



# CardinalBroadband

## PROPOSAL FOR WIRELESS INTERNET FOR THE GURA DISTRICT

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### **GURA**

Prepared for

Mark Heller

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Prepared by Jon Bartlett

March 8, 2006

# Executive Summary

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Mark, thank you for the opportunity to present you with our proposal to provide the Wireless Network. We're very excited about working with GURA on this project. This proposal outlines the services that we discussed. Please keep in mind that we are very flexible and are able to adapt the scope as the needs change or grow.

Cardinal Broadband specializes in design, implementation and maintenance of Video, Voice, and Data networks. With first-class customer service, back-office and infrastructure systems and Cardinal Broadband's experience and expertise in end-to-end solutions, we believe that we can not only meet the demands of the GURA wireless network, but clearly exceed them.

We believe that the high-speed wireless Internet service will be best utilized if it is provided as a free service to the GURA community. Similar to the deployment at Cherry Creek North, the free service will act to help the local businesses by attracting users to the GURA area.

With the proposed hardware and software, the network can be expanded to provide additional services, including; WiMAX, VoIP, video services and connectivity to public safety vehicles. These services need to be addressed on a case-by-case basis. However, as an example, the upgrade to provide WiMAX service is simply the addition of a miniPCI card to the existing access points.

We believe that GURA project presents a unique opportunity for the local businesses in Golden. By directing users of the wireless network to a Cardinal Broadband supported login (splash) page or web portal, local businesses can have an opportunity to advertise their products and services to customers who are in the GURA area. This also provides an opportunity for Cardinal Broadband to develop revenue streams based on selling advertising space on the web portal.

Additional opportunities include the ability to connect security cameras (with DVR) to the system and, as is the case at Cherry Creek North, the parking meters.

We recommend at least 1.5Mb (1 T1) for backbone connectivity and can provide up to 20Mb. These circuits would be terminated at the Head End in the Millstone development.

If you have any questions regarding the proposal, please don't hesitate to contact me at 303-285-5347.

Jon Bartlett  
President  
Cardinal Broadband

# Scope of Services

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Following is an overview of the services that Cardinal Broadband will provide GURA based on the outlined scope of work.

## Overview

The network will consist of wireless access points throughout the proposed coverage area, with users having the ability to log in to the internet via a controlled web portal. By passing through this portal the user is exposed to messages and advertisements that Cardinal Broadband will keep fresh and targeted toward the client base using this network. The revenue from these advertisers will help offset the ongoing operation and maintenance of the network.

## System Operation

The wireless network will be connected to the Internet via T1's or fractional DS3. These would be terminated at the Millstone Development.

The user can connect to the network from any 'WiFi' enabled device. Examples include laptop computers (Windows or Mac), PDAs, and WiFi enabled cell phones.

With the proposed contract, GURA will pay for the equipment and labor; Cardinal Broadband will own, operate and maintain the network, and will provide GURA, and businesses and customers in the GURA district, free "limited access" to the network. GURA will assist in marketing the service to local business through networking, introductions, etc...

## Job Functions

- Site Survey
- Roof/Pole Rights – Will require the help of GURA and the City of Golden
- Provide a detailed architecture and design of the proposed network
- Implement the Wireless Internet Infrastructure for the GURA project
- Provide testing and delivery of the network upon completion
- Provide operation and maintenance services for the Wireless Internet Infrastructure for a period of 5 years with successive like terms upon mutual consent
- Provide T1's or DS3 for Internet connectivity for a period of 5 years, with like renewable terms upon mutual consent
- Design, Build, Host and Manage Web Portal for the contract duration

The implementation of the network will start with the backbone of the network and work out to the access points. Generally, the implementation will be in the following phases:

- Headend construction
- Wireless POP(s)
- Access Points



- 900MHz radio + Antenna
- 2 x 5GHz AP + antennas
- Mounts, surge, cable, etc
- Extra APC UPS (if required)

4 different "levels" of radios based on 2 different hardware platforms

- 900Mhz for NLOS (Non Line of Site) ("900MHz SuperNode Repeaters")
- 2.4GHz "WiFi" AP ("End Nodes", "WiFi APs")
- 2.4GHz/5GHz/4.9GHz Repeater/access nodes ("SuperNodes")
- 5GHz Access points and repeater nodes ("MasterNodes")

\* 900MHz Radios:

- WaveIP "GigAccess 900"
- 8Mb of usable throughput
- Extends reach of network (capable of NLOS connections)
- Real QoS support for better network performance

\* 2.4GHz(b/g) / 5GHz / 4.9GHz Radios:

- Hardware Platform: Soekris Engineering and PC Engines
- Software Platform: MT OS
- RF (Radio) Platform: Atheros

## Equipment Counts:

AP	30
SN	10
900 Client	5
900 Base	1
5.8 Base	2
5.3 Base	2
Head End	1

*A SN is also an AP.*

## Software

- Web Site Design and Hosting
- Walled Garden – Customer Portal
- Banner Ads
- Sponsor Ads
- Links – Chamber of Commerce, InGolden.com, GURA, City of Golden

## Build Out

- 2-3 weeks (assuming permits & permissions in place)
- T1 Installation 3 – 4 weeks

## System Costs

- \$70,000.00
- Includes labor, equipment, web design and project management

- 2/3 due upon contract signing; balance due upon completion
- Warranty – 1 year parts
- Additional coverage and WAPs quoted upon request

## **Management**

- On-going maintenance and internet access
- Customer Help Desk
- Sales, Marketing and Advertising Placement Services

# Summary

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Once again, thank you for the opportunity to provide you with a proposal to provide a free to user wireless network. We look forward to a long and prosperous working relationship that's beneficial to the public, GURA and Cardinal Broadband.

Please feel free to contact us with any questions or clarification that you may have regarding the proposal.

The Cardinal Broadband Team

## **References**

*Please contact us prior to reaching these references*

The Grand Timber Lodge  
Downtown Denver Partnership  
The Breck Inn  
Subway Restaurants  
Cherry Creek North  
ViCORP (Village Inn/Bakers Square Restaurants Corporation)  
BioTest  
Markley Motors

