Orick Net

Orick Wireless Broadband Business Plan

For the Community of Orick California

January 16, 2007

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GLOSSARY

Access Point (AP) = A hardware device that acts as a communication hub for users of a wireless device to connect to a wired network. APs are important for providing heightened wireless security and for extending the physical range of service a wireless user has access to.

Anchor subscribers = A major or prime customer of network services. As a larger consumer than residential subscribers, anchor tenants contribute a larger portion, based on usage, to the financial success of a network project.

Asynchronous Transfer Mode (ATM) = A technology used to transmit video, audio, and computer data over the same network, and assure that no single type of data hogs the line. Phone companies often use ATM on their networks to transport DSL traffic to the Internet.

Backhaul = 1) In wireless network technology, to transmit voice and data traffic from a cell site to a switch, i.e., from a remote site to a central site, 2) To transmit data to a network backbone or the Internet.

Bandwidth = The amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually in bits per second (bps), usually noted as megabits per second (mbps) or kilobits per second (kbps).

Broadband = High-speed transmission. The term commonly refers to Internet access via cable, DSL, and wireless, which is considerably faster than dial-up. Broadband has always referred to a high-speed connection. The FCC defines broadband as a minimum upload speed of 200 Kbps, though many consider this slow and an obsolete definition.

California Environmental Quality Act (CEQA) = A California law (California Public Resources Code section 21000 et seq.) passed in 1970, shortly after the Federal Government passed the National Environmental Policy Act. CEQA does not directly regulate land uses, but instead requires development projects submit documentation of their potential environmental impact.

California Teleconnect Fund (CTF) = Provides qualified organizations a 50% discount on select telecommunications services offered by AT&T California. CTF was established in 1996 by the California Public Utilities Commission (CPUC) and is solely funded through an end-user surcharge placed on all telephone bills in California. Qualified organizations are schools, libraries, community based organizations, hospitals, health clinics, and state/local government.

Community Services District = A geographic sub area of a city or county used for the planning and delivery of parks, recreation, and other human services based on an assessment of the service needs of the population in that sub area.

Cottage Industries = An industry primarily manufacturing, which includes many producers, working from their homes, typically part time.

Customer Premise Equipment (CPE's) = Communications equipment that resides on the customer's premises.

DSL = Refers collectively to all types of Digital Subscriber Lines. DSL technologies work over a telephone company's copper wires. They are sometimes referred to as last-mile technologies because they are used only for connections from a telephone switching station to a home or office, not between switching stations.

E-rate funding = A discount provided by the federal government and funded by telecommunications providers that funds schools and libraries with telecommunications services. http://www.usac.org/default.aspx has detailed information.

Fiber to the Home Technology (FTTH) = A broadband telecommunications system based on fiber-optic cables and associated optical electronics for delivery of multiple advanced services such as of telephone, broadband Internet and television across one link (triple play) all the way to the home or business.

Federal Communication Commission (FCC) = An independent United States government agency, created, directed, and empowered by Congressional statute (see 47 U.S.C. § 151 and 47 U.S.C. § 154). The FCC was established by the Communications Act of 1934 as the successor to the Federal Radio Commission and is charged with regulating all non-Federal Government use of the radio spectrum (including radio and television broadcasting), and all interstate telecommunications (wire, satellite and cable) as well as all international communications that originate or terminate in the United States. It is an important factor in US telecommunication policy.

Geographic Information System (GIS) = A system for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to the earth. In the strictest sense, it is a computer system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically-referenced information. In a more generic sense, GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, and edit data.

GHz = Abbreviation for Gigahertz. A unit of frequency equal to one billion cycles per second.

Internet Service Provider (ISP) = A company that provides access to the Internet, usually for a monthly fee. Equipped with a modem/cable modem/DSL/wireless router, you can then logon to the Internet and browse the World Wide Web, and send and receive e-mail. In addition to serving individuals, ISPs also serve large companies, providing a direct connection from the company's networks to the Internet. A WISP is a wireless ISP.

MHz = Abbreviation for Megahertz. A measurement of frequency in millions of cycles per second.

Microwave System = is a radio system, configured to provide data or voice connectivity between fixed locations. In a single microwave radio segment, radio signals are transmitted

between two locations with directional antennas, forming a fixed radio connection between the two points. Multiple sites, each connected by such links, can be used to form a contiguous network, tying distant networks together.

Multi-point AP system = is a radio system using an access point at a central location, with links to multiple end points. End points could number from one to hundreds per central Access Point, and can be homes, businesses, or other users of the system, which can be in fixed locations or mobile.

Orick Economic Development Corporation (OEDC) = A private, non-profit 501(c)(4) corporation chartered under the laws of the State of California.

Propagation study = A "radio coverage" study. The application of wave propagation to radio communications. An analysis of typical radio coverage.

Redwood Regional Economic Development Commission (RREDC) = A collaboration of Humboldt County communities dedicated to the ongoing implementation of the Comprehensive Economic Development Strategy, Prosperity!

The RREDC was formed in 1977 to create a countywide economic development strategy and to make decisions on the allocation of grant funds given to the County as economic mitigation for the expansion of Redwood National Park. The RREDC mission is to support countywide economic development by expanding the opportunities for capital available to local businesses and organizations, providing leadership in regional policy and program development, and adding economic development capacity to local agencies and organizations.

Satellite Internet = Satellite Internet service sends data from remote sites via satellite to a hub, which then sends the data to the Internet. The satellite dish at each location must be precisely positioned to avoid interference with other satellites. Signals can fade due to weather. Uplink speeds rarely exceed one megabit per second and latency can be up to one second.

Streaming = Streaming media is media that is heard or viewed while it is being viewed or listened to. It is usually media that are distributed over computer networks; most other delivery systems are either inherently streaming (radio, television).

T1 = A dedicated connection supporting data rates of 1.544Mbits per second. A T-1 line actually consists of 24 individual channels, each of which supports 64Kbits per second. Each 64Kbit/second channel can be configured to carry voice or data traffic. Most telephone companies allow you to buy just some of these individual channels, known as *fractional T1* access. T1 lines are a popular leased line option for businesses connecting to the Internet and for Internet Service Providers (ISPs) connecting to the Internet backbone.

Telecommunications = Refers to all types of data transmission, from voice to data to video.

Ultra High Frequency (UHF) = Designates a range (band) of electromagnetic waves whose frequency is between 300 MHz and 3.0 GHz.

Very High Frequency (VHF) = The radio frequency range from 30 MHz to 300 MHz.

Videoconferencing = Conducting a conference between two or more participants at different sites by using computer networks to transmit audio and video data.

Virtual Private Network (VPN) = A private data network that makes use of the public (Internet) telecommunication infrastructure, maintaining privacy through the use of a tunneling protocol and security procedures. A virtual private network can be contrasted with a system of owned or leased lines that can only be used by one company. The idea of the VPN is to give the company the same capabilities at much lower cost by using the shared public infrastructure rather than a private one. Mobile workers find it particularly useful for telecommuting. A virtual private network makes it possible to have the same secure sharing of public resources for data.

Voice over Internet Protocol (VoIP) = A category of hardware and software that enables people to use the Internet or Wide Area Network (WAN) as the transmission medium for telephone calls. Internet telephony products are sometimes called IP telephony, Voice over the Internet (VOI) or Voice over IP (VoIP) products.

Wi-Fi = Wi-Fi stands for wireless fidelity® (also WiFi, wifi, etc.). It is a brand originally licensed by the Wi-Fi Alliance® to describe the underlying technology of wireless local area networks (WLAN) based on the IEEE 802.11 specifications. It was developed to be used for mobile computing devices, such as laptops, in LANs, but is now increasingly used for more services, including Internet and VoIP phone access, gaming, and basic connectivity of consumer electronics such as televisions and DVD players, or digital cameras.

Some of the definitions are courtesy of www.webopedia.com, www.answers.com, and www.wikipedia.org

ORICK NET

Orick Wireless Broadband Business Plan

1. Reader Summary

For many rural, natural resource dependent communities, the decline in natural resources has equated to a decline in the business community and consequently a decline in the local economy. The ability of a community to foster economic development by supporting existing businesses and attracting new businesses depends on transportation, communication and utility services. Advanced telecommunications, including high speed data services and/or broadband, has become increasingly integral to economic development and daily business activities, as more business services are conducted online. Broadband allows a company to do business with suppliers, customers and freight carriers more efficiently. High speed Internet access allows business owners to spend less time and resources on business travel while offering the same advantages. Broadband also enables employees to telecommute, which expands job and income opportunities for rural community residents.

Broadband could cultivate economic development in a rural area by facilitating tourism and creating significant jobs in tourist serving industries. A community based wireless broadband system could provide free Wi-Fi for tourists. Tourist serving cottage industries could upload content, e.g., visitor serving accommodations, to a business website attracting visitors to the area. High speed Internet access in a rural community has a positive effect on the local economy, allowing a community to attract new businesses, foster cottage industries, and maintain existing businesses in today's business climate.

Broadband service would also foster community development through educational opportunities. With a broadband system, educational facilities can take advantage of the many distance learning programs available. Broadband makes video conferencing possible, thus allowing students to participate in online classes that are not offered in the local school system. Access to broadband would also expand educational opportunities as residents could participate in online degree programs or professional online lecture series that require streaming audio and video. In addition, low speed data services, impair students' ability to conduct Internet research and has a limiting affect on e-mail performance. Indirectly, economic development would also be spurred by way of a better educated workforce.

This business plan provides an analysis of, and potential for, the deployment of wireless broadband in the Orick area. The proposed wireless broadband system, named Orick Net for this business plan, would be a community based service for individuals, small businesses and large, anchor subscribers (e.g., Orick School, Redwood National and State Parks) operating in the Orick area.

In larger urban applications, the large broadband customer base provides the economies of scale that permit the up-front capital costs of broadband capital stock, (e.g., towers, cable, transmitters) to be priced into the monthly service charge at a competitive rate. In contrast, the very small potential customer base for broadband in Orick (approximately 60) implies that the up front cost of purchasing capital stock cannot be costed into a monthly service charge that is competitive with satellite based broadband service.

Consequently, it is crucial to the successful implementation of broadband service that several anchor subscribers, are willing to participate and are able to either directly contribute toward the up front capital cost of the broadband network, or help secure grant funds for that purpose. Although the Orick Net system will require initial subsidies to facilitate infrastructure investment, the network will eventually become a self-sustaining network of operators and users.

This business plan lays out why wireless broadband was selected over other Internet choices, the hardware necessary to construct the system, potential tower sites and access points, possible funding sources, and the steps that are necessary to implement the system. If successful, the Orick wireless broadband system could be used as a model for other rural communities.

Plan Goals

- To design a wireless broadband system for the Orick community that can also be used as a template for other rural communities in Humboldt County;
- To provide a total aggregate bandwidth of 5 MBit/Sec bandwidth; and
- To provide service at a rate competitive with that charged for satellite service in order to retain users over time. This translates to a current monthly rate of $60 or less per user.

Keys to Success

- Successful startup;
- Community support and stewardship;
- Adequate subscriber base for successful long term operations;
- Competitive recurring costs;
- Community wide coverage in order to provide service to all potential subscribers; and
- Adequate bandwidth for the users sharing the network at any given moment without a reduction in service.

Overview of system recommendations

The geographic area being considered for the Orick Net system extends from the Big Lagoon causeway at the south end to Prairie Creek State Park campground and Visitor Center on the north end, roughly along Highway 101. Wolf Creek Education Center, Prairie Creek Campground, Redwood Trails RV Park, Redwood Park Lodge, Green Diamond, Freshwater Lagoon, Stone Lagoon, McDonald Creek and the town of Orick would be included in the service area. Residences and businesses along Kane Road, Bald Hills Road, and Lost Man Creek Road would also be within the service area. Figure 1 depicts the service area.

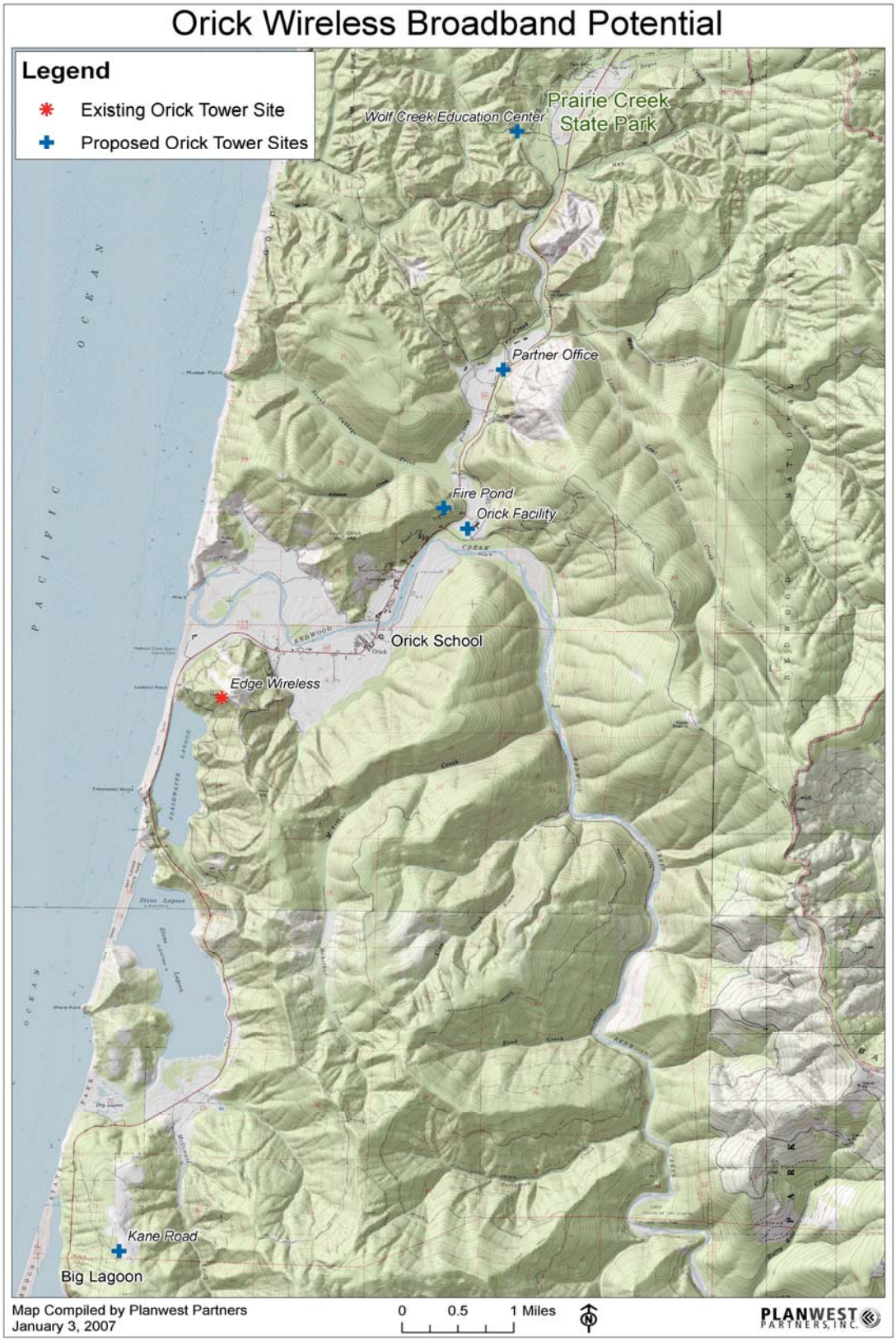
The system outlined in this plan is designed to elevate the current dial-up service offered in Orick to high speed Internet access. This will require new infrastructure, new service providers and a new local management entity.

The recommendation for Orick Net is to use a point to multi point access system. A 900MHz band should be used for the point to multi-point access point systems, to provide improved coverage, system reliability, and performance. For the backhaul links between sites, the recommended point to point systems should be a 5.8 GHz band, to provide increased bandwidth and high reliability.

For backhaul to an Internet connection, the Orick Net system should include construction of a point to point system connecting the network to a business that can provide an Internet connection in Eureka. This would increase the capital costs, but would greatly reduce the recurring costs, improving the network's potential long term success. A tower location near Arcata or Eureka should be used as a radio repeater site, with an additional link to an ISP, to keep recurring costs low.

Assuming the capital costs can be covered through outside grant funding, the projected revenue would need to cover the recurring costs for leased services, Internet access, network operations, equipment maintenance, and the cost to lease tower space for the antennas. If grant funding is secured for capital costs, and some of the recurring costs are able to be shared, the proposed Orick wireless broadband network has a very good prospect of being self-sustaining

Figure 1 Orick Net Service Area and Potential Tower Locations



2. Background and Setting

Orick is an unincorporated town in northern Humboldt County, forty miles north of Eureka on US Highway 101. The once thriving timber town is located in the coastal portion of the Redwood Creek Valley. The ridges surrounding Orick are densely covered with verdant forests of coast redwood, Sitka Spruce and Red Alder. Orick is a gateway to the Redwood National and State Parks, which encompass 104,312 acres.

Basic demographic information assists in understanding the potential Orick wireless broadband subscriber base. The following tables contain Orick demographics from the 2000 census.

Table 2.1 General Characteristics of Orick Residents

General Characteristics	Orick #	Orick %	Humboldt County %	U.S.
Total population	487			
Male	235	48.3%	49.4%	49.1%
Female	252	51.7%	50.6%	50.9%
Median age (years)	41.7	N/A	N/A	35.3
Under 5 years	35	7.2%	5.6%	6.8%
18 years and over	361	74.1%	76.8%	74.3%
65 years and over	72	14.8%	12.5%	12.4%
Average household size	2.42	N/A	N/A	2.59
Average family size	2.93	N/A	N/A	3.14
Total housing units	247			
Occupied housing units	201	81.4%	91.6%	91.0%
Owner-occupied housing units	106	52.7%	57.6%	66.2%
Renter-occupied housing units	95	47.3%	42.4%	33.8%
Vacant housing units	46	18.6%	8.4%	9.0%

Table 2.2 Social Characteristics of Orick Residents

Social Characteristics	Orick#	Orick %	Humboldt County %	U.S. %
Population 25 years and over	359			
High school graduate or higher	277	77.2	84.9%	80.4%
Bachelor's degree or higher	50	13.9	23.0%	24.4%
Civilian veterans (civilian population 18 years and over)	71	18.0	14.5%	12.7%
Disability status (population 5 years and over)	155	32.0	21.2%	19.3%

Table 2.3 Economic Characteristics of Orick Residents

Economic Characteristics	Orick#	Orick %	Humboldt County %	U.S. %
In labor force (population 16 years and over)	206	52.0	60.4%	63.9%
Median household income in 1999	$25,417	N/A	N/A	$41,994
Median family income in 1999	$29,479	N/A	N/A	$50,046
Per capita income in 1999	$13,041	N/A	N/A	$21,587
Families below poverty level	34	24.8	12.9%	9.2%
Individuals below poverty level	136	26.6	19.5%	12.4%

Internet History in Orick

The community in Orick has struggled to receive basic Internet service at competitive rates. In 2002, the North Coast Small Business Development Center (NCSBDC) got involved in trying to find a solution for Orick Internet access. Harborside Internet in Crescent City, with funding from NCSBDC, agreed to provide dial-up service to Orick for three years, as long as there were at least 50 users. Orick initiated the service with 51 users. Soon after, Harborside Internet was sold to Carroll's Web, a Kansas company. After a couple years, subscribers dwindled to around 30, due to the poor quality of service and the high cost being charged for dial-up Internet access. Ultimately, the low subscriber base caused Carroll's Web to terminate service to Orick.

This prompted calls in mid-2005 to NCSBDC. After scrambling for a few weeks, an Orick resident contacted Simple.Net, an ISP that not only provides unlimited dial-up Internet access, but free local access numbers as well. Simple.Net started providing service to Orick in 2005 and a 'simple' solution seemed to be at hand. Then in June 2006, Simple.Net notified Orick subscribers that toll-free calling would be limited to five hours per month. This translates into ten minutes per day, which is less toll free use than the typical usage time required to perform basic tasks, such as sending and receiving email, with dial-up Internet service. If Simple.Net provided unlimited toll-free calling, Orick residents would still be limited to dial-up Internet access in an ever increasing broadband world. Although a number of residents and businesses in Orick have dial-up or satellite Internet access, true broadband service is more desirable. Appendix A provides additional details on the history of Internet access in Orick.

Orick Internet Choices

Infrastructure is the basic building block of a telecommunications network and determines what services are available in a community. In the Orick area, basic telephone services are available, but data services are based on 20-year-old technology. For the past five years, the demand for Internet services has grown in Orick, but the options for Internet access have not. The only Internet access options for Orick residents or businesses are dial-up, T1, or satellite service and they are expensive options.

From a telecommunications perspective, Orick is more connected to Del Norte County than Humboldt County, since they are serviced by an existing telecommunications network in

Crescent City. Orick residents and businesses receive telephone service from the Incumbent Local Exchange Carrier (ILEC) Verizon Northwest. It is interesting to note that Orick is the only territory in Humboldt County served by Verizon Northwest.

Although Orick occupies an idyllic location on the Northern California coast, the telecommunications infrastructure is less than ideal; every telephone call out of Orick, whether voice or data, is a toll call, which makes dial-up Internet service an expensive proposition that can cost several hundred dollars a month. The California Public Utilities Commission (CPUC) will not entertain requests to extend the Orick local dialing area so that calls to Crescent City would not incur a toll charge. Verizon Northwest has been asked about the cost of upgrading their Crescent City and Orick central offices for DSL. Verizon Northwest stated they have no intentions of providing DSL service in Orick due to the high cost of upgrading equipment to asynchronous transfer mode (ATM).

Almega has the cable television franchise for the town of Orick. Almega has stated they have no intentions of providing cable modem service in Orick due to the high capital costs of upgrading cable infrastructure relative to the small subscriber base. Additionally, Almega currently serves the town of Orick, but not the outlying areas. As a result, households on the periphery of Orick would still lack high speed data services even if Almega upgraded the cable infrastructure.

Satellite Internet access is an option utilized by a few Orick residents. Satellite Internet does not use telephone lines or cable systems, but instead uses a satellite dish for two-way data communications. Satellite service requires up-front equipment purchases totaling $580 - $700 and monthly service charges ranging from $60 - $150 per month. In addition, some satellite Internet service still requires a dial-up or cable modem connection in order to send data to the Internet. Satellite latency precludes use of Virtual Private Network (VPN), Voice over Internet Protocol (VoIP), and the uploading of files can be almost as slow as dial-up service. Broadband service would have a positive impact on Orick, a community which has historically been underserved.

State of the Technology

For those who have not lived with broadband Internet access, the benefits of having it available are difficult to imagine. There are several different flavors of broadband infrastructure and each type of broadband service has unique characteristics, but the benefits are the same. The unique characteristics of each broadband service, determines whether a particular technology can be deployed in a given geographic area.

Table 2.4 below, summarizes broadband Internet technologies considered in this plan, based on the costs and capabilities, related to a small community. The bandwidth of the various technologies is explained in terms of how long it would take a user to download a full-length

DVD-quality movie, which is not quite a routine application for the Internet. However, many service providers are gearing up to offer video entertainment services across broadband networks. Therefore, it is given as an example of an application that could be made possible, given the proper broadband infrastructure. As an example, using some technologies (DSL, wireless broadband, cable modem), a user could expect to download a movie within a couple hours and then watch it the same evening. Slower technologies would take so long to perform the same task, that the example is not even a practical application.

At the other end of the spectrum, Fiber to the Home (FTTH) technology can transfer the data at such a high speed that the transfer exceeds the data rate necessary during playback. As a result, FTTH provides the advanced capability of being able to watch a DVD-quality movie while it is being downloaded. This capability is called Streaming, where the user is able to view multimedia content directly from a remote server, in real time.

Table 2.4 Summary of Broadband Internet Technologies Considered for Orick Net

Technology	Cost to Construct	Typical Bandwidth	Notes
Frame Relay	High	56 KBits/Sec to 1.5 Mbits/Sec Variable – 5 Hours to 248 Hours to download a DVD-quality movie	Early technology for broadband infrastructure based on costly electronics, which results in very high user costs. Bandwidth is not much more than current capabilities for dial-up Internet access at the lower speed end, while increased costs can get higher performance data rates.
Dedicated T1	Low	1.544 MBits/Sec 4.6 Hours to download a DVD-quality movie	Dedicated infrastructure results in very high recurring cost to users.
Satellite	High	772 KBits/Sec to 56 KBits/Sec Variable time to download a movie	Due to the large number of users sharing the bandwidth, download speeds are "throttled" in order to prevent individual users from "taking over" the bandwidth. This limits the capability for large file downloads. Even with these limitations, service typically costs $60 to $150 per month. However, if there are no other broadband choices, satellite may be an appropriate choice.
Wireless Broadband	Medium	3 MBits/Sec to 10 MBits/Sec, Shared 2.3 Hours to download a DVD-quality movie	Modest cost for wireless infrastructure makes wireless a financial possibility in smaller communities. Still requires dedicated backhaul to an ISP for Internet access. Costs range from $20 to $60 per month
DSL	Medium	3 MBits/Sec, Dedicated 2.3 Hours to download a DVD-quality movie	DSL service can be provided over normal telephone cables to the home. However, new central equipment at the telephone office is necessary. DSL is very cost effective. Costs range from $20 to $50 per month.

Technology	Cost to Construct	Typical Bandwidth	Notes
Cable Modem	High	6 MBits/Sec, Shared 1.1 Hours to download a DVD-quality movie	A complete system upgrade must be performed. Typically cable modem service is only available in larger communities. Costs range from $30 to $45 per month.
Fiber to the Home (FTTH)	Very High	15 MBits/Sec, Dedicated 27 minutes to download a DVD-quality movie	Verizon is deploying FTTH in larger markets. However the high construction costs make it very impractical in smaller communities. Costs range from $35 to $65 per month.

The current state of broadband technology is such that the typical broadband user either has DSL, a Cable Modem, or a comparable technology. Because of the widespread availability of 3 MBit/Sec to 6 MBit/Sec services, a great amount of multimedia content is made available that suits those users. As an example, music that is purchased on-line can be downloaded at a rate of approximately one song every 15 seconds. Also, most of the video content that is made available on-line is at less than DVD quality, which reduces the download times to the point of being able to stream the video, or view it while it is being downloaded.

In rural areas such as Orick, DSL and cable modem service are unlikely to be offered in the near future. The reality of a relatively small population is that the revenue required for upfront capital construction costs cannot be recovered from monthly user fees. Thus, many businesses will not entertain the idea of upgrading the infrastructure necessary to provide high speed data services in a small, rural area. From a community perspective, the most accessible technology currently available is Satellite service.

Although a few residents in Orick have satellite service, the individual user upfront capital costs ($580 - $700) required to buy the necessary start up equipment is cost prohibitive for many residents, especially given the slow performance associated with satellite service. Conversely, the satellite business owner's starts up costs (i.e., satellites and supporting infrastructure) are shared by rural users across the country, so the high capital costs are recovered through a relatively large user population. However, the widespread sharing of the network cost also means that the bandwidth available through the network is also shared. As a result, users are frequently disappointed in the performance of satellite service. A Google search performed by the team yielded a large amount of information pertaining to user dissatisfaction with satellite Internet due to slow connection speeds, poor technical support and in some cases a failure to connect with the service even though the equipment was installed correctly.

Wireless broadband is a unique opportunity, providing a useful amount of bandwidth at a relatively modest cost for infrastructure. This results in a network that can easily serve the needs of a smaller community, while requiring less revenue to pay for the construction. The community in and around Orick, with 60 to 100 potential individual subscribers, appears to be an ideal fit for the cost and bandwidth capabilities of a wireless broadband network.

3. Telecommunications Planning Methodology

An inventory of existing towers in the Orick area was conducted, using the County GIS database, the Federal Communication Commission (FCC) database for licensed radio towers, including sites at Orick Point, Rodgers Peak, Schoolhouse Peak and other area wireless facilities. Information about cell tower owners, users co-located on those towers, and a review of the County's tower and communication facility permitting record was compiled. All area Orick tower owners were contacted to verify availability of tower site space, as well as other organizations with telecommunications facilities that are co-located on their towers. The team reviewed data pertaining to existing towers, microwave technologies, wireless communication towers, and service providers co-located on these facilities to analyze the feasibility of integrating the Orick wireless broadband system with existing systems and technologies to cut initial capital costs.

Optimum locations for wireless transmission facilities, based on a topographical analysis for reaching the largest possible geographical area (GIS analysis) were identified. Additionally, a propagation study, which runs models and predicts the coverage area of service towers, was then applied to topographical analysis. A map was created that identified potential tower sites and optimum layout of transmission facilities based upon the topographic analysis, propagation study and potential subscriber locations.

Data backhaul to the Internet is one of the biggest challenges in rural areas because rural areas are not typically served by multiple telecommunications companies, and Orick is no exception. Data backhaul options were analyzed in order to determine the easiest path to integration with existing systems and ISPs. The backhaul analysis describes opportunities for connecting Orick to the Internet. The team paid particular attention to linking the Orick wireless broadband service area to existing broadband and telecommunication services in the Humboldt Bay region. Backhaul options and data costs were analyzed, taking into consideration parallel efforts to examine and build an alternate fiber optic cable link into the County from the east.

The County of Humboldt has funded a study to build a business case for an alternate fiber optic cable route to the east, either along Highway 299 or the PG&E right of way. Currently, there is only one fiber optic cable route into and out of the County. The existing fiber optic cable route is owned by AT&T and runs out of Eureka south to San Francisco, roughly along Highway 101. An initial report on the proposed alternate east fiber optic cable route details the costs and projected market. Within a few months a detailed business plan will be developed. While Orick is not located near the proposed alternate east fiber optic cable route, the alternative route would provide additional backhaul options for the Orick Net system once established.

Representatives of the County office of Emergency Services, Redwood National Park, California State Parks, and California Department of Forestry and Fire Protection were interviewed to learn

the current methods and capabilities for emergency services communications. From those interviews, a list of agencies and organizations and first responders that utilize emergency services telecommunications in the Orick area was compiled. The communications assessed included two-way radios, telephones, cellular phones, satellites, and dial-up Internet, among others. Opportunities for resource sharing with these entities were considered in our analysis effort. The results of the above research and analysis are detailed below.

Towers

The Orick area poses a number of significant challenges to an effective wireless system. Although the ridges in the area provide a number of opportunities for high tower sites, many of the ridges do not have electrical service. The cost of routing power to an undeveloped ridge is cost prohibitive if only to establish a wireless transmission facility. Therefore, the sites evaluated for wireless use were either equipped with power, close to commercial electrical service, or already equipped with a tower.

Two communications towers are located within the geographic area covered by the proposed system. US Cellular and Verizon each have a tower on the ridge south of Redwood Creek. The US Cellular tower no longer has room for the co-location of Orick Net wireless broadband equipment. The Verizon tower is currently used for telecommunication service only. Edge Wireless is also building a tower on the ridge south of Redwood Creek and has room for the co-location of Orick Net equipment on the tower.

A potential local business partner is considering construction of a microwave network to their facility in Orick within the next year. The potential partner is willing to discuss the possibilities of joining Orick community Internet traffic, with their data traffic, south to Eureka where it can connect to the Internet. A figure illustrating potential tower sites within the Orick Net service area are shown in Figure 1 and Appendix B.

The County of Humboldt conditions of approval for cellular towers include: conditional use permits and special permits. The following terms and requirements must be fulfilled before a building permit may be issued:

Conditions of Approval:

1. Applicant shall:
    a) Limit access to antennas during operation;
    b) Install warning signs which comply with ANSI C95.2 color, symbol and content conventions;
    c) Posted contact information for access to restricted areas; and this condition will be administered by the Community Development Services - Building Inspection Division. This condition shall appear as an information note on the Building Permit plot plan.

2. Prior to issuance of the building permits, the applicant shall make payment for all outstanding Humboldt County Community Development Services - Planning Division fees. Cost report available at the Humboldt County Community Development Services - Planning Division.

3. Applicant shall:
    a) Maintain erosion control as specified in §3432(9) of the Framework Plan;
    b) Implement "Best Management Practices" for erosion and sediment control during the construction phase of the project;
    c) Use dust control techniques when excavating to minimize dust problems on adjacent dwelling(s).
    d) Reseed disturbed areas prior to winter rain.
    e) Take all precautions necessary to avoid the encroachment of dirt or debris on adjacent properties.

This condition shall appear as an information note on the Building Permit plot plan.

4. The new tower, microwave dish antennas, including radomes, and appurtenances shall be fabricated or painted to blend with the existing site vegetation so as to minimize visual impacts to surrounding recreational areas (i.e., Freshwater Lagoon). The color(s) used shall be approved by the Planning Director and maintained for the life of the project. The applicant shall install matching antenna covers (radomes) onto the existing microwave tower.

There are also on-going requirements and development restrictions that must continue to be satisfied for the life of the project. The on-going conditions are as follows:

- All existing outdoor lighting shall be compatible with the existing setting and directed within the property boundaries. In particular, the security door light for the equipment building shall be down-shielded and directed to limit the amount of light escaping the site;
- Operations shall be consistent with the Project Description, site plan, and application (including supplemental information); and
- Existing site vegetation (i.e., mature trees and brush) shall be retained to the extent practical to provide screening of the facility. Maintenance of vegetation by limbing and/or removal shall be permitted when necessary for facility operations.

California Environmental Quality Act (CEQA) Requirements

CEQA states that one of the following findings must be made prior to approval of any development which is subject to the regulations of CEQA:

- That the project is either categorically or statutorily exempt;
- That there is no substantial evidence that the project will have a significant effect on the environment or any potential impacts have been mitigated to a level of insignificance and a negative declaration has been prepared pursuant to Section 15070 of the CEQA Guidelines; or
- That an environmental impact report (EIR) has been prepared and all significant environmental effects have been eliminated or mitigated to a level of significance, or the required findings in Section 15091 of the CEQA Guidelines are made.

See Appendix C for Orick cell tower permitting history.

Topographical analysis

Much like the very high frequency (VHF) and ultra high frequency (UHF) television frequency bands, other wireless, radio technologies can use a variety of frequency bands. As with broadcast television, where UHF signals don't typically carry as far as VHF signals, the higher frequency bands have more difficulty dispersing. The factors affecting the dispersion of a frequency include, distance, terrain, and vegetation.

Dense tree cover on the ridges that surround the town of Orick, pose a challenge to an effective wireless system. Trees in a given area can block the wireless signal, preventing transmission and ultimately service. Although there are effective ridge locations to use for a wireless system, tree-covered ridges throughout the area affect the ability for the wireless signal to “see” all the areas targeted for service. Because of this, one single ridge location cannot provide service to the entire Orick area. However, it is routine to build a system of this type with transmission facilities located on multiple ridges. There are two categories of wireless systems (radios) used for networks that require multiple access points.

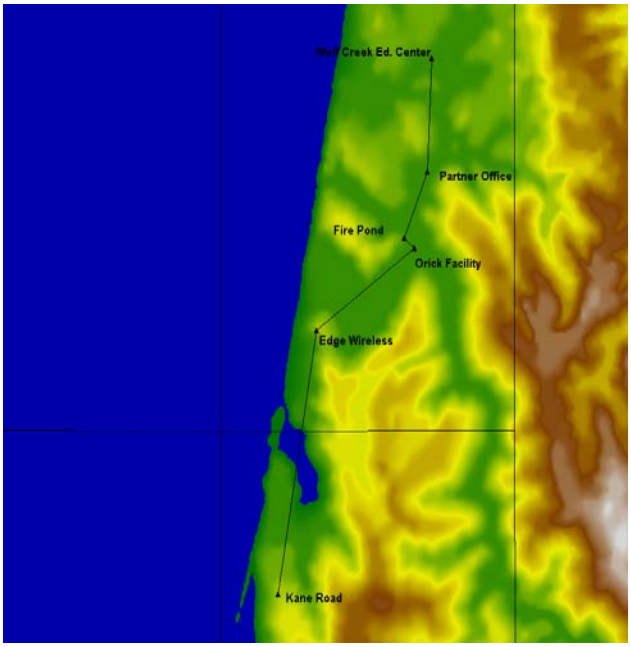
The first category of radio is called "point to multi-point", which refers to a sub-system of the network. A point-to-multi-point subsystem includes one wireless transmitter, or access point, at an elevated location, which provides service to multiple users. As an example, an elevated site with one antenna could provide service to dozens of homes, each of which would have an antenna pointed back at the hilltop. As a result, multiple sites are proposed, all of which would be tied together as a network.

The second category of wireless signal is called "point to point", and is used to provide connections between specific locations, such as between ridges, or between the system itself and the connection to the Internet. The point to point systems use dedicated antennas that point only in the direction needed to provide the necessary link. Point to point links typically carry data from several users, since these links are typically used to connect ridgetops or aggregation points in the network. Because of the potential widespread impact of link failures, the point to point

links need to be designed to relatively high reliability standards. A point to multi point access point system is recommended for the Orick wireless broadband network.

When designing a typical wireless broadband system, the higher frequency bands, such as 5.8GHz, offer more bandwidth than lower frequencies, such as 900MHz or 2GHz. However, because of the difficult propagation characteristics, a higher frequency system simply will not work. The terrain and heavy tree cover in the Orick area makes higher frequency systems impractical for providing widespread coverage from access points to user locations. As a result, the 900MHz frequency band has been selected for the point to multipoint service delivery systems. Although the bandwidth is limited to 3 MBits/Sec in the 900MHz band, this is an appropriate level of performance for the projected number of users for each elevated location. On the other hand, the point to point links, generally being between elevated sites, can make use of the higher frequency bands, providing more bandwidth for those links that have the traffic combined from multiple elevated sites.

Figure 2 Base Network and Topography



The recommendation for Orick is to use the 900 MHz band for the point to multi-point access point systems, to provide improved coverage, system reliability, and performance. For the backhaul links between sites, the recommended point to point systems are in the 5.8 GHz band, to provide increased bandwidth and high reliability. However, a dedicated connection is needed from at least one point in the network to the Internet. The available options are either to lease or otherwise obtain this connectivity using another entity's network, or to construct a point to point link, dedicated from the network to the Internet. Figure 2 depicts the base network tower requirements

Recommended data backhaul options

An Internet connection requires two components, an ISP and a dedicated data connection from the network to the ISP. Data backhaul options for the Orick Net system are as follows:

Option 1 Dedicated T1 services from phone company. A traditional method of providing a dedicated data connection is to lease a dedicated data circuit, such as one or more T1's, from the phone company. Based on the broadband requirements of 60 to 100 users, and industry accepted standards for calculating the necessary capacity, an Internet connection of 6 MBits/Sec is projected. The closest identified Internet connection capable of meeting the needs of the Orick area is located in Eureka. However, the recurring cost of four T1's (6 MBits/Sec) to Eureka is

$7,200 per month. Even if there were no other recurring costs, this amount would far exceed the expected revenue from subscribers. As a result the network could not be sustained.

Option 2 Connect with Suddenlink network at Big Lagoon. Suddenlink has fiber infrastructure between Big Lagoon and Eureka. One backhaul option evaluated was that of extending the Orick broadband system as far south as Big Lagoon to connect to the existing Suddenlink fiber network. From that location, Suddenlink would carry the traffic to Eureka and provide a 10 MBit/Sec Internet connection. Under this option, SuddenLink would provide an Internet connection from Big Lagoon, without ISP services for $2,000 per month. The monthly costs to backhaul to Suddenlink under this option would be $33.33 a month per user, assuming 60 initial users, and the cost does not include ISP services, tower lease costs and operations and maintenance. As a result, for this option to be viable, a reduced rate would need to be negotiated, even possibly including ISP service. Short of this, a contract with an ISP would still be required.

Option 3 Additional point to point links to 101Netlink network. Other backhaul options are available through competitive telecommunications service providers, such as 101Netlink. Such companies have constructed networks that are, to some degree, independent of the incumbent telephone company networks. Competitive carriers offer services primarily in the geographic areas where they have constructed their networks. However, through wholesale contracts with the incumbent carriers, a competitive carrier is able to stitch together the resources necessary to provide service beyond their existing networks. As an example, 101Netlink, currently has a network in place between Ukiah and as far North as Eureka based on a series of point to point radio links. In order for the Orick wireless broadband network to establish a connection to 101Netlink network, one or more point to point links would need to be constructed. The addition of point to point links would be added capital costs in addition to lease charges for backhaul service to an ISP in Eureka. Furthermore, the 101Netlink network is not yet available in the area, making it a future option, at best.

Option 4 Connect with Suddenlink network in Eureka. Another option, involving Suddenlink, would be for the Orick wireless broadband network to be built as far South as the Suddenlink office in Eureka. In order to establish a lower operational cost for the network, Suddenlink was asked to quote the recurring cost for a reduced bandwidth connection under this option. Based on initial bandwidth requirements for the Orick area, a 5 MBit connection was determined as being adequate. The quoted recurring cost for this connection is $1375 per month, which is substantially less than the quoted cost for a 10 MBit under option # 2. A contract with an ISP would still be required for customer support, email services, etc. Compared to connecting with the Suddenlink network in Big Lagoon, this option would raise the capital costs, but would somewhat reduce the recurring costs.

Option 5 Local Business Partner. The final option involves the use of a location in or near Arcata or Eureka as a radio repeater site, which would allow the relay of the wireless signal to an ISP. The Orick wireless broadband network would be built to connect with a building or tower near Arcata or Eureka and one additional point to point link would be needed to carry traffic directly to the ISP. This option might add recurring lease fees for tower access, but would connect the Orick network directly to an ISP, such as Humboldt Internet for services. To avoid

tower lease costs, a partnership is suggested with a local business partner where the local business partner would be responsible for some of the fixed and recurring costs associated with the backhaul.

Therefore, the recommended alternative for backhaul to an ISP is for the Orick Net network to include construction of a point to point system connecting the network to an ISP in Arcata or Eureka. This would increase the capital costs, but would reduce the recurring costs greatly and improve the network's long term success. Backhaul options four and five meet this criteria. Option five has the additional advantage that the costs of the backhaul could be shared between the project and a local business partner reducing the capital costs for both parties.

Emergency services telecommunications inventory in region

First responders in the Orick valley include State and National Park Service, Orick Volunteer Fire Department, Arcata/Mad River ambulance, United States Forest Service, and the California Highway Patrol.

Current methods and capabilities for emergency services communications in the Orick area include two-way radios, telephone, cellular phones, satellites, dial-up Internet and television. Radio contact through the fire station, regional Sheriffs office, and local forest management agencies is the primary form of emergency communications. Cellular phones are also used, but previous communication studies have shown northern Humboldt County has many dead zones. This was confirmed by emergency service personnel interviewed.

Emergency service providers could use the Orick Net system to disseminate information to Orick residents during an emergency situation. For example, during a tsunami threat, local residents with broadband could monitor a website that provides flood stage data in real time. Wireless broadband would allow Orick residents to access emergency communications resources, independent of the local traditional telecommunications systems, which could ultimately save lives in an emergency situation.

4. Market Analysis (customer analysis)

One of the considerations of the market analysis was to give this service a unique identity, one that would have special meaning and appeal to the Orick community. The name Orick Net was selected for this purpose.

Potential Subscribers

To estimate the potential individual subscriber base for an Orick wireless broadband network, the team conducted a community outreach campaign to assess the level of interest in a wireless, broadband network.

Information about the Orick Net was made available to Orick residents in a myriad of ways, via email, phone calls, and leaflets placed in the Orick Post Office (see Appendix D). The team also set up a table at the Orick Rodeo in July, 2006.

A community meeting was held at the Orick Community Center on September 12, 2006. 35 members of the community attended the meeting, while others provided feedback via email. Meeting attendees were asked to mark their locations on a map so the team could see the clusters of potential subscribers and their geographic location (see Appendix E). This was an important step in understanding the cost to build and maintain the system, as costs to provide service will vary by subscriber locations. Information pertaining to broadband functionality, wireless Internet infrastructure, and target range costs associated with wireless Internet service was provided at the meeting (see Appendix F). There were some concerns expressed at the meeting about government ownership of a network. Other questions centered on "how do we implement?" a network after the planning has been completed. Community meeting attendees indicated a willingness to pay $50 per month for wireless broadband service.

In addition to residential subscribers, the team was interested in compiling a list of interested anchor subscribers. Anchor subscribers are larger subscribers that emphasize the need for broadband Internet service from a business perspective. Potential anchor subscribers include Prairie Creek Redwoods State Park, Redwood National Park Visitor Center, Wolf Creek Education Center, Orick Community Services District, Orick School District, Green Diamond, and the proposed Redwood Park Lodge. Potential anchor subscribers are provided in Table 4.1

Table 4.1 Potential Anchor Subscribers: Information from Core Subscriber Base

Organization	Location	Notes
Orick School	Orick School	Demand is high from students, administrators, and teachers. Phone bills indicate they have frame relay 56kb circuit to the Humboldt County Office of Education (HCOE). After discounts from the California Teleconnect Fund (CTF), the approximate cost per month is $25. This does not include fee HCOE service charges of $105 per year. 56kb frame relay is inadequate bandwidth to make use of digital resources provided by HCOE. To go to T1 speed to HCOE is $1800 per month plus $1680 per year HCOE charge, though 90% of the cost could be offset by e-rate funding. Orick has an e-rate approved tech plan through 2009. They are eligible for 90% e-rate funding from the Universal Services Fund, but they have not applied for e-rates. Orick is a potential recipient of the California K-12 High Speed Network (HSN) grant funding for $21,397 in last mile connectivity if funding is approved. Internet filtering must be installed if the school district ISP is not HCOE. The school would need to apply for e-rate funding this fall. There are companies who can do this for them for a fee. Infinity is a company that provides e-rate application support to school districts. HCOE has provided the Orick School District with Infinity's contact information.
National Park Service	Orick Visitor Center Wolf Creek Education Center	The National Park Service (NPS) is interested in connectivity at Wolf Creek Education Center. The NPS did not express much interest in public WiFi at the Freshwater Lagoon Visitor Center. There could be an opportunity for a concessionaire to establish WiFi service.
State Parks (Stone Lagoon Visitor Center, Prairie Creek Campground and Visitor Center)	Stone Lagoon Visitor Center Prairie Creek Campground and Visitor Center	Feedback from State Park staff covered two areas: 1) New towers: Commercial towers on state park land may be restricted, though there's the possibility of tower siting for free services. 2) Subscribers: Public WiFi is not part of State Park Service plan for parks in Humboldt County at this time. AT&T is installing WiFi in parks in other regions of the state. The State Park service is not interested in providing fee-for-service WiFi for tourists either, but is interested in a "concessionaire" who would establish WiFi service. The State Park Service does not believe that the Orick network will have adequate bandwidth for videoconferencing with wireless unless Quality of Service (QoS) is available. Services at the Stone Lagoon Visitor Center and Prairie Creek Campground and Visitor Center are of interest.
Green Diamond	Valley Green Office & Orick Mill	Green Diamond is interested in improving their network to the Orick Mill and their Valley Green office.

Organization	Location	Notes
Redwood Trails RV Park	RV Park just south of Stone Lagoon	Unable to establish a contact during the Orick Net network research phase. In previous conversations, they have been interested in establishing broadband service. They now have a satellite connection at the RV park. Permanent park residents are interested in becoming subscribers.
Redwood Park Lodge Company	Across highway from Simpson Valley Green Office	The company currently has a satellite connection and use WiFi to establish a connection to a cluster of vacation rental homes they own and manage north of Orick. They are interested in broadband services.
Orick Community Services District	Office in Orick	The CSD needs better connectivity than dial-up via Simple.Net
La Hacienda Restaurant	Restaurant in town	May be interested in WiFi access if it can be demonstrated that free WiFi access for customers could pay for itself with tourists, residents and business travelers stopping for meals.
Palm Café and Motel	Restaurant/motel in town	May be interested in WiFi access if it can be demonstrated that free WiFi access for customers could pay for itself with tourists, residents and business travelers stopping for meals.
Eyeconnect	Telecommuter living in Orick.	Interested in providing fee-for-service WiFi in Orick.

A subscriber database was compiled as a result of the community outreach efforts and information obtained from Simple.Net. Sixty-six potential residential and small business subscribers willing to pay for wireless broadband service have been identified. For privacy reasons, the names and addresses of potential subscribers are not available in this plan, but are available for the County and future service providers.

5. Financial Plan

In order to attract subscribers, service fees must be competitive. Based on feedback received from Orick area residents, an assumption was made that the initial user base would be approximately 60 users. To retain or even grow the user base over time will require that the network meet or exceed users' expectations in bandwidth and reliability, and remain competitively priced. The proposed wireless technology is expected to outperform satellite service. The goal is to provide service at a price competitive with that charged for satellite service in order to retain users over time, which translates into a budgeted monthly cost of $60 per user. However, annual revenues were figured at users paying $50 per month based on feedback received at the community meeting held September 12th, 2006.

The projected annual revenues generated by 60 users paying $50 per month for service is $36,000. Since operating costs are projected to consume most or all of that revenue, there is not much left for capital costs. Even the most basic of wireless broadband networks could be

difficult to finance with this level of revenue. However, the hope is that most if not all of the capital costs might be financed through either private or public grant funding. Assuming the capital costs can be covered through outside funding, the projected revenue would simply need to cover the recurring costs for leased services, Internet access, ISP services, network operations, equipment maintenance, and the cost to lease tower space for the antennas.

As previously discussed, a potential business partner has expressed interest in sharing a portion of the capital and recurring costs of the network, in order to help meet corporate data needs at their Orick area facilities. As a result, the capital cost of installing facilities to serve the Orick facility is assumed to be shared by Orick Net and the local business partner. The potential business partner would share costs to extend the network to their facilities. With the potential partner as an anchor subscriber, the recurring costs for the backhaul to Eureka, including the Operations & Maintenance of equipment, and tower lease costs, could be shared with them.

If grant funding was secured to cover the capital costs and some of the recurring costs were shared, the proposed Orick wireless broadband network can be self-sustaining.

Capital Costs for New Facilities

The technical design of a wireless broadband network can be driven by two factors: coverage and capacity. Coverage is the capability of the network to provide service to the necessary locations. Capacity is the ability of the network to provide the bandwidth needed, for the number of users sharing the network at any given moment. Many wireless networks begin through the construction of one or more sites to provide coverage. However, once enough users are in place, the capacity of the network can be impacted by multiple users. At that point, the system owner can choose to add additional transmission sites in order to subdivide the network so that existing transmission sites can be shared by fewer users, resulting in greater capacity being made available on a per user basis. In the case of Orick, the coverage challenges are such that three or more transmission access points will be needed simply to provide coverage to the necessary areas. Because of this, a coverage based design for the area is expected to meet the capacity requirements for the foreseen future.

Point to point links will be necessary to connect the transmission sites into a unified network. The antennas needed for these links are very similar and can mount onto many of the same towers or poles used for the access point radios.

Baseline coverage for Orick requires a total of four transmission sites. In order to provide the connectivity between sites, two additional sites would be used for point to point links. The two locations are owned by the potential local business partner. Since there is a potential partner, there is a strong potential for sharing the point to point links, which would help with the overall system cost being reasonable.

Costs Associated with Backhaul Options

The following table summarizes capital and recurring costs of the various backhaul options discussed above.

Table 5.1 Costs Associated with Backhaul Options

Backhaul Option	Capital Costs (Backhaul Only)	Annual O&M (5% of Capital)	Recurring Fees and Leases (Annual)
#1: Verizon, 4 T1's	$ 252,093	$ 12,605	$ 98,400
#2: Suddenlink, Big Lagoon	$ 276,509	$ 13,825	$ 30,000
#3: 101Netlink, Future Option	$ 291,922	$ 14,596	$ 38,400
#4: Suddenlink, Eureka Office	$ 330,505	$ 16,525	$ 28,500
#5: Local Business Partner	$ 280,824	$ 14,041	$ 12,000

Based on the cost estimates provided by potential partners and service providers, shown above, five year capital and operating cost would be as follows:

Table 5.2 Five Year Capital and Operating Costs

Backhaul Option	Five Year Operating Budget	Five Year, Plus Original Capital
#1: Verizon, 4 T1's	$ 555,025	$ 807,118
#2: Suddenlink, Big Lagoon Fiber	$ 219,125	$ 495,634
#3: 101Netlink, Future Option	$ 264,980	$ 556,902
#4: Suddenlink, Eureka Office	$ 225,125	$ 555,630
#5: Local Business Partner	$ 130,205	$ 411,029

Although the cost comparison includes estimated maintenance costs and recurring lease fees, they do not include the Internet Service Provider costs for services and profit. However, the ongoing operating costs for the network (O&M and leases) under Option #5 appear to be at a level that can be supported by 60 users, while still allowing for a reasonable profit for the ISP.

The option with the *lowest recurring costs* is using a partnership with a local business partner for the backhaul to their facility near Eureka, with an additional link to an ISP (Option five as shown in the above tables). Although this option has a higher capital cost than Option #2, that difference is shown to quickly be overcome by the reduced recurring costs.

Since the survival of the network depends upon limited revenue to sustain recurring costs, option five is the preferred choice. If through further negotiations, the factors change for option five,

option two or option four could become the leading approach. Detailed capital costs and network layout plans for options five, two, and four are shown in Appendix D.

Based on the preferred backhaul approach, (Option # five, refer to tables on page 20) the following table summarizes the estimated start up capital costs.

Table 5.3 Estimated Start up Capital Costs

Site	Total Capital Budget
Capital Costs	
Customer Radios (60 Assumed)	$32,340
Internet Service Provider Site	$34,488
Local Business Partner Facility in Arcata	$12,488
Edge, Orick Hilltop, (AP)	$36,765
Kane Road, (AP)	$48,038
Local Business Partner Facility in Orick	$15,355
Fire Pond (AP)	$41,520
Local Business Partner Office	$15,853
Wolf Creek School, (AP)	$43,979
Additional Costs	
Startup Costs (First Year)	$24,772
Tower Lease Fees	$2,000
Detailed Technical Design	$22,000
Develop RFP for O&M	$12,000
Total Project Capital Costs	**$341,592**

More detailed cost data for Option #2, Option #4 and Option #5 can be found in Appendix G

Operations and Maintenance (O&M)

Ongoing system maintenance is necessary to ensure network reliability. The same personnel who perform routine maintenance typically also provide responsive repairs when necessary. System reliability is critical to maintaining user satisfaction, which retains customers and maintains revenues. In a small network, such as the one proposed for Orick, the relative importance is even greater than it is for a larger network (a small network simply can not afford to lose even a few customers). As a result, a solid operations and maintenance organization must be established.

Local companies have expressed interest in providing operations and maintenance services for a wireless broadband network. The potential local business partner would provide the physical

infrastructure between their Eureka facility and their Orick facility, in return for maintenance and support of that portion of the network. Humboldt Internet has expressed interest in submitting a bid to provide complete ISP services. CRE PowerPage has not expressed an interest in providing ISP services, but they have expressed interest in performing maintenance and/or service for radios/antennas.

For Orick Net, the access points and Customer Premise Equipment (CPE's) are designed for simple installation and trouble shooting. However, the core of the network, such as the routers, and the backhaul to Arcata or Eureka, may require more expertise or familiarity with the technology.

Anchor subscribers create the potential for shared maintenance and operating costs for the joint components of the system. This arrangement would help control costs for Orick Net. The remaining point to multi-point systems, could be installed and maintained through an agreement with an independent contractor such CRE PowerPage.

An important part of implementing Orick Net would be to negotiate agreements with the entities that will ultimately have responsibility for system maintenance.

To provide backhaul connectivity from the network to the Internet, dedicated 5.8 MHz point to point microwave has been recommended as the most cost effective approach. To investigate the recurring costs, preliminary tower lease costs have been requested from tower owners. Based on preliminary information received from Edge Wireless, tower lease costs for their sites might be available for approximately $1,000 per month.

O & M costs could be incurred and charged by the ISP for the Orick portion of the network, with the work possibly performed by CRE PowerPage.

Funding

Funding needs to be addressed in two areas: capital to build the network and ongoing operations and maintenance (O&M). With a small population base in Orick, capital investment costs make it difficult to develop a return on investment (ROI). The recommendation for Orick is that grant funding and school e-rate funds be used to cover the network capital costs. E-rates can be used to pay for a portion of the upfront capital costs and recurring costs. Ongoing O&M will need to be covered by subscriber monthly costs. However, in order to insulate the owner of the Orick Net system from high future capital costs that might be incurred as a result of equipment replacement or additions, grants funds should also be sought to cover two to three years of

recurring fees. Subscriber fees paid during the first two to three years could be put in an account and used when equipment needs replacing or additional links need to be added.

Extensive grant funding research work was done for this plan. Appendix H contains a list of both government and private funding sources. Many of the grant sources appear to be open to K-12 requests. Orick School is currently lacking broadband access with a 56K frame relay connection to the Internet. Funding for the Orick Net system will need to come from several sources, such as the school's e-rates and public and private grant sources.

6. Strategy and Implementation

Ownership

A key to Orick Net success will be community based ownership of the system. A community based organization such as the Orick Economic Development Corporation, a local 501(c)3 non-profit organization, or the Orick Community Services District (CSD) are desirable options for this ownership. A private entity will not see a return on investment sufficient to invest in a market this small nor would a private entity have the ability to apply for grant funding. A local non-profit organization or CSD would have an easier time of obtaining grant funding to build the infrastructure. A majority of the ongoing services related to the network, such as operations and maintenance and Internet Service, could be outsourced to various organizations. The 501(c)3 or CSD's ongoing role would be managing contracts with the service providers. The Orick Economic Development Corporation, a dormant organization at the moment, could be key to getting the network off the ground.

Recommended System

This plan recommends that Orick use the 900 MHz band for the point to multi-point access point systems, to provide improved coverage, system reliability, and performance. For the backhaul links between sites, the recommended point to point systems are in the 5.8 GHz band, to provide increased bandwidth and high reliability.

The option with the *lowest recurring costs* is a partnership with a local business partner, who would bring the traffic to their facility near Arcata or Eureka with the Orick project funding an additional link to an ISP (Option five as shown in the above tables).

Assuming the capital costs can be covered through grants, e-rate funding and/or anchor subscribers, the projected revenue would be limited to recurring costs for leased services, Internet access, network operations, equipment maintenance, and the cost to lease tower space for the antennas. Replacement costs for capital facilities at tower sites would be the responsibility of the facility owner.

If grant, e-rate and/or anchor subscriber funding was secured to cover the capital costs and some of the recurring costs were shared, the proposed Orick wireless broadband network can be self-sustaining.

Key Implementation Steps

1. Orick Net must become the responsibility of a local organization.
    - Potential local Orick organizations include the Orick Economic Development Corporation (OEDC) or the Community Service District (CSD).
    - County and/or Redwood Regional Economic Development Commission (RREDC) could play a facilitating role in initial Orick Net implementation efforts.
    - Define the County's role, if any, in the implementation of Orick Net and designate a grant preparer (e.g., County, RREDC).
    - This step is complete when a local organization enters into an agreement to coordinate the implementation of Orick Net.

2. Determine if there are one or more anchor subscribers to share some initial capital costs, (i.e., Orick School).
    - If there are anchor subscribers willing to share initial capital costs it is important to negotiate the amount they are willing to contribute.
    - This step is complete when and if there are anchor subscriber willing to share capital costs.

3. Construct initial five year budget
    - Construct initial five year budget (Capital and Recurring costs and Operations and Maintenance).

4. Orick School must apply for the e-rate funding
    - Applications must be submitted in the fall previous to the year funding is needed, i.e., applications are due in November of 2006 for 2007 funding.
    - This step is complete when application has either been accepted or denied.

5. The local organization (identified in step 1) must use the Orick Net business plan to apply for grants to cover initial capital funding.
    - Potential capital funding sources are provided in Appendix H.
    - This step is complete when there are sufficient funds committed to the Orick Net system.

6. Apply for necessary permits for transmission facilities

7. The Orick Net owner must request proposals for the following services: installation, operation and maintenance, management, and ISP.
    - Potential installers, operators, managers and ISP are CRE Power Page, 101 Netlink, Suddenlink, Verizon, Humboldt Internet, Carlson Wireless Technologies etc.
    - This step is complete when the prospective firms submit their proposals for the services required to install, operate, maintain, manage and provide internet services to the town of Orick.

8. The Orick Net owner selects and hires a firm(s) to perform services requested in the Request for Proposals.
    - This step is complete when the county enters into agreements with the firm(s) selected to perform the required services.

9. The Orick Net owner will oversee the Orick Net Implementation process

10. Finalize five year budget for Orick Net.

11. Determine cash flow model for recurring services and costs based on number of subscribers.

Transferability: Rural Humboldt County Broadband Checklist

While this plan has been prepared specifically for the Orick community, it is transferable to other rural communities seeking the same service. The following are key considerations in bringing Broadband telecommunications services to any rural Humboldt County community:

- Identify local entity for owning and managing services.
  Is there an organization to take ownership, manage and or oversee the Orick Net system?

- Identify proximity of existing services.
  How close is existing broadband service?
  How accessible is the closest existing broadband service?

- Identify rural, topographical/ geographic and community characteristics.
  Are there any topographical and geographical characteristics that limit or prohibit the transmission of radio signal?

- Compile subscriber database.
  How many potential subscribers are there?

- Identify potential anchor subscribers.
  Are there potential anchor subscribers such as businesses, schools, government offices?

- Allocate potential anchor subscribers cost sharing capabilities.
  Do any of these anchor subscribers have the ability or desire to share capital in addition to recurring costs?

- Characterize subscriber demographics.
  Who are the local subscribers?

- Identify different options for service providers.
  Who are the different service providers?

- Calculate costs, both capital/system costs and recurring/ operating costs.
  What are the different capital costs and recurring costs?

- Select appropriate sources and apply for available public and private funding (see appendix).

- Prepare a multi year budget

FINDINGS

The Orick Net system could be a catalyst to economic and community development by expanding business, tourist and scholastic opportunities for the residents of Orick. The broadband wireless system proposed in this business plan would be a community based system requiring community stewardship. Funding for initial capital costs must be secured from a combination of grant funding, e-rate funding and anchor subscriber contributions, but eventually the system would be self-sustaining with revenues derived from subscription fees. The Orick Net system could be the catalyst for positive economic and community growth in Orick. Once successful, it could also be a model applied to other rural, resource dependent communities.

Appendix A

Wireless Broadband in Orick, by Tina Nerat - Tech Beat Article - 06/27/06 Times-Standard

Who knew you could get wireless connections in Orick?

By Tina Nerat

It's been quite a saga trying to provide Internet service to the town of Orick over the past few years. I got involved in 2002 when the Small Business Development Center (SBDC) found that Orick residents had to make toll calls for dial-up Internet service, sometimes costing hundreds of dollars a month for businesses. The only other option was a costly investment in satellite equipment.

Orick residents and businesses are served by Verizon's network out of Crescent City, and every call out of Orick is a toll call. Even after prodding, the California Public Utilities Commission (CPUC) would not entertain requests to extend the Orick local dialing area. In 2003, SBDC asked me to look into what it would take to provide Orick with a local dial-up Internet option.

Originally, Harborside Internet in Crescent City, with funding from SBDC, agreed to provide dial-up service to Orick for three years, as long as there were at least 50 users. Orick scraped together 51 users. Soon after, Harborside Internet was sold to Carroll's Web, a Kansas company. After a couple of years, subscribers dwindled to around 30, and Carroll's Web terminated service. This prompted some frantic calls in mid-2005 to SBDC. After scrambling for a few weeks, an Orick resident found Simple.Net, which provides 800 numbers for calling, and a ?simple? solution was at hand.

However, this is still dial-up service, and we are living in a broadband world. Meanwhile, the 3 Ross (Redwood Technology Consortium - RTC, Redwood Region Economic Development Commission - RREDC, Redwood Coast Rural Action - RCRA) are partnering with the County of Humboldt to advocate for broadband initiatives on the North Coast.

Eureka, Fortuna, McKinleyville, Arcata, Blue Lake, Ferndale, Fieldbrook, Trinidad, Rio Dell, Petrolia, Garberville, Redway, Benbow, Manila, Samoa, and Willow Creek all have at least one broadband option. Orick is the next largest community without broadband.

The County of Humboldt recently published a Request for Proposals (RFP): Business Plan for Deploying Wireless Broadband in the Orick Area of Humboldt County. The RFP has been awarded to a team consisting of Planwest Partners in Arcata, NERATECH in Eureka, and Sparling, a Portland (OR) company. The RFP is online at www.neratech.net/projects.html and as the project gears up, more information will be put online. This project will build a business plan not only for Orick, but will also provide a template for other communities in Humboldt County that are not currently served by broadband.

One of the more important aspects of the project is quantifying how many Orick residents are interested in being a subscriber to this network. Orick has a number of residents and businesses with satellite Internet, but true broadband service would be more desirable than satellite. Simple.Net has close to 70 subscribers, so that tells me demand is much higher than it was just a year ago when we were down to 30 subscribers with Carroll's Web.

Are we just talking about business impact? Consider that Orick School only has a 56K connection to the Internet, barely better than dial-up.

Consider the possibilities with broadband in Orick: the ability to easily upload content to business web sites, Wi-Fi for tourists, telemedicine, the school being able to use online county educational and state

resources, transferring files or pictures, videoconferencing, streaming audio/video, distance learning, and more. If you consider the original problem, the issue of Orick toll calls ? with broadband, Voice Over Internet Protocol (VoIP) becomes a very real possibility for Orick government, residents and businesses.

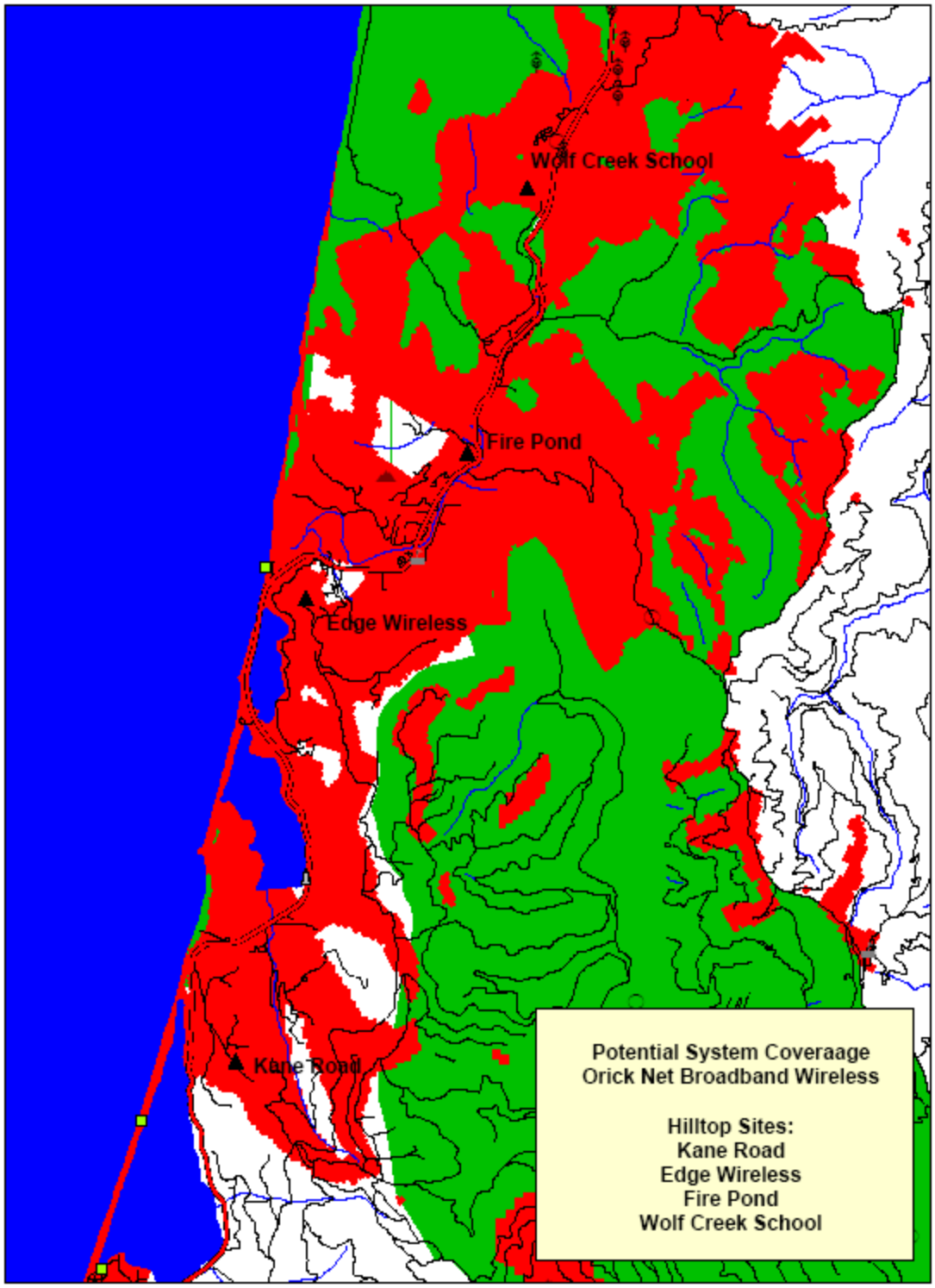
Orick residents and businesses should e-mail me as soon as possible at **tina@neratech.net** to get on the list for information distribution. There will be a community meeting in Orick in a few months to get public input, provide information about broadband, provide information on the project, and to gauge the level of subscriber interest. If you know anyone in Orick, please pass on this information. Stay tuned as we try to get one more community connected!

RTC is a good place to network with others who are interested in technology and business. Meetings are free and open to the public. Check out the web site for meeting dates and location.

Tina Nerat is a board member of the Redwood Technology Consortium and with her husband, Mike Nerat, is owner of NERATECH, a technology consulting business. She can be contacted at tina@neratech.net.

Appendix B

Map of potential tower locations



Appendix C

Permitting record of cell towers in the Orick area

Verizon California, Inc. , FCC file number: A0254020.
PROJECT LOCATION: The project site is located in Humboldt County, in the Orick area, at the end of a private road, off of the west side of Hilton Road, this intersection being approximately 1 mile southwest from the intersection of Hilton Road with State Highway 101, on the property known as 844 Hilton Road.

PRESENT ZONING: Rural Residential Agriculture specifying a minimum lot size of 5 acres in addition to a Special Representation for a Minimum Lot Size of 2.5 acres, Manufactured Home, Coastal Elk Habitat and Design Review combining zones (RA-5-Y2.5-M/E,D).

The project involves the development of a 57' tall lattice tower to supplement the existing 49' tower within the same small fenced operations area. This tower will be further developed with three microwave dish antennas. Each antenna will be ± 4' deep x 8' wide. The microwave relay facility will be operated by Verizon (formerly operated by West Coast Telephone Co.) as part of a common carrier fixed point-to-point microwave service. The new tower and microwave installation are necessary for system reliability and quality. The facility routes calls along an existing telecommunication network consisting of five towers relaying microwave signals between Eureka and Crescent City. This facility is not for wireless communications – neither cellular nor PCS. As mentioned earlier, the proposed tower will be constructed within the existing fenced area which it will share with the existing 49' tower (it has two microwave dishes) and a 256 square foot equipment shelter. The shelter is a permanent structure, approximately 15' in height. The secured area does not require a lease as Verizon owns the entire 22,500 sf property.

Public telephone systems, including common carrier fixed point-to-point microwave facilities, are classified as "Minor Generation and Distribution Facilities" within the coastal zone, a "Civic" Use Type. Per §313-171.7, Use Types, of the coastal zoning regulations, Minor Generation and Distribution Facilities require a Conditional Use Permit in the Rural Residential Agriculture (RA) zone and include, but are not limited to "communication transmission facilities, including radio and television transmission antennae, communication equipment installations and exchanges, and substations" (§313-171.7.1, HCC). The Coastal Development Permit is a requirement of the local jurisdiction of the Coastal Zone and the Special Permit is required because the proposed 57' tower will exceed the 35' height limit of the RA zone and for Design Review. As noted, the existing microwave relay tower is 49 feet in height. The existing tower was built in the 1950s.

The most significant planning issue is aesthetics. The subject parcel is located on a ridgetop within a mapped *Coastal Scenic Area* immediately adjacent to a very large parcel currently developed with a 150' tall lattice tower owned and operated by US Cellular (see enclosed enhanced digital photo). This tower is very near the Verizon site, but is predominant on the ridgeline. The Verizon site is approximately 200 feet to the west of US Cellular and is more concealed by trees and other foliage. However, while less prominent, the existing microwave dishes are visible from US 101 near Freshwater Lagoon, and it would appear that the new

installation will be equally visible. Fortunately, none of the existing or proposed structures will require aviation safety lighting. To further reduce visual impacts, staff is recommending that the tower and microwave antennas be painted so as to blend with the surrounding vegetation. Microwave dish antennas are often highly visible. Microwave antenna cover's, termed "radomes", can be ordered in green, gray or brown colors to further to disguise the facility. Because the existing vegetation effectively screens most of the facility from view, staff is further requiring that the maximum tree cover be retained and vegetation removed only if it interferes with operation of the facility.

This facility involves a non-guyed tower clustered in an area developed with existing telecommunication facilities. The project has been evaluated for conformance with the objectives of the U.S. Fish and Wildlife Service's "Interim Guidelines for Recommendations on Communication Tower Siting, Construction, Operation and Decommissioning". The worksheet supplied by the USFWS was completed and forwarded on for their review. Consistent with other recent tower applications, the USFWS's guidelines have been incorporated into the County's review for land use compatibility and projects conditioned accordingly.

The 22,500 sf parcel is zoned Rural Residential Agriculture (RA) – 2.5 acre minimum parcel size (5 acre average) with manufactured home, Roosevelt Elk habitat and Design Review combining zones. The project is consistent with the zones that apply to the property for the following reasons: 1) the project is considered a conditionally permitted use under the Generation and Distribution Facilities Use type in the RA zone, 2) no major grading, tree removal or other intensive treatment of the natural landforms will be required, and mitigation has been incorporated to make it less visible from Highway 101, and 3) the project is meant to not only maintain, but enhance the existing telephone services on the northcoast which would positively effect emergency response times and residential and commercial communications. The Planning Division has prepared and circulated a Draft Negative Declaration pursuant to the California Environmental Quality Act (CEQA).

Based on the on-site inspection, a review of Planning Division reference sources, and comments from all involved referral agencies, planning staff believes that the applicant has submitted evidence in support of making all of the required findings for approving the Coastal Development/Conditional Use/Special Permits.

Edge Wireless LLC, fcc file # A0475634.

PROJECT LOCATION**:** The project site is located in Humboldt County in the Orick area on a private road approximately 1,600 feet northwest of the intersection of said private road with Hilton Road, on the property known as 300 Hilton Road.

PRESENT PLAN DESIGNATIONS**:** Rural Residential (RR10). Density: 1 unit per 10 acres. Rural Residential (RR5). Density: 1 unit per 5 acres. "North Coast Area Plan" (NCAP). Slope Stability: Moderate Instability.

PRESENT ZONING**:** Rural Residential Agriculture in the coastal zone specifying a minimum parcel size of 5 acres in a combining zone of design review, elk habitat, manufactured home and specified minimum and average lot size (RA-5-Y2.5-M/D,E; RA-10-Y2.5/D,E).

A Wireless Communication Facility (WCF) that includes the development of a 120 foot tall monopole support structure with the following antennas and dishes: three (3) sectors of four (4) panel antennas per sector at the 120 foot level, two (2) microwave antennas mounted at 80 feet, two (2) microwave antennas mounted at 75 feet, one (1) 8 foot diameter microwave dish mounted at 80 feet, one (1) four foot microwave dish mounted at 50 feet and one (1) 6 foot microwave dish mounted at 40 feet. A prefabricated equipment building 8' x 14' and 9 feet tall will house the ground based equipment. The site area will consist of a leased area that will be fenced measuring 50' x 50'. The WCF will be operated by Edge Wireless. A U.S. Cellular lattice type cell tower is located on the same parcel approximately 100 feet to the west and is 150 feet tall.

Wireless Communication Facilities are classified as "Minor Generation and Distribution Facilities" within the coastal zone, and a "Civic" Use Type. Per §313-171.7, Use Types, of the coastal zoning regulations, Minor Generation and Distribution Facilities require a Conditional Use Permit in the Rural Residential Agriculture (RA) zone and include, but are not limited to "communication transmission facilities, including radio and television transmission antennae, communication equipment installations and exchanges, and substations" (§313-171.7.1, HCC). The Coastal Development Permit is a requirement of the local jurisdiction of the Coastal Zone and the Special Permit is required because the proposed 120' tower will exceed the 35' height limit of the RA zone and for Design Review. As noted, the existing U.S. Cellular tower is 150 feet in height and was built in 1995.

The most significant planning issue is aesthetics. The subject parcel is located on a ridgetop within a mapped *Coastal Scenic Area* immediately adjacent to a very large parcel currently developed with a 150' tall lattice tower owned and operated by US Cellular. This tower is approximately 100 feet from the Edge site, and is predominant on the ridgeline. The Edge site is approximately 100 feet to the east of U.S. Cellular and is equally visible. The Edge tower will be a monopole design which is somewhat less obtrusive than a lattice tower. The applicant initially explored the idea of co-locating on the existing U.S. Cellular tower, however, that tower is built to capacity. Therefore, instead of co-locating, the applicant has proposed to cluster this tower next to an existing one. This tower will be available for co-location of other carriers. The proposed structure will not require aviation safety lighting. To further reduce visual impacts, staff is recommending that the tower and microwave antennas be painted so as to blend with the surrounding environment to the maximum extent feasible. Microwave dish antennas are often highly visible. Microwave antenna covers, termed "radomes", can be ordered in green, gray or brown colors to further to disguise the facility. Because the existing vegetation screens some of the base view from the south and most of the facility from the north (Orick), staff is further requiring that the maximum tree cover be retained and vegetation removed only if it interferes with operation of the facility.

The approximately 39 acre parcel is zoned Rural Residential Agriculture (RA) – 2.5 - 5 acre minimum parcel size (2.5 acre average) with manufactured home, Roosevelt Elk habitat and Design Review combining zones. The project is consistent with the zones that apply to the property for the following reasons: 1) the project is considered a conditionally permitted use under the Generation and Distribution Facilities Use type in the RA zone, 2) no major grading, tree removal or other intensive treatment of the natural landforms will be required, and mitigation has been incorporated to make it less visible from Highway 101, and 3) the project is meant to provide a needed coverage gap in the existing cellular service area. The Planning

Division has prepared and circulated a Draft Mitigated Negative Declaration pursuant to the California Environmental Quality Act (CEQA).
Based on the on-site inspection, a review of Planning Division reference sources, and comments from all involved referral agencies, planning staff believes that the applicant has submitted evidence in support of making all of the required findings for approving the Coastal Development/Conditional Use/Special Permits.

Permitting record of communication towers in Trinidad

**A location east of Trinidad might ultimately be slated for a tower

Overview:
Trinidad Head is zoned OS – Open Space with a variety of roads, benches, signs and vista points. This area includes a cable television transmission site built before 1983, approximately 20' to the northwest of the existing Call North Cellular site. The existing communication facility was redeveloped by Cal-North in 1997, with additions in 2000 and 2001. There is currently a 41' pole and a 21' pole, a small equipment shed and two transmitter cabinets. There is also a 6' fence, topped with barbed wire, with two separate gates, that surrounds the site. Cal-North subleases the site to other communications companies (Sprint and Edge Wireless). A NOAA weather station site is located approximately 20' north of the proposed communication site and contains a trailer and several other structures and a variety of weather monitoring equipment. The site also appears to be utilized by other entities as well (i.e. Scripts Institute). The US Cellular tower is located adjacent to the existing access road. Utilities are provided underground from the existing pole across the road from the proposed site.

Trinidad Permitting Requirements: The following Trinidad Planning Commission findings are required to approve Tower project at Trinidad Head:

- Proposed site and development will be necessary or desirable for and compatible with neighborhood or the community.
- Such use as proposed will not be detrimental to the health, safety, convenience, or general welfare of persons residing or working in the vicinity with respect to aspects including by not limited to the following:
    - The nature of the proposed site, including its size and shape, and the proposed size, shape and arrangement of structures.
    - The accessibility of the traffic pattern for persons and behicles, and the type of volume of such traffic, and the adequacy of proposed off-street parking and loading.
    - The safeguards afforded to prevent noxious or offensive emissions such as noise, glare, dust and odor.
    - Treatment given, as appropriate, to such aspects as landscaping, screening, open space, parking and loading areas, wervice areas, lighting and signs.
- Development feature will comply with the applicable provisions of this title, will be consistent with the policies and programs of the general plan and will assist in carrying out and be in conformity with the Trinidad coastal program.
- Use or feature will have no significant adverse environmental impact or there are no feasible alternatives, or feasible mitigation measures, as provided in the California Environmental Quality Act, available which would substantially lessen any significant adverse impact that the actions allowed by the conditional use permit may have on the environment.
- When the feature is located between the sea and the first public road paralleling the sea or within three hundred feet of the inland extentof any beach or of the mean high tide line where there is no beach, whichever is the greater.

- The development provides adequate physical access or public or private commercial use and does not interfere with such uses.
- The development adequately protects public views from any public road or from a recreational area to, and along, the coast.
- The development is compatible with the established physical scale of the area.
- The development does not significantly alter existing natural landforms.
- The development complies with shoreline erosion and geologic setback requirements.

Cell Tower Permitting History:
Cal-North Cellular,
FCC file number: A0494989. In May of 1997 Cal North Cellular submitted a application for the construction of a 8' wide concrete slab, a 12' wide microwave dish, and two utility poles. On June 11, 1997 the city council decided that the US Cellular project was consistent with the City's Zoning Ordinance and General Plan and the necessary findings for granting approval of the project can be made. The Planning Commission has approved the project.

Edge Wireless LLC, Communications Site, Trinidad Head, Trinidad, CA 95570
FCC file number: A0483628. The communication facility is located on City property and was developed by Cal-North Cellular in 1997, with addition's in 2000 and 2001. There is currently (as of 2003) a 41' pole and a 21' pole, a small equipment shed and two transmitter cabinets. There is also a 6' fence, topped with barbed wire, with two separate gates, that surrounds the site. Cal-North subleases the site to other communication companies (Sprint and Edge Wireless). In September of 2003, the city of Trinidad approved a proposal from Edge Wireless to build a 5' x 6' concrete slab and to install a 4.5' x 2' by 6' tall equipment cabinet. This project did not expand the existing facility footprint. It was recommended for city (Trinidad) staff approval in October of 2003.

United States Cellular Corp.
FCC file number: A0254043. November 15th 2005 US Cellular submitted an application to the city to build a new, approximately 25' x 50' communication facility just north of the existing communications site. The site would include a 50' wooden pole with two sets of Cellular Panel Antennas, a 12' x 12' equipment shelter on a concrete slab all surrounded by a green vinyl slat 6' tall fence topped with barbed wire. The project is consistent with City's Zoning Ordinance and General Plan and the necessary findings for granting approval of the project can be made. In December of 2005, the city of Trinidad planning commission finds the project to be consistent with the City's Local Coastal Program, including the Zoning Ordinance and General Plan. Staff recommended that the Planning Commission to approve the project

Appendix D

Orick Wireless Broadband Project FAQ – July, 2006

Q: What is broadband?
A: *Broadband definitions vary from "high speed and always-on" to the official FCC definition of "200kbps or higher" speed (kilobits per second). By contrast, dial-up is 56kbps at best. Most people these days would not call 200kbps "high speed", so the FCC definition is outdated. See the other side of this flyer of a graphic depiction of speeds.*

Q: I want DSL. Why wireless broadband?
A: *In rural, sparsely populated areas, wireless is more cost-effective to install. DSL is normally provided by a telephone company. In Orick's case, this is Verizon, and they appear to have no plans for offering DSL service.*

Q: I have satellite Internet. Why would I change to wireless broadband?
A: *Satellite Internet, while better than dial-up, has latency (delay) issues and is slower than true broadband, especially when uploading or sending files. Satellites typically do not support applications like Voice over IP (VoIP) or Virtual Private Networks (VPN). If you were considering purchase of satellite Internet, you might want to hold off until you see this project's results and action plan.*

Q: The previous question mentioned VoIP? What is this and what does it mean to me?
A: *As Orick residents know, every call out of Orick is a toll call. VoIP is a way to make phone calls using the Internet. You may have seen ads for Vonage, one of many VoIP providers. The FCC has good information at http://www.fcc.gov/voip/.*

Q: What is this project and who is paying for it?
A: *This project is funded by the County of Humboldt through a Community Development Block Grant (CDBG). CDBG funds are targeted for planning projects. The project will evaluate the feasibility and develop a business plan for deployment of wireless broadband in the Orick area.*

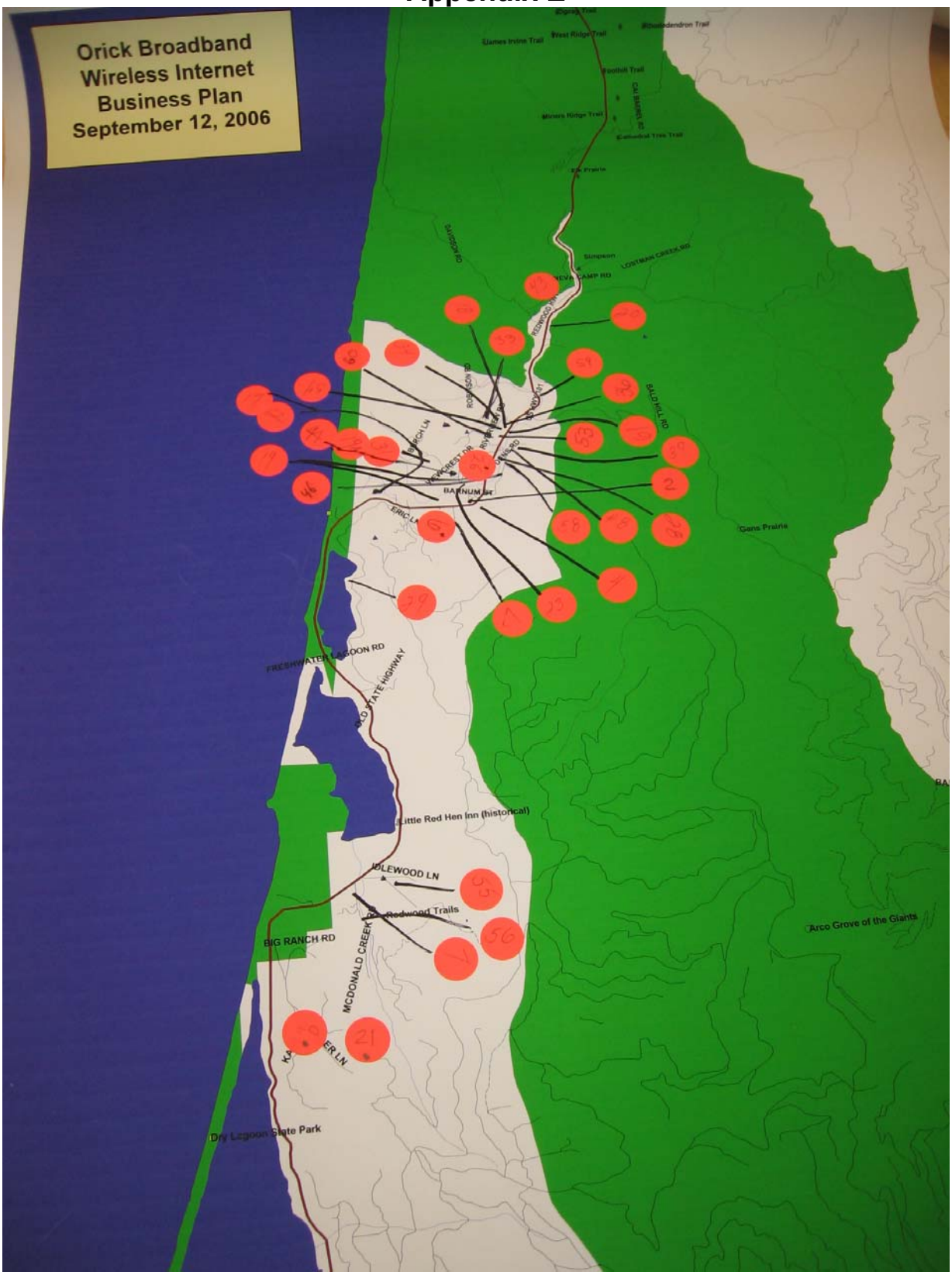
Q: Who is doing the project?
A: *Planwest Partners (George Williamson) of Arcata is the lead on the project. Other participants are NERATECH (Tina Nerat) of Eureka and Sparling (Adam Haas) of Portland.*

Q: I live several miles outside Orick. Will broadband come to my home or business?
A: *The area being considered is from Prairie Creek State Park to just north of Big Lagoon causeway, roughly along Highway 101. Costs will have to be evaluated to outlying areas.*

Q: How much will wireless broadband cost?
A: *This cannot be answered - yet. You can help influence the cost – the more subscribers we have, the more feasible the project will be. We will be evaluating the installation costs of various wireless technologies and the ongoing costs to connect an Orick wireless network to the Internet.*

Q: How can I help make this happen?
A: *Tell your neighbors about this project and have them send e-mail to tina@neratech.net to get on our update list. Mark your calendar to attend the September 12 Orick community meeting to give public input to the project and to hear more about broadband. The team is especially interested in knowing how you currently use the Internet and how you might use and leverage the Internet if you had a high speed connection.*

Appendix E


Orick Broadband
Wireless Internet
Business Plan
September 12, 2006
Gans Prairie
Little Red Hen Inn (historical)
IDLEWOOD LN
Redwood Trails
BIG RANCH RD
MCDONALD CREEK
Arco Grove of the Giants
Dry Lagoon State Park
FRESHWATER LAGOON RD
BALDHILL RD
BARNUM

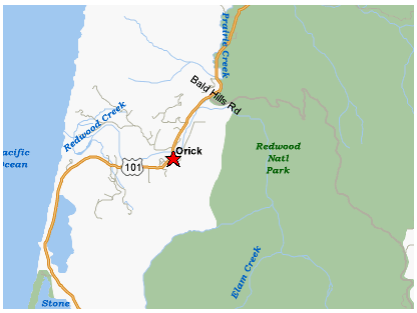
Appendix F

PowerPoint presentation from Community Meeting held on September 12, 2006

Broadband in Orick?!

Yes!

September 12, 2006



CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

What We Mean By "Broadband"

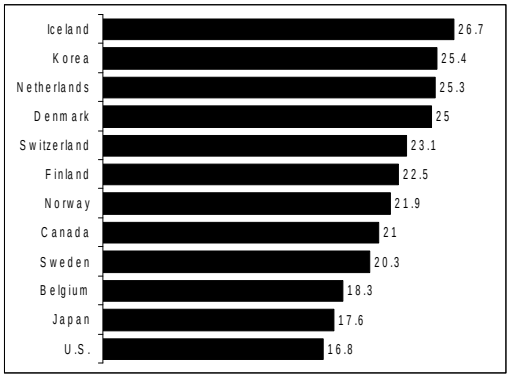
- **High Speed Internet (always on, 200k and greater, versus 56k dial-up)**
- **Examples:**
  - **DSL (Digital Subscriber Line-18,000ft. over twisted pair)**
  - **Cable Modem (via coaxial cable-shared)**
  - **Wireless Broadband**

CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

Are we really ahead of the game?

How We Compare

Total broadband subscribers per 100 inhabitants, as of December 2005



Source: Organization for Economic Cooperation and Development

Technology Battles

- **Copper and Fiber**
- **Satellite Internet Service**
- **Blue Tooth, WiFi**
- **Wireless Broadband**

Wireless Broadband

- Mature Technology
- Cost Effective
- Flexible Installations
- Line of Site Issues
- Bandwidth

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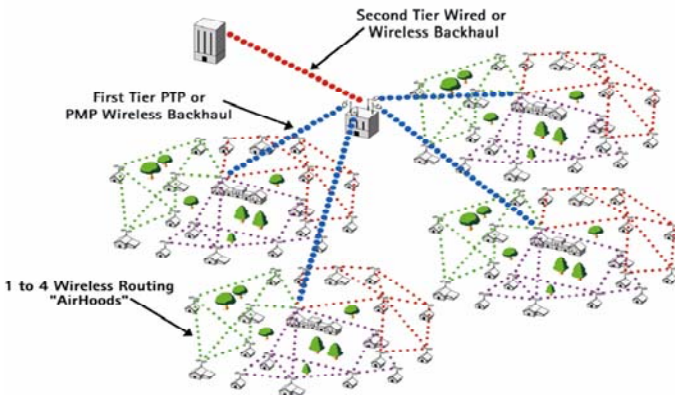
Wireless Broadband Topology



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Building Blocks of Bandwidth

			Digital Equivalence		
Service Type	Kilobits	Megabits	DS0s	T1s	DS3s
Dialup	28.8	0.0288	~0.5 DS0		
ISDN	128	0.128	2 DS0's		
256K DSL	256	0.256	4 DS0's		
640K DSL	640	0.640	10 DS0's		
T1	1,544	1.544	24 DS0's	1 T1	
DS3	44,736	44.736	672 DS0's	28 T1's	1 DS3
OC3	155,520	155.52	2016 DS0's	84 T1's	3 DS3's

CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

Wireless Broadband vs. Satellite

- **Line of Site**
- **Weather Effects**
- **Bandwidth**
- **Sustained Throughput**

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Internet Applications Are Changing

- **Web Sites Expect Broadband**
- **Remote Work**
- **Tele-health & On-line Tele-education**
- **Web Content**
- **Video Entertainment**
- **Voice over IP**

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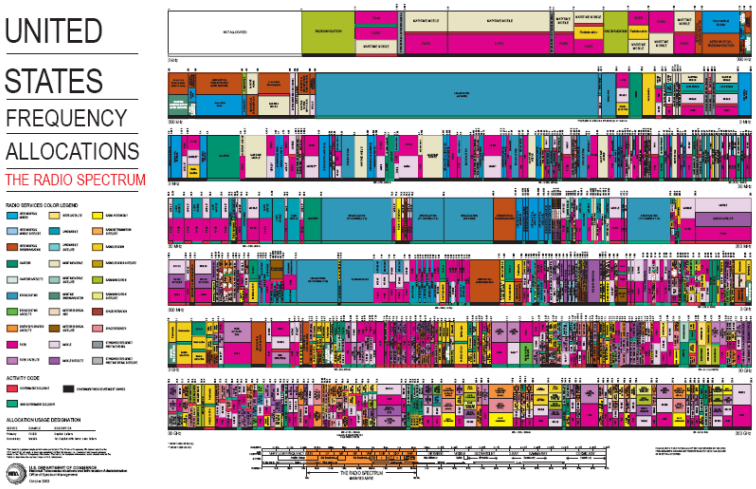
Text Vs. Graphics



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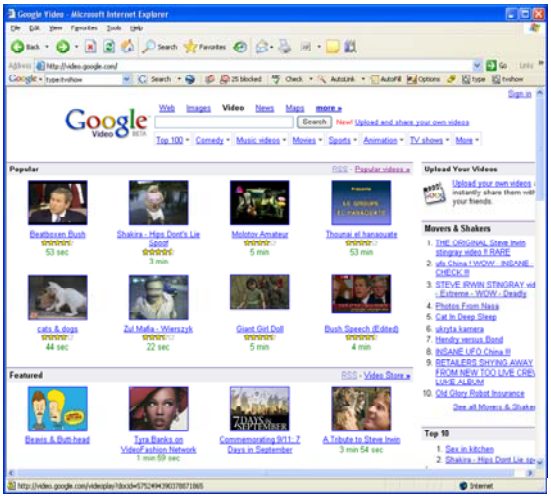
Video is Emerging



Google Video (and Others):

TV Shows

Music Videos

Amateur Videos

Movies

Voice Over IP (Telephone Over the Internet)

- **Vonage and others:**
  - **Geared Toward Consumer**
  - **Low Cost**
  - **Features Included**

Subscribers

- Every one counts!!
  - Remember Harborside/Carroll's Web (50 subscribers dwindled to 33)
  - Simple.net = 66 subscribers in Orick
  - Broadband to school is vital
  - Green Diamond at Valley Green has interest
  - State Parks – Prairie Creek, Stone Lagoon
  - National Park Service – Wolf Creek Ed Ctr

CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

Funding - Startup & Ongoing

- List of grant funding sources identified
  - K-12 angle might work well
- E-rate funding for school
  - 90% based on free and reduced lunch %
- Ongoing costs
  - Backhaul to Internet
  - Tower rental fees
  - Outsourced operations
  - Maintenance/spares

CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

Other Questions.....

- Ownership?
  - Community Service District?
  - Other?
- Geographic challenges
  - Is Big Lagoon to Prairie Creek feasible?
- If plan is feasible, what's next step?
  - This project is planning only
  - Who/how is it implemented?

CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

Thank you!

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(503) 273-0086

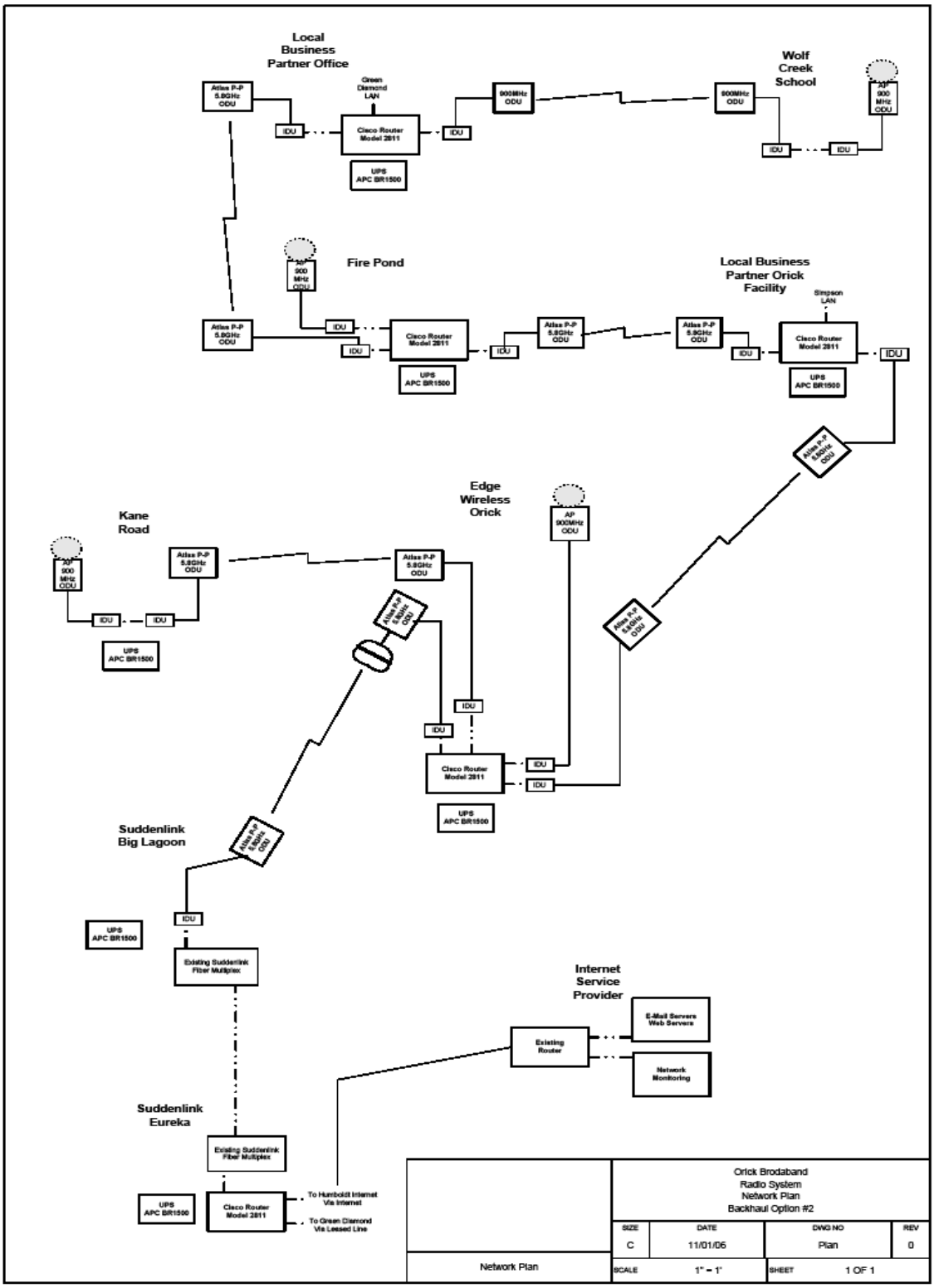
tina@neratech.net
268-0777

CLIENT NAME: Planwest Partners Inc. — Orick Wireless Business Plan SPARLING

APPENDIX G
Detailed Cost Estimate for Option #2

Orick Broadband																			
12/21/2006																			
Orick Broadband Wireless																			
Backhaul Option #2: Build Orick network using Suddenlink Big Lagoon fiber and 10MBit Internet connection to ISP.		Internet Service Provider		Suddenlink Eureka		Suddenlink Big Lagoon		Kane Road		Edge Wireless Orick		Local Partner Orick Facility		Fire Pond		Local Partner Office		Wolf Creek School	
		Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total
Power	EST. COST																		
UPS, APC BR1500	$250		$0	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250
UPS Battery Pack	$140		$0	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140
Radio																			
Trango M900S P-MP AP	$1,595		$0		$0		$0	1	$1,595	1	$1,595		$0	1	$1,595	1	$1,595	1	$1,595
Trango M900S P-MP SU	$539	60	$32,340		$0		$0		$0		$0		$0		$0		$0	1	$539
Trango Atlas Int	$1,598		$0		$0		$0	1	$1,598	2	$3,195	2	$3,195	2	$3,195	1	$1,598		$0
Trango Atlas Ext	$1,398		$0		$0	1	$1,398		$0	1	$1,398		$0		$0		$0		$0
Radio Spares	$3,200		$0		$0		$0		$0	2	$6,400		$0		$0		$0		$0
Antennas & Support																			
Pole Mount	$385		$0		$0		$0	2	$770		$0	2	$770	3	$1,155	2	$770	2	$770
Pipe Mounts	$500		$0		$0	1	$500	2	$1,000	4	$2,000	2	$1,000	3	$1,500	2	$1,000	2	$1,000
5.8 GHz Waveguide (ft)	$7		$0		$0		$0		$0	20	$130		$0		$0		$0		$0
WG Misc Components	$750		$0		$0		$0		$0	1	$750		$0		$0		$0		$0
WG Connectors	$250		$0		$0		$0		$0	2	$500		$0		$0		$0		$0
Coax Adapter	$225		$0		$0		$0		$0	1	$225		$0		$0		$0		$0
Antenna, 5.8Ghz, 4-foot	$740		$0		$0	1	$740		$0	1	$740		$0		$0		$0		$0
Antenna, 5.8Ghz, 6-foot	$936		$0		$0		$0		$0		$0		$0		$0		$0		$0
928MHz Master Ant, Omni	$685		$0		$0		$0	1	$685	1	$685		$0	1	$685		$0	1	$685
Network																			
IP Router	$3,000		$0	1	$3,000		$0		$0	1	$3,000	1	$3,000	1	$3,000	1	$3,000		$0
Construction																			
Site Construction (Pole + Cabinet)	$35,000		$0		$0		$0	1	$35,000		$0		$0	0.5	$17,500		$0	1	$35,000
Site Construction (Cabinet)	$25,000		$0		$0	0.5	$12,500		$0	1	$25,000		$0		$0		$0		$0
Installation																			
Pt-Pt Radios	$5,000		$0		$0	1	$5,000	1	$5,000	1	$5,000	1	$5,000	2	$10,000	1	$5,000		$0
AP Radio	$2,000		$0		$0		$0	1	$2,000	1	$2,000		$0	1	$2,000	1	$2,000	2	$4,000
Antenna	$1,500		$0		$0		$0		$0	1	$1,500	1	$1,500		$0		$0		$0
Router	$500		$0	1	$500		$0		$0	1	$500	1	$500	1	$500	1	$500		$0
			$32,340		$3,890		$20,528		$48,038		$55,008		$15,355		$41,520		$15,853		$43,979
Total Cost	$276,509																		

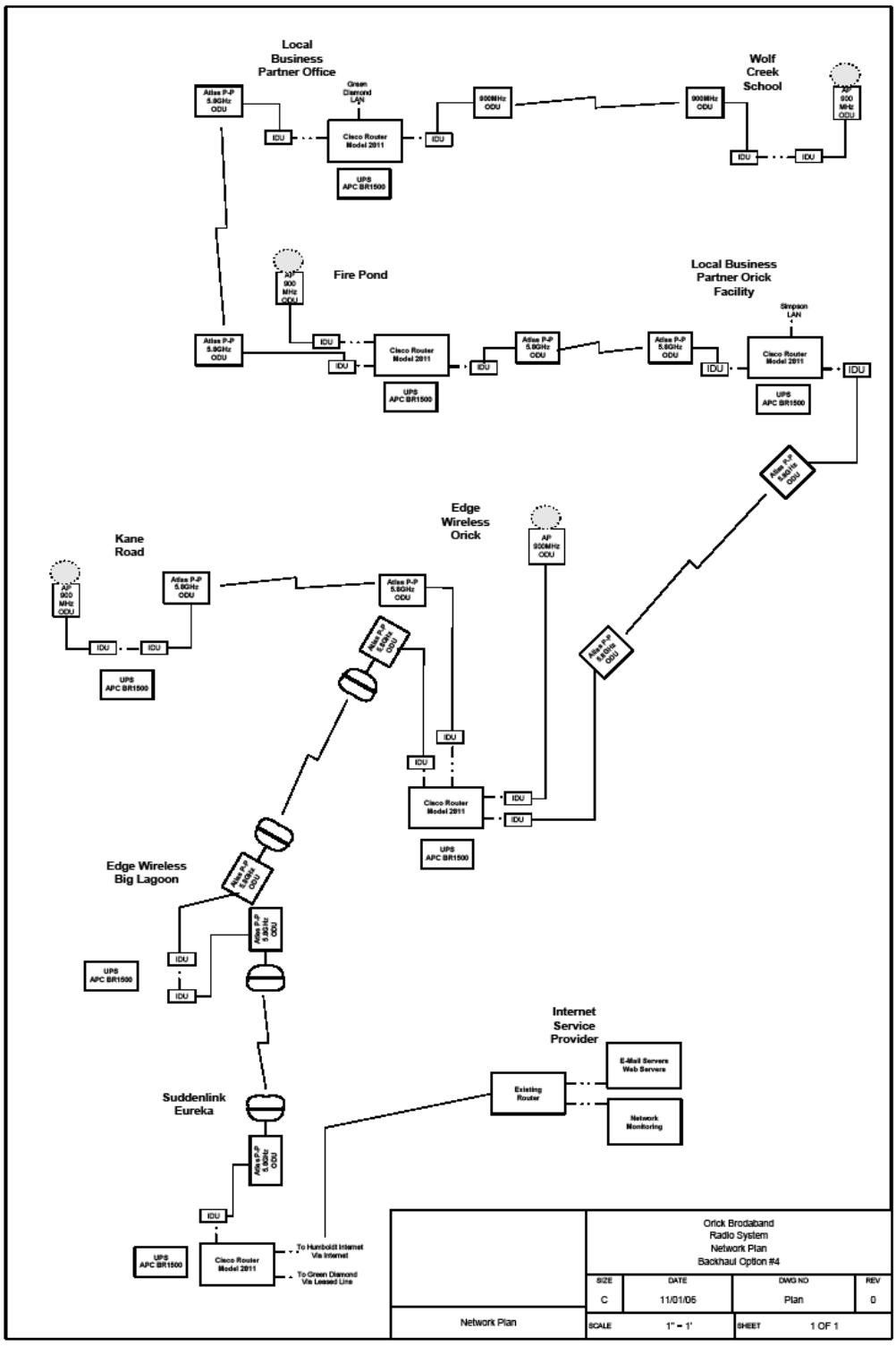
Network Layout Plan for Option #2



Detailed Cost Estimate for Option #4

Orick Broadband																			
12/21/2006																			
Orick Broadband Wireless																			
Backhaul Option #4: Build Orick network using Suddenlink Eureka office internet connection to ISP.		Internet Service Provider		Suddenlink Eureka		Edge Wireless Big Lagoon		Kane Road		Edge Wireless Orick		Local Partner Orick Facility		Fire Pond		Local Partner Office		Wolf Creek School	
		Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total
Power	EST. COST																		
UPS, APC BR1500	$250		$0	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250
UPS Battery Pack	$140		$0	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140
Radio																			
Trango M900S P-MP AP	$1,595		$0		$0		$0	1	$1,595	1	$1,595		$0	1	$1,595	1	$1,595	1	$1,595
Trango M900S P-MP SU	$539	60	$32,340		$0		$0		$0		$0		$0		$0		$0	1	$539
Trango Atlas Int	$1,598		$0		$0	1	$1,598	1	$1,598	3	$4,793	2	$3,195	2	$3,195	1	$1,598		$0
Trango Atlas Ext	$1,398		$0	1	$1,398	1	$1,398		$0		$0		$0		$0		$0		$0
Radio Spares	$3,200		$0		$0		$0		$0	2	$6,400		$0		$0		$0		$0
Antennas & Support																			
Pole Mount	$385		$0		$0		$0	2	$770		$0	2	$770	3	$1,155	2	$770	2	$770
Pipe Mounts	$500		$0	1	$500	1	$500	2	$1,000	3	$1,500	2	$1,000	3	$1,500	2	$1,000	2	$1,000
5.8 GHz Waveguide (ft)	$7		$0	20	$130	20	$130		$0		$0		$0		$0		$0		$0
WG Misc Components	$750		$0	1	$750	1	$750		$0		$0		$0		$0		$0		$0
WG Connectors	$250		$0	2	$500	2	$500		$0		$0		$0		$0		$0		$0
Coax Adapter	$225		$0	1	$225	1	$225		$0		$0		$0		$0		$0		$0
Antenna, 5.8Ghz, 4-foot	$740		$0		$0	1	$740		$0		$0		$0		$0		$0		$0
Antenna, 5.8Ghz, 6-foot	$936		$0	1	$936		$0		$0		$0		$0		$0		$0		$0
928MHz Master Ant, Omni	$685		$0		$0		$0	1	$685	1	$685		$0	1	$685		$0	1	$685
Network																			
IP Router	$3,000		$0	1	$3,000		$0		$0	1	$3,000	1	$3,000	1	$3,000	1	$3,000		$0
Construction																			
Site Construction (Pole + Cabinet)	$35,000		$0		$0		$0	1	$35,000		$0		$0	0.5	$17,500		$0	1	$35,000
Site Construction (Cabinet)	$25,000		$0	1	$25,000	1	$25,000		$0	1	$25,000		$0		$0		$0		$0
Installation																			
Pt-Pt Radios	$5,000		$0	1	$5,000	2	$10,000	1	$5,000	1	$5,000	1	$5,000	2	$10,000	1	$5,000		$0
AP Radio	$2,000		$0		$0		$0	1	$2,000	1	$2,000		$0	1	$2,000	1	$2,000	2	$4,000
Antenna	$1,500		$0	1	$1,500	1	$1,500		$0		$0	1	$1,500		$0		$0		$0
Router	$500		$0	1	$500		$0		$0	1	$500	1	$500	1	$500	1	$500		$0
			$32,340		$39,829		$42,730		$48,038		$50,863		$15,355		$41,520		$15,853		$43,979
Total Cost	$330,505																		

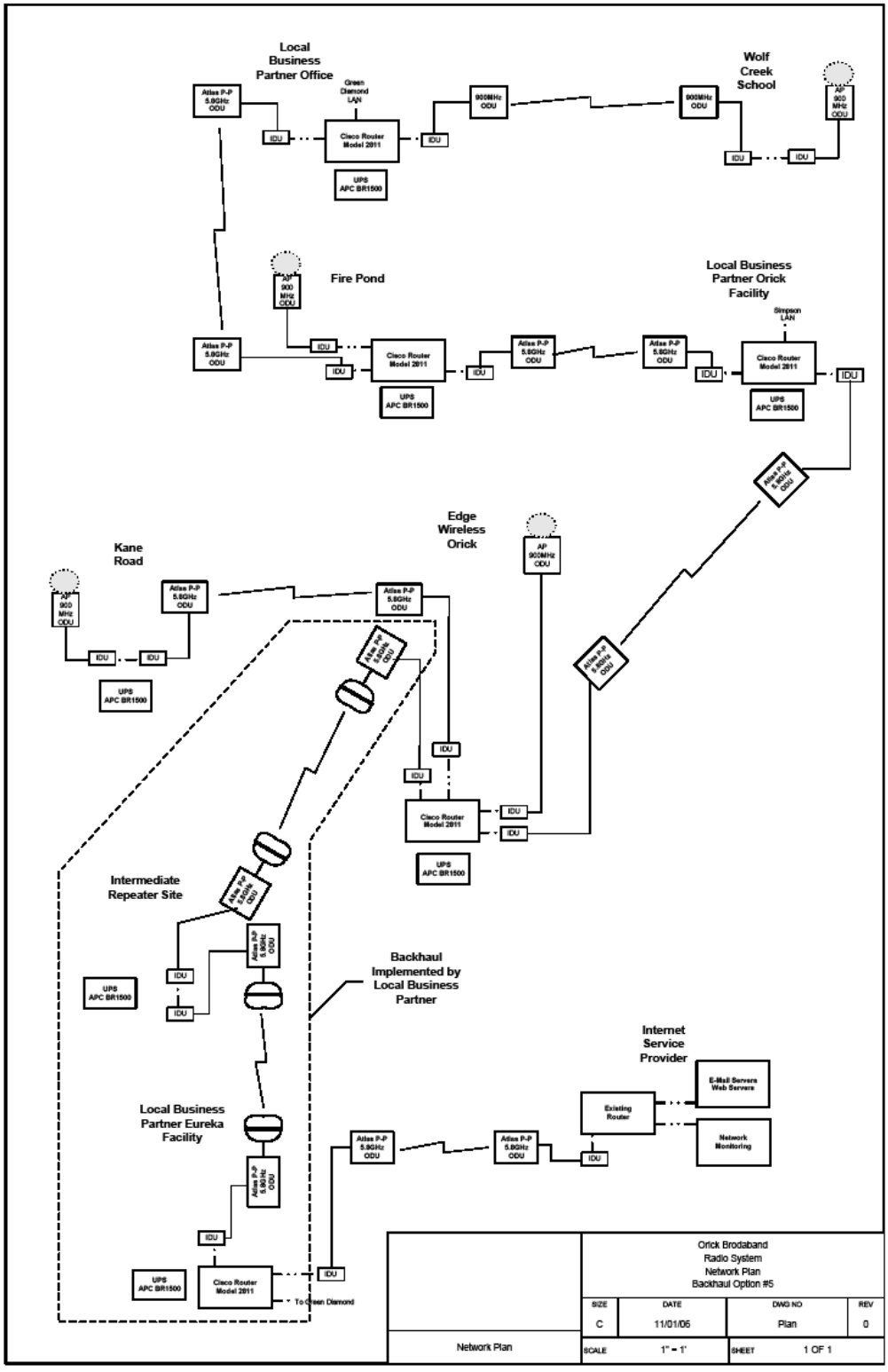
Network Layout Plan for Option #4



Detailed Cost Estimate for Option #5

Orick Broadband																	
12/21/2006																	
Orick Broadband Wireless																	
Backhaul Option #5: Build Orick network using Local Business Partner Backhaul.		Internet Service Provider		Local Partner Eureka Facility		Kane Road		Edge Wireless Orick		Local Partner Orick Facility		Fire Pond		Local Partner Office		Wolf Creek School	
		Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total	Qty	Total
Power	EST. COST																
UPS, APC BR1500	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250	1	$250
UPS Battery Pack	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140	1	$140
Radio																	
Trango M900S P-MP AP	$1,595		$0		$0	1	$1,595	1	$1,595		$0	1	$1,595	1	$1,595	1	$1,595
Trango M900S P-MP SU	$539	60	$32,340		$0		$0		$0		$0		$0		$0	1	$539
Trango Atlas Int	$1,598	1	$1,598	1	$1,598	1	$1,598	2	$3,195	2	$3,195	2	$3,195	1	$1,598		$0
Trango Atlas Ext	$1,398		$0		$0		$0		$0		$0		$0		$0		$0
Radio Spares	$3,200		$0		$0		$0	2	$6,400		$0		$0		$0		$0
Antennas & Support																	
Pole Mount	$385		$0		$0	2	$770		$0	2	$770	3	$1,155	2	$770	2	$770
Pipe Mounts	$500	1	$500	1	$500	2	$1,000	3	$1,500	2	$1,000	3	$1,500	2	$1,000	2	$1,000
5.8 GHz Wavequide (ft)	$7		$0		$0		$0		$0		$0		$0		$0		$0
WG Misc Components	$750		$0		$0		$0		$0		$0		$0		$0		$0
WG Connectors	$250		$0		$0		$0		$0		$0		$0		$0		$0
Coax Adapter	$225		$0		$0		$0		$0		$0		$0		$0		$0
Antenna, 5.8Ghz, 4-foot	$740		$0		$0		$0		$0		$0		$0		$0		$0
Antenna, 5.8Ghz, 6-foot	$936		$0		$0		$0		$0		$0		$0		$0		$0
928MHz Master Ant, Omni	$685		$0		$0	1	$685	1	$685		$0	1	$685		$0	1	$685
Network																	
IP Router	$3,000		$0	1	$3,000		$0	1	$3,000	1	$3,000	1	$3,000	1	$3,000		$0
Construction																	
Site Construction (Pole + Cabinet)	$35,000		$0		$0	1	$35,000		$0		$0	0.5	$17,500		$0	1	$35,000
Site Construction (Cabinet)	$25,000	1	$25,000		$0		$0	0.5	$12,500		$0		$0		$0		$0
Installation																	
Pt-Pt Radios	$5,000	1	$5,000	1	$5,000	1	$5,000	1	$5,000	1	$5,000	2	$10,000	1	$5,000		$0
AP Radio	$2,000		$0		$0	1	$2,000	1	$2,000		$0	1	$2,000	1	$2,000	2	$4,000
Antenna	$1,500	1	$1,500	1	$1,500		$0		$0	1	$1,500		$0		$0		$0
Router	$500	1	$500	1	$500		$0	1	$500	1	$500	1	$500	1	$500		$0
			$66,828		$12,488		$48,038		$36,765		$15,355		$41,520		$15,853		$43,979
Total Cost	$280,824																

Network Layout Plan for Option #5



APPENDIX H Potential Government Funding Table

(Note: This list contains government grant and loan opportunities. Items of particular interest are highlighted in bold lettering. Also, note that under "Priorities" only the ones that could possibly be appropriate to this project are listed; the agency may have other interests not listed here. Ellipses (…) are used to indicate non-relevant items cut from list.)

Agency/Programs/Websites	Contact/Address	Phone/E-mail	Type of grants/Program purposes/Priorities	Limitations/other info
Department of Commerce, Economic Development Administration. Program # 11.300: Grants for Public Works and Economic Development Facilities Program # 11.307: Economic Adjustment Assistance Program EDA website: http://www.eda.gov/AboutEDA/Programs.xml Catalog of Federal Domestic Assistance (CDFA) website: http://12.46.245.173/cfda/cfda.html	Economic Development Representative servicing California: Anne Berblinger U.S. Department of Commerce California Economic Development Administration One World Trade Center, Suite 244 121 S.W. Salmon St. Portland, OR 97204 Download **Pre-application for Investment Assistance (Form ED-900P)** PDF at http://www.eda.gov/InvestmentsGrants/Application.xml	(503) 326-3078 aberblin@dialoregon.net	**Program # 11.300:** Grants to enhance regional competitiveness and promote long-term economic development in regions experiencing substantial economic distress. Public works investments to help distressed communities and regions revitalize, expand and **upgrade their physical infrastructure** to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term private sector jobs and investment. Current priorities include existing industry clusters, emerging new clusters, attract new economic drivers. Investments in facilities such as … industrial and business parks … distance learning, business incubator … facilities, **and telecommunications infrastructure improvements** needed for business retention and expansion**. Projects may also include infrastructure for broadband deployment and other types of telecommunications-enabling projects, and other kinds of technology infrastructure.** **Program # 11.307:** Intended to enhance a distressed community's ability to compete economically by stimulating private investment in targeted areas. Current investment priorities include proposals that … promote comprehensive, entrepreneurial, and innovation-based economic development efforts that enhance the competitiveness of regions in the global economy, and those that **support technology-led economic development and reflect the important role of linking universities and industry and technology transfers.**	Project must be located in a region that satisfies one or more of the economic distress criteria set forth in 13 C.F.R. 301.3(a). Project must fulfill a pressing need of the region and must … assist in the creation of additional long-term employment opportunities in the region; or … primarily benefit the long-term unemployed and members of low-income families. Proposed investments must be consistent with the currently approved Comprehensive Economic Development Strategy (CEDS) for the region. Required local share of funds committed, available and unencumbered is required. Project must be capable of being started and completed in a timely manner. Applicant is given 30 days after a formal application has been invited to submit a completed application.

Agency/Programs/Websites	Contact/Address	Phone/E-mail	Type of grants/Program purposes/Priorities	Limitations/other info
U.S. Department of Education, Office of Elementary and Secondary Education ***(2006 deadline passed: see "Limitations" column)*** Program # 84.358: Rural Education Small, Rural School Achievement Program (84.358A) and Rural and Low-Income Schools Program (84.358B) http://www.ed.gov/programs/reapsrsa/index.html	Eric Schulz Office of Elementary and Secondary Education, U.S. Department of Education, 400 Maryland Avenue, SW., Washington, 20202 DC Application forms are available from the headquarters office. For the Rural and Low-Income School Program component, an SEA must submit an application that includes specific, measurable goals and objectives for the activities to be carried out through the grant. If an SEA does not participate in the program, eligible LEAs in the State may submit an application directly to the Department	(202) 401-0039 reap@ed.gov	Provide financial assistance to rural districts to carry out activities to **help improve the quality of teaching and learning in their schools.** Grantees under the Small, Rural School Achievement Program component **may use program funds to carry out activities authorized under … Title II-Part D (Educational Technology State Grants);** … **Title V-Part A (State Grants for Innovative Programs).** Grantees under the Rural and Low-Income School Program component **may use program funds for … educational technology**	***(Note: FY 2006-07 deadline was June 30, 2006. Contact office for information about next year's program.)*** For the Small, Rural School Achievement Program component, local educational agencies (LEAs) annually submit applications to the Department of Education. For the Rural and Low-Income School Program eligible recipients are state educational agencies (SEAs). States then must distribute funds to LEAs on a formula or competitive basis..

Agency/Programs/Websites	Contact/Address	Phone/E-mail	Type of grants/Program purposes/Priorities	Limitations/other info
U.S. Department of Education, Office of Innovation and Improvement Program # 84.203: Star Schools Program ***(2006 deadline passed: see "Limitations" column)*** http://www.ed.gov/programs/starschools/index.html	Brian Lekander U.S. Department of Education, OII Office of Innovation and Improvement Technology in Education Programs FB-6, Room 4W226 Washington, DC 20202	(202) 205-5633 brian.lekander@ed.gov	The purpose of this program is to support distance education projects that … **serve underserved populations, including disadvantaged,** nonreading, and limited English proficient (LEP) populations and individuals with disabilities. **Star Schools grants are made to eligible telecommunications partnerships, to enable such partnerships to: (a) develop, construct, acquire, maintain, and operate telecommunications audio and visual facilities and equipment;** (b) develop and acquire educational and instructional programming; and (c) obtain technical assistance for the use of such facilities and instructional programming. **Grants are used to obtain telecommunications facilities and equipment;** develop and acquire instructional programming for students; provide preservice and in-service staff development for teachers; provide educational programming for parents and community members; obtain technical assistance for teachers, school personnel, and other educators in the use of the facilities and programming; and improve instruction in the areas of reading and math by utilizing emerging mobile technologies and the use of games and simulations.	***Application deadline for 2006 is closed; contact office to determine if program will be renewed for 2007*** Funding has ranged (nationally) from $50.5 million in 2000, $59.3 million in 2001, decreasing almost every year since then to $14.8 million in 2006

Agency/Programs/Websites	Contact/Address	Phone/E-mail	Type of grants/Program purposes/Priorities	Limitations/other info
U.S. Department of Education, Office of School Support and Technology Programs Program # 84.318X: Enhancing Education Through Technology (Ed-Tech) Applications are available at http://www.ed.gov/programs/edtech/applicant.html	Most questions concerning the availability of funding or requirements are best answered by Ed-Tech state contact: Barbara E. Thalacker, Administrator California Dept. of Education, Education Technology Office P.O Box 944272 Sacramento, CA 94244-2720	(916) 323-5715	Primary goal of the Ed-Tech program is to improve student academic achievement through the use of technology in schools. It is also **designed to assist students in crossing the digital divide** by ensuring that every student is technologically literate by the end of eighth grade, and **to encourage the effective integration of technology with teacher training and curriculum development to establish successful research-based instructional methods**. Stated purposes and goals of the "Enhancing Education Through Technology Act of 2001" that specifically may apply to Orick: • To provide assistance to states and localities for the **implementation and support of a comprehensive system that effectively uses technology in elementary schools** … to improve student academic achievement. (Digitial California Project?) • To assist states and localities in the acquisition, development, interconnection, **implementation, improvement, and maintenance of an effective educational technology infrastructure in a manner that expands access to technology for students (particularly for disadvantaged students) and teachers.**	Under the Ed-Tech program, the U.S. Department of Education provides grants to State educational agencies (SEAs) on the basis of their proportionate share of funding under Part A of Title I. States may retain up to 5 percent of their allocations for state-level activities, and must distribute one-half of the remainder by formula to eligible local educational agencies and the other one-half competitively to eligible local entities. Announcement of awards takes place annually on July 1

Agency/Programs/Websites	Contact/Address	Phone/E-mail	Type of grants/Program purposes/Priorities	Limitations/other info
USDA Rural Development Broadband Loan and Loan Guarantee Program http://www.usda.gov/rus/telecom/broadband.htm **NOTE: As of July 2006, Open Range Communications Inc. has pending loan applications under this program for the City of Fortuna and McKinleyville CDP;** **For information contact:** **Open Range Communications Inc.** **4600 South Syracuse** **Denver, CO 80237** **Mark D. Adolph** **(303) 376-2101**	Submit applications to Rural Development General Field Representative or to Washington Broadband Office: Kenneth Kuchno Broadband Division Telecommunications Program Rural Development, Utilities Programs U.S. Department Of Agriculture Stop 1599, Room 2844-S 1400 Independence Avenue, SW Washington, Dc 20250-1599	No phone # given for Kenneth Kuchno For Open Range Communications Inc. contact: Mark D. Adolph (303) 376-2101	Rural Development makes broadband loans and loan guarantees to: . Finance the construction, improvement, and acquisition of facilities and equipment to provide broadband service in eligible rural communities; . Finance broadband facilities leased under the terms of a capital lease, as defined in generally accepted accounting principles; financing will be limited to 5 years of lease . Finance the acquisition by an eligible entity of another system, lines or facilities to furnish or improve rural broadband service (cannot exceed 50 percent of requested loan amount)	**Applicants must read the latest Notice of Funds Availability (NOFA) published in the Federal Register; and 7 CFR 1738 – Rural Broadband Access Loans and Loan Guarantees.** See website for link to latest notice: http://www.usda.gov/rus/telecom/broadband.htm Rural Development will not make a broadband loan or loan guarantee for the following items: . Acquisition of any stock, facilities or equipment of an affiliate of the applicant; . Customer terminal equipment (including modems) and any associated inside wiring not owned by the applicant during its economic life; . Vehicles not used primarily in construction; . Broadband facilities leased under the terms of an operating lease; . Merger or consolidation of entities; and . Operating expenses of the project.

Agency/Programs/Websites	Contact/Address	Phone/E-mail	Type of grants/Program purposes/Priorities	Limitations/other info
Headwaters Fund of Humboldt County Applications and information forms are available at: http://www.theheadwatersfund.org/default.asp?menuitem=CommInvest	Headwaters Fund Coordinator County of Humboldt 520 E St., Eureka, CA 95501	(707) 445-7745 dhoward@co.humboldt.ca.us	The Headwaters Fund is a public fund for the advancement of economic and community development in Humboldt County. The Headwaters Fund offers business loans, loans/grants for infrastructure projects, and economic development grants via the following three programs: The ***Community Investment Fund*** is a loan and grant program for infrastructure and related projects that will result in permanent and tangible economic benefits to the community.	The application deadline for the 2006 grant round was June 23, 2006 The Community Investment Fund (CIF) accepts funding applications on an ongoing basis. The *Financing for Industries* program offers **loans and/or grants for infrastructure-related projects where businesses, preferably base industries bringing money into the County, are the primary beneficiary.** Eligible projects include industrial parks, transportation infrastructure, **telecommunications networks/facilities**, and other projects that facilitate business and economic development in Humboldt. Applicants may apply for a loan, a loan and grant, or a grant (though loan-only financing is preferred). The *Financing for Communities* program offers **loans for infrastructure-related projects where community or residential areas are the primary beneficiary**. Eligible projects are water, sewer, drainage, power, telecommunications, workforce housing, and transportation facilities/systems.

Potential Private Funding Table

(Note: This list contains private, corporate and community foundations. A separate list will contain government grant opportunities. Items of particular interest are highlighted in bold lettering. Also, note that under "areas of interest" only the ones that could possibly be appropriate to this project are listed; the foundation may have other interests not listed.) here.)

Name/Address	Contact Name	Phone/Email	Type of grants/fields of interest	Limitations/other info
Bourns Foundation 1200 Columbia Ave., Riverside, CA 92507-2129 http://www.bourns.com	Karen J. Smarr, Secy-Treas	None given	Supports organizations involved with technology, education & science Fields of interest include education; (elementary /secondary); engineering/technology; higher education; science	Primarily southern CA but has given in northern CA Application form required. Initial approach: Contact foundation for application
Robert C. & Lois C. Braddock Charitable Foundation 1221 Broadway, 21st Fl. Oakland, CA 94612 http://www.braddockfoundation.org	Robert C. Braddock, Jr., Tr.	(510) 451-3300	Projects that enhance the well-being of children, youth, the elderly, the disabled and veterans. Dedicated to assisting these groups in the areas of basic life necessities, education, job training, rehabilitation, and environmental issues that have an impact upon people's lives Fields of interest include human services, public libraries, education; environment, natural resources; health organizations; higher education	Giving primarily in San Leandro and Oakland, CA and central FL.but has given in Oregon, Sacramento, Truckee, Fresno, Lake Tahoe, and Eugene, OR Usually does not accept unsolicited applications. See guidelines on foundation Web site before proceeding.

Name/Address	Contact Name	Phone/Email	Type of grants/fields of interest	Limitations/other info
Candelaria Fund 332 Pine St., Ste. 511 San Francisco, CA 94104	Richard Tower, Dir.	(415) 834-0430 E-mail: candelaria_fund@sbcglobal.net	Areas of interest: Community development; economic development; historical activities. Types of support: General/operating support, program development.	Giving primarily in northern CA. Of particular note: Foundation gave a grant in 2003 to Garberville for its Town Square project; Other interesting grants for general support to I-5 Corridor Development Corp.; city of Winslow, AZ; and the Cumbres and Toltec Scenic Railroad in Antonito, CO. Application form not required Initial approach: Letter
Comerica Bank Corporate Giving Program 500 Woodward Ave. Detroit, MI 48226-3416 http://www.comerica.com	(no name given)	(313) 222-7356	Areas of interest: Arts, community development, economic development, health care, human services, public affairs.	Giving primarily in areas of company operations, with emphasis on CA, FL, MI, and TX.

Name/Address	Contact Name	Phone/Email	Type of grants/fields of interest	Limitations/other info
Community Foundation Silicon Valley 60 S. Market St., Ste. 1000 San Jose, CA 95113-1000 http://www.cfsv.org	Peter Hero, Pres.; For grant information meeting reservations, Lupe Barrera, Exec. Asst./Receptionist	(408) 278-2200 E-mail: info@cfsv.org phero@cfsv.org lbarrera@cfsv.org	Types of grants: Arts and cultural participation; education and lifelong learning; neighborhood grants program; neighborhoods & civic engagement; organizational effectiveness; self-reliant individuals and families. Fields of interest include engineering/ technology, adult education, community development, education, environment, health care, housing, mental health services, American Indians.	Giving primarily in Santa Clara and southern San Mateo counties, CA. but has given in Oregon and Las Vegas. No support for city or state government agencies or for equipment purchases but does grant for technical assistance. No grants for capital campaigns, expenditures for equipment purchases; Visit foundation Web site for application forms and additional guidelines per grant type Initial approach: Attend a grant information meeting Deadline(s): Feb. 1, May 1, Sept. 1, and Nov. 1 for community investment grants
Community Technology Foundation of California c/o Rincon Ctr. 101 Spear St., Ste. 218 San Francisco, CA 94105 http://www.zerodivide.org	Tessie Guillermo, Pres. and C.E.O.	(415) 371-8808 info@zerodivide.org	Purpose: Meet the needs of California's underserved communities for full and equal access to telecommunications services, by supporting community-based organizations in designing and integrating technology into practice; Fields of interest include community development; disabled; education (creating lifelong learning opportunities for communities and individuals); community economic development (increase access to technology-related self-sufficiency through workforce development, asset building or microenterprise and small business assistance); minorities; telecommunications	Giving limited to CA See Web site for application guidelines.

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The Fluor Foundation 1 Enterprise Dr. Aliso Viejo, CA 92656-2606 http://www.fluor.com/communities/default.asp	Suzanne Huffmon Esber, Exec. Dir	(949) 349-6797 community.relations@fluor.com	Supports organizations involved with community and economic development, arts and culture, higher education, public and civic affairs, and health	Giving primarily in areas of company operations, with some emphasis on Orange County, CA, Greenville, SC, Fort Bend and Harris County, TX, and Richland, WA, but has also given in AZ, SC, NY and elsewhere Initial approach: Proposal
Friedman Family Foundation 353 Folsom St. San Francisco, CA 94105 http://www.friedmanfamilyfoundation.org	Lisa Kawahara	(650) 342-8750 fffdn@aol.com	Support for programs which attempt to end the cycle of poverty, especially programs that provide tools, support, asset building, and opportunity to people in need in order to overcome the root causes of their poverty, and in which the people to be helped are part of the design and decision making of the organization or project. Preference is given to new and creative programs, and programs working for systemic change. Fields of interest include community development, economic development, economically disadvantaged	Giving primarily in the San Francisco Bay Area, but has given in Virginia. Application guidelines available on foundation Web site Application form required. Initial approach: 2-3 page letter, or 1-2 page application
Walter and Elise Haas Fund 1 Lombard St., Ste. 305 San Francisco, CA 94111 http://www.haassr.org	Pamela H. David, Exec. Dir.	(415) 398-4474	Areas of interest: Arts and culture (fostering partnerships between artists and nonprofit organizations to create new work and engage the public in new ways); economic security (to help low-income working individuals and families achieve upward mobility and economic security); harness the benefits of economic development activities in and near low-income communities that advance the economic security of local residents and area small businesses;	Giving primarily in San Francisco and Alameda County but has given in Pennsylvania and Washington DC Initial approach: Letter of inquiry, see Web site for required format

Name/Address	Contact Name	Phone/Email	Type of grants/fields of interest	Limitations/other info
The William and Flora Hewlett Foundation 2121 Sand Hill Rd. Menlo Park, CA 94025 http://www.hewlett.org	Paul Brest, Pres.	(650)234-4500 E-mail: info@hewlett.org	Technology: Improve access to exemplary postsecondary and K-12 educational content through a variety of approaches, including supporting institutions and individuals to make high-quality content freely available on the web; Fields of interest: Arts, community development; elementary/secondary education Types of support: Continuing support, emergency funds, employee matching gifts, general/operating support, land acquisition, matching/challenge support, program development, program-related investments/loans, seed money.	Limitations: Giving limited to the San Francisco Bay Area, CA, for family and community development programs; Application information: The foundation prefers to receive letters of inquiry via its online submission form at its Web site.
The Hofmann Foundation (formerly K. H. Hofmann Foundation) P.O. Box 907 Concord, CA 94522 Application address: 1380 Galaxy Way, Concord, CA 94522,	Lisa Hofmann Seeno, Secy.	(925) 687-1826	Areas of interest: Education: Local educational institutions that demonstrate a profound need to challenge and improve the hearts and minds of its students; Arts & culture: Local cultural organizations, especially those that demonstrate a desire to establish and create long-lasting cultural programs and facilities; General welfare: To a limited degree, local organizations that address general welfare; Medical & health agencies; children/youth, services; economic development; elementary/secondary education; Health care; Human services;	Limitations: Giving primarily in the San Francisco Bay Area, CA, with emphasis on Contra Costa County, but has given in Memphis, TN

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William Knox Holt Foundation 300 W. Aztec Ave., Ste. 200 Gallup, NM 87301	George M. Malti, Pres. and Treas.	None given	Giving primarily for higher and secondary education in the field of science Fields of interest: Engineering/technology; Higher education; Museums; Science; Secondary school/education	Limitations: Giving primarily in northern CA and southern TX. No grants for general support, operating budgets, continuing support, annual campaigns, emergency funds, deficit financing, equipment, land acquisition, or endowment funds; Deadline(s): Submit proposal in Jan. or Feb,deadline Feb. 15
The James Irvine Foundation 575 Market St., Ste. 3400 San Francisco, CA 94105 http://www.irvine.org	Kelly Martin, Grants Mgr.	415) 777-2244	The mission of the foundation is to expand opportunity for the people of CA to participate in a vibrant, successful, and inclusive society. **Of particular interest: Communities Organizing Resources to Advance Learning (CORAL)** Initiative: Increase the academic achievement of youth (with an emphasis on elementary school students) by involving students, families schools, and organizations in high-quality, out-of-school learning opportunities. The initiative will come to a planned conculusion in 2007. Areas of interest: Giving primarily for the arts, education, workforce development, civic culture, sustainable communities; children, youth and families. community development; neighborhood development; economic development; employment, training Types of support: Employee matching gifts, general/operating support, matching/challenge support, program development, program evaluation, seed money, technical assistance.	Limitations: Giving limited to CA. No support for agencies receiving substantial government support.. Grants can be requested up to a maximum of $50,000, over one or two years. Initial approach: Online application form Deadline(s): Jan. and July 5

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LexisNexis Corporate Giving Program c/o LexisNexis Cares 9443 Springboro Pike Miamisburg, OH 45342 http://www.lexisnexis.com/cares		(800) 227-9597 community.relations @lexisnexis.com	Contributions to nonprofit organizations involved with arts and culture, education, and economic development. Emerging areas of interest include literacy. Economic development: Supports programs designed to promote local economic development and government affairs initiatives. Education: Supports programs designed to encourage employee involvement with K-12 education and help students see the critical link between education and employment. Types of support include general/operating support and matching/challenge support	Limitations: Giving primarily in areas of company operations, with emphasis on San Francisco, CA, Colorado Springs, CO, Bethesda, MD, Newark, NJ, New York, NY, Dayton, OH, Provo, UT, Charlottesville, VA, and Seattle, WA. Application forms available online.
Robert and Teresa Lindsay Family Foundation 630 5th Ave., 30th Fl. New York, NY 10111			Fields of interest: Business school/education; community development; education; health care; human services.	Giving primarily for education; funding also for social services. Geographic focus: California; New York. Application information: Submit detailed description of project and amount of funding requested. Initial approach: Letter

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The J. M. Long Foundation (formerly Long Foundation) P.O. Box 3827 Walnut Creek, CA 94598	Deborah Bland, Admin.	(925) 935-4138	Giving to benefit organizations located in California and Hawaii involved with health care, education, and conservation. Preference is given to new initiative projects which will be completed with the foundation's contribution. Fields of interest: Animals/wildlife preservation/ protection; children/youth services; health organizations; youth development; youth centers/clubs.	Application form required. Deadline(s): Given out after letter of inquiry received
LS Foundation 746 Webster St. Palo Alto, CA 94301	Laurence L. Spitters, Pres.	(650) 324-1775	Giving for education and the arts. Fields of interest: Arts; business school/ education; health care; higher education; law school/education;	Limitations: Giving primarily in CA. Application form not required. Initial approach: Proposal
Mizuho USA Foundation, Inc. (formerly The IBJ Foundation, Inc.) 1251 Ave. of the Americas, 31st Fl. New York, NY 10020-1104 (Donor(s): The Industrial Bank of Japan Trust Co.; The Industrial Bank of Japan, Ltd.; Mizuho Corporate Bank (USA).	Lesley Harris Palmer, Exec. Dir.	(212) 282-4192 mizuho.usa.foundation@ mizuhocbus.com	Supports organizations involved with workforce development, affordable housing, economic development, and community development Fields of interest: Community development, economic development, employment, housing/shelter. Types of support: Continuing support, Employee matching gifts, program development, seed money.	Giving primarily in Los Angeles, CA, Chicago, IL, and New York, NY, but has given in NJ, GA, TX No grants for building or construction, capital campaigns, general operating support. Initial approach: Telephone or proposal Application form not required. Deadline(s): 1st Fri. in July

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Northern California Community Loan Fund 870 Market St., Ste. 677 San Francisco, CA 94103 http://www.ncclf.org	Mary A. Rogier, Pres.	(415) 392-8215 info@ncclf.org	Dedicated to strengthening the economic base of low income and minority communities by providing loans, technical assistance, and grants in the areas of human services, economic development, and housing. **Of particular interest:** **NCCLF Lending Program:** Makes loans to groups that develop affordable housing, community facilities, jobs and job-training programs, and vital human services NCCLF Nonprofit Space Capital Fund: Provides grants and technical assistance to help community groups acquire program and office space. Fields of interest: Economic development; economically disadvantaged; Types of support: Building/renovation, consulting services, land acquisition, program-related investments/loans, technical assistance.	Giving limited to northern CA.

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The Northrop Grumman Foundation (formerly Foundation of the Litton Industries) 1840 Century Park E. Los Angeles, CA 90067 http://www.northropgrumman.com/com_rel/foundation.html	Sandra Evers-Manly, Pres.	(800) 478-5478	Supports organizations involved with arts and culture and education Areas of interest include computer science; education; elementary/secondary education; engineering/technology	Limitations: Giving primarily in the metropolitan Los Angeles, CA, area; giving on a national basis for higher education. No grants for capital funds, equipment, land acquisition
The PepsiCo Foundation, Inc. 700 Anderson Hill Rd. Purchase, NY 10577 http://www.pepsico.com/citizenship/contributions.shtml	Jacqueline R. Millan, V.P.	(914) 253-3153	Supports organizations involved with arts and culture, education, health, human services, and youth services. Foundation is committed to helping address the needs of today's youth, focusing on (1) encouraging physical activity and promoting youth fitness; and (2) skill development, primarily among urban and low-income youth, of leadership, entrepreneurship, and other life skills which prepare young people to be successful in postsecondary education and the workforce.	Limitations: Giving primarily in areas of company operations, with emphasis on Irvine, CA, Wichita, KS, Louisville, KY, Somers, NY, and Plano, TX; has also given in MN, IL, NC, MA, VA, and CT. Application form not required.

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PG&E Corporation Contributions Program M.C. B32 P.O. Box 770000 San Francisco, CA 94177-0001 http://www.pge.com/about_us/community/charitable/index.html	Dan C. Quigley, Dir., Charitable Contribs.	(415) 973-1636 dcq1@pge.com	Fields of interest: Community development; disasters preparedness/services; economic development; elementary/secondary education; employment services. Also makes charitable contributions to nonprofit organizations directly. Types of support: Capital campaigns, donated equipment, donated land, donated products, emergency funds, employee volunteer services, equipment, general/operating support, in-kind gifts, matching/challenge support, program development.	Limitations: Giving primarily in areas of company operations in central and northern CA. Application form not required. Initial approach: Proposal to headquarters or nearest company facility Deadline(s): Oct. 15
Mary Pickford Foundation Ranch Adm. Bldg., 40730 Calle Bandido Murrieta, CA 92562	Henry Stotsenberg, Pres.		Grants largely for scholarship funds at colleges and universities, and for well-established medical or community service organizations, including performing arts programs, museums, and agencies serving the elderly and other disadvantaged groups. Fields of interest: Aging (centers/services); arts; business school/education; community development; economically disadvantaged; education; health organizations; higher education	Giving primarily in CA, with emphasis on Los Angeles and Palm Springs, but has given in San Francisco. Application form not required. Initial approach: Letter or telephone

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The Prudential Foundation Prudential Plz. 751 Broad St., 15th Fl. Newark, NJ 07102-3777	Lata N. Reddy, V.P. and Secy.	community.resources @prudential.com	Supports organizations involved with education, health care, employment, housing/shelter, youth development, human services, and community development. Fields of interest include children/ youth, services; community development; economic development, education, early childhood education; elementary/secondary education; **Of particular interest:** **Ready to Learn program**: Supports initiatives that strengthen public education at the elementary school level. Supports organizations involved with systematic school reform, improving teacher and educational leadership skills, increasing parental involvement, arts education, early childhood care and education, and bolstering literacy in the early years. **Ready to Live Program:** Supports community well-being through initiatives that build healthy families, **improve community-based services for disadvantaged populations**, and address major human services issues affecting children and families. **Ready to Work Program:** Supports initiatives that increase employment opportunities by strengthening job skills and opportunities and by promoting neighbor-hood development and increasing entrepreneurship through financial training and access to capital. Neighborhood stability is addressed through community organizing, leadership development, and neighborhood strategic planning. Types of support include General/operating support, Program development, Program-related investments/loans, Seed money, Technical assistance	Limitations: Giving primarily in areas of company operations, with emphasis on Phoenix, AZ, Los Angeles, CA, Jacksonville, FL, Atlanta, GA, Minneapolis, MN, Newark, NJ, Philadelphia, PA, and Houston, TX., but has given in NY (e.g., $100,000 in 2002 to Committee for Economic Development, New York, NY, for programs addressing education, digital economy, workforce development, health care reform and others.) Download application form and mail; Optional concept paper and application form to foundation. Application form required. The New York Area Common Application Form is accepted

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Rose Foundation for Communities and the Environment 6008 College Ave., Ste. 10 Oakland, CA 94618 http://www.rosefdn.org	Tim Little, Exec. Dir.	(510) 658-0702 rosefdn@earthlink.net	Fosters community and environmental stewardship, improves communications between businesses and the neighbors, recognizes individual responsibility for the environmental stewardship and sustainable job creation, harnesses economic power to leverage environmental sustainability. Fields of interest include business/industry, environment, natural resources; human services. Types of support: Conferences/seminars, consulting services, continuing support, equipment, general/operating support, income development, program development, publication, research, seed money, technical assistance	Application information: See Web site for complete details Initial approach: Telephone or 2-page letter of inquiry Deadline(s): May 31 (for Aug. decision) and Nov. 30 (for Jan. decision) or Mar. 31; June 30, Sept. 30, Dec. 31 for Grassroots Fund

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Rosenberg Foundation 47 Kearny St., Ste. 804 San Francisco, CA 94108-5528 http://www.rosenfound.org	Linda Moll, Grants Mgr.	(415) 421-6105: lmoll@rosenfound.org	Priority given to (among others) Families in poverty in rural and urban areas of CA, activities which reduce dependency, promote self-help, create access to the economic mainstream, or which address the causes of poverty Areas of interest include: Economic Security of Working Families: The goal of this program is to strengthen the economic well-being of working families. Projects designed to improve economic security through increased wages and earned income and projects designed to achieve public policy promoting good jobs and good wages are considered priorities. Fields of interest include: Children/youth services, civil rights, immigrants, economically disadvantaged, rural development, women.	No grants to individuals, or for endowment, building, or capital funds, operating expenses of established agencies, scholarships, fellowships, continuing support, annual campaigns, emergency funds, deficit financing, matching funds, land acquisition, renovation projects, or conferences and seminars; generally no grants for equipment, films, or publications (except when a necessary part of larger project). Application form not required. Initial approach: Letter of inquiry (1-2 pages) or telephone call to Grants Mgr.

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Sprint Foundation (formerly United Telecommunications Foundation) 6220 Sprint Pkwy. Overland Park, KS 66251 Mailing address: P.O. Box 11315, Kansas City, MO 64112 http://www.sprint.com/community/ sprint_foundation	Ralph Reid, Exec. Dir.	(913) 762-3767	Supports organizations involved with arts and culture, education, disabled, health, community development, and youth development. Areas of interest: Arts and culture: visual and performing arts organizations that have effective outreach programs which broaden the cultural experience for the general public, particularly youth and non-traditional audiences Education: The foundation provides support for programs involved with increasing and improving student engagement, parental involvement, and professional development for teachers, administrators, and staff. Primarily supports K-12 education, also programs that promote business and economic education for youth Fields of interest include: Adult education-literacy, basic skills & GED; arts; business school/education; children/youth services; community development; disabled; economics; education; reading; elementary school/education; youth development.	Giving primarily in Westwood, KS, and areas of company operations in CA, Washington, DC, GA, KS, Kansas City, MO, Dallas, TX, and Herndon, VA., but has given in NC

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Elbridge and Evelyn Stuart Foundation c/o Bank One Trust Co., N.A. P.O. Box 1308 Milwaukee, WI 53201	Anne Myers, Trust Off. c/o Bank One Trust Co., 70 W. Madison St., Chicago, IL,60670		Fields of interest: Secondary school/education; youth services.	Giving primarily in CA. Application form not required. Initial approach: Letter
Synopsys Technology Education Opportunity Foundation (formerly Synopsys Technology Opportunity Scholarship Foundation) 700 E. Middlefield Rd. Mountain View, CA 94043 http://www.synopsys.com	Christopher K. Sadeghian, Dir	(650) 584-1772	Giving primarily for science and technology educational programs and to high schools for science and educational programs Fields of interest: American Red Cross; community development, business promotion; disasters, (e.g. 9/11), secondary school/ education.	Giving primarily in CA. Initial approach: Proposal