

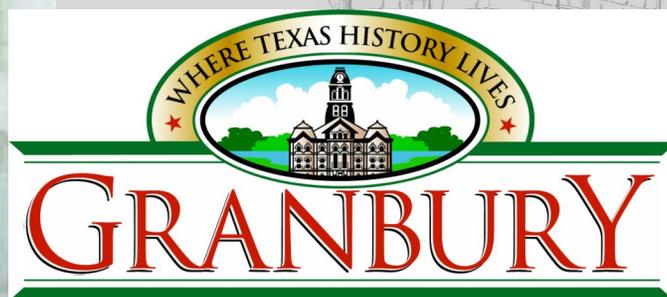
City of Granbury, Texas Broadband Project Submittal

To The

**National Telecommunications and
Information Administration**

In Accordance With The

**American Recovery and
Reinvestment Act of 2009
Broadband Initiatives**





PROJECT PLAN FOR CITY OF GRANBURY, TEXAS BROADBAND PROJECT

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City of Granbury, Texas Broadband Project Plan
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City of Granbury, Texas Broadband Project Plan
Project Plan Approvals:

Project Name	:	City of Granbury Broadband Project		
	:			
Project Manager	:	Name	Contact No.	Initials
		Anthony W. Tull	817-408-7170	
Project Sponsor	:	Name	Contact No.	Initials
		Harold Sandel	817-573-1114	
Executive Sponsor	:	Name	Contact No.	Initials
		Mayor David Southern	817-573-1114	



City of Granbury, Texas Broadband Project Plan

Executive Summary:

The City of Granbury Broadband Project will provide access in un-served areas, improve access in underserved areas, improve access for all public safety agencies and citizens, provide broadband education, awareness, training, access, equipment, and support and stimulate demand for broadband, economic growth, and job creation to the rural town of Granbury, Texas. This project builds upon the successful broadband initiative that the City started in 2005. The City has invested \$1,151,153.68, to date, excluding labor, in this initiative. The City has a track record that demonstrates expertise in the deployment, operation and management of this network. The City of Granbury Broadband Project will cover an area of 46.25 square miles and offer inexpensive broadband service to 11,209 residences and businesses. It will provide improved access for all public safety agencies involved in the City/County Joint CAD and Law Enforcement Records Management system currently being deployed. The fiber network will be used to provide connectivity for 11 Granbury Independent School District campuses, and 5 Hood County Government campuses, and 5 City of Granbury Government campuses. The project will consist of 703 Wireless Mesh Network Radios, 50 miles of Single Mode fiber, Infrastructure enhancements, and a Community Technology Center. The project can begin immediately upon grant award with a total project deployment of 6 months to completion. The total cost for the City of Granbury Broadband Project is estimated to be \$6,941,408.50.

Background:

The City of Granbury Texas is a small rural town located approximately 35 miles southwest of Fort Worth, Texas. The city has a population of 8,027 based upon the July 2007 estimate by the U.S. Census Bureau. The incorporated City limits cover an area of 13.63 square miles with an additional area of 32.62 square miles in the City's Extraterritorial Jurisdiction (ETJ). The City of Granbury is an innovator and leader in the planning, deployment, and operation of wireless broadband networks and infrastructure for public safety broadband network access and inexpensive broadband Internet access for citizens.

In October of 2005 the City of Granbury began deployment of a 100 node wireless mesh network with equipment supplied by Motorola and TROPOS Networks. The primary intent of the project was to bring broadband access to the various public safety agencies, i.e. Police, Fire, EMS, Sheriffs. The secondary intent was for the private partner in the project to sell broadband Internet access to the citizens of the City at an inexpensive rate and manage and maintain the network for the City. Granbury is an underserved City and this partnership was to bring Internet access to the many citizens that could not afford Cable or DSL rates or did not have access to those services. This partnership was dissolved after the private partner failed to maintain the network at an acceptable state of operation and had not delivered service as promised to underserved citizens. The network had become an essential part of the City's Public Safety operations. For this reason the City of Granbury negotiated the outright purchase of the network in April 2007 and took possession of the network and the entire associated infrastructure. The City IT staff spent 2 months redesigning and redeploying the network infrastructure. In June 2007 the network went live under the management of the City IT staff. The City has



City of Granbury, Texas Broadband Project Plan

continued to slowly expand the network and has a total 132 Mesh Network Radios currently operational. The City has also continued to increase the number of citizens subscribed to the network with a total of 325 subscribers as of February 27, 2009. Subscription rates for network access range from \$5.95/day for 768 Kb/s data rate to \$19.95/month for 768 Kb/s data rate.

To date the City of Granbury has invested \$1,151,153.68 in this network and associated infrastructure. This investment does not include any labor expenses required to maintain or operate this network.

Project Goals and Scope:

The goals of the Granbury Broadband Project are to build upon the existing network and infrastructure that is currently in place and utilized by public safety and the citizens. This project will provide access in un-served areas, improve access in underserved areas, improve access for all public safety agencies and citizens, provide broadband education, awareness, training, access, equipment, and support and stimulate demand for broadband, economic growth, and job creation.

The scope of the Granbury Broadband Project is to bring broadband access to the entire incorporated City limits and the City's ETJ. This would expand the current coverage area of 10.2 square miles to a total coverage area of 46.25 square miles. This would increase the availability of broadband to a total of 11,209 businesses and residences. This increased coverage would be accomplished by deploying a combination of wireless and fiber networks. The project design calls for the deployment of an additional 703 TROPOS radios (App. B), 51.81 miles of single mode fiber (App. C), upgrade of existing wireless infrastructure and construction of a Community Technology Center.

The City of Granbury and Hood County are currently partnered in the deployment of a shared Public Safety Dispatch and Law Enforcement Records Management system. One of the goals of the City of Granbury Broadband Project is to enhance the broadband capabilities that are available to the Public Safety vehicles so that they can utilize this network for accessing that system's mobile data software. To enhance the City of Granbury Fire Department communications and broadband access nine mobile TROPOS radios will be installed in the City of Granbury fire apparatus that have been equipped with mobile computers. The City Police Department is also operational with digital video cameras in all of the Police vehicles. The cameras utilizing the new joint Public Safety Dispatch software can transmit live video feeds wirelessly to the County Dispatch Center via this proposed Mesh Network. This live video feed will greatly enhance office safety.

The Granbury Independent School District will be able to utilize the fiber network to interconnect 11 school campuses. This interconnection is currently being served via a private network provided by the incumbent CableCo at a cost of over \$130,000 per year. Hood County government will be able to network their 5 campuses which are currently connected via dedicated T1 circuits which limit functionality do to bandwidth provided by these circuits.



City of Granbury, Texas Broadband Project Plan

These project tasks will support the project goal to provide access in un-served areas, improve access in underserved areas, and improve access for all public safety agencies and citizens.

This project includes the construction of a 1000 square foot community technology center to be equipped with 12 computers and broadband access for use by the citizens and instructors for community based training. This will support and stimulate demand for broadband, economic growth, and job creation and support broadband education, awareness, training, access, and equipment

This project will employ approximately 40 people through completion.

Project Approach:

The Granbury Broadband Project will be simultaneously deployed in four project areas.

Mesh Radio installation would begin immediately after a full site survey has been completed. This survey will be completed 2 weeks after the start of the project. At the completion of the site survey 3 teams will begin installation of the Mesh Radios. One team will target the north side of Highway 377, one team will target the south side of Highway 377 and one team will focus on the incorporated city limits.

In conjunction with the site survey the installation of the fiber will commence. The fiber portion of the project will be divided by aerial, trenched, and bored installations. The fiber installation will be further divided by 24 strand fiber for the central business district and Highway 377 bypass area and 12 strand fibers for all other areas.

As Mesh Radio units are installed they will be incorporated into the existing network so that expansion of the network will be a continuous process throughout the project. These units will be tied into the fiber network as it is deployed.

After completion of the site survey the upgrade of the wireless backhaul infrastructure will begin and construction will start on the 250' free standing tower.

Construction of the Community Technology Center would begin after completion of the construction drawings which will be 6 weeks after the start of the project. The Center will include the installation of a gigabit network, training server, and 12 computers.

Project Deliverables:

- 50 miles of single mode fiber, 30 miles of 12 strand and 20 miles of 24 strand (App. C)
- 240 fiber connected gateway radios
- 200 wireless gateway radios
- 703 total Mesh radios (App. B)
- 10 - 100 Mb wireless backhails



City of Granbury, Texas Broadband Project Plan

- 250' free standing tower with communication building
 - Community Technology Center with 12 computers
 - Bi-weekly status reports published on the web
-

Key Milestones:

#	Milestone	Target Completion Date	Comments
3.	Grant Award	Day 1	TBD
4.	Order materials	Day 1	
5.	Begin architectural drawings on Community Technology Center	Day 3	
6.	Site Survey	Day 5	
7.	Begin Fiber install	Day 5	
8.	All materials delivered	Day 8	
9.	Begin Mesh Radio installs	Day 8	
10.	Begin Backhaul upgrades	Day 8	
11.	Begin tower construction	Day 8	
12.	Begin construction on Community Technology Center	Day 30	
13.	Complete tower construction	Day 45	
14.	Begin fiber tie-ins to radios	Day 50	
15.	Install Communication Bldg	Day 60	
16.	Complete Backhaul upgrades	Day 120	
17.	Complete construction on Community Technology Center	Day 150	
18.	Complete Mesh Radio installs	Day 180	
19.	Complete fiber install	Day 198	
20.	Complete fiber tie-ins to radios	Day 205	
21.	Project Complete	Day 210	

Assumptions:

- Project will be completely funded by grant with no funding by the City
 - Grant funds will be available for contractor funding during project
 - All materials can be delivered at time of funding
 - All state permitting can be obtained in a timely manner
 - FCC and FAA permits for 250' tower can be obtained in a timely manner
-



City of Granbury, Texas Broadband Project Plan

Key Resource Requirements:

Major Project Activities	Skill/Expertise Required	Internal Resource	External Resource	Issues/Constraints
Project Management	Management	Yes	Yes	None
Fiber installation	Fiber	No	Yes	None
Fiber Splices	Fiber	Yes	Yes	None
Radio Site Survey	Wireless	No	Yes	None
Mesh Radio Installation	TROPOS	Yes	Yes	None
Tower Construction	Tower Erection	No	Yes	None
Communication Bldg Installation	Construction	Yes	No	None
Community Technology Center Construction	Construction	Yes	Yes	None

Constraints:

- Permitting by TXDOT for attaching fiber to bridges
- Permitting by Cen-Tex Railroad for boring under railroad right of way
- Approval of waiver for matching funds by City of grant funds
- Permitting by FAA/FCC of 250' free standing tower

Interrelated Projects:

The completion of the City/County Joint CAD and Records Management project is scheduled to be complete on May 14, 2009. The City of Granbury Broadband Project will provide improved broadband access for the Public Safety agencies utilizing this new system.

Acceptance Criteria:

The Mesh network will be accepted when the wireless network will support 10 Mb/s throughput utilizing a standard laptop wireless device used outdoors within the mesh.

The fiber network will be accepted when each of the terminations provides less than 3db transmission loss.

The backhaul network will be accepted when the link provides a minimum of 90 Mb/s throughput between endpoints.



City of Granbury, Texas Broadband Project Plan

Financial Analysis:

The budget estimate for the Granbury Broadband Project is broken into three components; Mesh network, Fiber, and Infrastructure. Each estimate is based on detailed inspection of the City and the requirements that must be met for installation of the various components of the project. Detailed breakdowns of each of the three components are included in Appendix A.

The total estimate for the TROPOS Mesh Network component is \$2,817,724.35. The total estimate for the Fiber component is \$2,996,374.00. The total estimate for the Infrastructure component including the Community Technology Center is \$925,133.20. A 3% contingency item for \$202,176.95 has been included. This brings the total project cost estimate to \$6,941,408.50.



City of Granbury, Texas Broadband Project Plan
Appendix A Financial Details



555 Del Rey Ave.
 Sunnyvale, CA 94085
 Main: 408-331-6800
 Fax: 408-331-6801

Sales Quote - NA

Quote Number	NTIA Grant
Date of Order	26-Feb-09

Purchaser:		Ship To:	
Name:	City of Granbury, TX	Name:	Same
Address:	116 W Bridge St	Address:	
City, State:	Granbury, TX 76048	City, State:	
Country:		Country:	
Contact:	Tony Tull	Contact:	
Phone #:	(817) 573-1114	Phone #:	
Fax #:		Fax #:	
Email Address:	tull@granbury.org	Email Address:	

Qty	Product	Part Number	Price/Unit	Disc. %	Disc. Price/Unit	Ext. Price
Hardware						
273	5210: 28dBm TX, AC Power, NoBatt	52103030	\$ 2,495.00	15.0%	2,120.75	578,964.75
430	5320: 2.4 & 5.8GHz, AC Power, NoBatt	53203030	\$ 4,495.00	15.0%	3,820.75	1,642,922.50
100	Weather-Tight Gateway Connector Kit	EC003500	\$ 139.00	15.0%	118.15	11,815.00
703	Pwr Cable, 20ft, 2-wire, Photo-Cell	PT021020	\$ 219.00	15.0%	186.15	130,863.45
9	4210 Mobile Router: 28dBm TX, N-conn	42102100	\$ 2,695.00	15.0%	2,290.75	20,616.75
18	1-Vehicle Mnt, 7.4dBi Omni Ant Cable Kit	AN074090	\$ 149.00	15.0%	126.65	2,279.70
9	1-Veh Mnt, GPS Rcvr w/ Cable & USB Intf	GR000350	\$ 449.00	15.0%	381.65	3,434.85
100	Network Termination Accessory	MB008000	\$ 300.00	15.0%	255.00	25,500.00
					Hardware Subtotal	2,416,397.00
Software						
712	Tropos Control Router License	NMC06500-100	\$ 169.00	15.0%	143.65	102,278.80
712	Tropos Insight Router License	NMI06500-100	\$ 99.00	15.0%	84.15	59,914.80
1	Tropos Drive, Drive Test Appliance & Kit	TD042100	\$ 6,995.00	15.0%	5,945.75	5,945.75
					Software Subtotal	168,139.35
					Product TOTAL	2,584,536.35
Support						
<i>Reseller Support - Customer support provided by Reseller. Includes Software Updates, Bug Fixes & Maintenance Releases; Level 1 and Level 2 support provided by reseller.</i>						
<i>TROPOS Support - Customer support provided by TROPOS. Includes Software Updates, Bug Fixes & Maintenance Releases; Hotline, Web and Email Support</i>						
282	Premium SW + HW Replace Single Radio Router - 1 year	SUHWP001	\$ 249.00	0%	\$ 249.00	70,218.00
430	Premium SW + HW Replace Dual Radio Router - 1 year	SUHWP002	\$ 379.00	0%	379.00	162,970.00
-				0%	-	-
-				0%	-	-
					Support Subtotal	233,188.00
Training and Professional Services						
-	Project Management Services (per week)	PSPMW001	\$ 9,000.00	0%	\$ 9,000.00	-
-	Network Implementation Sup (per week)	PSNIW001	\$ 9,000.00	0%	9,000.00	-
-				0%	-	-
-				0%	-	-
					Training and Services Subtotal	-
					Support and Services TOTAL	233,188.00
					GRAND TOTAL	\$ 2,817,724.35

Notes: _____

Quote Terms and Conditions:

- 1 Payment terms: Net 30 upon prior approval, F.O.B. Tropos manufacturing facility.
- 2 Quote expires in 30 days from date of quote.
- 3 Sales tax and shipping will be added to final invoice as appropriate.
- 4 Delivery of the products is EX Works (Incoterms 2000) Seller's factory or EX Works facility of Seller's agent, as designated by Seller. Seller reserves the right to ship Best Way at its own expense.
- 5 This price quotation does not constitute an offer by Tropos to sell products, but is instead an invitation to issue a purchase order to Tropos before the validity date specified in this quotation has expired.

Internal Use / End User: _____
Sales Rep: Pequette
Requested Delivery Date: _____
Requested Delivery Means: _____
Shipper # _____

Please fax orders to (408) 331-6529 or email to OrderStatus@tropos.com



City of Granbury, Texas Broadband Project Plan

Granbury Broadband Project				
Infrastructure Detailed Cost Estimate				
Item	Quantity	Unit Price	Total	Vendor
2008 INTERNATIONAL 4300 BUCKET TRUCK	1	\$152,000.00	\$152,000.00	Texas Cooperative Buy Board
2008 FORD 1 TON EXTENDED CAB TRUCK w/ TONEAU COVER AND ROLLOUT BED	1	\$28,000.00	\$28,000.00	Texas Cooperative Buy Board
Fitel S177A Fusion Splicer Kit	1	\$17,400.00	\$17,400.00	Fiberoptic.com
Fluke Networks OptiFiber Multimode/Singlemode Certifying OTDR	1	\$38,250.00	\$38,250.00	CDWG
Fluke Networks Professional Vision Suite	1	\$42,911.00	\$42,911.00	CDWG
Siemon Fiber Termination Kit - network tools kit	1	\$999.00	\$999.00	CDWG
Cyclone 5.7 GHz 360 Degree Advantage Access Point. Mfg P/N: Cyclone 5750-360	3	\$2,749.00	\$8,247.00	Double Radius
Motorola Avantage Subscriber Modules	200	\$580.00	\$116,000.00	Double Radius
Motorola PTP54500 Series Full 105 Mbps connectorized backhaul link	8	\$12,956.90	\$103,655.20	Double Radius
10/100TX - 100Base-FX (SC) Single Bridge Mode Fiber Converter - 50KM, LFPT	240	\$140.00	\$33,600.00	Planet Networks
Black Box Fiber Econo fiber optic connector (SC)	500	\$3.86	\$1,930.00	CDWG
250' Free Standing Tower	1	\$150,000.00	\$150,000.00	Allstate Towers
8' x 12' Communication Building	2	\$16,267.00	\$32,534.00	Enviro Buildings
1000' Sq. Ft. Town Hall Expansion for Community Technology Center	1000	\$150.00	\$150,000.00	City of Granbury
HP TouchSmart IQ504 - Core 2 Duo T5750 2 GHz - 22" TFT	12	\$1,098.00	\$13,176.00	CDWG
HP ProCurve 1800-24G Switch	1	\$380.00	\$380.00	CDWG
APC NetShelter SX Enclosure without rear doors - rack - 42U	1	\$1,112.00	\$1,112.00	CDWG
APC Smart-UPS 1500VA USB & Serial RM 2U 120V	1	\$634.00	\$634.00	CDWG
Kohler 25 KW Generator Set M/N 20REOZJC Diesel Fuel, 120/240 Volt, 1 Phase, 60 HZ, 1800 RPM, 100 Amp Kohler Automatic Transfer Switch M/N KSS-DFNC-0100S	1	\$31,025.00	\$31,025.00	Clifford Power
Electrical wiring tie-in for Generator and Communication Building	1	\$3,280.00	\$3,280.00	G&G Electric
Total			\$925,133.20	



City of Granbury, Texas Broadband Project Plan

j/p Installations

305 Sunrise Drive
Granbury, Texas 76049
Office [817] 578-8407
Fax [817] 573-8002
jpInstallations.com
specserv@swbell.net

Tony

Here is the bid for the Granbury Broadband Project Fiber Deployment:

Placement of aerial messenger and fiber including anchors and down guys 179,520'.

Bury 1x1.50" HDPE by methods of directional bore and trench 84,480'.

Place a 17"x30" hand hole every 2,000' would equal to 42 boxes.

Bore and place a 4" steel at 2 railroad locations for approximately 225'.

Make bridge attachments at 4 different locations (3 locations have an existing water main attached to the bridge)

We will secure a contractor to draw the plans for the entire build.

It will be the responsibility of the City of Granbury to secure all city, state and railroad permits.

Henkels & McCoy will supply all materials to complete this project.

We will also test and terminate fiber upon completion.

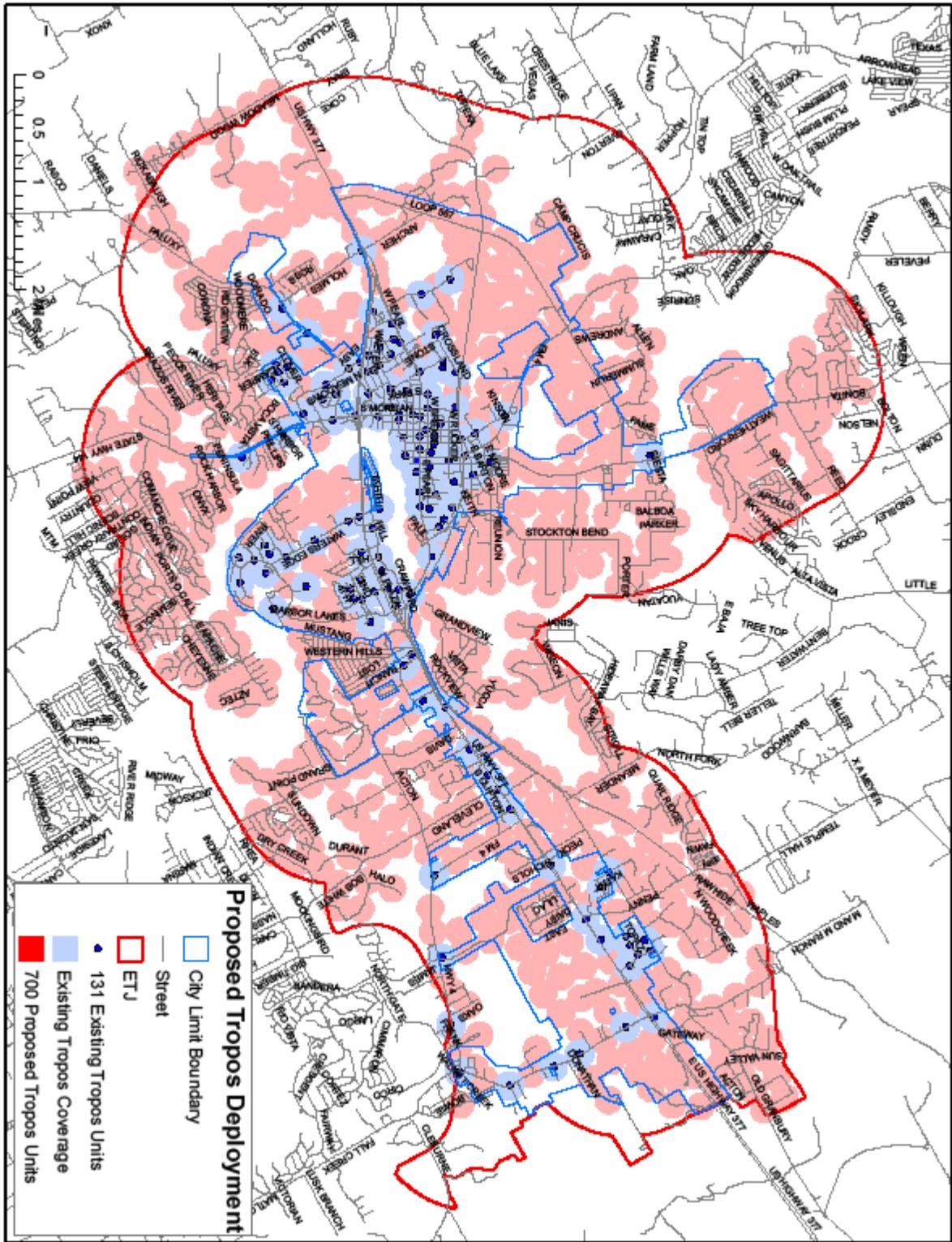
The price is strictly budgetary at this time until we can get confirmation to proceed.

- Construction cost \$ 1,415,819.00
- Material cost \$ 927,425.00
- Engineering cost \$ 510,446.00
- Project Management cost \$142,684.00

Total cost \$ 2,996,374.00

We look forward to working with you,

City of Granbury, Texas Broadband Project Plan
Appendix B



City of Granbury, Texas Broadband Project Plan
Appendix C

