

Northern California Regional Middle-Mile Infrastructure (NCRMMI) Project

I. PROJECT SUMMARY

A. Applicants' Names

- Golden Bear Broadband, LLC (GBB) and The Siskiyou Telephone Company (STC) are the joint applicants.

B. Contact Person

- Mitch Drake, the Interim Part-Time GBB Chief Executive Officer, will be the contact.

C. Project Title

- The Northern California Regional Middle-Mile Infrastructure (NCRMMI) Project.

D. Proposed Project Area Location (Counties/Communities)

The overall NCRMMI Plan is a fiber-based middle-mile broadband infrastructure that crosses the 16 rural counties in Northern California: Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Siskiyou, Sonoma, Tehama, Trinity, and Yolo. **Figure 1.0** below shows the overall design for NCRMMI.

These 16 Northern California counties encompass nearly 27 percent of the state's geography, and over 1.634 million Californians live in this region. There are 54 Incorporated Communities, 262 Census Designated Places, 631,402 households, and 1,281 Census Block Groups in 282 Zip Code Areas.

Within the overall NCRMMI Plan the specific Project Area Location, for which GBB is seeking CASF Infrastructure Program funding, is depicted in **Figure 2.0** below. In this initial phase of the NCRMMI Plan 14 of the 16 counties are to be served. Del Norte and Trinity are not included because we understand there are other entities planning to construct those routes.

This NCRMMI Project area encompasses nearly 25 percent of the state's geography, and 1,591,571 million people. There are 53 Incorporated Communities, 245 Census Designated Places, 615,412 households, and 1085 Census Block Groups in 191 Zip Code Areas.

E. Project Type

- **Middle Mile Plus (Up to an Eight (8) mile fixed wireless service on both sides of this backbone)**
 - NCRMMI is a fiber-based middle mile broadband infrastructure plus fixed wireless capabilities.
 - This specific project covers 2,247 long-haul route miles across 14 of the 16 counties.

- NCRMMI is designed to directly connect, via fiber, over 50 anchor institutions (CSU Campuses, Community Colleges, County Offices of Education, County Libraries and Major Health Delivery Facilities) to this backbone.
- Initially, up to thirty-three (33) GBB fixed wireless towers are to be deployed to extend the NCRMMI's reach up to an eight (8) mile service area on both sides of the backbone enabling "last mile" providers, that partner with GBB, to serve thousands of residential and other customers.

F. CASF Funding Requested

- \$119,394,315 is being requested as a CASF Grant.
- \$0 is being requested as a CASF Loan.

G. Project Description

The Northern California Regional Middle-Mile Infrastructure (NCRMMI) Plan is the foundation component of a comprehensive three-tier overall *Northern California Broadband Plan*. In addition to NCRMMI, each of the 16 counties needs a fiber-based countywide backbone system as the second tier. The Northeastern and Upstate California Connect Consortia have already drafted a countywide backbone conceptual design for each of the counties and have started working with the leadership in each county to refine and hopefully have each county adopt such a plan in their General Plan to serve as the framework for future broadband development. The third tier will be community-based fiber to the premise and/or wireless services throughout each Incorporated Community and Census Designated Place.

The NCRMMI Plan is designed to provide a robust fiber-based network infrastructure across these 16 counties that will meet current broadband needs as well as provide growth capacity for the next 20 to 30 years. This infrastructure will bring next-generation services that will promote: 1) economic growth of businesses and industry; 2) enhanced educational services; 3) access to increased library services and resources; 4) improved access to quality healthcare; 5) interoperability of public safety services; 6) online access to all levels of government services; and 7) provide each citizen the opportunity to avail themselves of the wide range of information resources and services they deem appropriate to improve their quality of life.

The overall NCRMMI Plan is a fiber-based middle mile infrastructure plus fixed wireless capabilities. As shown in **Figure 1.0** there are two (2) "master-rings" equipped to interconnect and integrate five (5) major geographic areas via five (5) main fiber rings, four (4) sub-rings, two (2) sub-sub rings and one (1) non-ring route to provide for maximum reach and edge access. The total route miles across the 16 counties is 2,587 miles.

This specific NCRMMI Project covers **2,247** route miles across the 14 of the 16 counties. This project is comprised of approximately **1,236** miles of existing fiber owned by long-haul or rural local exchange carriers and **1,011** miles of new construction. It is a ring architecture using a fully recoverable and scalable technological platform.

This specific project is designed to directly connect, via fiber, over 50 anchor institutions (CSU Campuses, Community Colleges, County Offices of Education, County Libraries and Major Health Delivery Facilities) to this backbone. There are 93 miles of fiber built into the project to connect these anchor sites to the NCRMMI backbone.

As part of this project, up to 33 new GBB fixed wireless towers are to be deployed to extend NCRMMI's reach up to eight (8) miles on either side of the backbone to enable "last mile" providers, that partner with GBB, to serve thousands of households and other end users. There are 102 miles of fiber built into the project to connect the cell towers to the NCRMMI backbone.

GBB will manage and operate this comprehensive, cohesive and redundant regional infrastructure as a unified whole. The GBB business model is based on being a middle-mile wholesaler of capacity and services targeting customers/partners that include: 1) "Last Mile" providers who will deliver services to households and other customers; 2) Providers needing long-haul capacity; 3) Large Commercial "last mile" providers; 4) Small Commercial "last mile" providers; 5) Large Commercial Businesses; 6) Education Anchors (CSU Campuses, Community Colleges and County Offices of Education), working through CENIC; 7) Tribal Communities, working through GBB Member Native Business Enterprises, LLC; 8) County Library Anchors, working through the NorthNet Library System and the State Librarian; 9) Major Health Facilities, working with the California Telehealth Network; and, 10) County and Local Governments.

H. Maps of the Proposed NCRMMI Project

The NCRMMI Plan is designed to deploy a comprehensive, robust, diverse and redundant set of fiber-based routes across the 16 counties. **Figure 1.0** shows the proposed fiber routes for NCRMMI. Under this specific grant project, GBB will not deploy a portion of Route #5A (Etna-to Rte 36 through Trinity County) and Route #6 (Eureka to Crescent City in Del Norte County) because GBB understand there are other entities planning to construct these routes. GBB may complete Route 2Ab with construction of a fiber path from Corning to Woodland at a later date, if it is needed.

Figure 2.0 depicts how the NCRMMI backbone will be extended with the strategic deployment of wireless towers to create a fixed wireless service area up to eight (8) miles (limited by topography) on both sides of the middle-mile backbone. This will enable residential customers to access the planned network in the near term. GBB intends to enable "last mile" providers, that partner with GBB, to serve thousands of households and other end-users on either side of the NCRMMI fiber backbone using this fixed wireless capability.

Figure 1.0 Northern California Regional Middle Mile Infrastructure Plan 1/5/13



Legend

- Cal-Ore
- Level 3
- New Build
- PG&E
- Plumas-Sierra
- Siskiyou Telephone
- Phase II
- Level 3 POP
- Community College
- State University
- Hospital
- Library
- K-12
- CA Counties
- NCBP 16 Counties



Figure 2.0
Northern California Regional Middle Mile
Infrastructure Plan 1/5/13



Legend

- Cal-Ore
- Level 3
- New Build
- PG&E
- Plumas-Sierra
- Siskiyou Telephone
- Phase II
- Level 3 POP
- Community College
- State University
- Hospital
- Library
- K-12
- CA Counties
- NCBP 16 Counties
- Project Area Buffer (2-8 Miles)



0 25 50 100 Miles

I. List of Census Block Groups

Within the 16 counties there are 1,281 Census Block Groups (CBGs) that ultimately will be served with the full implementation of the **Northern California Broadband Plan**. Within the GBB Proposed Project Area Location there are 1,085 Census Block Groups (CBGs) that will be served with the implementation of this specific **Northern California Regional Middle-Mile Infrastructure (NCRMMI) Plan Project**.

The list of the CBGs for this specific **GBB NCRMMI Project** can be found below.

The list of the CBGs for the entire 16 counties can be found in **Appendix B, Exhibit B.1.1**.

Table 1.1 List of CBGs-NCRMMI and up to an 8 Mile Fixed Wireless Service Area (1,085 CBs)

060070001021	061030007004	060971531033	060930003002	060971538092	060930009006
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060110005001	061030001003	060971538063	060930011001	060930011002	060971531042
060110005004	061030004001	060971538041	060930011003	060930008001	060971527025
060110005003	061030004002	060971509011	060971538042	060930006001	060971531032
060110003001	061030011001	060971507013	060971542012	060930001001	060971513092
060110002005	061030006003	060971507023	060971542022	060930009002	060971513074
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060110005002	061030006002	060971509024	060971542011	060930009004	060971513011
060110004001	061030007002	060971510001	060971506071	060930009005	060971506011
060110002001	061030008002	060971510003	060971513113	060971538071	060971506014
060110002003	061030008004	060971510002	060971529052	060971532003	060971523002
060110002004	061030005002	060971531041	060971529053	060971532001	060971519001
060110003002	061030003001	060971534031	060971530034	060971514025	060971519004
060110003003	061030002001	060971515042	060971511002	060971506122	060971520001
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061030011003	061030005004	060971530062	060971512014	060971512015	060971521001
061030004003	061030007001	060971530066	060971512013	060971512042	060971506013
061030011006	061030005005	060971531021	060971512012	060971512043	060971506012
061030010004	061030011005	060971531023	060971512011	060971512033	060971506021
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061030009001	061030007005	060930012001	060971518004	060930007033	060971506032
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060971506101	060971513082	060971512032	060971538012	060971530033	060971529044
060971509015	060971513091	060971512034	060971528012	060971530064	060971530053
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060330007012	060230003005	060230112001	060239400002
060330007011	060230004003	060230108001	060230115001
060330010001	060230004001	060230108002	060230116001
060330004002	060230004002	060230108004	060230116002
060330006004	060230008001	060230110003	060230101021
060490002001	060230106001	060230101023	060230101024
060490002002	060230106002	060230110001	060230009003
060490001001	060230008002	060230110002	060230009002
060490001003	060230002005	060230111004	060230009001
060490001005	060230107003	060230111002	060230012002
060490003002	060230107004	060230111001	060230012001
060490003003	060230007002	060230105021	060230012003
060490003001	060230007004	060230103005	
060070029002	060230007003	060230103003	
060070029001	060230001004	060230103002	
060070031002	060230001003	060230103004	
060070031003	060230001002	060230104002	
060070028005	060230002006	060230104001	
060070028003	060230001001	060230105012	
060330006005	060230002001	060230105013	

J. List of Zip Codes

Within the 16 counties there are 282 Zip Codes that ultimately will be served with the full implementation of the **Northern California Broadband Plan**. Within the Project Area Location there are 191 Zip Codes that will be served with the implementation of this specific **Northern California Regional Middle-Mile Infrastructure (NCRMMI) Plan Project**. These Zip Codes are listed below.

The list of Zip Codes for the entire 16 counties can be found in **Appendix B, Exhibit B.1.2**.

Table 1.2 List of 191 Zip Codes, NCRMMI and up to an 8 Mile Fixed Wireless Service Area:

95901	95552	95963	95482	95446	95968	95551
95974	95616	95951	95488	94931	95955	95528
95979	95691	95536	95410	95436	95501	95464
95503	95698	95458	96017	95937	95550	95422
95554	95969	95585	96022	95540	95569	95493
95560	95948	95420	96038	95562	95564	95468
95524	95932	96116	95694	95571	95559	95466
95485	95645	96013	95450	95573	95451	95587
96130	95943	96073	95430	95521	95435	95415
96109	95546	96084	96041	95556	96114	96065
96123	95547	96028	95966	95549	95494	96001
95425	95525	96058	95965	95443	95437	96016
95449	95453	96034	95973	96136	96101	96057
95456	96119	96064	95987	96105	96076	96097
95432	96113	96023	95920	95445	96047	95618
96134	96056	96085	95526	95454	96008	96092
96019	95470	95492	95537	96007	95568	95627
96051	95460	94928	95423	96002	95462	
96069	95417	96090	95457	96062	95421	
96025	96003	95697	96132	96032	95472	
96049	96086	95938	96121	95620	95412	
95441	96067	95912	96128	95612	95444	
95448	95403	95988	94952	94954	96021	
95465	95409	95519	95459	95404	95695	
95405	95439	95542	96015	95401	95776	
95407	95486	95553	96039	94922	95928	
94951	96035	95565	96050	96080	95926	
95497	95605	96117	96094	95563	95970	
96055	95917	95490	94923	95954	95950	

K. The Case for Implementing NCRMMI

An individual California citizen's access to high-speed Internet, via a robust and comprehensive fiber-based broadband infrastructure, is the keystone to educating future generations, creating jobs, promoting public safety and ensuring delivery of essential health services. Enabling greater access to improved, increased broadband services will improve the standard of living for every Californian in the future.

According to the California Public Utilities Commission (CPUC), in 2008 the minimum broadband service standard for a household was 3 Mbps download and 1 Mbps upload (about 20 to 60 times the capacity of a telephone connection). In 2011 the CPUC raised the minimum standard to 6 Mbps download and 1.5 Mbps upload. Based on this brief history we can expect this current minimum standard to continue to be raised higher and higher over the next decade. In fact, Nielsen's Law of Internet bandwidth, originally tested in 1998, is still outpacing predictions nearly 14 years later. At this pace, user broadband speed needs could surpass 100 Mbps by 2020, or sooner.

In February 2011, the Federal Communications Commission (FCC) issued the *National Broadband Plan (NBP)* wherein the FCC observed that "Broadband is the great infrastructure challenge of the early 21st century." The NBP recommends seven long-term goals, of which the first is:

"At least 100 million homes should have affordable access to actual download speed at 100 Mbps and actual upload speed of 50 Mbps by 2020."

Interestingly, neither the CPUC nor the FCC has set minimum standards for various types of businesses, anchor institutions or government agencies. In most instances, these private and community-based organizations' minimum capacity/speed requirements already exceed the minimum standard for households.

While some households in the 16 Northern California counties have access to broadband speeds at the current CPUC standard, many of the 1.634 million residents (631,402 households) are underserved or unserved in terms of provider choice and speed.

This past year, 2012, the Upstate (UCCC) and Northeastern (NECCC) California Connect Consortia confirmed that these 16 counties still lack a comprehensive, integrated, redundant, open-access, middle-mile fiber-based broadband infrastructure to meet their current needs let alone their future needs. Furthermore, they found that none of the counties has a comprehensive countywide backbone system infrastructure in place that can effectively link the last-mile community providers, who serve end-users, to the worldwide information resources so vital in the 21st century.

If the foregoing is not already cause for concern, in many instances the current services provided to many communities across Northern California utilize aged copper cable, discontinued and capacity exhausted equipment, and old linear non-diverse microwave radio routes.

Individually, most of the telecommunications companies that currently serve various communities within Northern California are not able to justify the investment necessary to upgrade to a fiber-based infrastructure. Since these companies face more risk and challenges than their more urban counterparts because they serve a distributed population over a wide geography with vast areas of rugged terrain, they must find ways to serve these rural customers with fewer resources. Also, they do not enjoy the same return on investment that large urban-based companies do. Thus, as demands for more capacity and higher speeds grow, reliance on simple market forces to serve the communities in Northern California will result in increases in the number of underserved citizens.

The Northeastern and Upstate California Connect Consortia approached the development of a **Northern California Broadband Plan (NBP)** as a comprehensive planning effort, rather than just attempting to fill holes.

Based on CPUC's analysis of provider reported data (RD 6, June 30 2012), 497,654 of the 631,402 households in these 16 counties are served and 133,748 are underserved/unserved with wireline, fixed wireless or mobile service. However, based on the same CPUC data if mobile service is removed, the number of underserved/unserved jumps to 150,839 households, or 23.9 percent, of the total.

Based on the CPUC data (RD 6, June 30 2012), the consortia found that 10 of the 54 Incorporated Communities, or 18.5 percent, are currently underserved. Of the 44 served communities 22, or 50 percent, have only one company providing services at or above the current CPUC standard.

Based on the CPUC data (RD 6, June 30 2012), the consortia found that 165 of the 262 Census Designated Places, or 63 percent, are currently underserved. Of the 97 served communities 56, or 58 percent, of the total have only one company providing services at or above the current CPUC standard.

Thus, the NECCC/UCCC asserts that 257 of the 316, or 81.4 percent, of the communities across the 16 counties are either underserved and/or have very limited choices for broadband services.

Given that Northern California is seriously lagging behind the rest of the state and nation in the quality of and access to the fiber-based broadband infrastructure required to meet today's capacity and speed needs let alone be able to meet the anticipated increases in demand for more capacity and greater speeds in the near and long-term future, **now is the time to act on the January 2008 California Broadband Task Force recommendation to:**

"Build out high-speed broadband infrastructure to all Californians"

by implementing a comprehensive **Northern California Broadband Plan**. The deployment of GBB's NCRMMI Project is the beginning.