Central Coast
Broadband Consortium

A Broadband Grid for A Connected Central Coast

Submitted to
The California Public Utilities Commission
California Advanced Services Fund

By
The University Corporation at Monterey Bay,
A 501(c)3 auxiliary to
California State University, Monterey Bay

On Behalf Of

The Central Coast Broadband Consortium (CCBC)

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Proposed Broadband Project Description:

Project size: 3,899.35 square miles. This area encompasses the unserved (2,495.75 square miles) and underserved areas (1,403.6 square miles) of Santa Cruz, San Benito and Monterey Counties (see Item 9 below for a detailed description). The total combined area of these three counties is 5,153.96 square miles.

Download and upload speed capabilities of proposed facilities: 100 Gbps download and 100 Gbps upload. This project is a middle-mile facility, and as such will be providing high speed connectivity to last-mile service providers and other wholesale customers. This facility will support symetric bandwidth at all nodes of 100 Gbps, which is the basis for the stated download and upload speeds.

Type of technology: The CCBC project includes SONET/TDM rings to provide a robust, reliable, and scalable infrastructure. The system will support traditional TDM services (DS1/DS3 to OC-x) as well as Ethernet over SONET and wavelength support. Every segment of the system will have a minimum of 100 Gbps symetrical bandwidth. The reference architecture is designed to be upgradable to 1.6 Tbps on a segment by segment basis by simply adding or replacing cards at individual nodes. Technical details of the network include:

- 428 mile fiber backbone, with armored sheath protection

- At least 85% of network will be underground construction, with the balance aerial construction.

- Backbone node facilities are secured 12' x 20' concrete shelter buildings, which also provide interconnection and co-location facilities for customers.

- 200 amps DC power system, battery backups, and emergency generators on-site

- A centrally located wireless interconnection facility, accessible via licensed microwave radios

- Two leased-line fiber optic connections to an Internet cross-connect and co-location facility in San Jose

- 21 node facilities, sited to the extent possible in or adjacent to unserved and underserved areas

The network system is designed to provide path diversity at every point on the network via a loop design. With the exception of two short segments, south of Bradley and Lucia in Monterey County, there will be a minimum of two completely separate paths from any point to any other point on the network, or to the San Jose interconnect facility. The two segments which will not initially have this path diversity will obtain it when an interconnect facility with San Luis Obispo County is constructed in a later phase.
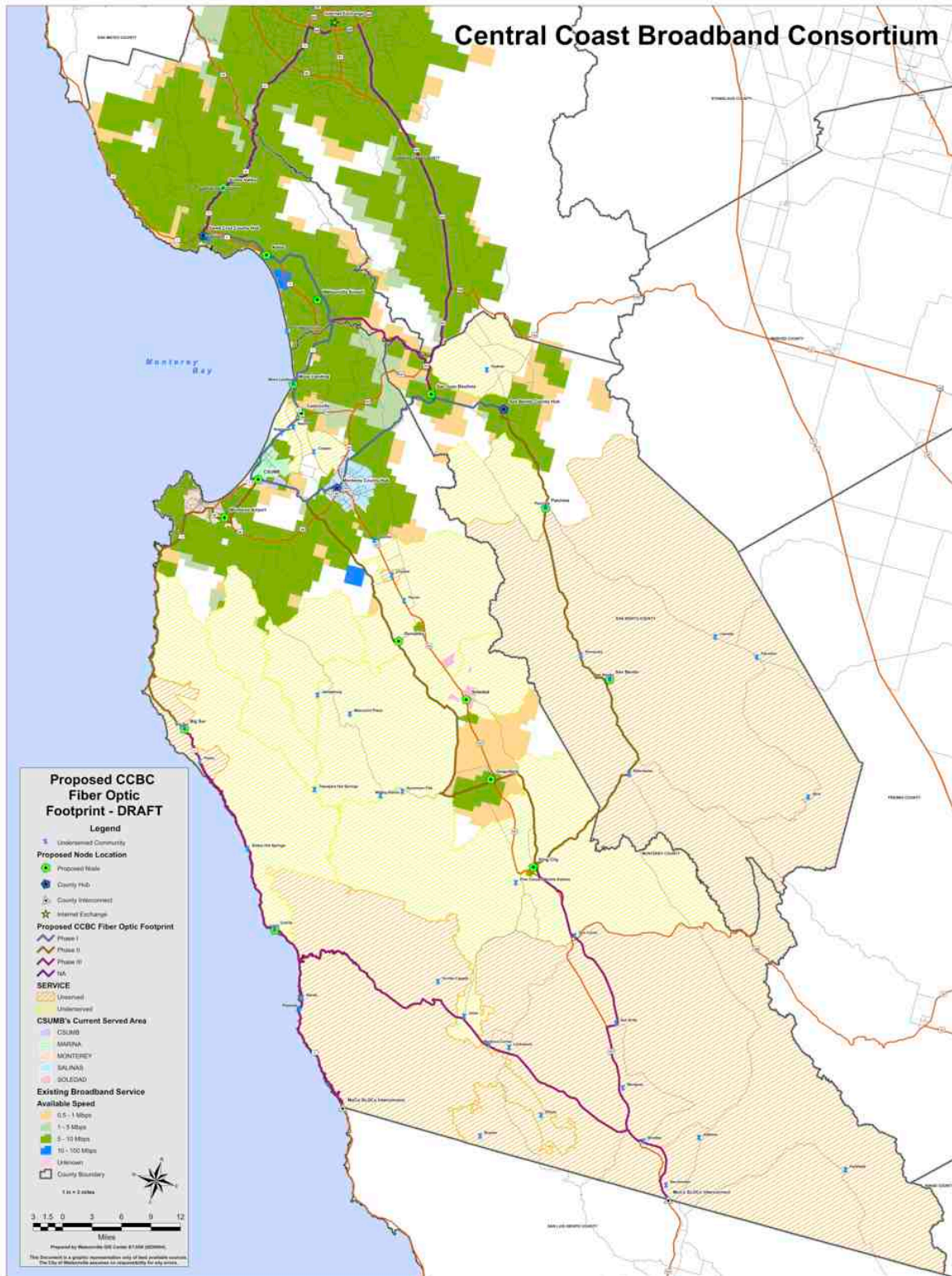
The proposed broadband project focuses on the Monterey Bay area, a tri-county region of California's central coast comprised of the counties of Monterey, San Benito and Santa Cruz. The region's largest employment sectors are small business, government, education, agriculture and tourism, all of which share the existing and limited network of community resources. Significant components of the central coast include the following:

- More than 15,000 small businesses, from retailers to environmental consultants (with an increasing emphasis on green technologies) to computer programmers to legal firms;

- Twenty-six institutions of scientific research and higher education that employ more than 12,000 faculty, staff and researchers and enroll some 65,000 students; and

- The Salinas Valley, which is known as "The Nation's Salad Bowl," one of the world's most productive agricultural centers.

Local leaders have envisioned developing the region's diverse economic and intellectual resources to establish a robust business environment. The highly productive economic engine of the nearby Silicon Valley has inspired these visions. The efforts of the region's leaders have been stymied, however, by two major factors: the predominantly rural and geographically challenging environment and the relentlessly seasonal character of its two largest industries —agriculture and tourism.

Geographical Challenges

The region includes two geographically challenging areas: the rugged mountains and coastline of the Big Sur area and the Santa Cruz mountains. These relatively remote areas experienced damaging and extensive wild fires in 2008 and 2009, during which voice and data connectivity were sharply limited or non-existent, and there was no cell phone coverage for large parts of the affected areas. During this emergency, Cal Fire struggled to contain blazes in Big Sur, Corralitos and the Santa Cruz Mountains simultaneously and all first responders found that their inability to communicate severely hampered their effectiveness.

The region's rural geography also challenges educational and medical services. These crucially important community resources are hard-pressed to provide equitable access to their resources and services, and maintain appropriate standards of quality throughout their extensive areas of responsibility. These constraints impact the residents directly, and contribute to frustrations in advancing the region's economic growth.

Economic Challenges

The region's tourism and agriculture industries, despite their successes, typically generate only lower wage salary scales and very seasonal employment opportunities, resulting in long-term economic stagnation. To counter this trend, the region must develop opportunities for year-round employment and high-end wages, both of which are associated with high-value products and services. To date, the pursuit of this high priority goal has been compromised by the region's inability to offer high-bandwidth optical connections in the downtown business

districts and industrial parks. This shortcoming has had an unmistakably negative impact on the recruitment and retention of high tech organizations as well as their ability to comply with their customer's needs.

The region could provide productive responses to long-standing needs for effective and equitable emergency services, economic development, medical and educational services by developing a cost-effective, robust and extensive broadband infrastructure.

A Cooperative Approach to Broadband Services

More than five years ago, far-sighted leaders of local governments, educational institutions and community organizations initiated studies of the potential value of high-speed access to the Internet. This early work has resulted in the establishment of The Central Coast Broadband Consortium (CCBC) to develop the disparate telecommunications networks within the tri-county Monterey Bay area. The mission of the CCBC involves planning a high-speed broadband network, building new facilities, connecting existing facilities, filling critical gaps, and offering high speed network transport services, to ensure equitable access and promote digital literacy for all of the region's residents, businesses, governments, educational institutions and other civic and social services agencies.

By focusing on a cooperative network, the CCBC's initiatives and work balance environmental, technical, governmental, community and education requirements.

Through this proposed middle-mile project the CCBC will build-out the region's broadband infrastructure for multiple anchor sites, including schools, county offices of education, the Business Clusters of the Cities of San Juan Bautista and Marina, the Ryan Ranch Business Park, the new industrial park being planned in Hollister, and other industrial areas where the large-scale availability of broadband services would foster the growth of a vigorous economy that would keep local talent in our area, reversing a "brain drain" to other areas of California and the Nation, as well as support high paying jobs.

This project will also enable the connection of fire, medical and police units for public safety—our goal is "Connected, Protected and Educated Communities". It also will link two of the region's large, high-quality medical centers, Natividad Hospital and the Community Hospital of Monterey County, with health clinics, such as Clinicas de Salud and the Big Sur Health Clinic, in rural areas that are now dramatically underserved.

The project also will extend high-speed broadband services to rural residents who currently have limited access to such services, or no access at all. The extension of broadband availability into the region's most rural areas will open new opportunities for residents to benefit from a range of public and private services and to pursue educational opportunities that could prepare them for advanced studies and higher levels of income.

As an engine for economic development, this project will enable government agencies to realize significant savings in their daily operations; facilitate public safety communications; support significant cost reductions and improvements in medical services; carry training opportunities for unemployed and underemployed residents to learn new job skills; empower

the region's businesses to reach national and global markets; and provide the region's youth with practical experience in technology skills essential for their future success.

This project will create a broadband infrastructure where none now exists particularly in geographically challenging areas and at a myriad of public anchor institutions, from health clinics like Natividad Medical Center, Mee Memorial Hospital, Salinas Valley Memorial Hospital to business centers in Marina and San Juan Bautista. The proposed fiber mesh will connect research institutions such as Monterey Bay Aquarium Research Institute and the University of California, Santa Cruz with the Elkhorn Slough National Estuarine Research Reserve, a wildlife preserve and research stations located in the remote sites of the Big Sur Mountains. Public safety institutions long separated by geography will be able to coordinate responses to regional challenges, such as the Loma Prieta earthquake of 1989 and the disastrous wildfires of 2008.

The CCBC's proposed broadband network will provide wavelength services, Sonet/TDM service, Metro-Ethernet Services, and Fiber Channel Services to organizations within the unserved and underserved areas of the region's cities, rural and rural remote areas so that they could pursue their respective missions and provide their services to the public:

- **Education**: Elementary, secondary and postsecondary institutions; Public, educational and government (PEG) video programs; and workforce training;

- **Public Safety**: First responders, e.g., police, local fire agencies, CAL FIRE, 911 communications, California Emergency Management Agency (Cal-EMA), telephone services for translation of foreign languages, etc. ;

- **Government**: City and county offices for government activities and libraries;

- **Health**: California Telehealth Network, planned to connect 300+ California healthcare providers in underserved areas to a state- and nation-wide broadband network;

- **Community Services**: multiple community-based non-profit organizations

- **Economic Development**: Business parks, workforce training centers, agriculture areas, and principal tourism destinations.

Estimated Potential Subscriber Size

The proposed project location contains:

- 11,150 potential broadband households

- 38,711 potential broadband subscribers

These totals are based on 2007 Census data for the specific Census Block Groups that describe the project location, per Item 7 above.

Generally, the project location contains many agencies, businesses, institutions and entrepreneurs who have expressed interest in purchasing wholesale capacity from this

Central Coast Broadband Consortium (CCBC) project, either for re-sale to consumers or as users themselves. This interest is documented in the attached letters and statements, which are incorporated into this item by reference.

Specifically, at least three last mile service providers with facilities in the three-county region – Etheric Networks, Surfnet Communications and Redshift Internet Communications – have stated a firm interest in using CCBC facilities to provide consumer and business Internet service to the project location. Etheric Networks and Surfnet Communications are predominantly wireless Internet service providers (ISP) and are submitting complementary applications for ARRA last mile project funding. Redshift Internet Communications uses both wired and wireless facilities to provide last mile service, and is considering a complementary ARRA application as well.

The project location also contains an existing wireless Internet distribution system operated by the Monterey County Office of Education (MCOE). Currently, this system is only used to provide broadband connectivity to schools in the project location. However, MCOE is interested in offering access to these distribution facilities to commercial providers and is a participant in the CCBC project. The CCBC project includes a wireless interconnection facility that interfaces with the MCOE network and provides an additional platform for extension of last mile services via the ISPs mentioned above, as well as others.

These wireless facilities and wireless ISPs, together with the wireless-friendly terrain characteristics of the area (predominantly broad valleys overlooked by high ground with many existing tower sites, see Attachment A) make it possible to rapidly extend last-mile service from the CCBC's middle-mile project facilities to households throughout the project location.

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