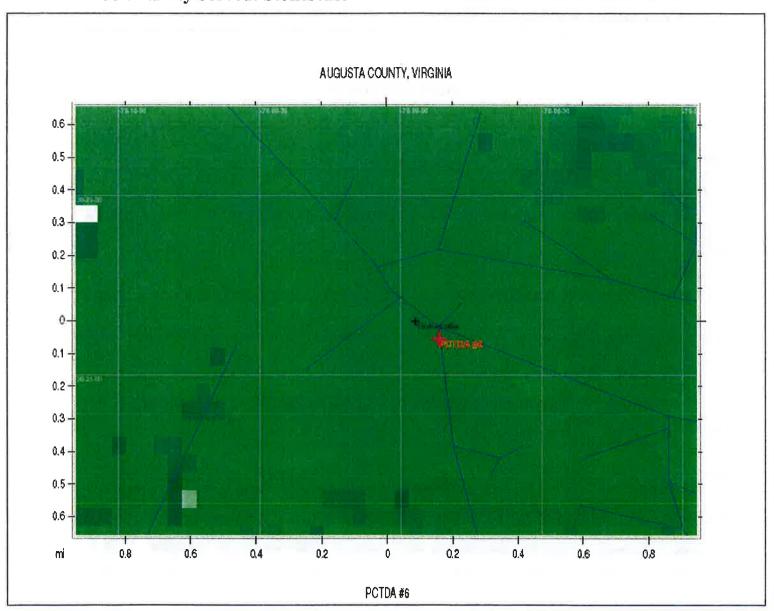


PCTDA SITE #: 6.

NAME: Stokesville

Latitude: 38-21-6 N Longitude: 79-8-52 W

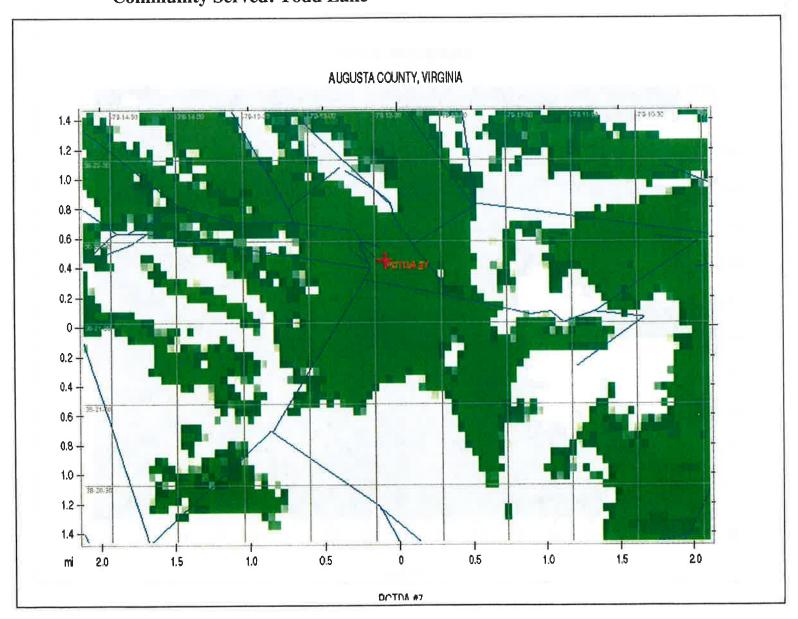
Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Stokesville



PCTDA SITE #: 7.

NAME: Todd Lake Recreational Area

Latitude: 38-21-53.2 N Longitude: 79-12-25.7 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Todd Lake

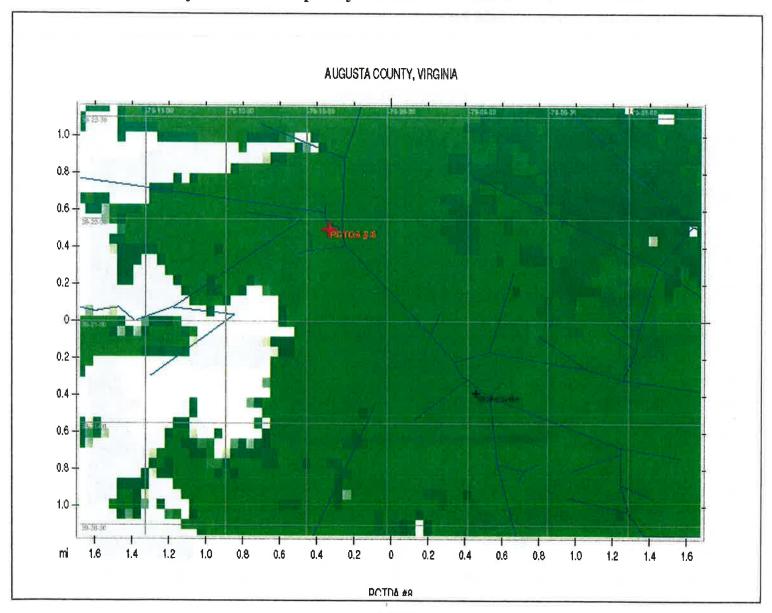


PCTDA SITE #: 8.

NAME: Camp May Flather

Latitude: 38-21-57.1 N Longitude: 79-9-51.8 W Height of Tower: AGL: 195' Co-Location Slots Available: 5

Community Served: Camp May Flather

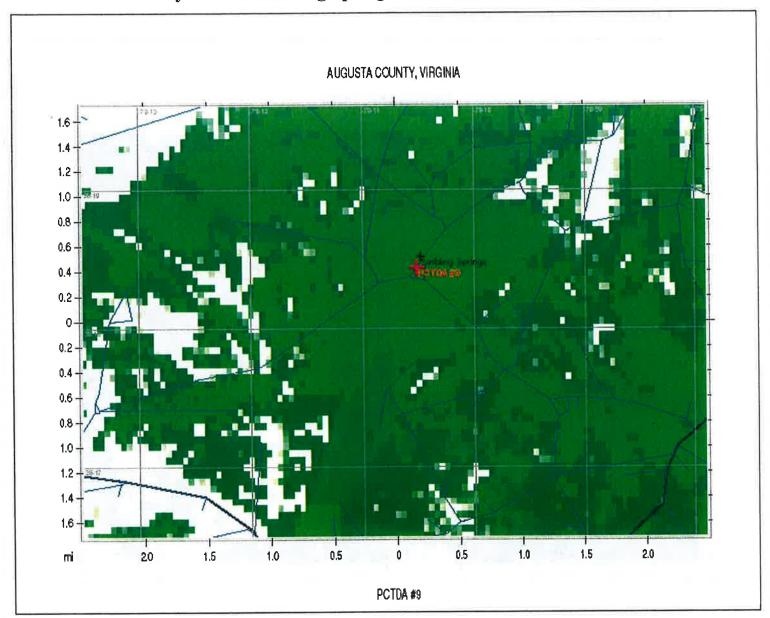


PCTDA SITE #: 9.

NAME: Stribling Springs

Latitude: 38-18-26.3 N Longitude: 79-10-31.2 W Height of Tower: AGL: 195' Co-Location Slots Available: 5

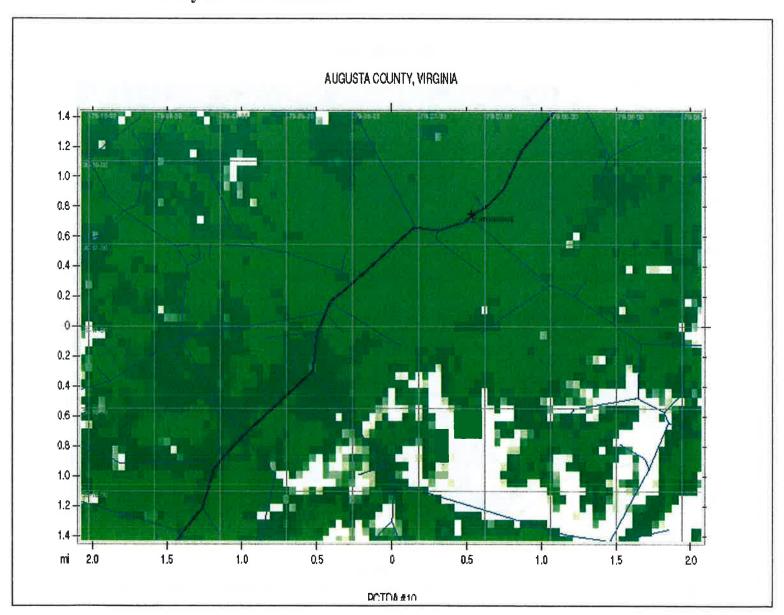
Community Served: Stribling Springs



PCTDA SITE #: 10.

NAME: Parnassus

Latitude: 38-17-39.4 N Longitude: 79-07-5.1 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Parnassus

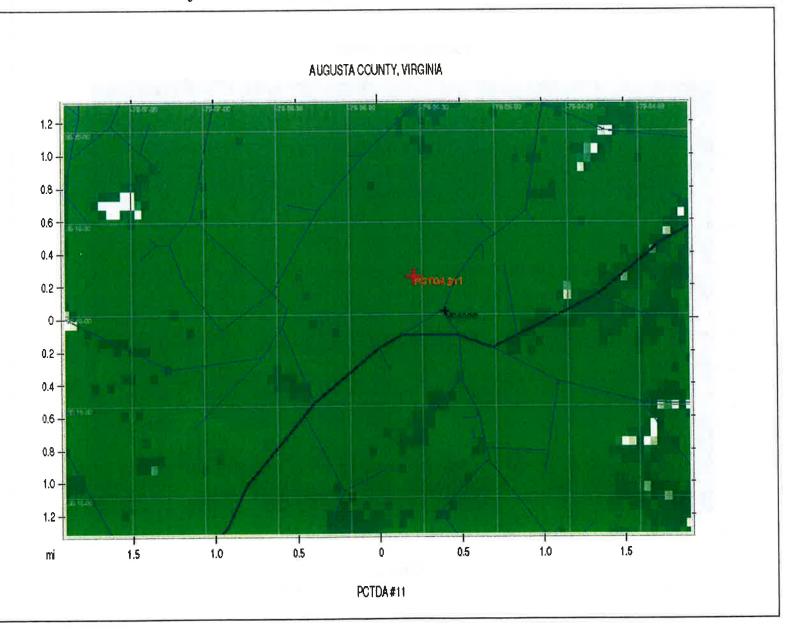


PCTDA SITE #: 11.

NAME: Moscow

Latitude: 38-19-12.5 N Longitude: 79-5-33.7 W

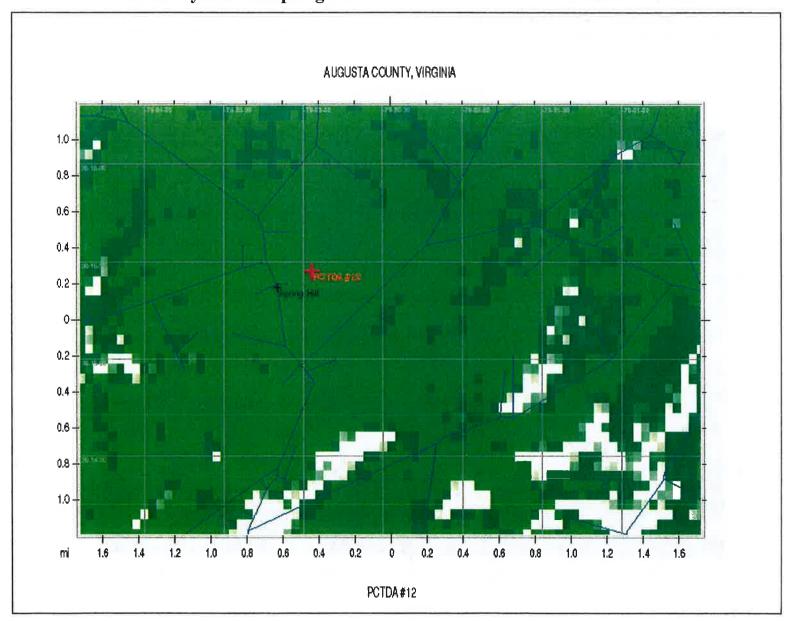
Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Moscow



PCTDA SITE #: 12.

NAME: Spring Hill

Latitude: 38-15-27 N Longitude: 79-2-56.8 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Spring Hill

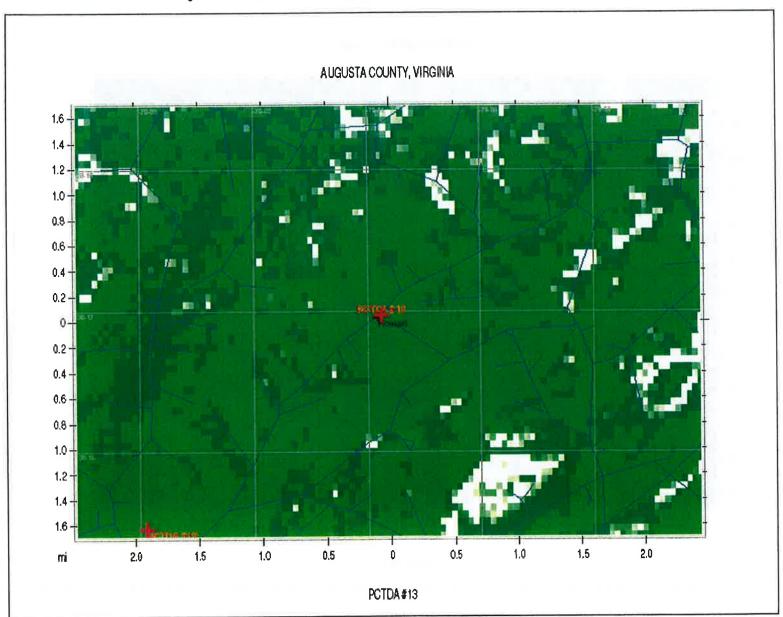


PCTDA SITE #: 13.

NAME: Roman Road

Latitude: 38-16-58.1N Longitude: 79-00-52.9 W Height of Tower: AGL: 195' Co-Location Slots Available: 5

Community Served: Roman Road corridor

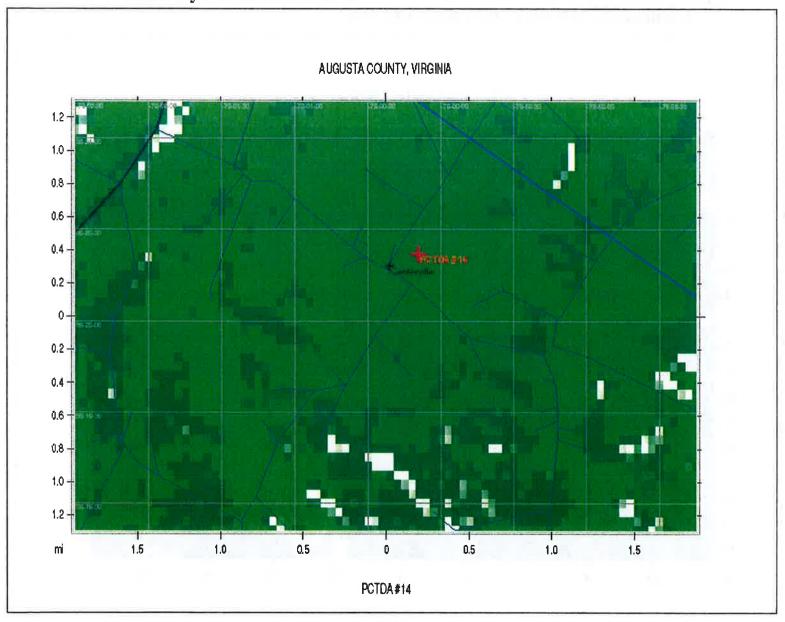


PCTDA SITE #: 14.

NAME: Centerville

Latitude: 38-20-22.1 N Longitude: 79-00-9.3W

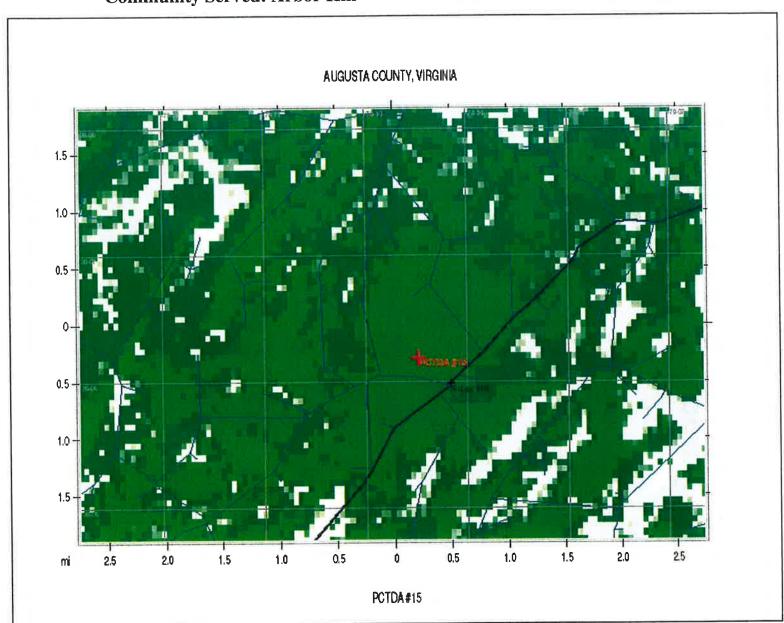
Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Centerville



PCTDA SITE #: 15.

NAME: Arbor Hill

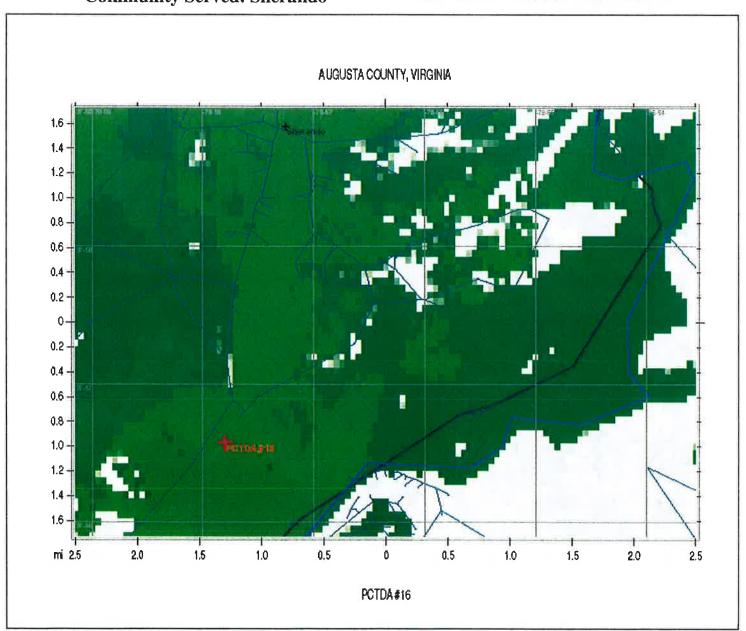
Latitude: 38-6-11.5 N Longitude: 79-9-29.4W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Arbor Hill



PCTDA SITE #: 16.

NAME: Sherando

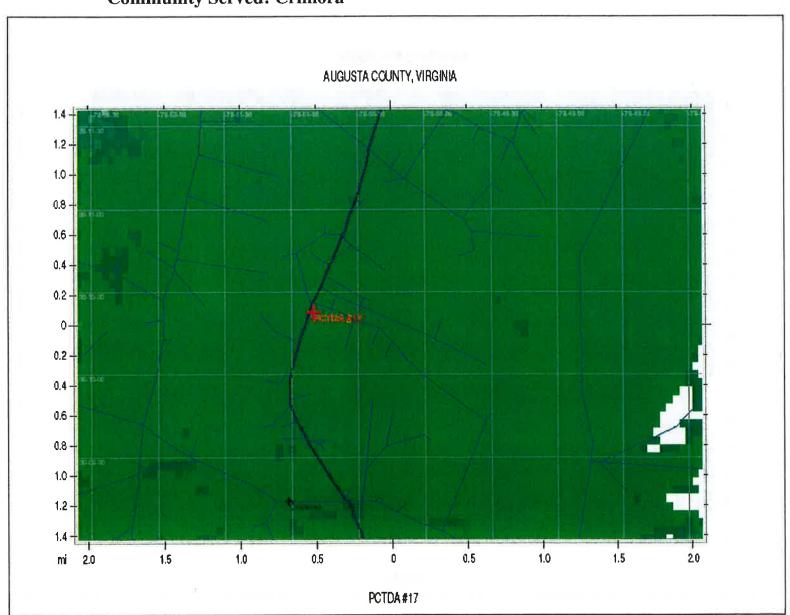
Latitude: 37-56-34.8 N Longitude: 78-57-48.1 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Sherando



PCTDA SITE #: 17.

NAME: Crimora

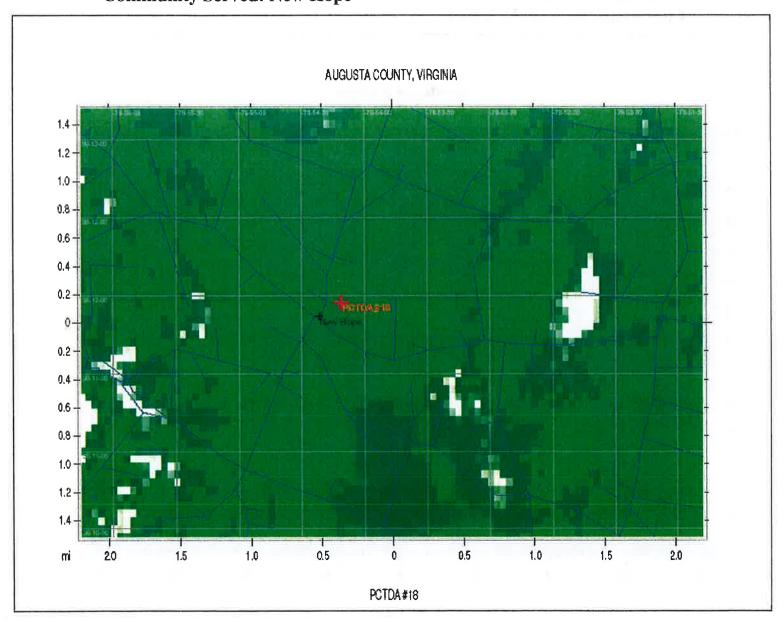
Latitude: 38-10-22.7 N Longitude: 78-50-50.5 W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Crimora



PCTDA # 18

NAME: New Hope

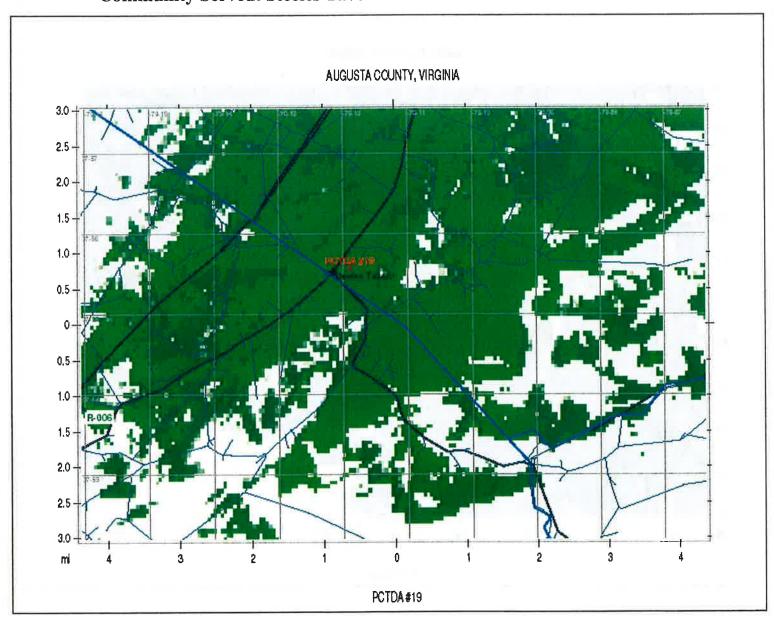
Latitude: 38-11-57.3 N Longitude: 78-54-11.3W Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: New Hope



PCTDA SITE #: 19.

NAME: Steeles Tavern

Latitude: 37-55-34.7 N
Longitude: 79-11-53.7W
Height of Tower: AGL: 195'
Co-Location Slots Available: 5
Community Served: Steeles Tavern



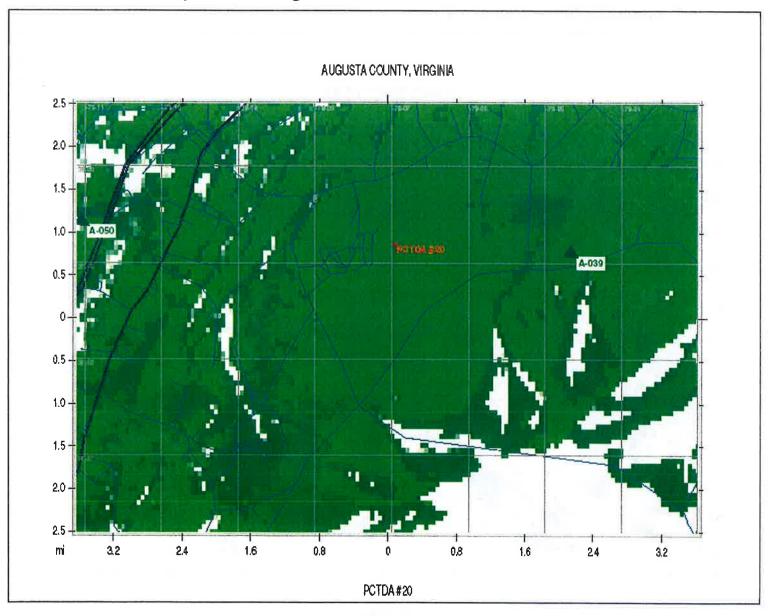
PCTDA #20

NAME: Stoney Creek

Latitude: 37-59-11.8 N Longitude: 79-6-57.4

Height of Tower: AGL: 195' Co-Location Slots Available: 5

Community Served: Sengers Mtn. Lake

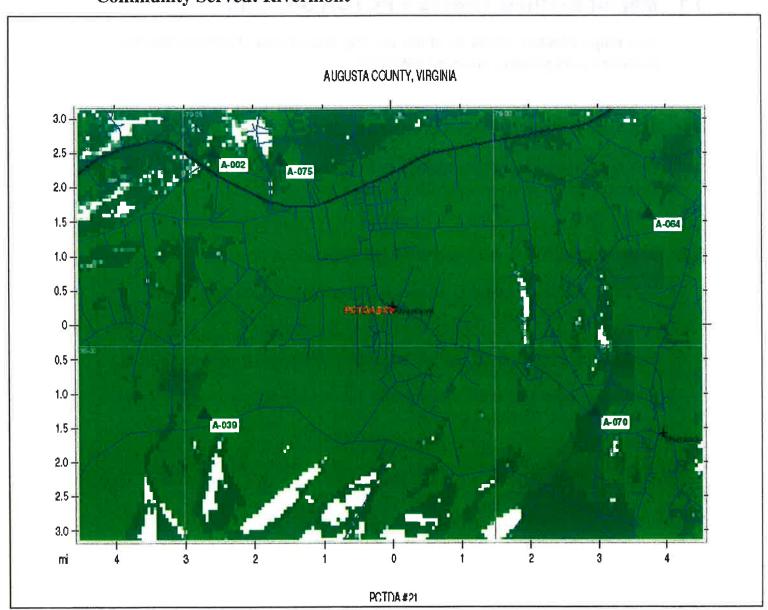


PCTDA SITE #: 21.

NAME: Rivermont/Lake Road

Latitude: 38-0-27.8 N Longitude: 79-1-38.4 W

Height of Tower: AGL: 195' Co-Location Slots Available: 5 Community Served: Rivermont



Exhibits:

4.0 FCC License Holders

4.1 Map of Existing Towers + PCTDA Structures

This map indicates where all of the existing towers and structures that has antennas or is pending to house antennas.

4.2 Map of Existing 3-G Coverage Only

This map indicates what the existing 3-G coverage is and what potential 4-G coverage will be when this service comes to Augusta County.

4.3 Map of PCTDA 4-G Coverage Only

This map indicates what 4-G coverage will be if PCTDA are built in total.

4.4 Map of Future 4-G Coverage for Wireless Broadband

This map indicates what existing and future 4-G coverage will be with existing and PCTDA sites are built.

Exhibit 4.0

FCC License Holders

The Federal Communications Commission (FCC), established in 1934, is an independent United States government agency. The FCC is charged with regulating interstate and international communications by radio, television, wire, satellite and cable. Among its responsibilities, the FCC grants licenses to license holders to operate at certain frequencies or within certain frequency ranges. The FCC also ensures that wireless telecommunication service providers comply with the Communications Act and Commission rules, orders and policies. The Wireless Telecommunications Bureau is a branch of the FCC and is responsible for all domestic wireless telecommunication programs, except those involving satellites. Listed below are the current wireless communication providers licensed by the FCC to operate in Augusta County. They are:

- 1. AT&T Wireless (merged with New Cingular)
- 2. Verizon Wireless (merged with GTE and ALLTEL)
- 3. NTELOS Wireless
- 4. Sprint/Nextel
- 5. T-Mobile
- 6. US Cellular

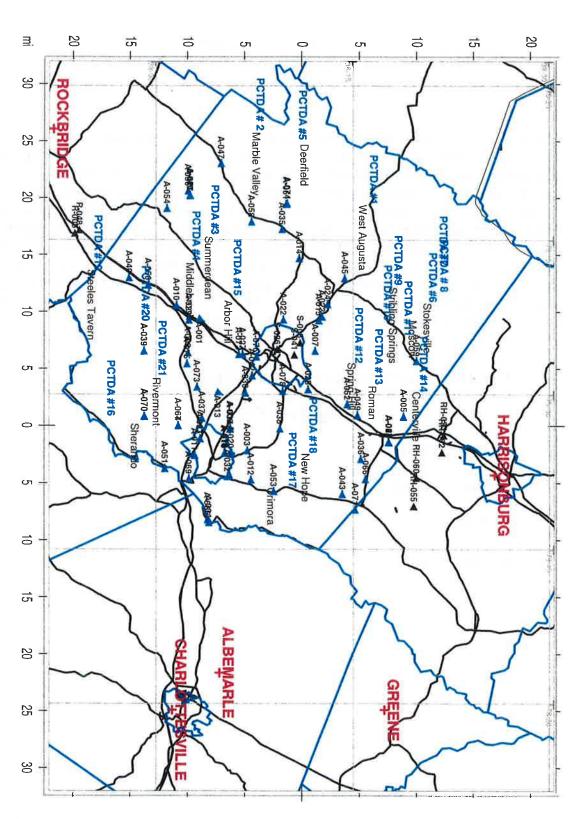
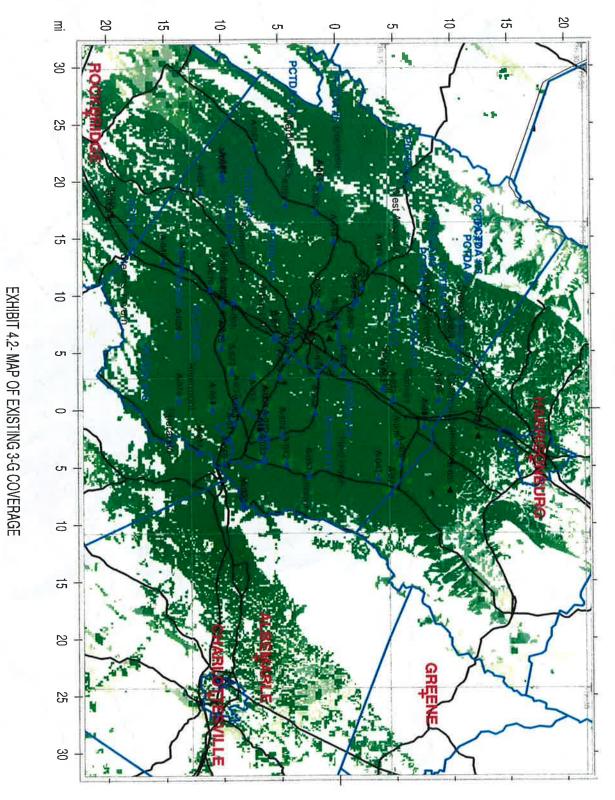


EXHIBIT 4.1- MAP OF EXISTING TOWERS + PCTDA STRUCTURES



AUGUSTA COUNTY, VIRGINIA

EXHIBIT 4.3 - MAP OF PCTDA 4-G COVERAGE ONLY

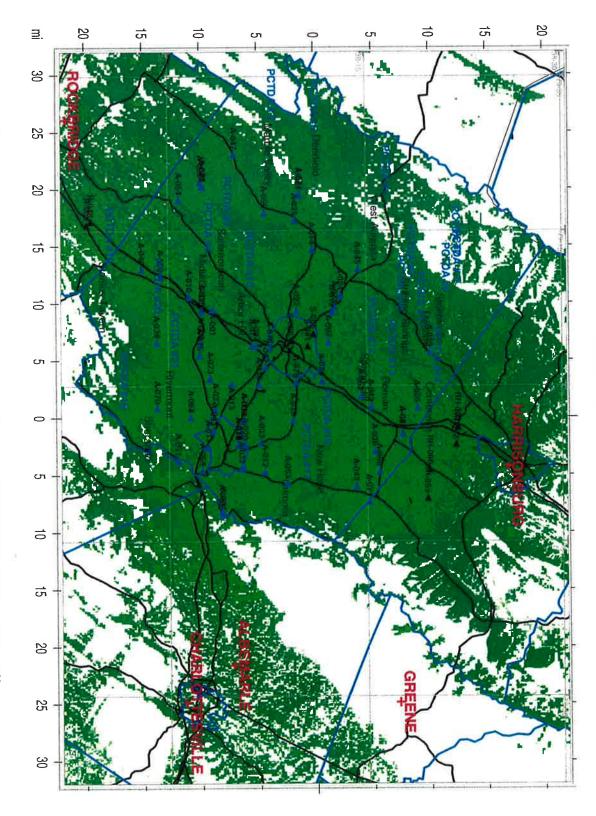


EXHIBIT 4.4 FUTURE 4-G TOTAL COVERAGE: WIRELESS BROADBAND WITH EXISTING TOWERS & PCTDA STRUCTURES