

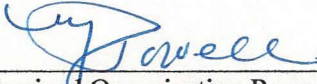
---

**U.S. Department of Commerce  
Broadband Technology Opportunities Program  
Authentication and Certifications**

---

1. I certify that I am the duly Authorized Organization Representative (AOR) of the applicant organization, and that I have been authorized to submit the attached application on its behalf.
2. I certify that I have examined this application, that all of the information and responses in this application, including certifications, and forms submitted, all of which are part of this grant application, are material representations of fact and true and correct to the best of my knowledge, that the entity(ies) that is requesting grant funding pursuant to this application and any subgrantees and subcontractors will comply with the terms, conditions, purposes, and federal requirements of the grant program; that no kickbacks were paid to anyone; and that a false, fictitious, or fraudulent statements or claims on this application are grounds for denial or termination of a grant award, and/or possible punishment by a fine or imprisonment as provided in 18 U.S.C. §1001 and civil violations of the False Claims Act.
3. I certify that the entity(ies) I represent have and will comply with all applicable federal, state, and local laws, rules, regulations, ordinances, codes, orders and programmatic rules and requirements relating to the project. I acknowledge that failure to do so may result in rejection or deobligation of the grant or loan award. I acknowledge that failure to comply with all federal and program rules could result in civil or criminal prosecution by the appropriate law enforcement authorities.
4. I certify that the entity(ies) I represent has and will comply with all applicable administrative and federal statutory, regulatory, and policy requirements set forth in the Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements ("DOC Pre-Award Notification"), published in the Federal Register on February 11, 2008 (73 FR 7696), as amended; DOC Financial Assistance Standard Terms and Conditions (Mar. 8, 2009); the Department of Commerce American Recovery and Reinvestment Act Award Terms (Apr. 9, 2009); and any Special Award Terms and Conditions that are included by the Grants Officer in the award.
5. I certify that any funds awarded to the entity(ies) I represent as a result of this application will not result in any unjust enrichment of such entity(ies) or duplicate any funds such entity(ies) receive under federal universal service support programs administered by the Universal Service Administrative Corporation (USAC).
6. I certify that the entity(ies) I represent has secured access to pay the 20% of total project cost or has petitioned the Assistant Secretary of NTIA for a waiver of the matching requirement.

3/18/2010  
Date

  
Authorized Organization Representative Signature

MICHAEL POWELL  
Print Name

President / CEO  
Title





# Michael Dale Powell



Mpowell@OnWav.com

**Education:** Ed.S, Education Specialist in Instructional Leadership, 2003  
Tennessee Technological University  
MA, Masters of Art in Instructional Leadership, 2002  
Tennessee Technological University  
BS, Business Administration, Management/Personnel, 1985  
Tennessee Technological University

**2006- Founding President/CEO,**  a CLEC authorized throughout Tennessee, is a corporation who specializes in providing data, voice, and video services through wireless connections. One of the first in the nation to deploy a true WiMax network in the 3.65 frequency, OnWav has built and maintains a successful middle and last mile network covering 30 square miles in the City of Cookeville, TN. In less than a year from launch, OnWav has been able to become cash-flow positive and continues to build upon that successful model daily.

**2001- Founder and CEO,** , a Master Agency for ATT, Qwest, and UsLec currently serving over 1,000 business and residential customers throughout the Upper Cumberland Region of Tennessee by delivering the full spectrum of communications services from these major companies. Partnered with TCS and Epic Technologies to sell and install phone equipment. Currently work hand and hand with all levels of telecommunications personnel from CEOs on special projects to helping technicians install and trouble shoot. Currently manage sub-agents and all aspects of the Master Agency such as accounting, tax preparation, payroll, and budgeting, etc; worked heavily in different areas of telecommunications since 1995 such as sales, customer service, customer provisioning, trouble shooting, etc.

**1991- Director, Volunteer State Community College, Livingston Campus**  
Responsible for all aspects of an Associate Degree Granting Center that averages 500 plus students each semester. The Livingston Campus consists of 50 faculty and staff.

## Highlighted duties:

- Developed college from ground floor of 14 students
- Manage daily operations
- Train staff and conduct weekly staff meetings
- Develop and maintain budget
- Serve as liaison resolving conflicts/concerns between students and faculty
- Serve as community liaison
- Develop programs and grants

**1987- Founder and CEO**, Career Development Center, Cookeville, TN 38501.  
The CDC contracted with the State of Tennessee to serve disadvantaged youth in career and employability skills training in the Upper Cumberland Region.

**Highlighted duties:**

- Responsible for all aspects of Center and daily operations
- Created, planned and implemented programs
- Developed and monitored budget
- Hired and trained staff
- Organized events

**1978- Founder and owner, RAMCO**, a Licensed Electrical and Plumbing Contractor Business; managed all aspects of an electrical and plumbing business. Sole responsibilities included job development to completion including bidding, accounting, invoicing, employee management, installing conduit and wiring to finishing trim out and inspection.

**1975—Founder and owner, Powell Trucking**, Owner/Operator of semi-tractors and trailers; built the business to a three truck operation. Responsibilities included haul development, bookkeeping, driving and managing drivers, adhering to all legal requirements, repairs and maintenance.

**Personal:** Search committee member for Tennessee Tech University and Volunteer State College, Dedicated community supporter, Active Board of Director for the Livingston/Overtown County Chamber of Commerce, Charter President Kiwanis International, Taught Senior Adult Sunday School Class, Play/Sing music in church band, Experienced traveler, and Developed a Youth Services Programs throughout 14 Upper Cumberland counties from 1981 to 1987.

**Character References:**

State Representative John Mark Windle, Livingston TN 38570


Attorney John Roberts, Livingston TN 38570

Attorney Jim Madewell, Cookeville TN 38501

Attorney Robert E Washburn, Pall Mall TN 38556

## Charlotte Ann Smith



**2007- Director Customer Care and Marketing,**  , a CLEC authorized throughout Tennessee, is a corporation who specializes in providing data, voice, and video services through wireless connections. Directs and oversees all aspects of a true caring relationship between customers and OnWav. Relies on experience and judgment to plan and maintain a solid customer care unit that balances corporate missions to daily customer needs. Builds and maintains customer records to ensure compliance. Builds and maintains good community relations and reports to top management. Currently serves as Secretary for the OnWav, Inc Board of Directors.

**2002-** CanISave.com, Telecommunications customer service specialist and sub-agent, CanISave.com is a Master Agency for ATT/ACC, PNG/Qwest, and UsLec/Paetec; responsibilities include sales, customer analysis, customer provisioning, and complete customer service. Routinely work with ILECs to provision customers and resolve any customer issues.


**1990-** Union Bank, Served in many areas of banking mainly in customer service, vault, and teller. Developed a deep understanding and skill set in customer service. Daily duties included making sure that every customer was cared for appropriately and effectively. Other skills developed and used include accounting, financial planning, and secretarial skills.

**Personal:** Self-trained chef, active in church and community, loves knitting and making things with my hands, takes time for family.



## BEAUREGARD SMITH

Mobile: [REDACTED]  
Bsmith@OnWav.com

**2007- Vice President Sales and Operations, **, Provides overall direction and guidance to the operational activities of the organization by using a hands on approach to all active technical operations of the company. Maximized wireless deployment skills and knowledge from ground floor skill building to running a solid, secure and successful city-wide last mile deployment.

### **Primary Duties and Responsibilities:**

- Leads all technical levels of the organization.
- Works closely with ILECs and other telecom vendors to ensure best cost, practices and effort.
- Manages organization operations by directing and coordinating activities consistent with established goals, objectives, and policies.
- Implements programs to ensure attainment of business plan for growth and profit.
- Provides direction and structure for operating units.
- Implements improved processes and management methods to generate higher ROI and workflow optimization. 5.
- Develops and creates strategies and policies aligned with organizational goals.
- Serves as Treasurer on the OnWav, Inc Board of Directors.
- Designed a WiMax network to support VOIP directly to the PSTN, Internet Access and various managed services.

### **2005- Frontier Communications, Enterprise Sales and Account Manager**

- Work within parameters of government tariffs and regulations to provide customer services with a balance of price and value
- Successfully managed a growth of 2.5 million dollar a year base.
- Worked with newer deregulated IP and wireless IP products.
- Managed the development of BDT(Business Development Tools) which compare the cost of ILEC builds, state and federal tariffs, and business needs to find a meaningful relationship between the three entities.
- Managed large companies such as Averitt Express, Oreck Vacuums, SunTrust Bank, State of Tennessee, Cookeville City Government, and Multiple Government Funded Agencies
- Worked to gain city approval and worked engineering to deploy a WiFi Network covering 4 square miles in Cookeville, TN

### **2001- CanIsave.com Telecommunications, Sales Manager/Owner,**

- Sold long distance, T1, Frame-relay and etc.
- Closed \$20,000 business monthly through multiple-year contracts
- Well-versed in telecommunications industry

- Successfully generated revenue on a commission-only basis
- Dealt with many companies that are CLEC's and Resellers
- Large Customer base including: Cookeville Regional Medical Center, Cumberland Medical Center, DCI Transportation, Heritage Ford, Upper Cumberland Community Services Agency

**2004- Epic Technologies, Sales Agent**

- Generate new business sales
- Closed new business within existing customer base
- Sold high end technology solutions including data switches, IP PBX's, routers, and more.
- Successfully generated revenue on a commission only basis
- Responsible for closing over \$200,000 in business with a margin over 40%
- Customer base includes Putnam First Mercantile Bank, Boswells Harley Davidson,
- Attorney Donna Simpson, Clear Channel Radio, R&D Services, First Vision Bank

**Specialized Training**

- **Citizen's Communications Direct Sales Training**, Rochester, NY
- **Citizens Communications Professional Selling Skills Training**, Middletown, NY
- **Trango Broadband Wireless Communications Wireless Backhaul Training**  
Orlando, FL
- **Intuitive Voice EVOLUTION VOIP PBX Training**, Phoenix, AZ

**Geoff Oslund**  
Cookeville, Tennessee  
Phone - (602) 249-5728  
E-Mail- [goslund@intuitivevoice.com](mailto:goslund@intuitivevoice.com)

**Objective** To obtain an engineering position that will fully utilize my intimate knowledge of cutting edge computer technology. Specializing in Multi protocol LANs and High availability servers with large storage sub-systems, Telephony signaling/switching and Internet based products. Qualified for end user network design and troubleshooting as well as R&D test design and setup for both data and telephony networks.

#### Skill Set

**OS** Windows NT 4.0,3.51 (Workstation & Server) Small Business and Enterprise Editions, Windows 2000, Windows 3.x/95/98/XP , DOS (All Versions), AIX, DEC/Compaq True64 UNIX 4.0, MAC OS, Linux , SunOS

**NOS** Windows NT Domains, Windows PEER-PEER with Win95,WFW 3.11,NT, MS Client & LAN Manager, LANtastic OS/2, Novell 3.x, Unix, Microsoft Active Directory

**Hardware** **PC Hardware:** 8088-Pentium Pro/II/III/4 and AMD Intimate hardware knowledge of major systems manufactures (Compaq, DEC, IBM, Etc.) either single processor or Symmetrical Multi processor servers & workstations, Alpha and PPC experience as well. **Storage Systems:** ECCS RAID Storage Systems, AML Raid Controllers with JBOD system, Differential SCSI systems.

**Software Applications** **Test Tools:** SQA Robot, Test Expert, Winrunner, Empirix test tools including hammer IT and sledge hammer, Hammer Callmaster and automated speech recognition, Load Runner experience  
**Network Management:** SNMPc, Openview, SMS, and Compaq insight manager, SMC Patrol  
**Certification Testing:** MS WHQL NDETESTING Suite, Novell TMS  
**Scripting/Programming:** Basic (QB/VB), Scripting (Unix/NT), Hammer Visual Basic  
**Others:** MS Office (All Versions) specific training in MS Access

**Telephony** **Hardware:** Compaq SS7, Aspect, Meridian, Netspeak, Nortel DMS 250 & 100e , Nortel MPS1000, Aspect ACD, Digium, Sangoma  
**Software:** Genesys, Weblin, Netspeak , Telephony at Work, Asterisk and asterisk based systems

#### Professional experience

##### Technical Advisory Board member, ONWAV Inc.

2009 - Present OnWav, INC, Cookeville, Tennessee – Currently a top level technical advisor for OnWav Inc. Providing technical advisement to the COO on matters regarding infrastructure and deployment of the OnWav network.

##### Director of Technical Support, Intuitive Voice Technology LLC

2009 - Present Intuitive Voice Technology, Cookeville, Tennessee – Currently the director of customer technical support managing all support operations for the Evolution PBX product produced by IVT.

##### Telephony Systems Test Engineer (CTI test group)

2005 - 2009 Cingular Wireless, Bothell, Washington (*Contracted through Ciber Inc.*) - Played senior role in testing organization who's prime responsibility was the testing of IVR systems which are customer facing. Helped in the merger between AT&T and Cingular by learning Cingular systems in depth and using this knowledge to support testing efforts on IVR systems. Some examples are test account data validation and manipulation, system performance evaluations, and cross interoperability testing for merging systems. Other activities included design and development of custom test case management system and a Test account data management system for use in IVR testing. Cutting edge test design used for hammer automation which simplified tasks needed to automate testing.

2002 - 2004 AT&T Wireless, Bothell, Washington (*Contracted through Ciber Inc.*) - Continued testing of the Nortel MPS1000 product used in the AT&T Wireless CRM environment. Solely responsible for implementation and operations of the Hammer live call injection systems used for testing at AT&T wireless. AT&T wireless Hammer system was the first to be deployed with speech recognition and Callmaster from the vendor Empirix. Provided valuable feedback to Hammer vendor on performance of these new products which resulted in improvements of the product. Responsible for development and execution of all Hammer visual basic test scripts used in load testing of devices on the AT&T telephony network including the Nortel MPS1000, Lucent PBX/ACD and Nortel CS2K Soft Switch then providing post test analysis of said call runs. Also provided training on aspects of load testing with Hammer to others at AT&T Wireless. Developed informational website for use in document retrieval for the Hammer IT network documentation as well as authored many instructional documents for said systems.



### **Telephony Systems Test Engineer (Intelligent Call Center Applications)**

**1998 - 2002 MCI, Colorado Springs, Colorado** (*Contracted through Ajilon*) - Worked on premier MCI Call Center products designing test beds and test cases as well as executing said cases. Notable activities include requirements development for proprietary in house test tools, multi carrier interface prototype testing, and next generation internet call center prototype testing. These products use systems such as: IP Telephony, Intelligent Voice response, automated mainframe/database to voice caller interaction, and Call center command and control systems. Additional testing involved new technologies in web based call centers. Maintained Intel based test platforms with IP Telephony hardware as well as Unix based telephony servers and switches.

**Webcenter Engineering (WCE)** - Headed up a testing project for a new product built by Nortel networks called MPS1000. The MPS1000 is a fully digital and network enabled telephony switch able to carry 64 ISDN PRI circuits per rack, and can provide custom IVR functions to each caller. This product was new and untested so testing efforts for this product required a real world test setup in the lab requiring many large-scale resources to be coordinated. Some examples are, building a large scale telephony network between several states in order to access needed facilities that could not be moved such as our test bed of class 3 switches, Developing ways to simulate 1000's of agents on their own computers interacting with the MPS1000 with just a small lab of computers, designing creative ways to use legacy switches and ACDs already in the MCI network for call generation and working with other engineers in house to develop proprietary systems to make it all work. The work proved valuable for MCI as well as the vendor, Nortel Networks, since many shortcomings with the Nortel product were discovered which were corrected before the product went to the field.

**Engineering from home** - All vendors, clients, co-workers, and management for this project were in different parts of the world. The required systems for this project were also located in other states, requiring advanced methods of system administration and manipulation. This new way of working required self-discipline and an independent engineering environment that would allow for a more comfortable and productive environment to work in. Building this environment at home made it possible to work odd hours on networks and systems in order to accommodate people in other time zones.

### **Systems Test Engineer (NT Systems development group)**

**1997 - 1998 Tandem Computers, INC. (Compaq Computer corp.) Cupertino, California** (Contracted through The Avery Group) - As systems test engineer for the systems QA department my primary responsibility was cluster server test designs and setup for the department. Projects involved testing of ServerNet, A high performance multi-node server interconnect for Windows NT clustering. Clustered servers include Tandem's S1000 line of servers, CS150 Line, Compaq Proliant 6500's as well as Shared Disk storage systems such as ECCS Raid systems, Unisys JBOD and Compaq JBOD systems. These systems were setup into a Multi node configuration (2-16 nodes) using the ServerNet switch as a high speed interconnect, and then tested for performance, function, and reliability.

### **Product Test Engineer (WHQL Certification LAB)**

**1995 - 1997 Microdyne Corporation San Jose, California** - As systems test engineer my primary responsibility was to test all Microdyne product drivers under all Microsoft driver specs with Windows Hardware Quality Labs test tools in order to maintain logo status for that product. Secondary responsibilities consisted of R&D hardware and software engineering support. Supporting activities mainly consisted of design and setup of network test beds both token ring (STP, UTP) and Ethernet (Fast, 10Base-T, 10Base-2) Other activities included investigation of major customer support issues with large OEM accounts such as Intel and IBM. These activities also consisted of design and setup of test networks (LAN/WAN) to simulate the customer's network providing Microdyne design engineers a platform for diagnosis and resolution of the problem. Did research project on push install technology with Microsoft networks. Wrote white papers on the unattended push installation over Ethernet using the three most common protocols IPX/SPX, TCP/IP, and NetBEUI of all release versions of Windows 95 Attended Novell NCA training classes in Provo Utah and obtained NCA Test Engineering status.

### **Information Systems Manager**

**1994 - 1995 Grove Technical Services San Jose, California** - Responsible for design and installation of telecommunications equipment and computer network then performing maintenance and/or upgrades to these systems as needed. Also served as the in house desktop publisher. Responsible for the complete and error free transfer of customer's electronic publication data via modem or removable disk to the print house and then assisting in the final output to film for printing.

### **Customer Service Representative/Technical Support**

**1994 Fidelity National Title San Jose, California** - Solely responsible for planning, implementing and managing a DTP department for the Santa Clara county corporate office of a nationwide title insurance company. The primary objective of the department was design and printing of bulk mail post cards and informational flyers of property listings for our top producing clients as well as any special projects they required. Special projects included sales and marketing brochures, training manuals, catalogs, posters, mailers, flyers, forms, labels, advertisements, and certificates.

### **Computer service technician**

**1992-1993 Fry's Electronics Campbell, California** - Responsible for trouble shooting and repair of both customers and display computers for the service department of a large computer retail store. Acquired excellent customer service and telephone support skills. Received training from a variety of computer and peripheral equipment manufacturers.

### **Sole proprietor of Contract Computer/Network Consultant Company**

**1990-PRESENT GO Networking! Woodinville, Washington** - Provide systems and network support as needed by the customer for several companies varied in size. Consulting done on both telecommunications and computer hardware/software for these companies.

## Education and Accreditations

1992 - 1994 Masters Institute Of Technology San Jose, CA

### **Computer Networking**

AS Degree Computer Networking Training in computer networking, and database design and deployment.

1991 - 1992 Sawyer College San Jose, CA

### **Analog/Digital Electronics**

Training in troubleshooting and basic design of electronics.

Novell NCA trained test engineer, Oracle trained in PL/SQL

2.	Land, structures, rights-of-way, appraisals, etc.	\$ 2,303,662.00	\$		\$ 2,303,662.00
3.	Relocation expenses and payments	\$ 0.00	\$		\$ 0.00
4.	Architectural and engineering fees	\$ 124,509.00	\$		\$ 124,509.00
5.	Other architectural and engineering fees	\$ 30,417.00	\$		\$ 30,417.00
6.	Project inspection fees	\$ 0.00	\$		\$ 0.00
7.	Site work	\$ 7,500.00	\$		\$ 7,500.00
8.	Demolition and removal	\$ 0.00	\$		\$ 0.00
9.	Construction	\$ 267,975.00	\$		\$ 267,975.00
10.	Equipment	\$ 2,368,065.00	\$		\$ 2,368,065.00
11.	Miscellaneous	\$ 994,918.00	\$		\$ 994,918.00
12.	SUBTOTAL (sum of lines 1- 11)	\$ 6,502,046.00	\$	0.00	\$ 6,502,046.00
13.	Contingencies	\$ 0.00	\$		\$ 0.00
14.	SUBTOTAL	\$ 6,502,046.00	\$	0.00	\$ 6,502,046.00
15.	Project (program) income	\$ 0.00	\$		\$ 0.00
16.	TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 6,502,046.00	\$	0.00	\$ 6,502,046.00
<b>FEDERAL FUNDING</b>					
17.	Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X <input type="text" value="80"/> %			\$ 5,201,636.00



11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-1 33, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

*SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL <i>[Signature]</i>	*TITLE <i>President/CEO</i>
*APPLICANT ORGANIZATION <i>ONWAV, Inc</i>	*DATE SUBMITTED <i>3/24/10<sup>00</sup></i>

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Bald eagle ( <i>Haliaeetus leucocephalus</i> )	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Chesapeake Bay Bald Eagle Recovery Plan	Final Revision 1
Birds	Bald eagle ( <i>Haliaeetus leucocephalus</i> )	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southwestern Bald Eagle Recovery Plan	Final
Birds	Bald eagle ( <i>Haliaeetus leucocephalus</i> )	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Northern States Bald Eagle Recovery Plan	Final
Birds	Bald eagle ( <i>Haliaeetus leucocephalus</i> )	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southeastern States Bald Eagle Recovery Plan	Final Revision 1
Birds	Bald eagle ( <i>Haliaeetus leucocephalus</i> )	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Recovery Plan for the Pacific Bald Eagle	Final
Birds	Arctic peregrine Falcon ( <i>Falco peregrinus tundrius</i> )		Recovery			
Clams	Tubercled blossom (pearlymussel) ( <i>Epioblasma torulosa torulosa</i> )	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Regional Director		
Clams	Turgid blossom (pearlymussel) ( <i>Epioblasma turgidula</i> )	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Regional Director		



Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Clams	Yellow blossom (pearlymussel) (Epioblasma florentina florentina)	Entire Range; Except where listed as Experimental Populations	Endangered	Cookeville Ecological Services Field Office	Three Pearly Mussels (3 spp.)	Final
Clams	Yellow blossom (pearlymussel) (Epioblasma florentina florentina)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Regional Director		
Clams	Catspaw (=purple cat's paw pearlymussel) (Epioblasma obliquata obliquata)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Regional Director		
Clams	Upland combshell (Epioblasma metastriata)		Endangered	Jackson Ecological Services Field Office	Recovery Plan for the Mobile River Basin (15 species)	Final
Clams	Cumberland pigtoe (Pleurobema gibberum)		Endangered	Cookeville Ecological Services Field Office	Cumberland Pigtoe Mussel	Final
Fishes	Smoky madtom (Noturus baileyi)	Tellico River, TN	Experimental	Office Of The Regional Director		
Fishes	Pygmy madtom (Noturus stanauli)		Endangered	Cookeville Ecological Services Field Office	Pygmy Madtom	Final
Insects	Fowler's cave beetle (Pseudanophthalmus fowlerae)		Candidate	Cookeville Ecological Services Field Office		



<b>Group</b>	<b>Name</b>	<b>Population</b>	<b>Status</b>	<b>Lead Office</b>	<b>Recovery Plan Name</b>	<b>Recovery Plan Stage</b>
Insects	Inquirer Cave beetle (Pseudanophthalmus inquisitor)		Candidate	Cookeville Ecological Services Field Office		
Mammals	Gray bat (Myotis grisescens)		Endangered	Columbia Ecological Services Field Office	Gray Bat	Final
Snails	Royal marstonia (snail) (Pyrgulopsis oqmorhaphe)		Endangered	Cookeville Ecological Services Field Office	Royal Snail	Final

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Chesapeake Bay Bald Eagle Recovery Plan	Final Revision 1
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southwestern Bald Eagle Recovery Plan	Final
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Northern States Bald Eagle Recovery Plan	Final
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southeastern States Bald Eagle Recovery Plan	Final Revision 1
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Recovery Plan for the Pacific Bald Eagle	Final
Birds	Arctic peregrine Falcon (Falco peregrinus tundrius)		Recovery			
Clams	Tubercled blossom (pearlymussel) (Epioblasma torulosa torulosa)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties AL	Experimental Population, Non-Essential	Office Of The Regional Director		

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Clams	Turgid blossom (pearlymussel) (Epioblasma turgidula)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Population, Non-Regional Director Essential		
Clams	Yellow blossom (pearlymussel) (Epioblasma florentina)	Entire Range; Except where listed as Experimental Populations	Endangered	Cookeville Ecological Services Field Office	Three Pearly Mussels (3 spp.)	Final
Clams	Yellow blossom (pearlymussel) (Epioblasma florentina)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Population, Non-Regional Director Essential		
Clams	Catspaw (=purple cat's paw pearlymussel) (Epioblasma obliquata)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental	Office Of The Population, Non-Regional Director Essential		
Clams	Upland combshell (Epioblasma metastrata)		Endangered	Jackson Ecological Services Field Office	Recovery Plan for the Mobile River Basin (15 species)	Final
Clams	Cumberland pigtoe (Pleurobema gibberum)		Endangered	Cookeville Ecological Services Field Office	Cumberland Pigtoe Mussel	Final
Fishes	Smoky madtom (Noturus baileyi)	Tellico River, TN	Experimental	Office Of The Population, Non-Regional Director Essential		



Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Fishes	Pygmy madtom (Noturus stanauli)		Endangered	Cookeville Ecological Services Field Office	Pygmy Madtom	Final
Flowering Plants	Short's bladderpod (Lesquerella globosa)		Candidate	Cookeville Ecological Services Field Office		
Mammals	Gray bat (Myotis grisescens)		Endangered	Columbia Ecological Services Field Office	Gray Bat	Final
Snails	Royal marstonia (snail) (Pyrgulopsis ogmorhapha)		Endangered	Cookeville Ecological Services Field Office	Royal Snail	Final

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Chesapeake Bay Bald Eagle Recovery Plan	Final Revision 1
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southwestern Bald Eagle Recovery Plan	Final
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Northern States Bald Eagle Recovery Plan	Final
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Southeastern States Bald Eagle Recovery Plan	Final Revision 1
Birds	Bald eagle (Haliaeetus leucocephalus)	lower 48 States	Recovery	Rock Island Ecological Services Field Office	Recovery Plan for the Pacific Bald Eagle	Final
Birds	Arctic peregrine Falcon (Falco peregrinus tundrius)		Recovery			
Clams	Tuberclad blossom (pearlymussel) (Epioblasma torulosa torulosa)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental Population, Non-Essential	Office Of The Regional Director		
Clams	Turgid blossom (pearlymussel) (Epioblasma turgidula)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental Population, Non-Essential	Office Of The Regional Director		

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Clams	Yellow blossom (pearlymussel) (Epioblasma florentina)	Entire Range; Except where listed as Experimental Populations	Endangered	Cookeville Ecological Services Field Office	Three Pearly Mussels (3 spp.)	Final
Clams	Yellow blossom (pearlymussel) (Epioblasma florentina)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental Population, Non-Essential	Office Of The Regional Director		
Clams	Catspaw (=purple cat's paw pearlymussel) (Epioblasma obliquata)	AL; Free-Flowing Reach of the Tennessee River below the Wilson Dam, Colbert and Lauderdale Counties, AL	Experimental Population, Non-Essential	Office Of The Regional Director		
Clams	Upland combshell (Epioblasma metastrata)		Endangered	Jackson Ecological Services Field Office	Recovery Plan for the Mobile River Basin (15 species)	Final
Clams	Cumberland pigtoe (Pleurobema gibberum)		Endangered	Cookeville Ecological Services Field Office	Cumberland Pigtoe Mussel	Final
Fishes	Smoky madtom (Noturus baileyi)	Tellico River, TN	Experimental Population, Non-Essential	Office Of The Regional Director		
Fishes	Pygmy madtom (Noturus stanauli)		Endangered	Cookeville Ecological Services Field Office	Pygmy Madtom	Final



<b>Group</b>	<b>Name</b>	<b>Population</b>	<b>Status</b>	<b>Lead Office</b>	<b>Recovery Plan Name</b>	<b>Recovery Plan Stage</b>
Flowering Plants	Cumberland sandwort ( <i>Arenaria cumberlandensis</i> )		Endangered	Cookeville Ecological Services Field Office	Cumberland Sandwort	Final
Snails	Royal marstonia (snail) ( <i>Pyrgulopsis ogmorhappe</i> )		Endangered	Cookeville Ecological Services Field Office	Royal Snail	Final

### Proposed Last Mile Service Offerings

Name of Service Tier	Advertised Speeds		Estimated Average Speeds		Average Latency	Pricing Plan (\$ per month)	Other Comments/Description/Features or Limitations
	Downstream Mbps	Upstream Mbps	Downstream Mbps	Upstream Mbps	@ End User CPE milliseconds		
Anchor Broadband	8	2	6 Mbps	1.5 Mbps	15ms	\$50.95	All anchors receive 25% discount off lowest area price, they also receive a 25% discount on ALL their current voice services, Anchors receive an installed interactive training room set-up
Anchor Broadband	6	1	4 Mbps	768 Kbps	15ms	\$43.47	
Business Broadband	8 Mbps	2 Mbps	6 Mbps	1.5 Mbps	15ms	\$67.95	
Residential Broadband	6 Mbps	1 Mbps	4 Mbps	768 Kbps	15ms	\$57.95	

**Explanation of Average Speed Calculations:**

Frequency band is 5MHz per sector. Assuming LOS to all remote users. So at least 64QAM3/4 (proposed solution supports up to 64QAM5/6) can be assumed to calculate DL throughput and 16QAM3/4 (proposed solution supports up to 64QAM5/6) can be used for UL.

This results the throughput above. To note, the throughput is PHY layer. Depending on IP packet size, the throughput for IP layer could be 10% to 20% less.

In real network, if LOS can be meet, the throughput can be higher by using highest modulation available.



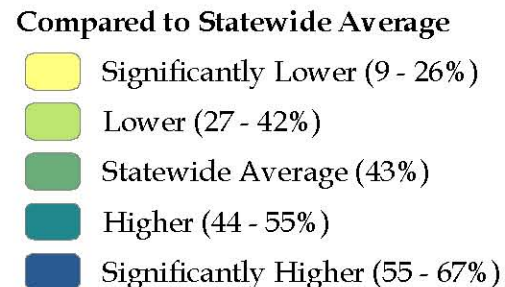
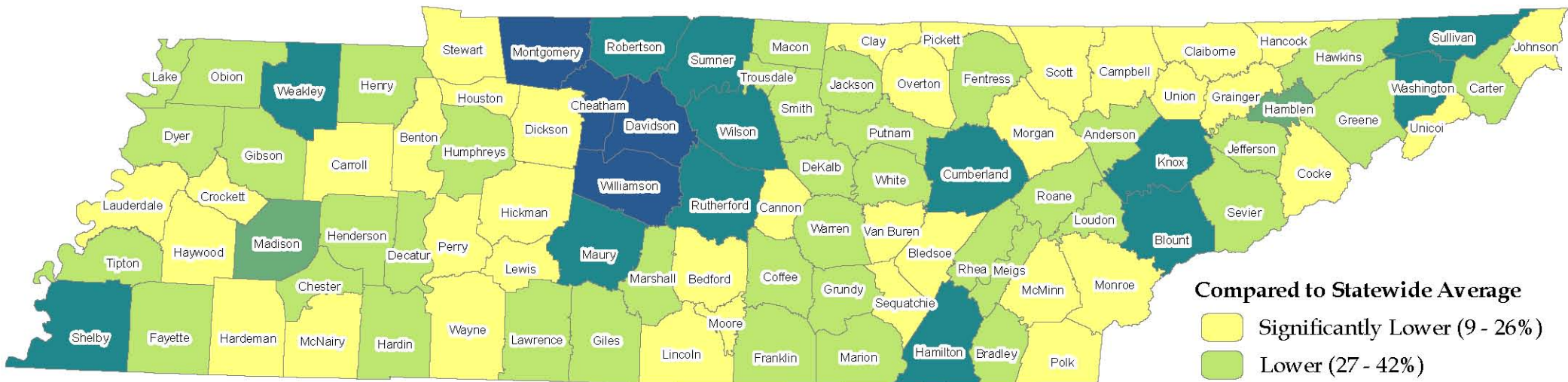
## Proposed Middle Mile Service Offerings

Name of Service Offering	Distance Band or Point to Point	Minimum Peak Load Network Bandwidth Capacity (Mbps)	Monthly/Yearly Pricing (\$)	Other Comments/Description/Features or Limitations
Wholesale Microwave Backhaul	Point to Point	130Mbps	\$6,000	OnWav network is open for wholesale to other area providers.





## Broadband Adoption in the State of Tennessee



Broadband Adoption Statewide: 43%

The representations contained herein are for informational purposes only. Best efforts are undertaken to insure the correctness and accuracy of this information. However, all warranties regarding the accuracy of this map and any representations or inferences derived therefrom are hereby expressly disclaimed. Connected Nation and its partners neither assume nor accept any liability for the accuracy of these data. Those relying upon this information assume the risk of loss exclusively for any potential inaccuracy. All errors and omissions brought to the attention of Connected Nation will be promptly corrected.

## Broadband Subscriber Estimates

Name of Service Offering	Customer Type	Year 0	Cumulative/ Net Add	Year 2				Year 3				Year 4				Year 5		
				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3
Anchor Bundle	Community Anchor Inst.	0	Net Add	0	5	15	15	15	35	45	21	0	0	0	0	0	0	0
			Cumulative	0	5	20	35	50	85	130	151	151	151	151	151	151	151	151
Business Bundle	Business		Net Add	0	6	24	26	27	25	9	9	9	9	9	9	9	9	9
			Cumulative	0	6	30	56	83	108	117	126	135	144	153	162	171	180	189
Residential Bundle	Residential/Individual		Net Add	0	9	36	51	63	63	101	120	120	121	24	24	24	24	24
			Cumulative	0	9	45	96	159	222	323	443	563	684	708	732	756	780	804
Wholesale Broadband Mbps	Business		Net Add	0	0	0	20	0	0	0	20	0	0	0	10	0	0	0
			Cumulative	0	0	0	20	20	20	20	40	40	40	40	50	50	50	50
Tower Leasing	Business		Net Add	0	0	0	0	2	0	0	2	0	0	0	1	0	0	0
			Cumulative	0	0	0	0	2	2	2	4	4	4	4	5	5	5	5
			Net Add															
			Cumulative															
Cumulative Totals (excluding Indirect)	Residential/Individual		Total	0	9	45	96	159	222	323	443	563	684	708	732	756	780	804
	Business		Total	0	6	30	56	83	108	117	126	135	144	153	162	171	180	189
	Community Anchor Inst.		Total	0	5	20	35	50	85	130	151	151	151	151	151	151	151	151
	Business		Total	0	0	0	20	20	20	20	40	40	40	40	50	50	50	50
	Business		Total	0	0	0	0	2	2	2	4	4	4	4	5	5	5	5
Cumulative Totals (including Indirect)	Residential/Individual		Total															
	Business		Total															
	Community Anchor Inst.		Total															

### Table of Customer Types

Residential/Individual
Business
Community Anchor Inst.
Third Party Service Provider
Indirect - Res./Ind.
Indirect - Business
Indirect - Com. Anchor Inst.

### Explanation of Methodology:

OnWav's plan is to install Anchor Institutions, Business, and Residential simultaneously. We have balanced our installments in a way to satisfy the 2 year fully deployed rule, all anchors are completed in the 23 month, target businesses in the 18 month, residential in month 30. This is an aggressive plan but it balances the growth with the capital outlay which should coincide perfectly with the true spirit of the Act.

Further, the leasing of tower space and providing critical wholesale bandwidth to multiple vendors will open this area to much needed competition resulting in cost savings for both business and residential citizens. The sole ILEC of the entire grant region has a very difficult time delivering bandwidth to anywhere near the levels of current demand.

Lastly, OnWav desires to bring the bandwidth to the region that is in line with other parts of the county. Without adequate broadband providers in the region, each individual suffers not only from very limited services, services that are being provided to others around the country, but they suffer from tremendous challenges of keeping pace with their peers. It is completely unfair to limit broadband services to the Upper Cumberland region of Tennessee or any other area around the country that is rural and being left behind.

Name of Service Offering	Customer Type	Year 6				Year 7				Year 8				Year 9				
		Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Anchor Bundle	Community Anchor Inst.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151
Business Bundle	Business	9	9	9	9	9	9	9	9	9	9	9	9	9	6	6	6	6
		198	207	216	225	234	243	252	261	270	279	288	297	306	312	318	324	330
Residential Bundle	Residential/Individual	24	21	21	21	21	18	18	18	18	18	18	18	18	18	18	18	18
		828	849	870	891	912	930	948	966	984	1002	1020	1038	1056	1074	1092	1110	1128
Wholesale Broadband Mbps	Business	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Tower Leasing	Business	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Cumulative Totals (excluding Indirect)	Residential/Individual	828	849	870	891	912	930	948	966	984	1002	1020	1038	1056	1074	1092	1110	1128
	Business	198	207	216	225	234	243	252	261	270	279	288	297	306	312	318	324	330
	Community Anchor Inst.	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151
	Business	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	Business	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Cumulative Totals (including Indirect)	Residential/Individual																	
	Business																	
	Community Anchor Inst.																	

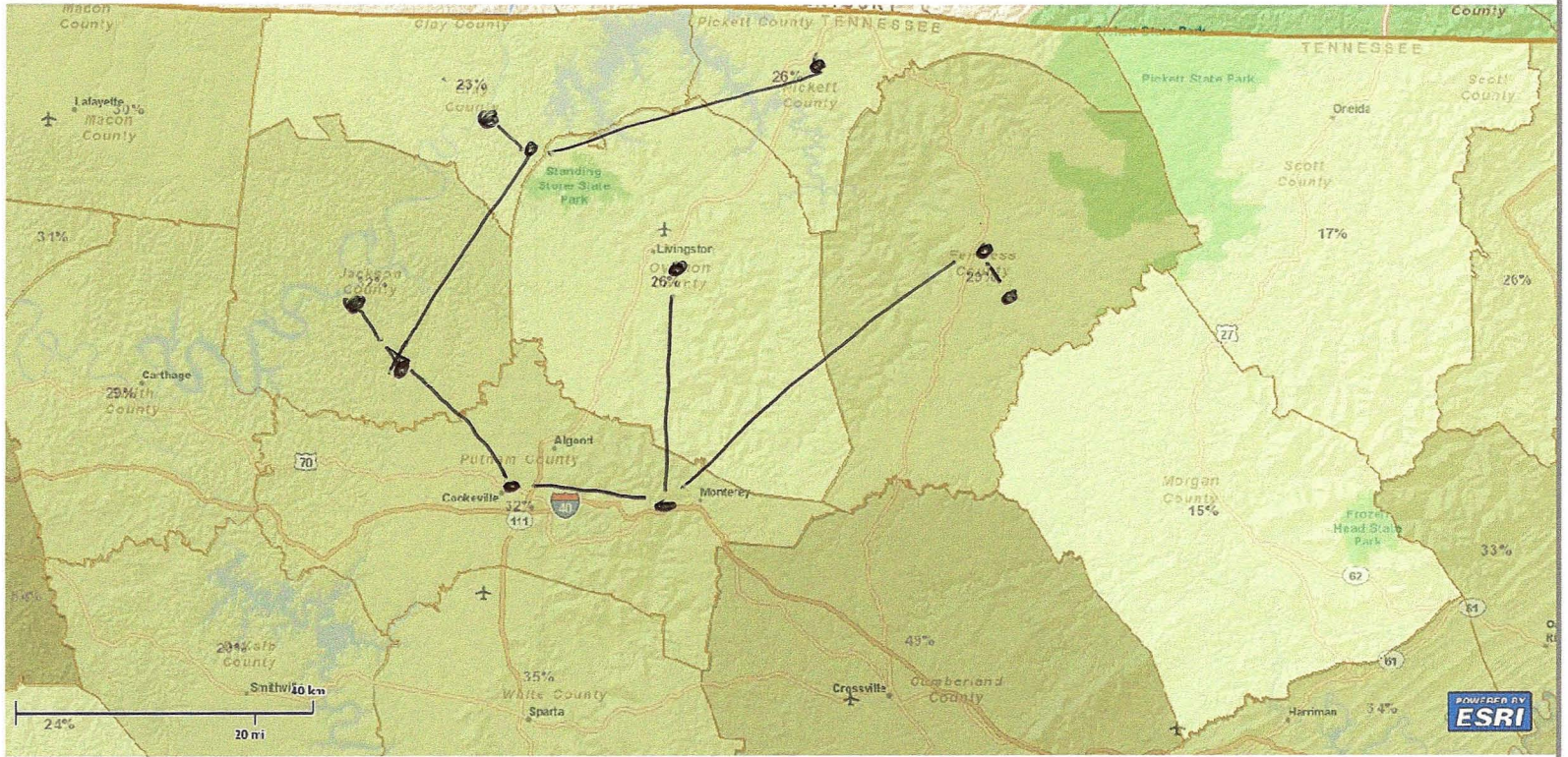
**Table of Customer Types**

Residential/Individual
Business
Community Anchor Inst.
Third Party Service Provider
Indirect - Res./Ind.
Indirect - Business
Indirect - Com. Anchor Inst.



# Tennessee Broadband Map

OnWav, Inc



© Copyright 2008 ESRI. All rights reserved. Printed on Fri Mar 26 2010 08:12:14 AM.

## Comprehensive Community Infrastructure Key Metrics Dashboard

Please refer to the CCI Grant Guidelines for instructions on completing this form.

Applicant Profile	
Applicant Name	<b>OnWav, Inc</b>
Title	<b>Five County Broadband Interconnected Training Access</b>
Easygrants ID	<b>6408</b>
Headquarters	<b>4100 Plantation Dr Cookeville, TN 38506</b>
Size (2009 Data) of Applicant Entity	<ul style="list-style-type: none"> <li>Current Year Revenues: \$257,519</li> <li>Employees: 10</li> </ul>
Technology Type	<b>WiMax</b>
Key Partners	<b>Aviat, Widelity, Community Anchors</b>

Project Economics			
Budget Information		Project Financials	
Project Budget	<b>\$6,502,064</b>	Project Revenues (Yr 8)	<b>\$16,707,166</b>
Federal Contribution (%)	<b>79.74%</b>	Net Income and Margin (Yr 8)	<b>\$1,951,366</b>
Cash Match Amount (%)	<b>18.94%</b>	EBITDA and Margin (Yr 8)	<b>\$7,554,242</b>
In Kind Match Amount (%)	<b>1.32%</b>	Rate of Return (w/o BTOP Funds)	<b>-1.00%</b>
Middle Mile/Last Mile Budget Allocation		Rate of Return (w/ BTOP Funds)	<b>22.00%</b>
Middle Mile Percentage (%)	<b>97.29%</b>	Cost Efficiency	
Last Mile Percentage (%)	<b>2.71%</b>	Cost per Mile (MM)	<b>\$50,365</b>
Rural Last Mile Percentage	<b>100%</b>	Cost per Household (LM)	<b>\$196.82</b>

Market Territory	
Geographic Area(s)	
Middle Mile Network Composition	
Total Proposed Network Miles (MM only)	<ul style="list-style-type: none"> <li>Total Miles:16.13</li> <li>Backbone Miles: 111.25</li> <li>Lateral Miles: 111.25</li> </ul>
New Construction Network Miles (MM only)	<ul style="list-style-type: none"> <li>Total Miles: 16.3</li> <li>Backbone Miles: 111.25</li> <li>Lateral Miles: 111.25</li> </ul>
Existing Applicant Network Miles Utilized (MM only)	<ul style="list-style-type: none"> <li>Total Miles: 0</li> <li>Backbone Miles: 0</li> <li>Lateral Miles:</li> </ul>
Leased Network Miles Utilized (MM only)	<ul style="list-style-type: none"> <li>Total Miles: 0</li> <li>Backbone Miles: 0</li> <li>Lateral Miles:</li> </ul>
Underserved/Unserved	<ul style="list-style-type: none"> <li>Percentage of Backbone Miles in Underserved/Unserved Areas: 100%</li> <li>Percentage of Lateral Miles in Underserved/Unserved Areas:100%</li> </ul>
Existing Customer Base	
Existing Residential/Individual Customers within PFSA	<b>0</b>



## Comprehensive Community Infrastructure Key Metrics Dashboard

Existing Business Customers within PFSA	<b>0</b>
Existing Community Anchor Institution Customers within PFSA	<ul style="list-style-type: none"> <li>• Total CAI's: 0</li> <li>• Community Colleges: 0</li> <li>• Public Safety Entities: 0</li> </ul>
Existing Third Party Service Provider Customers within PFSA	<b>0</b>
<b>Potential Customer Base</b>	
Market Potential Households (within PFSA)	<ul style="list-style-type: none"> <li>• Total HH's: 4567</li> <li>• Located in Underserved/Unserved Areas: 4567</li> </ul>
Market Potential Businesses (within PFSA)	<ul style="list-style-type: none"> <li>• Total Businesses: 725</li> <li>• Located in Underserved/Unserved Areas: 725</li> </ul>
Market Potential Community Anchor Institutions (within PFSA)	<ul style="list-style-type: none"> <li>• Total CAI's: 239</li> <li>• Located in Underserved/Unserved Areas: 239</li> <li>• Community Colleges: 2</li> <li>• Public Safety Entities: 21</li> </ul>
Market Potential Third Party Service Providers (within PFSA)	<ul style="list-style-type: none"> <li>• Total Third Party Service Providers in PFSA: 0</li> <li>• Expressing Commitment or Letter of Interest: 0</li> </ul>
<b>Funded Network Coverage</b>	
Households Connected to Network (via BTOP Funds by end of Year 3)	<ul style="list-style-type: none"> <li>• Total Households Connected: <b>762</b></li> <li>• Located in Underserved/Unserved Areas: 762</li> </ul>
Businesses Connected to Network (via BTOP Funds by end of Year 3)	<ul style="list-style-type: none"> <li>• Total Businesses Connected: 162</li> <li>• Located in Underserved/Unserved Areas: 162</li> </ul>
Community Anchor Institutions Directly Connected (via BTOP Funds by end of Year 3)	<ul style="list-style-type: none"> <li>• Total Directly Connected CAI's: 151</li> <li>• Located in Underserved/Unserved Areas: 151</li> <li>• Community Colleges: 3</li> <li>• Public Safety Entities: 18</li> </ul>
Projected Subscribers by Year Five	<p><b><u>Directly Served by Applicant</u></b></p> <ul style="list-style-type: none"> <li>• Community Anchor Institutions: 151</li> <li>• Households: 912</li> <li>• Businesses: 234</li> <li>• Third Party Service Providers: 1</li> </ul> <p><b><u>Served by Proposed Network Via Third Party Service Provider</u></b></p> <ul style="list-style-type: none"> <li>• Community Anchor Institutions: 0</li> <li>• Households: 0</li> <li>• Businesses: 0</li> </ul>



Comprehensive Community Infrastructure  
Key Metrics Dashboard

Other	
Proposed MM Network Capacity	<ul style="list-style-type: none"> <li>• Backbone: <b>400 Mbps</b></li> <li>• Laterals:</li> </ul>
Proposed LM Network Speed	<ul style="list-style-type: none"> <li>• Highest offered speed tier: <b>10 Mbps x 2 Mbps</b></li> <li>• Estimated Average speed for highest speed tier: <b>8 Mbps x 1.5 Mbps</b></li> </ul>
Total Points of Interconnection	<ul style="list-style-type: none"> <li>• Total Pol's: 161</li> <li>• Pol's in Underserved/Unserved Areas: <b>161</b></li> <li>• Environmentally-controlled, non-passive Pols: 0</li> </ul>
Jobs Created	<ul style="list-style-type: none"> <li>• <b>Direct Job-years: 25</b></li> <li>• <b>Indirect Job-years: 12</b></li> <li>• <b>Induced Job-years: 20</b></li> </ul>
Required Time for Project Completion (Number of Required Quarters to Fully Build-out and Test Network and Make Ready for Commercial Service)	<b>7 Quarters</b>

**Allardt**

Census Blocks	Census Tracts
470499652002016	470499652
470499652002017	
470499652002018	
470499652002019	
470499652002021	
470499652002024	
470499652002025	
470499652002026	
470499652002027	
470499652002028	
470499652002029	
470499652002030	
470499652002036	
470499652002037	
470499652002038	
470499652002039	
470499652002040	
470499652002041	
470499652002047	
470499652002048	
470499652002049	
470499652002050	
470499652002051	
470499652002052	
470499652002053	
470499652002062	
470499652002063	
470499652002064	
470499652002065	
470499652002066	
470499652002067	

**Byrdstown**

Census Blocks	Census Tracts
471379851003000	471379851
471379851003007	
471379851003008	
471379851003009	
471379851003010	
471379851003011	
471379851003012	
471379851003013	
471379851003014	
471379851003015	
471379851003017	
471379851003018	
471379851003019	
471379851003020	
471379851003021	
471379851003022	
471379851003023	
471379851003024	
471379851003025	
471379851003026	
471379851003027	
471379851003028	
471379851003029	
471379851003030	
471379851003031	
471379851003032	
471379851003033	
471379851003034	
471379851003035	
471379851003036	
471379851003037	
471379851003038	
471379851003039	
471379851003040	
471379851003041	
471379851003042	
471379851003043	
471379851003046	
471379851003047	
471379851003048	
471379851003049	
471379851003050	
471379851003051	

471379851003052  
471379851003053  
471379851003054  
471379851003055  
471379851003060  
471379851003061  
471379851004010  
471379851004011





### Census Block ID's by City

#### Celina

Census Blocks	Census Tracts
470279550004007	470279550
470279550004008	
470279550004009	
470279550004010	
470279550004011	
470279550004012	
470279550004013	
470279550004014	
470279550004015	
470279550004016	
470279550004017	
470279550004018	
470279550004019	
470279550004020	
470279550004021	
470279550004022	
470279550004023	
470279550004024	
470279550004025	
470279550004026	
470279550004027	
470279550004028	
470279550004029	
470279550004030	
470279550004031	
470279550004032	
470279550004033	
470279550004034	
470279550004035	
470279550004036	
470279550004038	
470279550004040	
470279550004041	
470279550004042	
470279550004043	
470279550004044	
470279550004045	
470279550004046	
470279550004047	
470279550004048	
470279550004049	
470279550004050	
470279550004051	

#### Gainesboro

Census Blocks	Census Tracts
470879601001999	470879601
470879603003002	470879603
470879603003003	470879604
470879603003006	
470879603003007	
470879603003008	
470879603003009	
470879603003010	
470879603003011	
470879603003012	
470879603003013	
470879603003014	
470879603003015	
470879603003016	
470879603003017	
470879603003018	
470879603003019	
470879603003020	
470879603003021	
470879603003022	
470879603003023	
470879603003025	
470879603003026	
470879603003027	
470879603003028	
470879603003029	
470879603003030	
470879603003031	
470879603003032	
470879603003033	
470879603003034	
470879603003035	
470879603003036	
470879603003037	
470879603003038	
470879603003039	
470879603003040	
470879603003042	
470879603003043	
470879603003045	
470879603003046	
470879603003047	
470879603003048	

470279550004052  
470279550004053  
470279550004054  
470279550004055  
470279550004056  
470279550004057  
470279550004058  
470279550004059  
470279550004060  
470279550004062  
470279550004063  
470279550004064

470879603003049  
470879603003050  
470879603003051  
470879603003052  
470879603003053  
470879603003054  
470879603003055  
470879603003056  
470879603003059  
470879603003060  
470879603003993  
470879603003994  
470879603003995  
470879603003996  
470879603004002  
470879603004003  
470879603004004  
470879603004005  
470879603004006  
470879603004007  
470879603004008  
470879603004009  
470879603004010  
470879603004011  
470879603004012  
470879603004019  
470879603004020  
470879603004021  
470879603004022  
470879603004023  
470879603004024  
470879603004025  
470879603004026  
470879603004027  
470879603004028  
470879603004029  
470879603004030  
470879603004031  
470879603004032  
470879603004033  
470879603004034  
470879603004035  
470879603004036  
470879603004037  
470879603004038  
470879603004039  
470879603004040

470879603004041  
470879603004042  
470879603004043  
470879603004044  
470879603004045  
470879603004046  
470879603004047  
470879603004048  
470879603004049  
470879603004050  
470879603004051  
470879603004052  
470879603004053  
470879603004054  
470879603004055  
470879603004056  
470879603004057  
470879603004058  
470879603004059  
470879603004060  
470879603004061  
470879603004062  
470879603004063  
470879603004995  
470879603004996  
470879603004997  
470879604001016  
470879604001020  
470879604001021  
470879604001022  
470879604001025  
470879604001026  
470879604001027  
470879604001995  
470879604001996





**Jamestown**

<b>Census Blocks</b>	<b>Census Tracts</b>
470499651001005	470499651
470499651001021	
470499651001022	
470499651001023	
470499651001024	
470499651001027	
470499651001028	
470499651001029	
470499651001030	
470499651001031	
470499651001032	
470499651001033	
470499651001034	
470499651001035	
470499651001036	
470499651001037	
470499651001038	
470499651001039	
470499651001040	
470499651001041	
470499651001042	
470499651001043	
470499651001044	
470499651002002	
470499651002003	
470499651002004	
470499651002005	
470499651002009	
470499651002010	
470499651002011	
470499651002012	
470499651002013	
470499651002014	
470499651002015	
470499651002016	
470499651003014	
470499651003016	
470499651003017	
470499651003018	
470499651003019	
470499651003020	
470499651003021	
470499651003022	

**Livingston**

<b>Census Blocks</b>	<b>Census Tracts</b>
471339503001021	471339503
471339503001022	
471339503001023	
471339503001028	
471339503001031	
471339503001032	
471339503001033	
471339503001034	
471339503001035	
471339503001036	
471339503001037	
471339503001038	
471339503002002	
471339503002014	
471339503002015	
471339503002016	
471339503002017	
471339503002018	
471339503002019	
471339503002020	
471339503002021	
471339503002022	
471339503002023	
471339503002024	
471339503002025	
471339503002026	
471339503002027	
471339503002028	
471339503002029	
471339503002030	
471339503002031	
471339503002032	
471339503002033	
471339503002034	
471339503002035	
471339503002036	
471339503002037	
471339503002038	
471339503002039	
471339503002040	
471339503002041	
471339503002042	
471339503002043	

470499651003023	471339503002044
470499651003024	471339503002045
470499651003025	471339503002046
470499651003026	471339503002047
470499651003027	471339503002048
470499651003028	471339503002049
470499651003029	471339503002050
470499651003030	471339503002051
470499651003031	471339503002052
470499651003032	471339503002053
470499651003033	471339503002054
470499651003034	471339503002055
470499651003035	471339503002056
470499651003036	471339503002057
470499651003037	471339503002058
470499651003038	471339503002059
470499651003039	471339503002060
470499651003040	471339503002061
470499651003041	471339503002062
470499651003046	471339503002063
470499651003047	471339503002064
470499651004000	471339503002065
470499651004001	471339503002066
470499651004012	471339503002067
470499651004013	471339503002068
470499651004014	471339503002069
470499651004015	471339503002070
470499651004016	471339503002071
470499651004017	471339503002072
470499651004018	471339503002073
470499651004019	471339503002074
470499651004020	471339503002075
470499651004021	471339503002076
470499651004022	471339503002077
470499651004023	471339503002081
470499651004027	471339503002082
470499651004028	471339503002083
470499651004029	471339503002085
470499651004030	471339503002086
470499651004031	471339503002087
470499651004032	471339503002088
470499651004033	471339503002089
470499651004034	471339503002090
470499651004035	471339503002091
470499651004036	471339503002092
470499651004037	471339503002093
470499651004038	471339503002094

471339503002095  
471339503002101  
471339503002102  
471339503002103  
471339503003000  
471339503003001  
471339503003002  
471339503003003  
471339503003004  
471339503003005  
471339503003006  
471339503003007  
471339503003008  
471339503003009  
471339503003010  
471339503003011  
471339503003012  
471339503003013  
471339503003014  
471339503003015  
471339503003016  
471339503003017  
471339503003018  
471339503003019  
471339503003020  
471339503003021  
471339503003022  
471339503003023  
471339503003024  
471339503003025  
471339503003026  
471339503003027  
471339503003028  
471339503003029  
471339503003030  
471339503003031  
471339503003032  
471339503003033  
471339503003034  
471339503003035  
471339503003036  
471339503003037  
471339503003038  
471339503003039  
471339503003040  
471339503003041  
471339503003042

471339503003043  
471339503003044  
471339503003045  
471339503003046  
471339503003047  
471339503003048  
471339503003049  
471339503004016  
471339503004017  
471339503004018  
471339503004019  
471339503004020  
471339503004021  
471339503004022  
471339503004023  
471339503004024  
471339503004025  
471339503004026  
471339503004027  
471339503004028  
471339503004029  
471339503004030  
471339503004031  
471339503004032  
471339503004033  
471339503004034  
471339503004035  
471339503004036  
471339503004037  
471339503004038  
471339503004039  
471339503004040  
471339503004041  
471339503004042  
471339503004043  
471339503004044  
471339503004045  
471339503004046  
471339503004047  
471339503004048  
471339503004049  
471339503004050  
471339503004051  
471339503004052  
471339503004053  
471339503004054  
471339503005032



471339503005033  
471339503005035  
471339503005036  
471339503005058

# Broadband Technology Opportunities Program



## Waiver Request

EGID: 6408

Project Category: BTOP

Applicant Name: OnWav, Inc

Date: 3/26/2010

Project Title: Five County Broadband Interconnected Training Access

Contact Name: Michael Powell

Email Address: [Mpowell@onwav.com](mailto:Mpowell@onwav.com)

Phone No.: 931-544-7224

**Type of Waiver Requested** (*check one*):

- Matching (pursuant to NOFA Section V.C.2.)
- Last Mile Coverage (pursuant to NOFA Section V.C.3.c.ii.)
- Sale or Lease of Assets (pursuant to NOFA Section IX.C.2.b)
- Buy American (pursuant to NOFA Section X.Q)
- General Provision (pursuant to NOFA Section X.N)

### Summary of Waiver Request

*(In the space below please provide a detailed explanation of the waiver request, including all information requested in the corresponding NOFA Section and Grant Guidance.)*

*No Waivers requested at this time.*

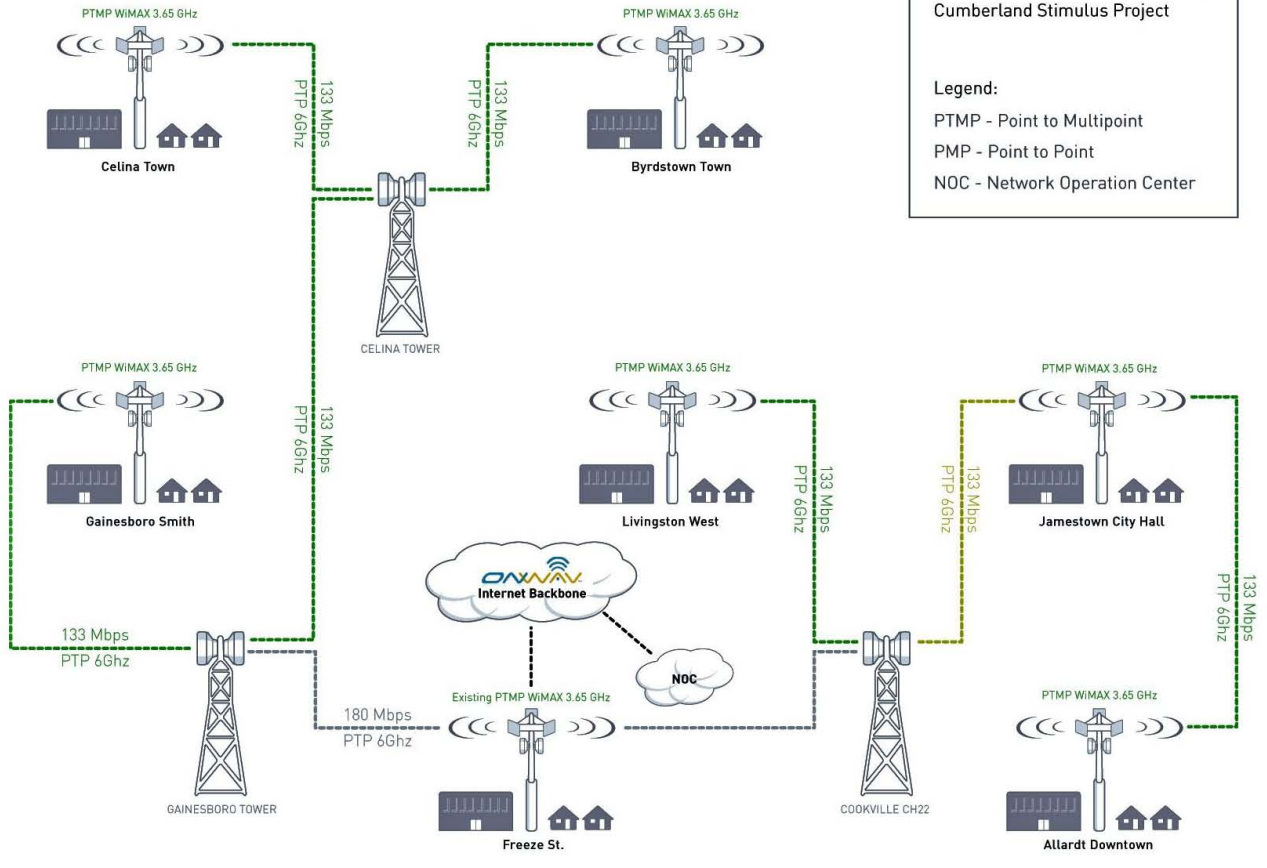
*Mpowell*

**Attached Documents**

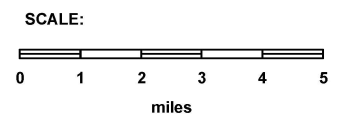
*(If applicable, indicate all attached supporting documentation)*

**ONVAV**  
**Network Diagram: Tennessee Upper Cumberland Stimulus Project**

**Legend:**  
 PTMP - Point to Multipoint  
 PMP - Point to Point  
 NOC - Network Operation Center

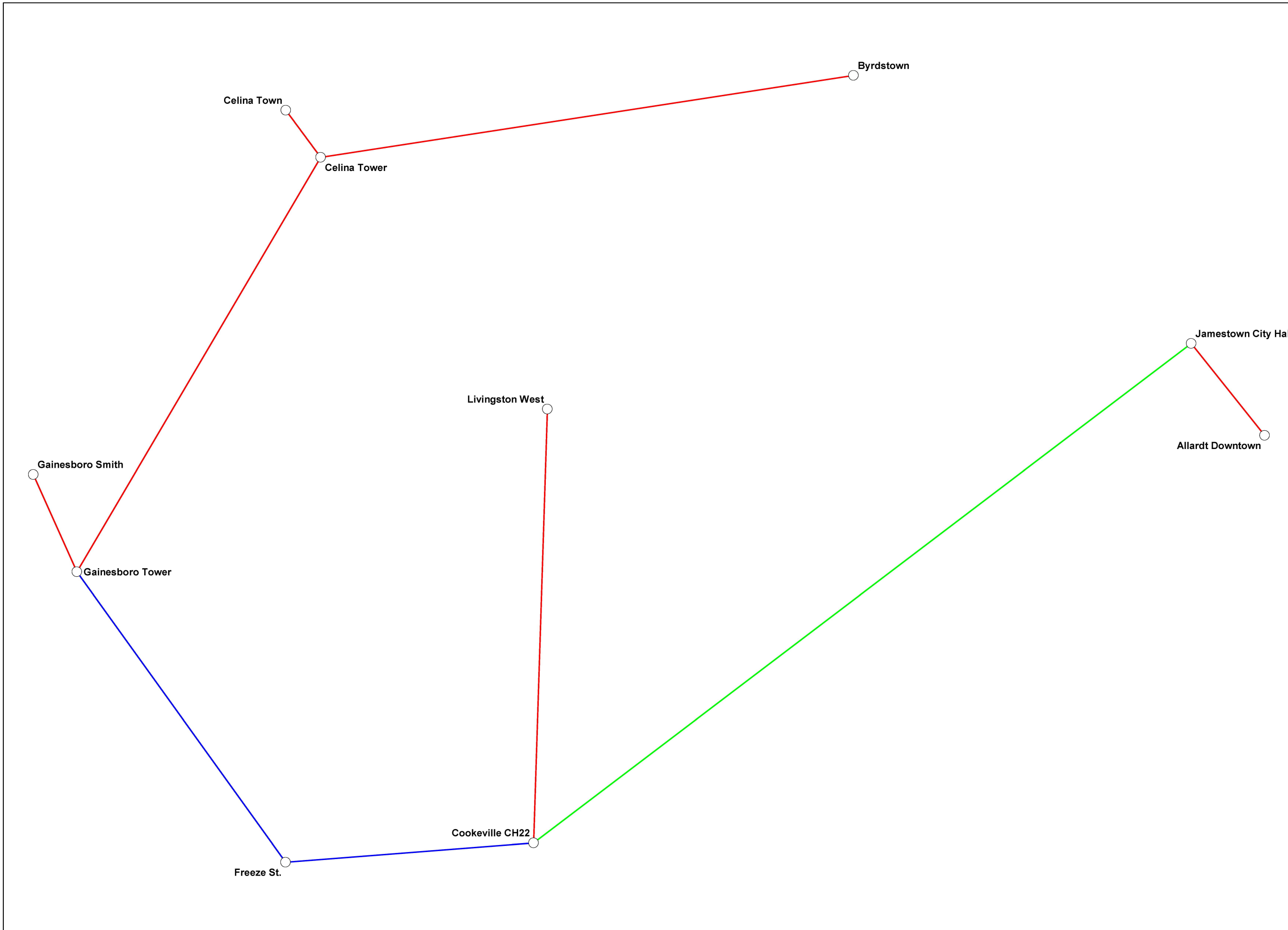


ISSUE	ENG NAME	DATE
A	J.Ma	03-11-2010



LEGEND:

<span style="color: red;">—</span>	IRU 600 L6 64QAM 6.2 GHz, 87 DS1 LOP MHS
<span style="color: blue;">—</span>	IRU 600 L6 256QAM 6.2 GHz, 115 DS1 LOP MHS
<span style="color: green;">—</span>	IRU 600 L6 64QAM 6.2 GHz, 87 DS1 LOP MHS-SD



Aviat Networks

**ONWAY  
ONWAY WIMAX+MW**  
System Layout

ENG BY: J.Ma	REV: 0.0
DWN BY:	DATE: 03-11-2010
SYSTEM ID: 5581-5572	Page 1 of 1

**SL-NA100305-33136**

Customer/Project: ONWAV - ONWAV WIMAX+MW  
Path ID: OOW-3

Date: 09-Mar-2010  
Rev. Date: 11-Mar-2010  
Engineer: J.Ma

Equipment Type: IRU 600 L6 64QAM  
Protection Type: Monitored Hot Standby (coupler)

Capacity: 87 DS1 LOP  
Frequency: 6.175 GHz (FCC)  
Band Width: 30 MHz 60/6X Static

Site Name:	<b>Cookeville CH22</b>	<b>Livingston West</b>
NAD83 Latitude:	36° 10 ' 26.5 " N	36° 23 ' 39.1 " N
Longitude:	085° 20 ' 37.4 " W	085° 20 ' 6.2 " W
Elevation:	1958.0 ft	1267.0 ft
Azimuth:	1.82°	181.83°

Path Length:	15.19 mi	
Free Space Loss:	136.04 dB	
Atmospheric Absorption:	0.22 dB	
Diffraction Loss:	0.00 dB	
Transmission Line Type:	Elliptical	Elliptical
Transmission Line Length:	180.00 ft	155.00 ft
Transmission Line Loss:	2.12 dB	1.83 dB
Transmit-Only Pads:	0.00 dB	0.00 dB
Jumper / Flex Loss:	0.27 dB	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>	<b>0.50 dB</b>
Transmitter ACU Loss:	1.00 dB	
Receiver ACU Loss:	1.00 dB	
Misc/Common Line Pads:	0.00 dB	0.00 dB
<b>TOTAL LOSSES:</b>	<b>143.75 dB</b>	

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	80.0 ft	55.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	61.8 dBm	62.1 dBm
Transmitter Power, GUARANTEED:	Standard Power (27.5 dBm)	
<b>TOTAL GAINS:</b>	<b>103.9 dB</b>	

Unfaded Received Signal Level:	-39.9 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	34.6 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	34.5 dB
Multipath Outage Probability:	0.000004976
Multipath Outage:	48.0 sec/year
Percent Reliability:	99.99985 %

c = 0.26 X = 1.0 w = 140.0 (Vigants 1975) Temperature = 60.0 °F  
Slope Equalizer? Std  
Unfaded Receive Signal Level ( at radio/transmission line interface ): -38.9 dBm (+/- 2dB)



Customer/Project:	ONWAV - ONWAV WIMAX+MW	Date:	09-Mar-2010
Path ID:	OOW-5	Rev. Date:	11-Mar-2010
Equipment Type:	IRU 600 L6 64QAM	Engineer:	J.Ma
Protection Type:	Space Diversity	Capacity:	87 DS1 LOP
		Frequency:	6.175 GHz (FCC)
		Band Width:	30 MHz 60/6X Static

Site Name:	<b>Cookeville CH22</b>	<b>Jamestown City Hall</b>
NAD83 Latitude:	36° 10 ' 26.5 " N	36° 25 ' 39.4 " N
Longitude:	085° 20 ' 37.4 " W	084° 55 ' 42.9 " W
Elevation:	1958.0 ft	1761.0 ft
Azimuth:	52.84°	233.08°

Path Length:	29.03 mi
Free Space Loss:	141.67 dB
Atmospheric Absorption:	0.41 dB
Diffraction Loss:	0.00 dB
Transmission Line Type:	Elliptical
Transmission Line Length:	542.00 ft
Transmission Line Loss:	6.40 dB
Transmit-Only Pads:	0.00 dB
Jumper / Flex Loss:	0.27 dB
Main Antenna Radome Loss:	0.00 dB
Transmitter ACU Loss:	1.00 dB
Receiver ACU Loss:	0.00 dB
Misc/Common Line Pads:	0.00 dB
<b>TOTAL LOSSES:</b>	<b>152.77 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	442.0 ft	133.0 ft
Antenna Gain:	38.9 dB	38.9 dB
Antenna Type:	HP6-59	HP6-59
Effective Radiated Power (EIRP):	62.7 dBm	66.4 dBm
Transmitter Power, GUARANTEED:	High power (31.5 dBm)	
<b>TOTAL GAINS:</b>	<b>109.3 dB</b>	

Unfaded Received Signal Level:	-43.5 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	31.0 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	31.0 dB
Diversity Improvement Factor:	8.2
Multipath Outage Probability:	0.000009667
Multipath Outage:	93.3 sec/year
Percent Reliability:	99.99970 %

c = 0.26	X = 1.0	w = 140.0	( Vigants 1975 )	Temperature = 60.0 °F
Diversity Spacing:	30.0 ft			Slope Equalizer? Std
Diversity Antenna Size/Type:	4.0 ft / PL4-59			4.0 ft / PL4-59
Diversity Centerline:	412.0 ft			103.0 ft

Unfaded Receive Signal Level ( at radio/transmission line interface ): -43.5 dBm (+/- 2dB)

Customer/Project: ONWAV - ONWAV WIMAX+MW  
Path ID: OOW-7

Date: 09-Mar-2010  
Rev. Date: 11-Mar-2010  
Engineer: J.Ma

Equipment Type: IRU 600 L6 256QAM  
Protection Type: Monitored Hot Standby (coupler)

Capacity: 115 DS1 LOP  
Frequency: 6.175 GHz (FCC)  
Band Width: 30 MHz 60/6X Static

Site Name:	<b>Cookeville CH22</b>	<b>Freeze St.</b>
NAD83 Latitude:	36° 10 ' 26.5 " N	36° 09 ' 51.1 " N
Longitude:	085° 20 ' 37.4 " W	085° 30 ' 1.0 " W
Elevation:	1958.0 ft	1138.0 ft
Azimuth:	265.62°	85.52°

Path Length:	8.78 mi
Free Space Loss:	131.28 dB
Atmospheric Absorption:	0.13 dB
Diffraction Loss:	0.00 dB
Transmission Line Type:	Elliptical
Transmission Line Length:	181.00 ft
Transmission Line Loss:	2.14 dB
Transmit-Only Pads:	0.00 dB
Jumper / Flex Loss:	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>
Transmitter ACU Loss:	1.00 dB
Receiver ACU Loss:	1.00 dB
Misc/Common Line Pads:	0.00 dB
<b>TOTAL LOSSES:</b>	<b>139.50 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	81.0 ft	105.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	59.8 dBm	59.5 dBm
Transmitter Power, GUARANTEED:	Standard Power (25.5 dBm)	
<b>TOTAL GAINS:</b>	<b>101.9 dB</b>	

Unfaded Received Signal Level:	-37.6 dBm (+/- 2dB)
Required Level For 10-6 BER:	-67.5 dBm
Flat Fade Margin:	29.9 dB
Dispersive Fade Margin:	39.0 dB
Composite Fade Margin:	29.4 dB
Multipath Outage Probability:	0.000003148
Multipath Outage:	30.4 sec/year
Percent Reliability:	99.99990 %

WARNING: - EIRP limitation due to short path length EIRP not to exceed 81.8 dBm

c = 0.26 X = 1.0 w = 140.0 (Vigants 1975) Temperature = 60.0 °F  
Slope Equalizer? Std  
Unfaded Receive Signal Level ( at radio/transmission line interface ): -36.6 dBm (+/- 2dB)

Customer/Project:	ONWAV - ONWAV WIMAX+MW	Date:	09-Mar-2010
Path ID:	OOW-17	Rev. Date:	11-Mar-2010
Equipment Type:	IRU 600 L6 64QAM	Engineer:	J.Ma
Protection Type:	Monitored Hot Standby (coupler)	Capacity:	87 DS1 LOP
		Frequency:	6.175 GHz (FCC)
		Band Width:	30 MHz 60/6X Static

Site Name:	<b>Jamestown City Hall</b>	<b>Allardt Downtown</b>
NAD83 Latitude:	36° 25 ' 39.4 " N	36° 22 ' 51.1 " N
Longitude:	084° 55 ' 42.9 " W	084° 52 ' 55.8 " W
Elevation:	1761.0 ft	1646.0 ft
Azimuth:	141.23°	321.26°

Path Length:	4.13 mi
Free Space Loss:	124.74 dB
Atmospheric Absorption:	0.06 dB
Diffraction Loss:	0.00 dB
Transmission Line Type:	Elliptical
Transmission Line Length:	232.00 ft
Transmission Line Loss:	2.74 dB
Transmit-Only Pads:	0.00 dB
Jumper / Flex Loss:	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>
Transmitter ACU Loss:	1.00 dB
Receiver ACU Loss:	1.00 dB
Misc/Common Line Pads:	0.00 dB
<b>TOTAL LOSSES:</b>	<b>133.71 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	132.0 ft	123.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	61.2 dBm	61.3 dBm
Transmitter Power, GUARANTEED:	Standard Power (27.5 dBm)	
<b>TOTAL GAINS:</b>	<b>103.9 dB</b>	

Unfaded Received Signal Level:	-29.8 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	44.7 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	43.8 dB
Multipath Outage Probability:	0.000000089
Multipath Outage:	0.9 sec/year
Percent Reliability:	> 99.99999 %

WARNING: - EIRP limitation due to short path length EIRP not to exceed 68.7 dBm

c = 1.95   X = 1.0   w = 30.0   (Vigants 1975)   Temperature = 60.0 °F  
Slope Equalizer? Std  
Unfaded Receive Signal Level ( at radio/transmission line interface ):   -28.8 dBm (+/- 2dB)

Customer/Project:	ONWAV - ONWAV WIMAX+MW	Date:	09-Mar-2010
Path ID:	OOW-18	Rev. Date:	11-Mar-2010
Equipment Type:	IRU 600 L6 256QAM	Engineer:	J.Ma
Protection Type:	Monitored Hot Standby (coupler)	Capacity:	115 DS1 LOP
		Frequency:	6.175 GHz (FCC)
		Band Width:	30 MHz 60/6X Static

Site Name:	<b>Freeze St.</b>	<b>Gainesboro Tower</b>
NAD83 Latitude:	36° 09 ' 51.1 " N	36° 18 ' 41.9 " N
Longitude:	085° 30 ' 1.0 " W	085° 37 ' 55.2 " W
Elevation:	1138.0 ft	1052.0 ft
Azimuth:	324.14°	144.07°

Path Length:		12.55 mi
Free Space Loss:		134.39 dB
Atmospheric Absorption:		0.18 dB
Diffraction Loss:		0.00 dB
Transmission Line Type:	Elliptical	Elliptical
Transmission Line Length:	246.00 ft	180.00 ft
Transmission Line Loss:	2.90 dB	2.12 dB
Transmit-Only Pads:	0.00 dB	0.00 dB
Jumper / Flex Loss:	0.27 dB	0.27 dB
Main Antenna Radome Loss:	0.00 dB	0.00 dB
Transmitter ACU Loss:		1.00 dB
Receiver ACU Loss:		1.00 dB
Misc/Common Line Pads:	0.00 dB	0.00 dB
<b>TOTAL LOSSES:</b>		<b>142.13 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	146.0 ft	80.0 ft
Antenna Gain:	38.9 dB	38.9 dB
Antenna Type:	HP6-59	HP6-59
Effective Radiated Power (EIRP):	64.2 dBm	65.0 dBm
Transmitter Power, GUARANTEED:		High Power (29.5 dBm)
<b>TOTAL GAINS:</b>		<b>107.3 dB</b>

Unfaded Received Signal Level:	-34.8 dBm (+/- 2dB)
Required Level For 10-6 BER:	-67.5 dBm
Flat Fade Margin:	32.7 dB
Dispersive Fade Margin:	39.0 dB
Composite Fade Margin:	31.8 dB
Multipath Outage Probability:	0.000006881
Multipath Outage:	66.4 sec/year
Percent Reliability:	99.99979 %

c = 0.34   X = 1.0   w = 115.1   (Vigants 1975)   Temperature = 60.0 °F  
 Unfaded Receive Signal Level ( at radio/transmission line interface ):   Slope Equalizer? Std   -33.8 dBm (+/- 2dB)

Customer/Project: ONWAV - ONWAV WIMAX+MW  
Path ID: OOW-19

Date: 09-Mar-2010  
Rev. Date: 11-Mar-2010  
Engineer: J.Ma

Equipment Type: IRU 600 L6 64QAM  
Protection Type: Monitored Hot Standby (coupler)

Capacity: 87 DS1 LOP  
Frequency: 6.175 GHz (FCC)  
Band Width: 30 MHz 60/6X Static

Site Name:	<b>Gainesboro Tower</b>	<b>Gainesboro Smith</b>
NAD83 Latitude:	36° 18 ' 41.9 " N	36° 21 ' 39.5 " N
Longitude:	085° 37 ' 55.2 " W	085° 39 ' 33.9 " W
Elevation:	1052.0 ft	822.0 ft
Azimuth:	335.80°	155.78°

Path Length:		3.73 mi
Free Space Loss:		123.85 dB
Atmospheric Absorption:		0.05 dB
Diffraction Loss:		0.00 dB
Transmission Line Type:	Elliptical	Elliptical
Transmission Line Length:	241.00 ft	270.00 ft
Transmission Line Loss:	2.84 dB	3.19 dB
Transmit-Only Pads:	0.00 dB	0.00 dB
Jumper / Flex Loss:	0.27 dB	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>	<b>0.50 dB</b>
Transmitter ACU Loss:		1.00 dB
Receiver ACU Loss:		1.00 dB
Misc/Common Line Pads:	0.00 dB	0.00 dB
<b>TOTAL LOSSES:</b>		<b>133.47 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	141.0 ft	170.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	61.1 dBm	60.7 dBm
Transmitter Power, GUARANTEED:	Standard Power (27.5 dBm)	
<b>TOTAL GAINS:</b>		<b>103.9 dB</b>

Unfaded Received Signal Level:	-29.6 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	44.9 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	44.0 dB
Multipath Outage Probability:	0.000000008
Multipath Outage:	0.1 sec/year
Percent Reliability:	> 99.99999 %

WARNING: - EIRP limitation due to short path length EIRP not to exceed 66.9 dBm

c = 0.26 X = 1.0 w = 140.0 (Vigants 1975) Temperature = 60.0 °F  
Slope Equalizer? Std  
Unfaded Receive Signal Level ( at radio/transmission line interface ): -28.6 dBm (+/- 2dB)

Customer/Project:	ONWAV - ONWAV WIMAX+MW	Date:	10-Mar-2010
Path ID:	OOW-21	Rev. Date:	11-Mar-2010
Equipment Type:	IRU 600 L6 64QAM	Engineer:	J.Ma
Protection Type:	Monitored Hot Standby (coupler)	Capacity:	87 DS1 LOP
		Frequency:	6.175 GHz (FCC)
		Band Width:	30 MHz 60/6X Static

Site Name:	Celina Tower	Celina Town
NAD83 Latitude:	36° 31 ' 19.9 " N	36° 32 ' 45.9 " N
Longitude:	085° 28 ' 41.1 " W	085° 30 ' 0.4 " W
Elevation:	1025.0 ft	732.0 ft
Azimuth:	323.35°	143.34°

Path Length:		2.05 mi
Free Space Loss:		118.66 dB
Atmospheric Absorption:		0.03 dB
Diffraction Loss:		0.00 dB
Transmission Line Type:	Elliptical	Elliptical
Transmission Line Length:	180.00 ft	268.00 ft
Transmission Line Loss:	2.12 dB	3.16 dB
Transmit-Only Pads:	<b>10.00 dB</b>	<b>10.00 dB</b>
Jumper / Flex Loss:	0.27 dB	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>	<b>0.50 dB</b>
Transmitter ACU Loss:		1.00 dB
Receiver ACU Loss:		1.00 dB
Misc/Common Line Pads:	0.00 dB	0.00 dB
<b>TOTAL LOSSES:</b>		<b>137.52 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	80.0 ft	168.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	51.8 dBm	50.8 dBm
Transmitter Power, GUARANTEED:	Standard Power (27.5 dBm)	
<b>TOTAL GAINS:</b>		<b>103.9 dB</b>

Unfaded Received Signal Level:	-33.6 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	40.9 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	40.5 dB
Multipath Outage Probability:	0.000000003
Multipath Outage:	0.0 sec/year
Percent Reliability:	> 99.99999 %

WARNING: - EIRP limitation due to short path length EIRP not to exceed 56.5 dBm

c = 0.26	X = 1.0	w = 140.0	(Vigants 1975)	Temperature = 60.0 °F
Unfaded Receive Signal Level ( at radio/transmission line interface ):				Slope Equalizer? Std
				-32.6 dBm (+/- 2dB)



Customer/Project:	ONWAV - ONWAV WIMAX+MW	Date:	11-Mar-2010
Path ID:	OOW-25	Rev. Date:	11-Mar-2010
Equipment Type:	IRU 600 L6 64QAM	Engineer:	J.Ma
Protection Type:	Monitored Hot Standby (coupler)	Capacity:	87 DS1 LOP
		Frequency:	6.175 GHz (FCC)
		Band Width:	30 MHz 60/6X Static

Site Name:	<b>Celina Tower</b>	<b>Gainesboro Tower</b>
NAD83 Latitude:	36° 31 ' 19.9 " N	36° 18 ' 41.9 " N
Longitude:	085° 28 ' 41.1 " W	085° 37 ' 55.2 " W
Elevation:	1025.0 ft	1052.0 ft
Azimuth:	210.62°	30.53°

Path Length:		16.86 mi
Free Space Loss:		136.95 dB
Atmospheric Absorption:		0.24 dB
Diffraction Loss:		0.00 dB
Transmission Line Type:	Elliptical	Elliptical
Transmission Line Length:	205.00 ft	205.00 ft
Transmission Line Loss:	2.42 dB	2.42 dB
Transmit-Only Pads:	0.00 dB	0.00 dB
Jumper / Flex Loss:	0.27 dB	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>	<b>0.50 dB</b>
Transmitter ACU Loss:		1.00 dB
Receiver ACU Loss:		1.00 dB
Misc/Common Line Pads:	0.00 dB	0.00 dB
<b>TOTAL LOSSES:</b>		<b>145.57 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	105.0 ft	105.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	61.5 dBm	61.5 dBm
Transmitter Power, GUARANTEED:	Standard Power (27.5 dBm)	
<b>TOTAL GAINS:</b>		<b>103.9 dB</b>

Unfaded Received Signal Level:	-41.7 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	32.8 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	32.8 dB
Multipath Outage Probability:	0.000010735
Multipath Outage:	103.6 sec/year
Percent Reliability:	99.99967 %

c = 0.27   X = 1.0   w = 135.3   (Vigants 1975)   Temperature = 60.0 °F  
 Slope Equalizer? Std  
 Unfaded Receive Signal Level ( at radio/transmission line interface ):   -40.7 dBm (+/- 2dB)

Customer/Project: ONWAV - ONWAV WIMAX+MW  
Path ID: OOW-27

Date: 11-Mar-2010  
Rev. Date: 11-Mar-2010  
Engineer: J.Ma

Equipment Type: IRU 600 L6 64QAM  
Protection Type: Monitored Hot Standby (coupler)

Capacity: 87 DS1 LOP  
Frequency: 6.175 GHz (FCC)  
Band Width: 30 MHz 60/6X Static

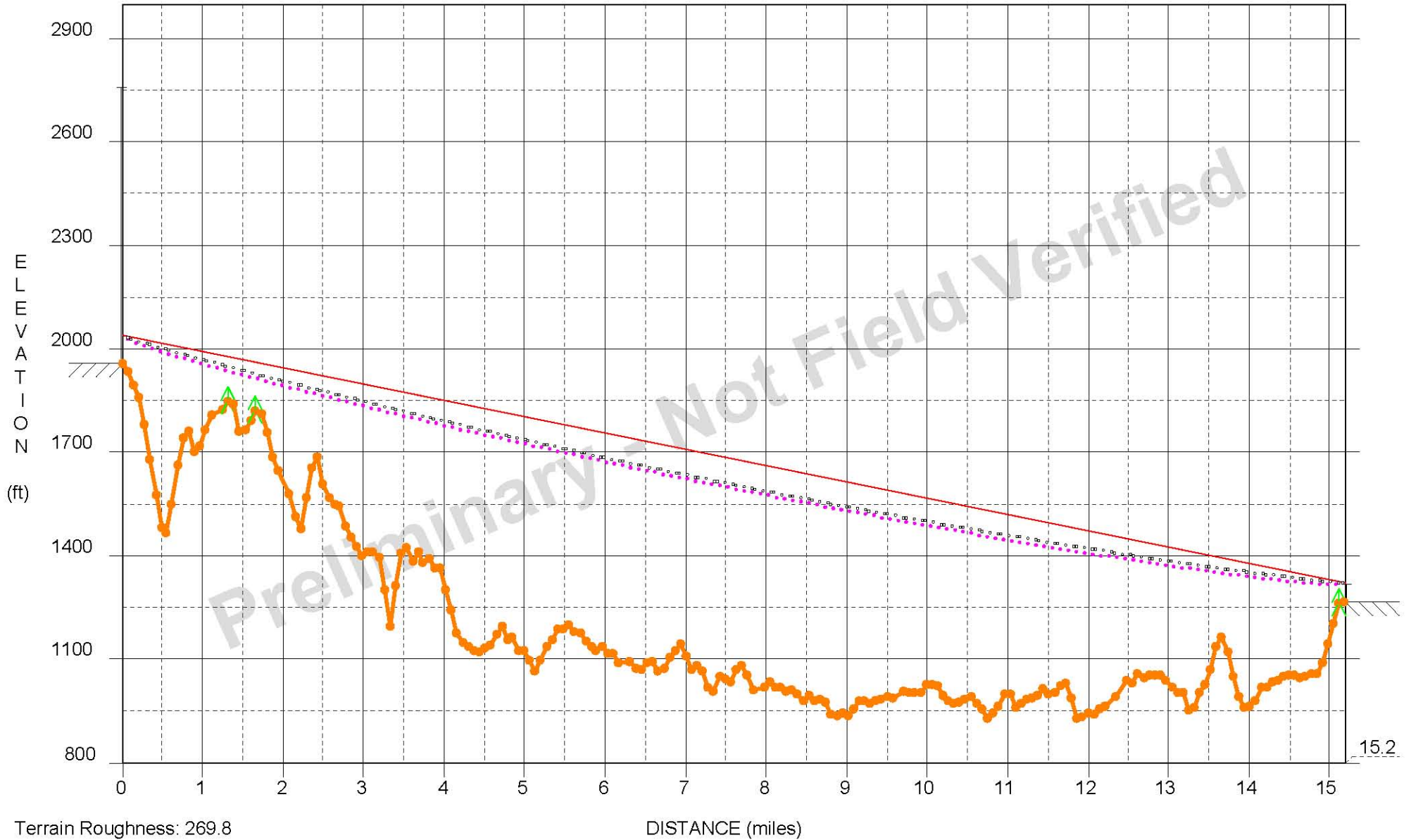
Site Name:	<b>Byrdstown</b>	<b>Celina Tower</b>
NAD83 Latitude:	36° 33 ' 49.4 " N	36° 31 ' 19.9 " N
Longitude:	085° 08 ' 30.3 " W	085° 28 ' 41.1 " W
Elevation:	1205.0 ft	1025.0 ft
Azimuth:	261.40°	81.20°

Path Length:		18.93 mi
Free Space Loss:		137.96 dB
Atmospheric Absorption:		0.27 dB
Diffraction Loss:		0.00 dB
Transmission Line Type:	Elliptical	Elliptical
Transmission Line Length:	276.00 ft	361.00 ft
Transmission Line Loss:	3.26 dB	4.26 dB
Transmit-Only Pads:	0.00 dB	0.00 dB
Jumper / Flex Loss:	0.27 dB	0.27 dB
Main Antenna Radome Loss:	<b>0.50 dB</b>	<b>0.50 dB</b>
Transmitter ACU Loss:		1.00 dB
Receiver ACU Loss:		1.00 dB
Misc/Common Line Pads:	0.00 dB	0.00 dB
<b>TOTAL LOSSES:</b>		<b>149.28 dB</b>

Antenna Size:	6.0 ft	6.0 ft
Antenna Centerline:	176.0 ft	261.0 ft
Antenna Gain:	38.2 dB	38.2 dB
Antenna Type:	PAR6-59	PAR6-59
Effective Radiated Power (EIRP):	64.7 dBm	63.7 dBm
Transmitter Power, GUARANTEED:		High power (31.5 dBm)
<b>TOTAL GAINS:</b>		<b>107.9 dB</b>

Unfaded Received Signal Level:	-41.4 dBm (+/- 2dB)
Required Level For 10-6 BER:	-74.5 dBm
Flat Fade Margin:	33.1 dB
Dispersive Fade Margin:	51.0 dB
Composite Fade Margin:	33.0 dB
Multipath Outage Probability:	0.000013618
Multipath Outage:	131.4 sec/year
Percent Reliability:	99.99958 %

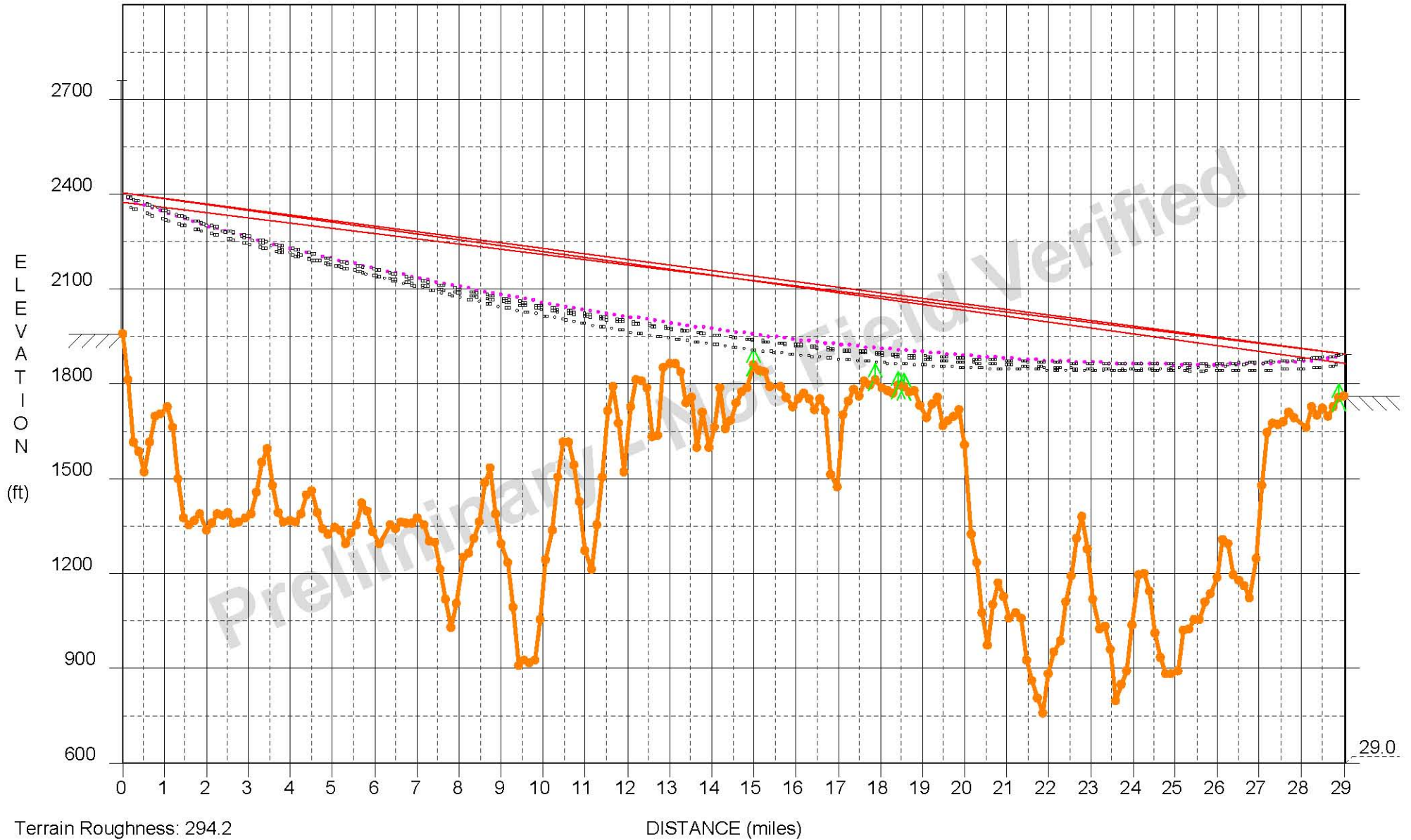
c = 0.26 X = 1.0 w = 140.0 (Vigants 1975) Temperature = 60.0 °F  
Slope Equalizer? Std  
Unfaded Receive Signal Level ( at radio/transmission line interface ): -40.4 dBm (+/- 2dB)



Site Name: **Cookeville CH22**  
 NAD83 Latitude N: 36° 10' 26.5" N  
 Longitude W: 085° 20' 37.4" W  
 Elevation AMSL: 1958.0 ft  
 Centerlines AGL: 80.0 ft  
 Reference Map:  
 Field Verified:  
Aviat Networks Confidential and Proprietary Information

ID: OOW-3	Freq = 6.175 GHz	09-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	--- = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

Site Name: **Livingston West**  
 NAD83 Latitude N: 36° 23' 39.1" N  
 Longitude W: 085° 20' 6.2" W  
 Elevation AMSL: 1267.0 ft  
 Centerlines AGL: 55.0 ft  
 Reference Map:  
 Engineer: J.Ma

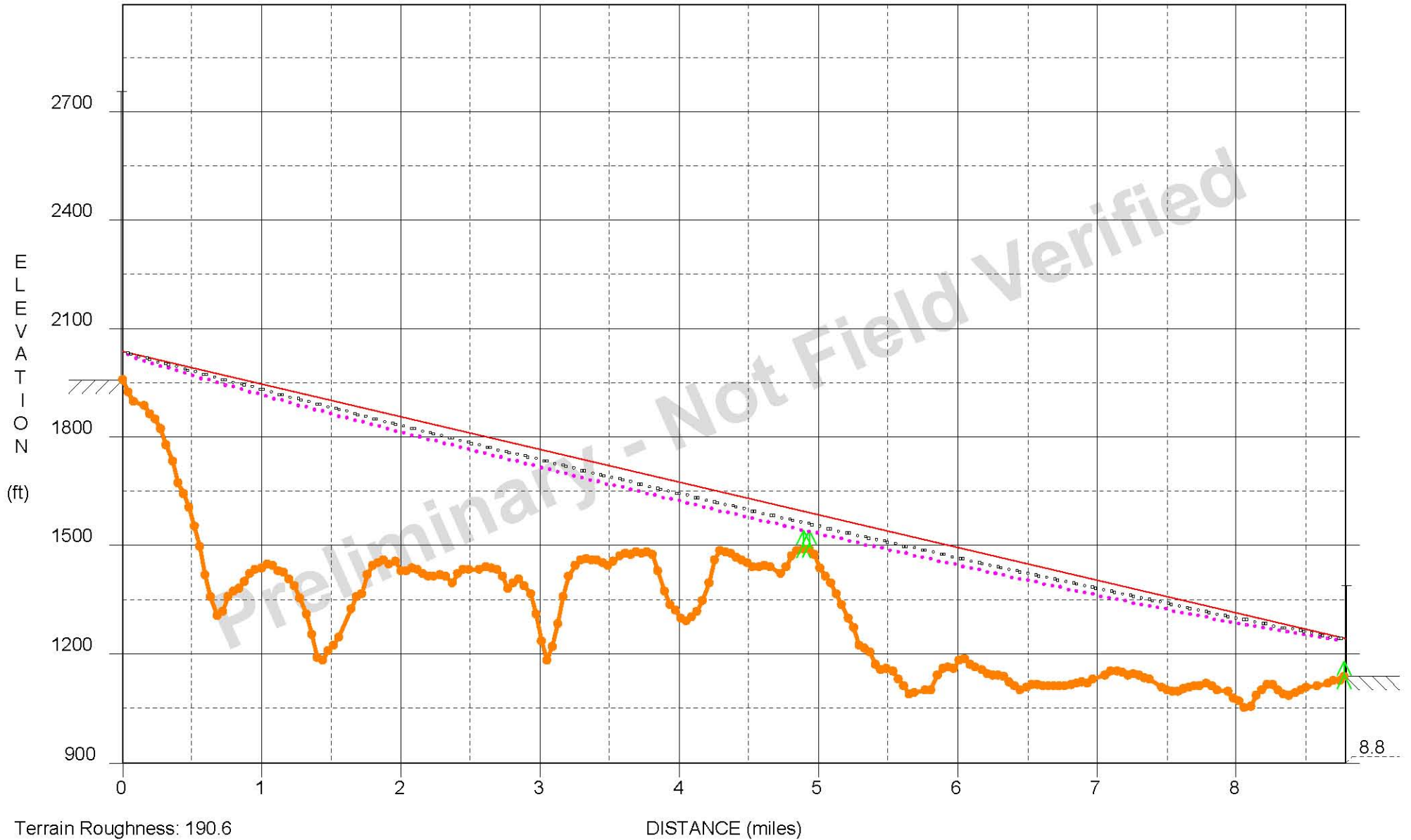


Site Name: **Cookeville CH22**  
 NAD83 Latitude N: 36° 10' 26.5" N  
 Longitude W: 085° 20' 37.4" W  
 Elevation AMSL: 1958.0 ft  
 Centerlines AGL: 442.0 / 412.0 ft  
 Reference Map:  
 Field Verified:  
 Aviat Networks Confidential and Proprietary Information

ID: OOW-5	Freq = 6.175 GHz	10-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	- - - = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

Site Name: **Jamestown City Hall**  
 NAD83 Latitude N: 36° 25' 39.4" N  
 Longitude W: 084° 55' 42.9" W  
 Elevation AMSL: 1761.0 ft  
 Centerlines AGL: 133.0 / 103.0 ft  
 Reference Map:  
 Engineer: J.Ma





Site Name: **Cookeville CH22**  
 Latitude N: 36° 10' 26.5" N  
 Longitude W: 085° 20' 37.4" W  
 Elevation AMSL: 1958.0 ft  
 Centerlines AGL: 81.0 ft  
 Reference Map:  
 Field Verified:

Aviat Networks Confidential and Proprietary Information

ID: OOW-7      Freq = 6.175 GHz      10-Mar-2010

**ONWAV**

ONWAV WIMAX+MW

Aviat Networks      ..... = 1.00 F1 @ K = 1.33  
 Aviat Networks      - - - = 0.30 F1 @ K = 0.67  
                                  = 0.60 F1 @ K = 1.00

Site Name: **Freeze St.**  
 Latitude N: 36° 09' 51.1" N  
 Longitude W: 085° 30' 1.0" W  
 Elevation AMSL: 1138.0 ft  
 Centerlines AGL: 105.0 ft  
 Reference Map:  
 Engineer: J.Ma

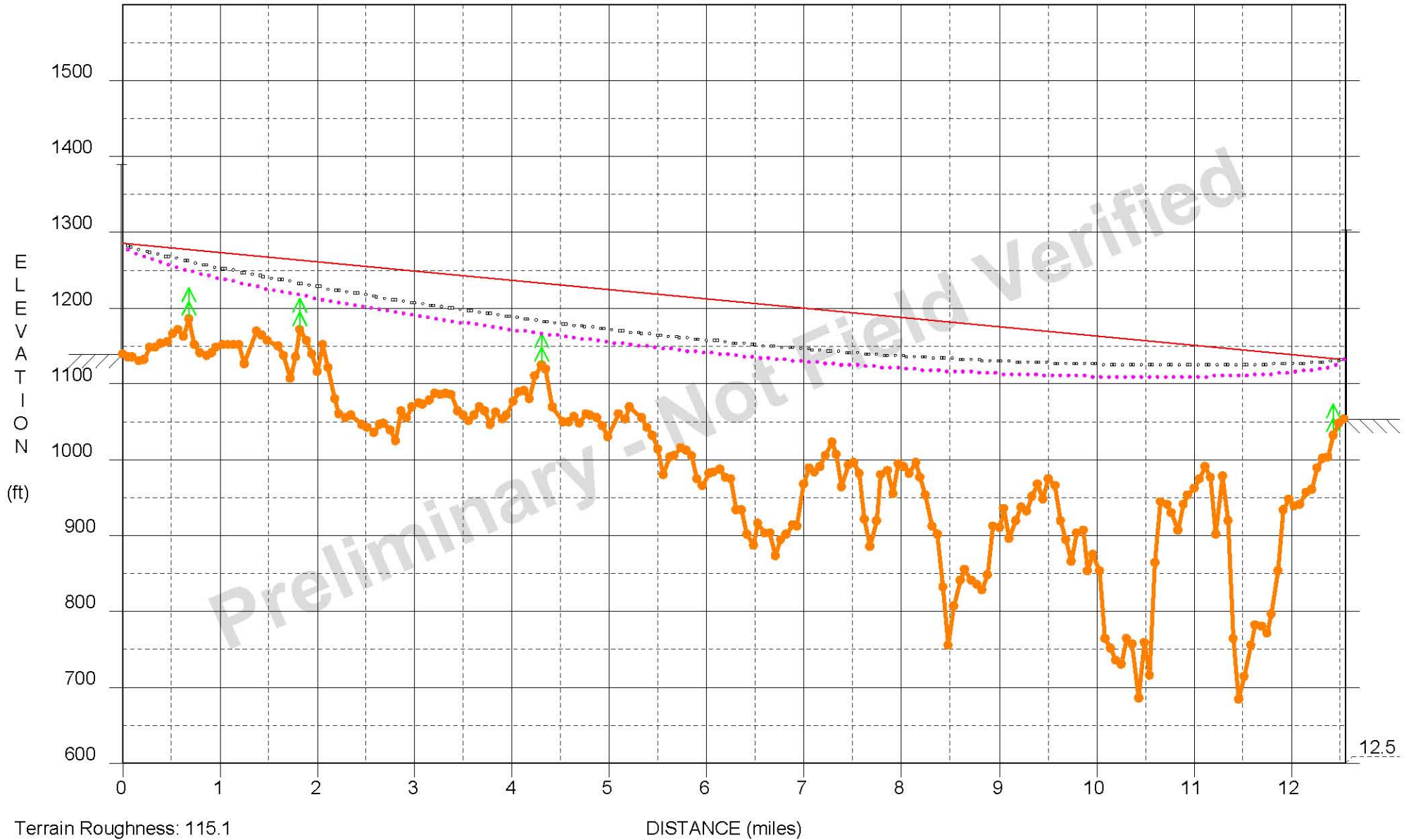


Site Name: **Jamestown City Hall**  
 Latitude N: 36° 25' 39.4" N  
 Longitude W: 084° 55' 42.9" W  
 Elevation AMSL: 1761.0 ft  
 Centerlines AGL: 132.0 ft  
 Reference Map:  
 Field Verified:  
Aviat Networks Confidential and Proprietary Information

ID: OOW-17	Freq = 6.175 GHz	10-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	--- = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

Site Name: **Allardt Downtown**  
 Latitude N: 36° 22' 51.1" N  
 Longitude W: 084° 52' 55.8" W  
 Elevation AMSL: 1646.0 ft  
 Centerlines AGL: 123.0 ft  
 Reference Map:  
 Engineer: J.Ma

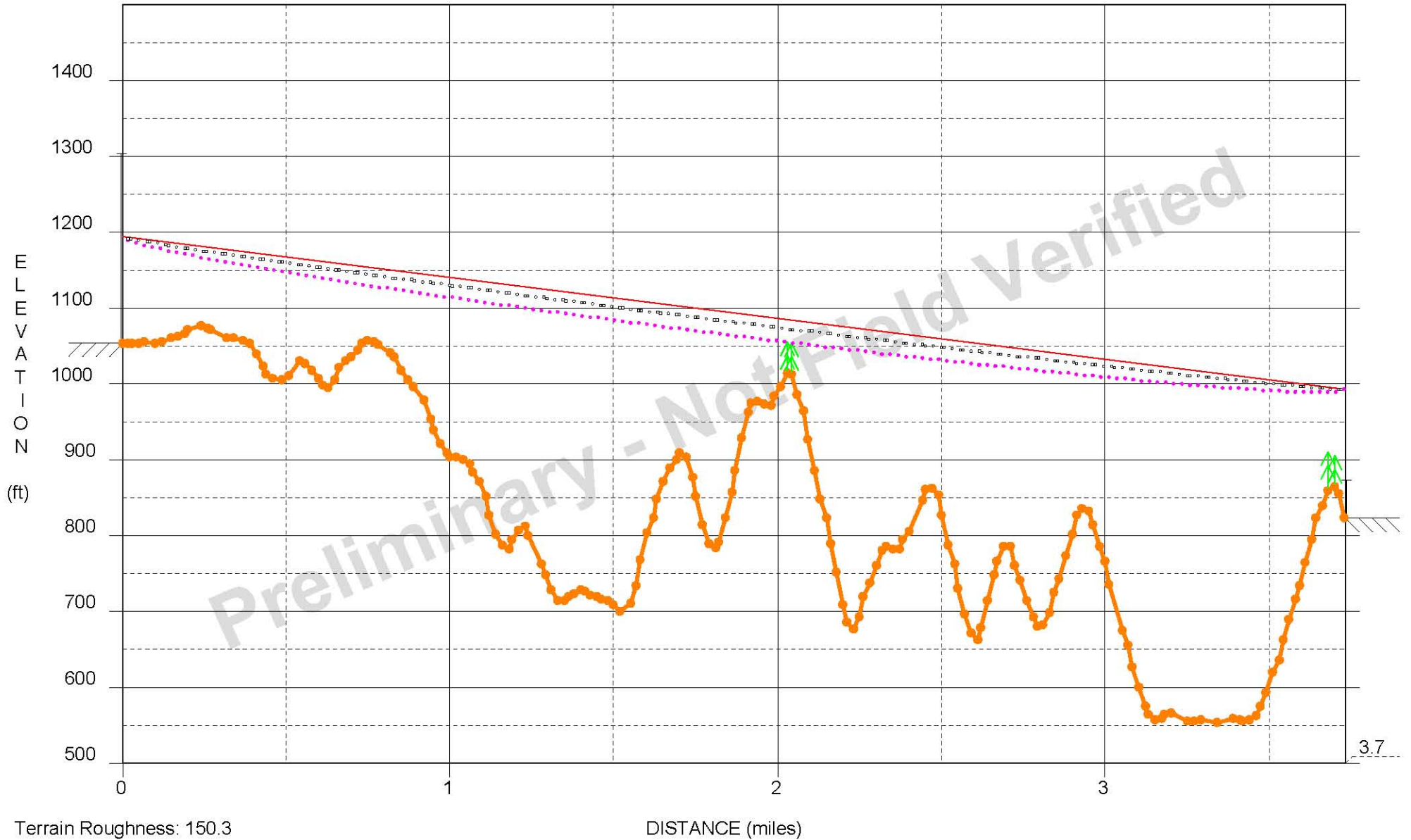




Site Name: **Freeze St.**  
 NAD83 Latitude N: 36° 09' 51.1" N  
 Longitude W: 085° 30' 1.0" W  
 Elevation AMSL: 1138.0 ft  
 Centerlines AGL: 146.0 ft  
 Reference Map:  
 Field Verified:  
 Aviat Networks Confidential and Proprietary Information

ID: OOW-18	Freq = 6.175 GHz	09-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	- - - = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

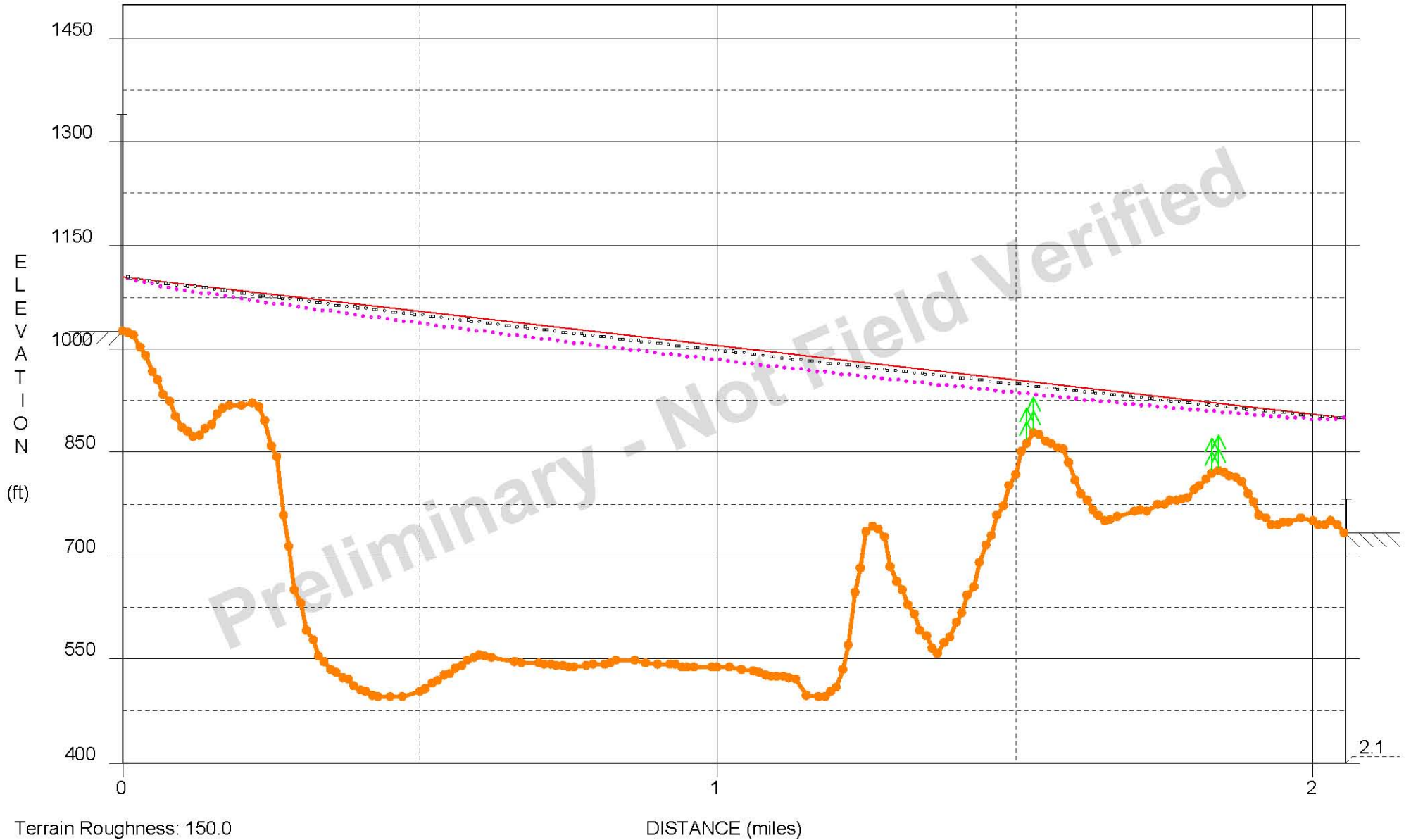
Site Name: **Gainesboro 1**  
 NAD83 Latitude N: 36° 18' 41.9" N  
 Longitude W: 085° 37' 55.2" W  
 Elevation AMSL: 1052.0 ft  
 Centerlines AGL: 80.0 ft  
 Reference Map:  
 Engineer: J.Ma



Site Name: **Gainesboro 1**  
 NAD83 Latitude N: 36° 18' 41.9" N  
 Longitude W: 085° 37' 55.2" W  
 Elevation AMSL: 1052.0 ft  
 Centerlines AGL: 141.0 ft  
 Reference Map:  
 Field Verified:  
Aviat Networks Confidential and Proprietary Information

ID: OOW-19	Freq = 6.175 GHz	11-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	- - - = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

Site Name: **Gainesboro Smith**  
 NAD83 Latitude N: 36° 21' 39.5" N  
 Longitude W: 085° 39' 33.9" W  
 Elevation AMSL: 822.0 ft  
 Centerlines AGL: 170.0 ft  
 Reference Map:  
 Engineer: J.Ma

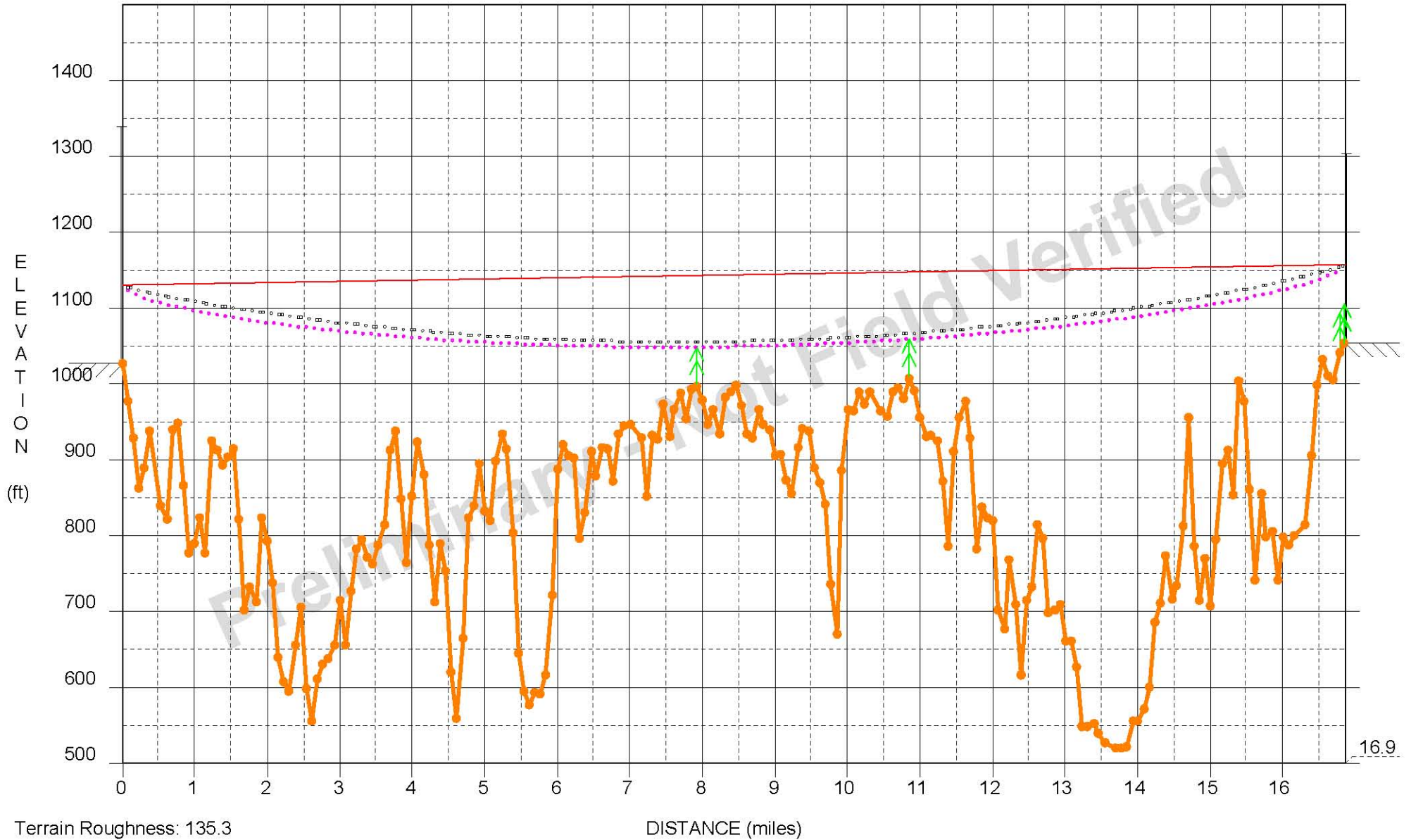


Site Name: **Celina 1**  
 Latitude N: 36° 31' 19.9" N  
 Longitude W: 085° 28' 41.1" W  
 Elevation AMSL: 1025.0 ft  
 Centerlines AGL: 80.0 ft  
 Reference Map:  
 Field Verified:  
Aviat Networks Confidential and Proprietary Information

ID: OOW-21	Freq = 6.175 GHz	10-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	--- = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

Site Name: **Celina Town**  
 Latitude N: 36° 32' 45.9" N  
 Longitude W: 085° 30' 0.4" W  
 Elevation AMSL: 732.0 ft  
 Centerlines AGL: 168.0 ft  
 Reference Map:  
 Engineer: J.Ma





Site Name: **Celina 1**  
 Latitude N: 36° 31' 19.9" N  
 Longitude W: 085° 28' 41.1" W  
 Elevation AMSL: 1025.0 ft  
 Centerlines AGL: 105.0 ft  
 Reference Map:  
 Field Verified:

Aviat Networks Confidential and Proprietary Information

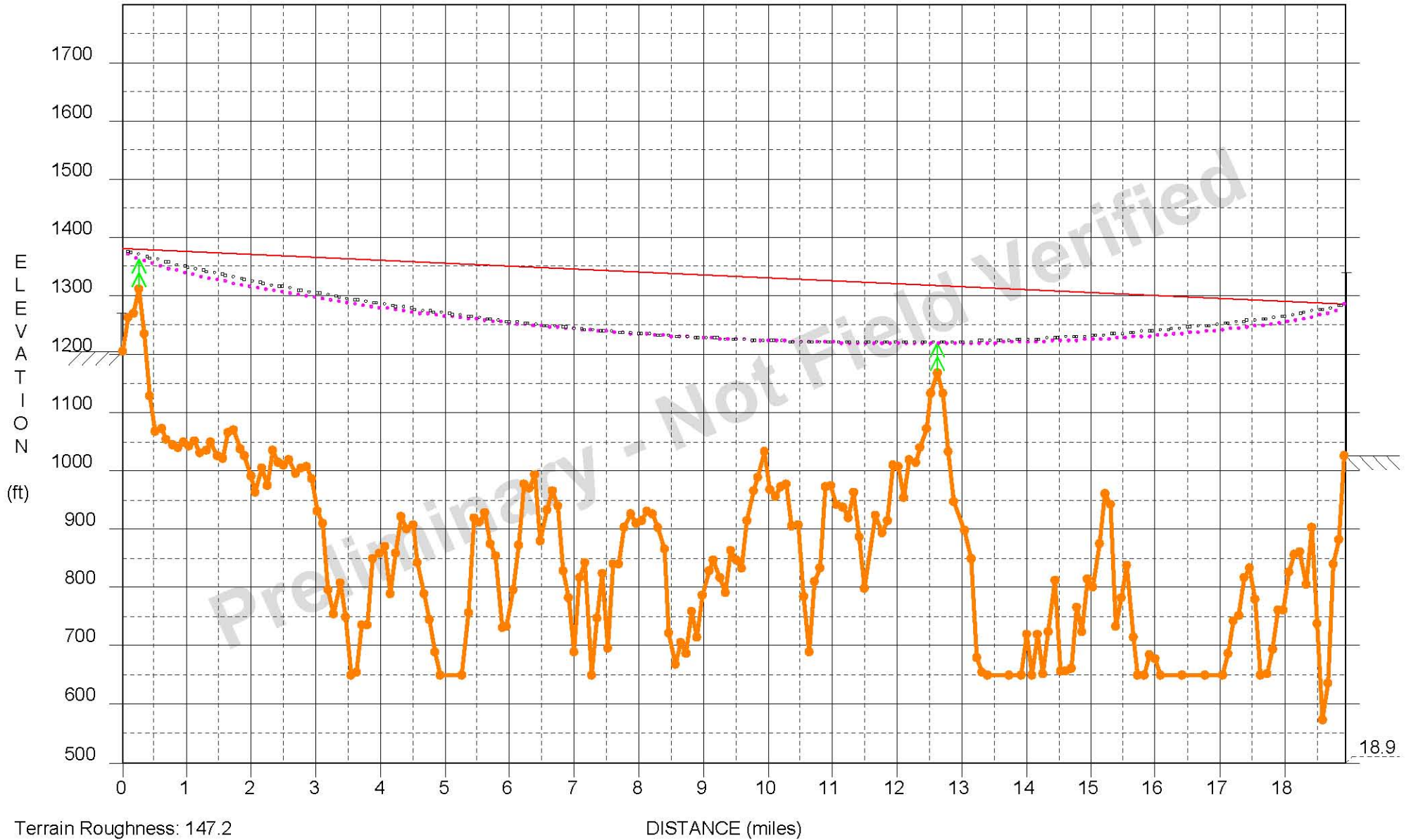
ID: OOW-25      Freq = 6.175 GHz      11-Mar-2010

**ONWAV**

ONWAV WIMAX+MW

Aviat Networks      ..... = 1.00 F1 @ K = 1.33  
 Aviat Networks      - - - = 0.30 F1 @ K = 0.67  
    = 0.60 F1 @ K = 1.00

Site Name: **Gainesboro 1**  
 Latitude N: 36° 18' 41.9" N  
 Longitude W: 085° 37' 55.2" W  
 Elevation AMSL: 1052.0 ft  
 Centerlines AGL: 105.0 ft  
 Reference Map:  
 Engineer: J.Ma



Site Name: **Byrdstown**  
 NAD83 Latitude N: 36° 33' 49.4" N  
 Longitude W: 085° 08' 30.3" W  
 Elevation AMSL: 1205.0 ft  
 Centerlines AGL: 176.0 ft  
 Reference Map:  
 Field Verified:  
 Aviat Networks Confidential and Proprietary Information

ID: OOW-27	Freq = 6.175 GHz	11-Mar-2010
<b>ONWAV</b>		
ONWAV WIMAX+MW		
Aviat Networks	..... = 1.00 F1 @ K = 1.33	
Aviat Networks	--- = 0.30 F1 @ K = 0.67	
	= 0.60 F1 @ K = 1.00	

Site Name: **Celina Tower**  
 NAD83 Latitude N: 36° 31' 19.9" N  
 Longitude W: 085° 28' 41.1" W  
 Elevation AMSL: 1025.0 ft  
 Centerlines AGL: 261.0 ft  
 Reference Map:  
 Engineer: J.Ma



TRANSMIT SITE NAME COORDINATES ELEVATION (ft)	CORRESPONDING RECEIVE SITE	PATH I.D.	DISTANCE AZIMUTH TRUE NORTH	PRIMARY ANTENNA SIZE / HEIGHT (ft)	DIVERSITY ANTENNA SIZE / HEIGHT (ft)	DOME	PRIMARY TRANS LINE LENGTH (ft)	DIVERSITY TRANS LINE LENGTH (ft)	RADIO TYPE CONFIGURATION FREQ (GHz)	CAP	XMIT PWR (dBm)	RSL TOP OF RACK (dBm)	SLOPE EQUALIZER	TRANSMIT ONLY PAD	COMMON PAD
Allardt Downtown LAT: 36 - 22 - 51.1 LON: 84 - 52 - 55.8 ELEV: 1646.0	Jamestown City Hall	OOW-17	4.13 mi 321.26°	6.0 / 123.0	---	YES	223.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 27.5		-28.8	STD	---	---
Byrdstown LAT: 36 - 33 - 49.4 LON: 85 - 8 - 30.3 ELEV: 1205.0	Celina Tower	OOW-27	18.93 mi 261.40°	6.0 / 176.0	---	YES	276.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 31.5		-40.4	STD	---	---
Celina Tower LAT: 36 - 31 - 19.9 LON: 85 - 28 - 41.1 ELEV: 1025.0	Gainesboro Tower	OOW-25	16.86 mi 210.62°	6.0 / 105.0	---	YES	205.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 27.5		-40.7	STD	---	---
	Celina Town	OOW-21	2.05 mi 323.35°	6.0 / 80.0	---	YES	180.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 27.5		-32.6	STD	10.0 dB	---
	Byrdstown	OOW-27	18.93 mi 81.20°	6.0 / 261.0	---	YES	361.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 31.5		-40.4	STD	---	---
Celina Town LAT: 36 - 32 - 45.9 LON: 85 - 30 - 0.4 ELEV: 732.0	Celina Tower	OOW-21	2.05 mi 143.34°	6.0 / 168.0	---	YES	268.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 27.5		-32.6	STD	10.0 dB	---
Cookeville CH22 LAT: 36 - 10 - 26.5 LON: 85 - 20 - 37.4 ELEV: 1958.0	Livingston West	OOW-3	15.19 mi 1.82°	6.0 / 80.0	---	YES	180.0	---	IRU 600 L6 64CB7 AM MHS 6.175	DS1 LOP 27.5		-38.9	STD	---	---
	Jamestown City Hall	OOW-5	29.03 mi 52.84°	6.0 / 442.0	4 / 412	---	542.0	512.0	IRU 600 L6 64CB7 AM MHS-SD 6.175	DS1 LOP 31.5		-43.5	STD	---	---

TRANSMIT SITE NAME COORDINATES ELEVATION (ft)	CORRESPONDING RECEIVE SITE	PATH I.D.	DISTANCE AZIMUTH TRUE NORTH	PRIMARY ANTENNA SIZE / HEIGHT (ft)	DIVERSITY ANTENNA SIZE / HEIGHT (ft)	DOME	PRIMARY TRANS LINE LENGTH (ft)	DIVERSITY TRANS LINE LENGTH (ft)	RADIO TYPE CONFIGURATION FREQ (GHz)	CAP	XMIT PWR (dBm)	RSL TOP OF RACK (dBm)	SLOPE EQUALIZER	TRANSMIT ONLY PAD	COMMON PAD
Cookeville CH22	Freeze St.	OOW-7	8.78 mi 265.62°	6.0 / 81.0	---	YES	181.0	---	IRU 600 L6 25015 QAM MHS 6.175	DS1 LOP	25.5	-36.6	STD	---	---
Freeze St. LAT: 36 - 9 - 51.1 LON: 85 - 30 - 1.0 ELEV: 1138.0	Gainesboro Tower	OOW-18	12.55 mi 324.14°	6.0 / 146.0	---	---	246.0	---	IRU 600 L6 25015 QAM MHS 6.175	DS1 LOP	29.5	-33.8	STD	---	---
	Cookeville CH22	OOW-7	8.78 mi 85.52°	6.0 / 105.0	---	YES	205.0	---	IRU 600 L6 25015 QAM MHS 6.175	DS1 LOP	25.5	-36.6	STD	---	---
Gainesboro Smith LAT: 36 - 21 - 39.5 LON: 85 - 39 - 33.9 ELEV: 822.0	Gainesboro Tower	OOW-19	3.73 mi 155.78°	6.0 / 170.0	---	YES	270.0	---	IRU 600 L6 64087 AM MHS 6.175	DS1 LOP	27.5	-28.6	STD	---	---
Gainesboro Tower LAT: 36 - 18 - 41.9 LON: 85 - 37 - 55.2 ELEV: 1052.0	Freeze St.	OOW-18	12.55 mi 144.07°	6.0 / 80.0	---	---	180.0	---	IRU 600 L6 25015 QAM MHS 6.175	DS1 LOP	29.5	-33.8	STD	---	---
	Gainesboro Smith	OOW-19	3.73 mi 335.80°	6.0 / 141.0	---	YES	241.0	---	IRU 600 L6 64087 AM MHS 6.175	DS1 LOP	27.5	-28.6	STD	---	---
	Celina Tower	OOW-25	16.86 mi 30.53°	6.0 / 105.0	---	YES	205.0	---	IRU 600 L6 64087 AM MHS 6.175	DS1 LOP	27.5	-40.7	STD	---	---
Jamestown City Hall LAT: 36 - 25 - 39.4 LON: 84 - 55 - 42.9 ELEV: 1761.0	Allardt Downtown	OOW-17	4.13 mi 141.23°	6.0 / 132.0	---	YES	232.0	---	IRU 600 L6 64087 AM MHS 6.175	DS1 LOP	27.5	-28.8	STD	---	---

TRANSMIT SITE NAME COORDINATES ELEVATION (ft)	CORRESPONDING RECEIVE SITE	PATH I.D.	DISTANCE AZIMUTH TRUE NORTH	PRIMARY ANTENNA SIZE / HEIGHT (ft)	DIVERSITY ANTENNA SIZE / HEIGHT (ft)	DOMES	PRIMARY TRANS LINE LENGTH (ft)	DIVERSITY TRANS LINE LENGTH (ft)	RADIO TYPE CONFIGURATION FREQ (GHz)	CAP	XMIT PWR (dBm)	RSL TOP OF RACK (dBm)	SLOPE EQUALIZER	TRANSMIT ONLY PAD	COMMON PAD
Jamestown City Hall	Cookeville CH22	OOW-5	29.03 mi 233.08°	6.0 / 133.0	4 / 103	---	233.0	203.0	IRU 600 L6 64087 AM MHS-SD 6.175	DS1 LOP	31.5	-43.5	STD	---	---
Livingston West LAT: 36 - 23 - 39.1 LON: 85 - 20 - 6.2 ELEV: 1267.0	Cookeville CH22	OOW-3	15.19 mi 181.83°	6.0 / 55.0	---	YES	155.0	---	IRU 600 L6 64087 AM MHS 6.175	DS1 LOP	27.5	-38.9	STD	---	---

**ATTACHMENT E – PROJECT PLAN (KEY PHASES AND MILESTONES TO DEMONSTRATE DEGREE OF COMPLETION)**

- Use the following table to list the major network build-out phases and milestones that can demonstrate that your entire project will be substantially complete by the end of Year 2 and fully complete by the end of Year 3. This is to be done at the aggregate level (combining all proposed funded service areas.)
- Indicate how the milestones listed below will demonstrate these completion objectives. The applicant should consider such project areas as: a) network design; b) securing all relevant licenses and agreements; c) site preparation; d) equipment procurement; e) inside plant deployment; f) outside plant deployment; g) equipment deployment; h) network testing; i) network complete and operational. The applicant may provide any other milestones that it believes showcase progress.
- Project inception (Year 0) starts at the date when the applicant receives notice that the project has been approved for funding.
- In the table, provide any information (e.g., facts, analysis) to: a) demonstrate the reasonableness of these milestones; b) substantiate the ability to reach the milestones by the quarters indicated.
- On a separate sheet, describe the key challenges, if any, to a timely completion of the project, including any applicable mitigation plans.

Time Period	Quarter	List All Relevant Milestones	Support for Reasonableness/Data Points
Year 0	-	<ul style="list-style-type: none"> <li>- WiMax sites confirmed and surveyed</li> <li>- Microwave sites confirmed and surveyed</li> <li>- Design finalized</li> </ul>	<ul style="list-style-type: none"> <li>- Line of sight confirmation required for all backhaul sites.</li> <li>- Design can be finalized only after site confirmations and line of sight validation</li> </ul>
Year 1	Qtr. 1	<ul style="list-style-type: none"> <li>- Microwave frequency selection and site licensing</li> <li>- Site acquisition</li> <li>- Begin lease site negotiation</li> <li>- Civil contractors secured</li> </ul>	<ul style="list-style-type: none"> <li>- Common Carrier licenses for access and backhaul.</li> <li>- Negotiate lease w/existing tower owners, perform structural analysis and designs</li> <li>- Bid civil construction work out to in-market civil contractors secured contracts</li> </ul>
	Qtr. 2	<ul style="list-style-type: none"> <li>- Site Engineering &amp; Approvals</li> <li>- Network Engineering &amp; Approvals</li> <li>- Lease tower finalization</li> </ul>	<ul style="list-style-type: none"> <li>- Architecture and Engineering drawings completed and submitted for local approvals can take time. Many times structural drawings go through many approval layers.</li> </ul>
	Qtr. 3	<ul style="list-style-type: none"> <li>- Civil construction begins</li> <li>- Finalize structural mods for lease towers</li> <li>- Field engineering and maintenance support plan established</li> <li>- Site radio equipment ordering</li> </ul>	<ul style="list-style-type: none"> <li>- On-going civil work progress will dictate equipment ordering for network build.</li> <li>- Support systems need to be tested and confirmed with new field personnel.</li> <li>-</li> </ul>

Year 2	Qtr. 4	<ul style="list-style-type: none"> <li>- Civil construction continues</li> <li>- Equipment staged and tested</li> </ul>	<ul style="list-style-type: none"> <li>- Sound engineering, logistics and staging practices dictate that all equipment received be tested prior to deployment.</li> <li>- Test bed of all access, backhaul network elements will ensure monitoring and maintenance systems are in order</li> </ul>
	Qtr. 1	<ul style="list-style-type: none"> <li>- Civil construction complete</li> <li>- Equipment delivery</li> <li>- Site equipment install begins</li> <li>- NOC support established</li> </ul>	<ul style="list-style-type: none"> <li>- Civil complete, inspected, and released for use. This may involve local authorities</li> <li>- NOC support scaled for service area based on final design.</li> </ul>
	Qtr. 2	<ul style="list-style-type: none"> <li>- Site equipment install continues</li> </ul>	<ul style="list-style-type: none"> <li>- Installation of MW and WiMAX equipment</li> </ul>
	Qtr. 3	<ul style="list-style-type: none"> <li>- Site equipment installed and tested</li> <li>- NOC/Field/Customer Service integration</li> <li>- Internet connection "live"</li> <li>- Production network testing established with "trial" customer(s).</li> </ul>	<ul style="list-style-type: none"> <li>- Production network is established in Year 2 Q2.</li> <li>- "Market-readiness" testing program is implemented and production network is "instrumented" within the NOC, field services, and customer services organizations</li> <li>- Interconnection with fiber provider for Internet services is complete</li> <li>- Integrate internet services with NOC and test the entire process (sale, contract, order, provision, install, commission, monitor, lifecycle manage) in a "live" customer test.</li> </ul>
	Qtr. 4	<ul style="list-style-type: none"> <li>- -Back office integration complete</li> <li>- -Production network "live"</li> <li>- -Sales channel "live"</li> </ul>	<ul style="list-style-type: none"> <li>- Core access and backhaul network "commercial quality" ready.</li> <li>- Customer support system in place and ready for customers.</li> </ul>
	Qtr. 1	•	•
	Qtr. 2	•	•



