Submitted Date: 8/20/2009 9:47:40 AM	**Easygrants ID: 2851**
Funding Opportunity: Broadband Initiatives Program and Broadband Technology Opportunities Program	**Applicant Organization:** Concept Development, Inc.
Task: Submit Application - Infrastructure Programs	**Applicant Name:** James M Reardon

• **Conformity with Statutory Purposes** • **Cost Sharing/Matching** • **Reasonableness of Project Budget**
The project advances at least one of the statutory purposes for BTOP
Applicant has provided documentation that the project would not have been implemented during the grant period without federal grant assistance.
Applicant has provided a budget that is appropriate to the proposed technical solution and only includes eligible costs.

- **Demonstration the Project Could not be Implemented But For Federal Grant Assistance**
  Applicant is providing matching funds of at least 20 percent towards the total eligible project costs?
  Yes

7-k. Cost Sharing/Matching Fund Explanation
Not requested.

C. Executive Summary

Executive Summary of Project for BIP and BTOP:

8. Infrastructure Projects Executive Summary
Overview

The Santa Ana Mountains, located in Orange and Riverside Counties, in Southern California are geographically adjacent to large urban population centers and yet remain largely unoccupied, particularly in the south. Consisting largely of rugged and sensitive areas of the Cleveland National Forest and County parkland, with a limited network of public roads, the area has a very small population. Nevertheless, historically there are pockets of settlement and a growing recreation and public safety infrastructure in the area.

Most of the proposed project area is unserved by any terrestrial broadband service because the areas are largely unoccupied. Cable television and broadband is unavailable. Basic telephone service is available along major roads, but DSL services are unavailable because of a combination of factors, including aging telephone infrastructure and the distance limitations of the underlying technology. Given the present complete lack of service in the area, and the low density of habitation, and the environmental sensitivity of the park lands, the Santa Ana Mountains are an ideal candidate for wireless delivery of broadband services.

Project

The service envisioned in this proposal will be implemented via a combination of wireless "last mile" access techniques chosen to deal with the rugged character of the terrain. Middle Mile services and backhaul will be provided by terrestrial microwave in combination with existing copper and fiber infrastructure.

The proximity of the Orange County and Riverside County urban areas present opportunities for project savings on the one hand, but also add to the implementation challenge. Orange County, in particular, provides convenient access to competitive Tier-1 Internet NAP facilities located in the cities of Irvine, Tustin, and Santa Ana. Through collocation agreements, these facilities will form the base for the proposed network.

Rising to over 5,500 feet in elevation, a prominent feature of the Santa Ana Mountains are its peaks, including Santiago Peak and Modjeska peak in the south, and Sierra Peak in the north. These peaks feature existing microwave facilities that overlook most of the terrain in the area, providing commanding line-of-site access to most of the service area. In particular, Modjeska Peak and Sierra Peak will be used as intermediate relay points to form a redundant backhaul and Middle Mile infrastructure of service using 200 mbit/sec licensed packet radio technology.

From the peaks, augmented by terrestrial fiber and copper infrastructure, a series of fixed-microwave access facilities will be installed to serve end-customers. Again, the proximity of the urban areas is a design factor in these facilities since the radio spectrum is heavily utilized in populated areas and the elevation of the Service Area allows interference to occur over greater distances. The project will utilize a combination of techniques to address this

challenge.

Technology Overview

The preferred access arrangement for the project will be [redacted] fixed-WiMAX. The combination of WiMAX, which provides for resilient service class discrimination and the [redacted] will ensure that customers are delivered a robust and reliable service. [redacted]

The Santa Ana Mountains Broadband project will further leverage [redacted] to minimize operational interference. [redacted]

Because of the rugged terrain in the Santa Ana Mountains, other wireless access technologies may be utilized for specific situations. For example, access radio systems operating in the 900 MHz band may be used to reach the most remote areas where operation at higher frequencies is infeasible or sensitive environmental obstacles exist. In addition, low-cost point-to-point equipment may be utilized, [redacted], for isolated customers. Otherwise, unlicensed point-to-point equipment may also be utilized.

Operations

The Santa Ana Mountains Broadband network will be operated from the City of Irvine. A collocation arrangement with upstream ISP will be leveraged to provide 24x7 network support and service dispatching while keeping operational costs to a minimum. Network maintenance for the Middle Mile and backhaul facilities will be performed by a combination of direct staff

and contractors. In general, customer premise installations will be subcontracted whenever possible.

Description of BTOP Project Purpose (BTOP Applicants Only Next Three Questions)

9. BTOP Statutory Purpose:

Provide access to broadband service to consumers residing in "unserved" areas of the United States.
Provide improved access to broadband service to consumers residing in "underserved" areas of the United States.
Provide broadband education, awareness, training, access, equipment, and support to schools, libraries, medical and healthcare providers, community colleges and other institutions of higher education, and other community support organizations by or through these organizations.
Improve access to, and use of, broadband service by public safety agencies.
Stimulate the demand for broadband, economic growth, and job creation.

10. Description of BTOP Project Purpose:

To extend middle mile (backhaul) facilities into the rugged Santa Ana Mountains of Orange and Riverside County, in Southern California in order to overcome the limitations of surrounding wired service providers and support last-mile access facilities serving the unserved and underserved communities in the Service Area.

11. BTOP Enhanced Services for Health Care Delivery, Education, and Children:

Universal residential broadband has become a necessity to effectively participate in elementary, secondary, and post-secondary education throughout the country. In unserved and underserved areas, students of all ages are impeded in their education because of their inability to access broadband services provided by their schools. In addition, access to online reference resources is extremely constrained on slower speed Internet services.

Students residing in the proposed service area attend urban schools in Orange and Riverside counties. These schools today simply assume that their families and students have access to

broadband services.

D. Proposed Funded Service Area

12. Proposed Funded Service Area Maps:

12-A. Service Area Map (Reference Number): **A62A-DF1D-41E9-A2B5**

12-B. Is the applicant is seeking a waiver for providing less than 100% coverage of a census block. **Yes**

13. Proposed Funded Service Area (BIP - Last Mile Projects):

Please refer to section M at the end of document.

14. Proposed Funded Service Area (BTOP - Middle Mile Project):

Please refer to section M at the end of document.

15. Non-Funded Service Area(BIP Only):

On the boundary of the underserved area adjacent on the suburban boundaries are residential and business areas already serviced by adjacent cable provider Cox Communications and/or DSL provider AT&T. Applicant will certify that no part of the funding provided will be used to service any customer who can elect to receive service from these incumbant providers according to the boundary of their broadband service area established as of the date of funding.

16. Coverage Waiver:

Applicant is seeking a waiver for providing less than 100% coverage of a census block.
Yes
For Response of "Yes" please refer to upload section for additional supporting documentation.

17. Methodology for Area Status:

Boundaries of unserved area were originally identified according to the California Public Utilities Commission (CPUC) database maintained in connection with the CASF Universal Service Fund. The area was then visited and certain potential communities within the area were surveyed (online and by mail) to determine types of existing service, preferences, and interest in terrestrial broadband service. Existing services were found to be either dailup modems (where telephone service was available) or satellite Internet. About 96 percent of respondents indicated that they were dissatisfied with the performance and utility of satellite

services.

The census data for the unserved area was then confirmed using online mapping resources at www.broadbandusa.gov .

Boundaries of the underserved areas were identified by checking for the availability of services from the two service providers in the surrounding areas (Cox Communication, Verizon and AT&T). Boundaries of the area outlined were adjusted to exclude areas where these companies can offer services today (generally, along the few roads that traverse the area).

To account for any potential inaccuracy, applicant will certify that no part of funding will be utilized to provide service in any subdivision along the boundary of the underserved area if a customer in these areas is able to elect service from an existing broadband supplier's service area as exists on the date of funding.

Finally, online resources such as search and www.dslreports.com were consulted to determine if any wireless suppliers advertised services in the underserved area. None were found.

18. Middle Mile Benefits

The Middle Mile services are intended to serve as a backbone from which to provide services in the identified unserved and underserved areas. As outlined in the executive summary, the rugged terrain of the San Ana Mountains, especially in the southern area on either side of CA State Hwy 74, make provision of services away from the highway itself very difficult. Compounding this problem, the sensitive environmental status of the Clevelend National Forest, the San Mateo Wilderness, and designated roadless areas, as well as Ronald Caspers Wilderness Park (Orange County), make installation of modern infrastructure very challenging. The proposed Middle Mile services along the peaks are intended to address this challenge by serving the access (last mile) networks, as well as point-to-point customers within the area.

Upstream interconnection will be obtained from Level 3 Communications, XO Communications and INTERNAP, all available in Irvine, Tustin and Santa Ana facilities.

The Middle Mile network will target telemetry, transaction, VPN, and public Internet service needs of the County of Orange (Parks, Fire Authority, Sheriffs Department), the County of

Riverside (Public Service Emergency Communication, Sheriff), State of California (Cal Fire, fire service for the County of Riverside in this area, Department of Fish and Game), and Federal agences including U.S. Forest Service, Fish and Wildlife Service, Corp of Engineers, FBI, DEA and others. In providing these tailored services, the resources of the associated Last Mile networks may also be used.

E. Proposed Service Offering

19. Broadband Service Offerings for Last Mile Project:
Please refer to upload section at the end of the document.

20. Service Offerings for Middle Mile Project:
Please refer to upload section at the end of the document.

Competing Service Providers

21. Existing Broadband Service Providers and Services Offered:
Please refer to upload section at the end of the document.

Non-Discrimination, Interconnection

22. Description of Network Openness:
Concept Development, Inc., ("CDI") as operators of Santa Ana Mountains Broadband will commit to the following Nondiscrimination and Interconnection obligations:

Adhere to the principles contained in the FCC's Internet Policy Statement (FCC 05-151, adopted August 5, 2005);

ii. Not favor [[Page 33111]] any lawful Internet applications and content over others;

iii. Display any network management policies in a prominent location on the our web page and provide notice to customers of changes to these policies;

iv. Connect to the public Internet directly or indirectly, such that the project is not an entirely private closed network; and

v. Offer interconnection, where technically feasible without exceeding current or reasonably anticipated capacity limitations, on reasonable rates and terms to be negotiated with requesting parties. This includes both the ability to connect to the public Internet and physical interconnection for the exchange of traffic.

CDI further agrees that all these requirements shall be subject to the needs of law enforcement and reasonable network management. CDI will employ generally accepted technical measures to provide acceptable service levels to all customers, such as caching and application-neutral bandwidth allocation, as well as measures to address spam, denial of service attacks, illegal content, and other harmful activities. In addition to providing the required connection to the Internet, CDI may offer managed services, such as telemedicine, public safety communications, and distance learning, which use private network connections for enhanced quality of service, rather than traversing the public Internet. CDI may elect to satisfy the requirement for interconnection by negotiating in good faith with all parties making a bona fide request. CDI and a requesting party may negotiate terms such as business arrangements, capacity limits, financial terms, and technical conditions for interconnection. If CDI and requesting party cannot reach agreement, CDI may voluntarily seek an interpretation by the FCC of any FCC rules implicated in the dispute.

Non-Discrimination and Interconnection (BTOP applicants only for next three questions)

23. Non-Discrimination Obligations (applicable to Last Mile and Middle Mile Applicants):

Adhere to the minimum non-discrimination requirements as set forth in the NOFA.
Display the nondiscrimination practices in a prominent location on the service provider's web page, and provide notice to customers of changes to these policies.

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24. Interconnection Obligations (applicable to Last Mile Applicants):

25. Interconnection Obligations Middle Mile Applicants:

Adhere to the minimum interconnection requirements as set forth in the NOFA.
Display the interconnection policies in a prominent location on the service provider's web page, and provide notice to customers of changes to these policies.
Commit to offering wholesale access to network components and services such as wavelength or fibers at reasonable rates and terms.
Commit to binding private arbitration of disputes concerning interconnection obligations.

Cost Effectiveness and Affordability

26. Cost per Household (BTOP only):

The cost of the BTOP portion of the project is estimated to be $9.02 per household.

27. Affordability

The proposed system will be deployed in the rugged Santa Ana Mountains area of Orange and Riverside Counties, in Southern California. This area contains numerous geographic, political and administrative barriers to wired broadband deployment. As a result, the only viable access to higher speed Internet is via satellite services such as Wildblue and DirectTV.

Satellite services range from $79 to $129 monthly for residential users, and usually involve an installation fee in the range of $600 to $1000. By comparison, the proposed service will range from $45 to $79 and provide superior levels of service -- in particular, terrestrial latency of approximately 95 milliseconds.

In terms of affordability, despite the sparse population of the area, it is located in one of the most affluent demographic regions of the United States. Demand for service is expected to be high among residential users. Institutional and government users will find the proposed telemetry rates to be attractive.

It is the intent of the applicant to utilize grant money in part to subsidize the installation of customer premise equipment for the duration of the 24 month build out period, in order to minimize any economic barrier to network acceptance.

F. Technology Strategy

28. Technology Type:

Wireless - Terrestrial Fixed
Other

Other: Fiber-optic backhaul segment

29. System Design

Middle-mile system design and feasibility study is provided in Supplemental #1.

30. Network Diagram:

Please refer to upload section at the end of document.

31. Certification by Professional Engineer:

Please refer to upload section at the end of document.

32. Buy American Waiver Request:

Is the applicant seeking an individual waiver of the Buy American provision? **No**

Buy American Waiver Request – Legal Justification

None.

33. Choice of Service Provider:

Does the project's Infrastructure and the Company's business plan allow more than one provider to serve end users in the proposed funded service area?

Yes

G. Project Milestones and Completion Factors

Timeline & Milestones

34. Infrastructure Build-out Timeline:

Please refer to upload section at the end of the document.

35. Licenses, Regulatory Approvals and Agreements:

Spectrum

The proposed network can be implemented without radio license approval. However, the applicant is planning to deploy Last Mile services [redacted] to avoid potential interference problems often associated with 5 GHz operations. [redacted]

[redacted]

[redacted]