



## Nevada County Last-Mile Broadband Grant Application

### Application Summary

Applicant's Name	Nevada County Fiber, Inc
Contact Person	Andrew Wilkinson President & CEO [REDACTED] Nevada City CA, 95959 [REDACTED]
Project Name	Banner Mountain South / Little Deer Creek
Location	Red Dog Road and Banner Quaker Hill Rd
Project Type	Underground fiber optic to the home
Grant Funding request	\$223,889 (49% match)
Confirmed matching capital	\$237,057 (51% match)
Number of parcels passed/connected	32 connected; anticipated 40 passed
Grant Funding per connected property	\$7,408
Web Site	www.NevCoFiber.com
Primary Existing Broadband service	AT&T DSL
Typical existing service levels	1-4 Mbps Download 0.5Mbps Upload

Planned Subscription Level	Cost	Additional services
10Mbps Down 10Mbps Up	\$60/month	<ul style="list-style-type: none"> <li>• Home Wi-Fi set up &amp; management</li> <li>• Extended Wi-Fi mesh set up</li> <li>• Internet security threat management</li> <li>• Internet telephone set up</li> <li>• Parental controls</li> <li>• Streaming media set up</li> <li>• Remote management</li> <li>• Smarthome advice</li> </ul>
50Mbps Down 50Mbps Up	\$75/month	
100Mbps Down 100Mbps Up	\$90/month	
1Gbps Down 1Gbps Up	Available*	
10Gbps Down 10Gbps Up	Upon request	

\* 1 Gigabit service will be offered when total number of subscribers exceeds 75, or upon request

## **Nevada County Last-Mile Broadband Grant Application**

### **Instructions – Refer to Nevada County Last-Mile Broadband Grant Program Guidelines Before Continuing with Grant Application**

Application must be reviewed by a professional engineer (PE) or other qualified individual. A separate review is required for each grant application if submitting multiple applications.

***Final application deadline is December 6, 5:00 PM, 2019.***

No incomplete or late applications will be accepted.

#### **Attachments:**

- For attachments containing more than 5 pages, a summary page is required.
- For surveys or petitions, the summary page must include the number of signatures and description of process to verify addresses are in the proposed service area.

#### **Match Requirement**

The grant will cover up to a 50% of eligible project expenses. In-kind matches (i.e. donation of land for infrastructure, labor, donation of lease for infrastructure, etc. will be accepted at a lower point value than cash matches).

Applicants with additional local match or leveraged funds will receive additional points in the scoring process. Federal broadband grant funding is not an eligible match.

#### **Applicant Conference Call and Questions**

An applicant informational conference call is scheduled for Tuesday, November 12 at 2pm. The call is voluntary and will be recorded. Any questions regarding this application or for inclusion in the call should be submitted in writing via email by EOD Friday November 8.

***Recipient:*** [cwalterscheid@sierrabusiness.org](mailto:cwalterscheid@sierrabusiness.org)

***Subject Line:*** Nevada County Broadband Grant Application Question

### **1. Applicant Information**

#### **1. Applicant Contact Information**

Name: Andrew Wilkinson  
Company: Nevada County Fiber, Inc  
Title: President & CEO  
Email: [REDACTED]  
Phone: [REDACTED]

1.2 What type of legal entity is applicant? California Corporation C4288603

### 1.3 Describe applicant's history with other Broadband deployment projects.

May 2017 and Nov 2017 Andrew Wilkinson was part of the leadership team at Spiral Internet Fiber Project. Assuming the Chief Financial Officer role as an unpaid volunteer he worked on various financial models to move the project into planning and construction. The project was transitioned to Race Communications and is now being built.

April 2018 – July 2019 Andrew Wilkinson completed the Tahoe Basin Feasibility Study for Tahoe Prosperity Center. The feasibility study was funded by a grant from the Economic Development Agency with three priority areas:

- 1) An analysis of the Tahoe Basin region to identify opportunities for industry diversification and how Broadband can be the catalyst for that evolution.
- 2) A business analysis for the financing and management of Tahoe Basin Broadband infrastructure. This business analysis will include a (i) market analysis; (ii) estimated capital and operating costs; (iii) estimated revenues; (iv) potential regulatory and other barriers; and (v) potential funding structures. This deliverable will essentially help the Tahoe Prosperity Center obtain answers for issues pertaining to who pays for Broadband infrastructure and how.
- 3) An analysis determining an appropriate entity to manage Broadband infrastructure and related efforts in the Tahoe Basin. More specifically, a comprehensive analysis will be conducted to identify an appropriate entity, already existing or to be created, to manage Broadband infrastructure expansion, operations, and maintenance.

## 2. Project Overview

2.2 Project Name: Banner Mountain South/ Deer Creek

2.3 Project Technology:

The project will be 100% underground fiber to the premise. Initially, the service will be a synchronous 100Mbps connection, meaning 100Mbps download and 100Mbps upload. As subscriber demands grow the service will readily expand to synchronous 1Gbps without any additional construction or equipment. The infrastructure could easily deliver an astounding 10Gbps and beyond with minor updates in the electronic equipment using the same fiber optic.

Much of today's Fiber to the Premise (FTTP) is currently using GPON technology. One of the benefits if GPON was that it allowed providers to use a single strand of fiber which could be passively split to serve unto 128 subscribers. This helped reduce the cost of fiber and avoided the need for an electrical supply outside of the central office. In today's market, the cost of fiber has continued to decline due to manufacturing efficiency and growing global demand. One of the limitations of GPON is that it is shared bandwidth and its upstream capability is 50% of the downstream speed.

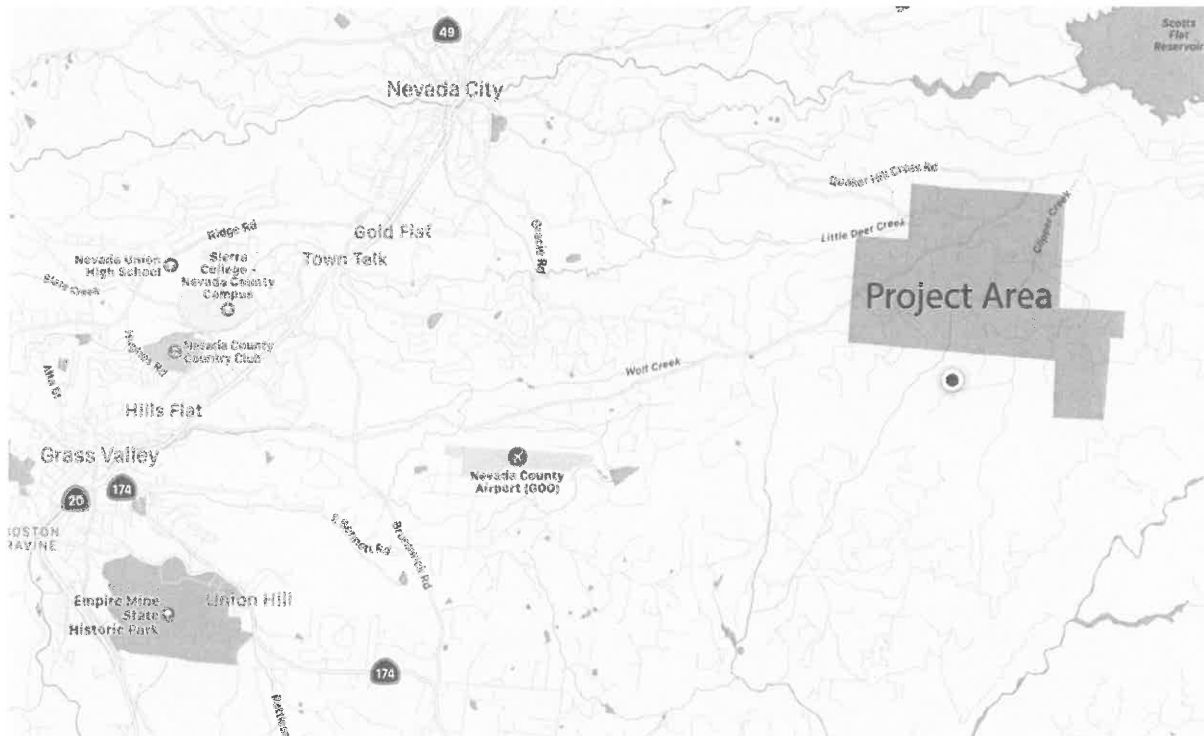
The project will provide a dedicated fiber to each subscriber from the central office which will future proof the design to allow for synchronous connections that can be easily upgraded over time to 10Gbps and beyond that will meet the needs of the community for the foreseeable future and beyond. This will allow the greatest flexibility as it will accommodate both a GPON and Active Ethernet solution.

See Appendix B Professional Independent Review for project design and construction review.

## 2.4 Proposed Service Area

The project area is located approximately 4.5 miles east of Nevada City, and 2.0 miles south west of Scotts Flat reservoir. The area is heavily forested with significant changes in elevation, steep slopes and a year round creek passing from north east to south west.

The project area is 2,179 acres of which 520 acres are zoned TPZ (forest preserve) resulting in a net area of 1,659 acres. There are a total of 260 parcels with a average size of 6.4 acres.



Attach a .shp or .kml/.kmz/Shape File format or File GO Database format file showing the map of the proposed service area showing boundary data for each contiguous area. **Note: If submitting multiple applications, do not combine multiple project areas into one file. Submit a separate mapping file for the project area with each application.**

See attachment: Banner Mountain South/ Little Deer Creek.kmz

## 2.5 Project Permitting

Include a schedule of all required permits for the project including permit type, fee, permitting agency or regulatory board and status of the permit. Ensure that the application is complete and that all of the required local/city/county/state approvals necessary for this project to proceed been considered (planning commission, zoning, route and road authorities, railroad crossing, etc.) Indicate clearly what remains to be done and what is required for completing the process of obtaining approvals. Include this information in the project timeline/schedule

### 1. Installation of underground communication utilities

The project is expected to deploy 12/10 2 Way Duraline Future path conduit which has cross section dimensions of 0.60" x 1.10" suitable for micro bore fiber optic cable, or similar.

With reference to Nevada County Building Code Sec. L-V 13.3 Permits Required

*Section B. Except in flood plains as regulated in section L-II 4.3.10 of the Land Use and Development Code, a **grading permit is not required** for the following, provided no unstable or erodible slopes are created and no encroachment onto sewage disposal systems, water supply systems or hazardous material sites, areas or setbacks is created.*

### 5. Excavations for wells or tunnels or utilities

**Determination:** The project plan has been reviewed by Nevada County Building Control and it is determined that a permit permit not required as fiber optic conduit is classified as a utility.

### 2. Installation of a communications cabinet for Central Office fiber optic distribution electronics and connect to a new PG&E electrical service.

The project plan requires the installation of a 36"x 24"x 60" telecom cabinet on a concrete plan and the install a PG&E meter pedestal and underground conduits to the communications cabinet for electrical service

With reference to Sec.L-V2.31. Section105.2: Work Exempt From Permit

*One-story detached accessory buildings without electrical, mechanical or plumbing not intended for habitation, provided the projected roof area does not exceed 200 square feet. One structure per parcel. In additional the location for the telecoms cabinet is currently zoned TPZ-40 and with reference to Sec. L-V 2.4 Section 105.2: Work Exempt from Permit section 15 4) Pump Houses. Limited in size to 100 square feet*

**Determination:** A building permit for cabinet not required as less than 200 sq ft and similar to a pump house

### 3. Install an electrical service to the communications cabinet as described in (2) above.

**Determination:** All new or revised electrical service require an electrical permit. This is available over the counter

#### **4. Placing a fiber optic conduit under a County Road**

The project plan may require a fiber optic conduit to pass under a county road to provide service to a subscriber. The technique will be to use a horizontal direction drill (HDD) to bore under the county road.

Determination: An Encroachment Permit will be required from the Department of Public Works. The cost will be \$364.52 and will require a \$1M General Liability Certificate with Nevada County Public Works named as Certificate Holder.

#### **3. Is CEQA review required?**

CEQA, or the California Environmental Quality Act, is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

Determination: With reference to the above the local agency cannot deny the request to install communication conduits as they are exempt from permitting per "Sec. L-V 13.3 Permits Required" hence it is determined that no CEQA review would be required.

Additional supporting information

#### **1. California Environmental Quality Act (CEQA) Compliance [Rule 2.4]**

Pursuant to CEQA and Commission Rule 2.4, the Commission (CPUC) examines projects to determine any potential environmental impacts in order that adverse effects are avoided and environmental quality is restored or enhanced to the fullest extent possible under CEQA. In Rule 2.4(b), the Commission recognizes that the Secretary for Resources has exempted certain classes of projects from CEQA. The following are the classes of projects that are exempt from CEQA and for which neither an EIR nor a Negative Declaration is required:

Class 1 Exemption: operation, repair, maintenance, leasing or minor alteration of existing public or private structures and facilities, with negligible or no expansion of an existing use. This includes existing facilities used to provide public utility services. 14 CCR §15301.

Class 3 Exemption: construction including water main, sewage, electrical, gas and other utility extensions of reasonable length to serve such construction. This includes the construction of limited numbers of new small facilities or utility extensions. 14 CCR §15303.

Determination: The communication conduits would be classified a new small facility

**2. The Spiral Internet Fiber Project.**

As a condition of the grant application the CPUC was required to compete a CEQA review as part of the grant application process as it covered 26 square miles. The project was similar underground service using a combination of horizontal direction boring and cable plowing. The study cost of the study was approximately \$170,000 and the outcome was a negative declaration.

The permitting section above has been reviewed with:

County Department	Department Head
Building Department Director	Craig Griesbach
Planning Director	Brian Foss
Public Works Director	Trisha Tillotson

**2.6 Service and Pricing Levels**

Provide the service and pricing levels to be offered in the grant project area:

Subscription Level	Cost	Additional services
10Mbps Down 10Mbps Up	\$60/month	<ul style="list-style-type: none"> <li>• Home Wi-Fi set up &amp; management</li> <li>• Extended Wi-Fi mesh set up</li> <li>• Internet security threat management</li> <li>• Internet telephone set up</li> <li>• Parental controls</li> <li>• Streaming media set up</li> <li>• Remote management</li> <li>• Smarthome advice</li> </ul>
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The fiber optic equipment and infrastructure installed will easily support 1 Gbps. The ability to offer a 1Gbps subscription is dependent on the growth of subscribers which needs to reach approx. 100 to make this economically feasible. In the interim 100Mbps is at least 30 times faster than the current bandwidth provided by AT&T DSL

Are there any limitations on data usage?

No, and no content filtering or prioritization. Commercial hosting of servers, streaming, sharing etc will require a business service plan which has yet to be defined.

Additional information:

The service offering will offer customer premise equipment that will allow Nevada County Fiber to offer managed Wi-Fi service and additional security, content filtering and parental controls to deliver a world-class internet experience.

**Voice service.** Nevada County Fiber does not intend to offer dedicated voice service. There has been a growing trend of subscribers terminating their wired landline and using mobile-only, and the ILECS are already starting to make the case with the FCC to sunset the traditional phone service. Last year AT&T reported that landlines are down 76% between 2007 and 2017 with a further decline between Jan 2018 and November 2018.

As an alternative to AT&T land lines Nevada County Fiber will provide easy to follow guides to set up VoiP services such as Ooma & Vonage, and offer a subsidized service to set up these systems for subscribers who are not familiar to technology. Typically subscribers can see significant cost savings, when compared to their traditional telephone service. Recent local experiences from the PG&E PSPS have shown that the once reliable traditional telephone is no longer as reliable as behind the scenes the ILEC's have migrated to VoIP. Once the batteries are exhausted in the remote cabinets providing the last mile connect the phone service is not available

**Media** It is common for broadband providers to provide television service over the broadband connections, however the industry is in the midst of significant change. With the popularity of 'unbundling' and 'cord cutting' subscribers are now choosing which service and programming meets their needs which typically saves significant costs. Nevada County Fiber will be offering guides and videos showing subscribers how to access popular streaming services such as Netflix, Amazon, Hulu etc, and for those who are intimidated by technology, they will offer in-home support and training.

**Home Wi-Fi** Subscribers often equate their WI-Fi experience as their broadband experience which is not an issue when performance is high and latency is low. However many perceived broadband issues can originate from the home network, for example an older smartphone can slow the Wi-Fi performance, unexpected big downloads can impact other users. Many subscribers do not yet have the experience or skills to resolve such issues and Nevada County Fiber, Inc will be evaluating two leading home Wi-Fi solutions and be able to offer deep support and offer managed services to ensure subscribers have the very best broadband experience.

**Law Enforcement Agencies & CALA (Communications Assistance for Law Enforcement)** Lawful intercept orders at the U.S. federal level have increased 72 percent over the last decade, and 11 percent over the last year and costs for non-compliance for service providers can be as high as \$10,000 per day, whilst many of the lawful intercepts were related to mobile devices provisions have been made by Nevada County Fiber for rapid compliance with lawful request for their subscribers. Any lawful intercept activity will be able to be conducted without effecting subscriber-facing services, while at the same time maintaining the highest level of security and protection for network data. It is not anticipated that there will be any such requests for lawful intercepts, but if such a request is made Nevada County Fiber will be able to offer a fast and reliable response to the requesting agency.



## 2.7 Project Schedule

Provide a detailed project schedule outlining the individual tasks and their timing for the overall project including broadband deployment tasks and activities necessary to complete the project. Include expected completion date (month and year) of the activity. The last task on the project schedule should indicate the date upon which service to the last location will be turned up.

Q1-2020: Begin Construction of central office facility, provisioning of fiber optic backhaul from AT&T. Parcel level planning and survey for the first 7 connections. Application for electrical and encroachment permits.

Q2-2020: Construction of primary distribution conduits, installation of fiber optic cable and connection to the first 7 properties. Central Office facility remote monitoring and automation complete. Operation support process defined implemented.

Q3-2020: Survey and planning for the next group of 10 properties, continued expansion of primary distribution conduits and fiber optic deployment of ONT (Optical Network Terminals) and customer support

Q4-2020: Survey and planning for the next group of 5 properties, continued expansion of primary distribution conduits and fiber optic to additional 5 properties.

Depending on the allocation of Nevada County Last-Mile Broadband Grant fund the program would continue as follows

Q1-2021: Survey and planning for the next group of 2 properties, continued expansion of primary distribution conduits and fiber optic to additional 2 properties.

Q1-2021: Survey and planning for the next group of 8 properties, continued expansion of primary distribution conduits and fiber optic to additional 8 properties.

Last property expected to be connected on or before June 30<sup>th</sup> 2021

List any factors that would change or delay this schedule

The primary factor influencing the schedule is the weather. During periods of heavy rain, or snow underground construction will not be possible. If the area was subject to a wild-land fire that a significant impact on the schedule would occur.

The project schedule reflects this factor as the number of connections expected during the first quarter of each year (Jan-March) is low, with most connections being completed during the spring and summer months.

### 3. Level of Service Verification

Please provide evidence of current service levels which may include but is not limited to:

- Statistically significant survey of residents from grant area
- Documentation of area’s existing infrastructure demonstrating existing service area
- Documentation from website of reported service provider stating that service is not available in this area
- Testimonials and commitments from residents, businesses or institutions in project area are strongly encouraged

PASSINGS TALLY	HOUSEHOLDS	BUSINESSES	COMMUNITY INSTITUTIONS
<p><b>Currently UNSERVED</b> Number of passings expected to improve to at least 25/3 as a result of the project</p>	Phase 1 wireline 6-8*	Phase 1 wireline 2*	1 see “Public Safety Pod” in section 6
<p><b>Currently UNDERSERVED</b> Number of passings expected to improve from between 25/3 &amp; 100/20 to 100/20 and above as a result of the project</p>	Phase 1 40 Future Phase 2 80* Future phase 3 100*  * estimated	Phase 1 8 Phase 2 12* Phase 3 20*	

Note: With cellular and satellite few are truly unserved, the details provided are assuming served by wireline

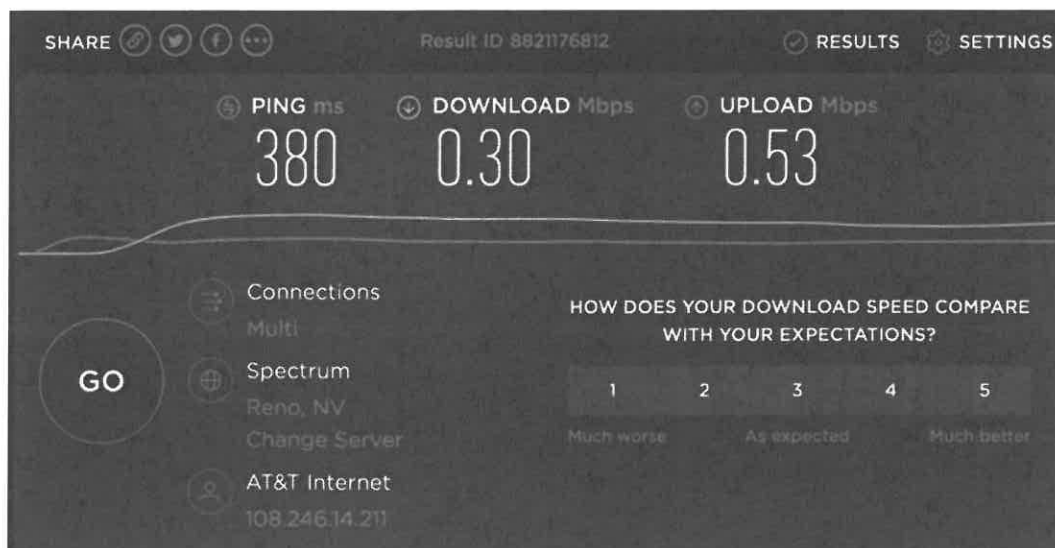
Much of the project area is covered by AT&T DSL, however its widely known that AT&T has an active desire to sunset their copper line services. There are several properties in the project area who used to be able to obtain AT&T DSL, but during the change of ownership, the original owner notified AT&T that they no longer needed service which is the established practice when selling a home to notify the utility companies such as PG&E, NID, Waste Management. What has been happening with AT&T DSL is that the new owner’s request for service is being denied, consequently they are having to rely on Satellite service which is expensive, or wireless service if there is a reasonable line of sight to a local provider.

The fastest AT&T service is advertised as 6Mbps download and 1.5Mbps upload. The further the distance that the property is located from the distribution facility the lower the broadband performance will be. With the growth in popularity of streaming media has resulted in a significant oversubscription in the bandwidth needed. During the peak, early evening hours of 7pm to 10pm the bandwidth is typically less than 3Mbps

The above speed test was taken December 4th at approximately 9:15pm with one device streaming Netflix. The advertised AT&T DSL service level is 6Mbps download, and is currently \$61.00/month. In addition to the very low bandwidth, the Ping, which is the time it takes for a server to reply to a request, is very high, typical response times should be 10-20ms or less.

Typical download/upload speeds within project area

Provider	Download Mbps	Upload Mbps	Location
AT&T DSL	3.17	0.58	Deep Creek Rd
	0.30	0.53	Dusty Drive
	1.23	0.52	Banner Lava Cap Rd
Satellite	0.73	2.24	Lolas Echo Rd
	0.97	1.23	Lolas Echo Rd
Wireless	11.69	1.93	Caroline Rd



See Appendix A- Community.pdf for additional community feedback

3.1 List in the box below the total number of passing's proposed in your project by type of location:

Phase 1 would connect 32 households with a projected total passing of 40 based on a projected connection rate of 80%. As community confidence grows it is expected that the connection rate will continue to grow and likely that subsequent phases will see 80%+. The main factor influencing the connection rate is the household profile.

Typically the least likely to subscribe are the elderly with limited internet usage, as more telemedicine applications become available it is projected that this will have one of the largest impacts in stimulating the demographic to subscribe. The most likely profile to subscribe are those with younger families, who are more likely to stream media, work remotely or have a home business.

3.2 Describe the methodology used to determine the number of locations (e.g. number of meters, existing customers, address points)

Extensive use of Nevada County GIS parcel data has been used to analyze the project area. The inclusion of building footprint details made available by Alex Friant Nevada County GIS Analyst II has been very helpful in evaluating distribution routes.

3.3 With respect to density, what is the average number of homes, businesses and institutions per square mile within the proposed service area?

The total project area is 2,179 acres, of which 520 acres are zoned TPZ (Timber Preserve Zone) leaving an effective project area of 1,659 acres or 3.4 square miles. The initial Nevada County Grant funding will allow for some 22-34 homes to be connected to high-speed underground fiber optic. The total number of properties in the defined project area is 260 which is an average property size of 6.4 acres. It is also noted that there are several large undeveloped areas and a number of smaller lots which may attract developers and homeowners with the availability of world class gigabit fiber optic.

3.4 In terms of infrastructure installation, explain why this area was chosen for the grant and is unlikely to be served without grant funding. Include an explanation of terrain, population density, or other factors contributing to the overall cost of the project.

The project area is located within my own local neighborhood and having personally experienced the continued degraded performance from AT&T DSL which is the only fixed-wire broadband connection available I have realized that there is a big opportunity to improve the quality of life and public safety for more those who are also using the same DSL service in my community.

I have become aware that some properties which used to have access to AT&T DSL have been unsuccessful in asking AT&T to allow them to continue access after purchasing their home. Having evaluated many options I have determined that the best long term solution is to install conduits to each home and provide every home with the ability to connect to the internet using fiber optic. The heavily forested area and significant undulations in terrain are not suitable for point to point wireless which works best with an uninterrupted line of sight for optimal performance.

If necessary, provide any additional information on the grant area that may be helpful during the scoring process that was not asked on the application.

### 3.5 Anticipated Improvements

Using the “**Anticipated Improvements**” table below, please provide the **number** of households, businesses, and community institutions that will be able to receive improved broadband services as a result of the proposed project. Please identify the speeds currently available for each type of location, using the ranges provided on the table, and the speeds that will be offered if the project is awarded grant funding.

To the extent possible, please identify location types by household, business (including home-based business or telecommuter, farm, etc.) and community anchor institutions.

#### **Anticipated Improvements in Broadband Service Based on the Broadband Project Investments**

# of Passings	Speed Now:	0/0	≤10/1	100Mbps available for Phase 1 project build			1Gbps available with 75+ subscribers		
	Speed After Build:	25/3	25/3	0/0	≤10/1	25/3	0/0	≤25/3	<100/20
				100/20	100/20	100/20	1G/1G	1G/1G	1G/1G
Households				8	32		8	32	32
Businesses				2	8		2	8	8
Community				1	1		1	1	1
<b>TOTAL</b>				10	41		10	41	41

Note: As the number of personal discussions take place with homeowners, it is apparent that a much higher percentage than originally expected have some form of business or home based business than originally anticipated.

Note: The project build will be immediately capable of 1Gbps, but the financial model requires approx 75 subscribers to be a viable service offering due to scale, hence the above chart reflect the initial build and the expansion that allows for the offering of 1Gbps. The build also provide 10Gbps should a business or residence, or cellular provider extreme bandwidth.

### 3.6 Include a description of the business model and plan to sustain operation of the network. Include estimated take-rate in grant area

The business model is to offer underground fiber-optic to each property as an alternative to AT&T DSL or Hughes Satellite. The subscriber will be provided with the ONT (optical network terminal) which provides a standard Ethernet connection for the more technology-enhanced subscribers who already have a home network that includes Wi-Fi, servers, video surveillance etc

Each subscriber will have the option to purchase a high performance Wi-Fi 6 access point and mesh network extenders to provide world-class Wi-Fi experience. This will also allow Nevada County Fiber to provide high-quality support by understanding the operation of devices that are on the home network, offer advice on ensuring the very best internet performance and the option to configure parental controls, network intrusion detection, and virus prevention, content filtering, and guest network access.

Telephone support will be available during normal business hours, with 24x7 automated system monitoring and alerts for broad issues effecting multiple subscribers. As the number of subscribers grows Nevada County Fiber will expand its support capability by initially partnering and eventually hiring dedicated support staff. A business decision has been made to invest in 'carrier-class' equipment and cloud-based support solutions to reduce the cost of 'truck rolls' and support calls which will greatly improve the customer experience and ensure lower support costs.

#### **4. Project Cost Analysis**

A full project budget must be completed as part of this application. Please use the template supplied in Appendix A and provide a summary in section 4.3 below.

##### **4.1 What are the total eligible project costs?**

Remember to figure in both time and expenses for the required local and state environmental reviews and permits.

Total eligible expenses include the construction of the central office facility to distribute & manage fiber optic broadband, the installation of underground conduits, fiber optic cable, vaults, and optical network termination at each property.

##### **4.2 How much grant money are you seeking from the Nevada County Last-Mile Grant program for this project?**

*\*up to 50% of the total broadband development cost is eligible to be reimbursed the county broadband grant, to a maximum of \$225,000. Points will be awarded to projects that leverage greater local match funding – more than 50% -- from alternative sources.*

The project is requesting \$223,889. Please note that the project is structured to accommodate lesser amounts depending on how the funds are allocated between different applicants. For the project to be viable it needs to connect at least 20 homes which will require a grant match of \$124,209, and can be readily adjusted for up to 32 homes if not other projects are funded, or additional funds are available.

In comparison to similar underground projects, the cost per parcel is approx. 50% less expensive than the recent estimate provided by Race Communications when they assumed the CASF Grant from Bright Fiber in January 2019. The updated cost provided to the CPUC in January 2019 was \$27,477 per parcel.

The project is a similar cost to the Bright Fiber project that was approved by the CPUC in 2015 of \$13,873, however that cost in 1995 did not include the prevailing wage requirement. Construction costs have risen significantly since 2015 which is portrayed in the updated costs described above.

It is notable that in the past five years that the majority of funded CASF projects are entirely aerial, with an average grant value of \$6,682/connection. The majority of CASF grants cover 60% of project costs, when adjusted to the Nevada County Last-Mile Broadband grant rate of 50% the average CASF grant would be \$5,050 which is only 28% less per parcel than Nevada County Fiber is requesting for an underground solution.

Why is Nevada County Fiber, Inc confident that it can build an underground fiber-optic network a significantly lower cost than other similar CASF approved projects?

**Strategy** The traditional approach is to build underground networks along public roads which is costly with reinstating the road surface to County or State requirements. Nevada County Fiber is focused on building on private property, along parcel boundaries or to the rear of properties in forested areas that mostly do not have existing underground utilities. The most efficient construction techniques will be used which may include horizontal direction drilling for sensitive areas and road/driveway crossing, and minimal disturbance plowing in more open forested areas.

**Lower overhead** Equipment maintenance and repairs will be facilitated in house with only occasional need for dealer support. Network management, and customer support is locally based with cloud-based solution to improve automation and response times.

**Locally based** The project is located within a couple of miles of the Nevada County Fiber location which results in lower travel costs, and lower overhead for equipment and material handling & storage. If an onsite truck roll is required to support a subscriber the travel time is minimal.

**Efficiency & Automation** Specialized equipment will be used to prepare the access, install the conduits and fiber optic cable that will minimize the need to staff a traditional crew of 3-5 people or utilize specialized resources located outside of the County.

4.3 Fill out the PROJECT BUDGET TABLE below indicating the sources, uses, and amounts of all funds that will be used for eligible broadband development costs as defined in the guidelines. Use the recommended Use of Funds categories where possible, creating other categories where anticipated expenses do not fall within one of the recommended categories. Attach your full project budget to the grant application using the supplied template. Be sure to include a contingency for project completion.

**Sources and Uses of Broadband Grant Funds and Local Match for the Project**

**PROJECT BUDGET**

Use of Funds (Activity-Category)	Amount	Costs Incurred (Y/N)	Date Incurred	Source of Funds (Local portion/County grant)	Date Funds Committed
Equipment/materials	\$5,000	Y	3/31/2020	Nevada County Fiber, Inc	1/28/2019
Prevailing Rate Labor	\$12,000	Y	3/31/2020	Nevada County Fiber, Inc	1/28/2019
Fees/permits/GPS Survey	\$2,500	Y	3/31/2020	Nevada County Fiber, Inc	1/28/2019
Equipment/materials	\$39,200	Y	6/30/2020	Nevada County Fiber, Inc	1/28/2019
Prevailing Rate Labor	\$58,385	Y	6/30/2020	Nevada County Fiber, Inc	1/28/2019
Fees/permits/GPS Survey	\$4200	Y	6/30/2020	Nevada County Fiber, Inc	1/28/2019
Equipment/materials	\$56,000	Y	9/31/2020	Nevada County Fiber, Inc	1/28/2019
Prevailing Rate Labor	\$83,407	Y	9/31/2020	Nevada County Fiber, Inc	1/28/2019
Fees/permits/GPS Survey	\$6,000	Y	9/31/2020	Nevada County Fiber, Inc	1/28/2019
Equipment/materials	\$9,140	Y	12/31/2020	Nevada County Fiber, Inc	9/31/2020
Prevailing Rate Labor	\$28,000	Y	12/31/2020	Nevada County Fiber, Inc	9/31/2020
Fees/permits/GPS Survey	\$3,000	Y	12/31/2020	Nevada County Fiber, Inc	9/31/2020
Equipment/materials	10,870	Y	3/31/2021	Nevada County Fiber, Inc	12/31/2020
Prevailing Rate Labor	\$14,179	Y	3/31/2021	Nevada County Fiber, Inc	12/31/2020
Fees/permits/GPS Survey	\$1,100	Y	3/31/2021	Nevada County Fiber, Inc	12/31/2020
Equipment/materials	\$43,480	Y	6/30/2021	Nevada County Fiber, Inc	3/31/2021
Prevailing Rate Labor	\$56,717	Y	6/30/2021	Nevada County Fiber, Inc	3/31/2021
Fees/permits/GPS Survey	\$4,400	Y	6/30/2021	Nevada County Fiber, Inc	3/31/2021

**EXPLANATION OF BUDGET TABLE ITEMS:**

- **Use of Funds (Activity-Category)** – Use the recommended categories where possible, creating other categories where anticipated expenses do not fall within one of the recommended categories. You can also add additional rows as necessary
- **Amount** – Total cost of the budget line item



- **Costs Incurred** – Has work on this activity started?
- **Date Incurred** – When was this work done?
- **Source of Funds** – Who is paying for this activity? Please note if it will be included in an invoice for reimbursement from the Nevada County Last-Mile Broadband Grant Program.
- **Date Funds Committed** – When were the funds secured from this source?

**Nevada County Last-Mile Broadband Grant Project Details**

	2020	2021	Total
Total Project Cost	\$320,941	\$ 135,976	\$456,916
Av Cost/parcel	\$14,588	\$ 13,598	\$ 14,279
Requested Grant Amount	\$157,261	\$ 66,628	\$223,889
Number of parcels passed	28	12	40
Connection rate %	79%	83%	80%
Number of parcels connected	22	10	32
Percentage Match	49%	49%	49%
Contingency %	4%	4%	4%

	2020				2020	2021				2021
	Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
Equipment/Materials	\$ 5,000	\$ 39,200	\$ 56,000	\$ 9,140	\$ 109,340	\$ 10,870	\$ 43,480			\$ 54,350
Labor (Prevailing Wage)	\$ 12,000	\$ 58,385	\$ 83,407	\$ 28,000	\$ 181,792	\$ 14,179	\$ 56,717			\$ 70,896
Fees/Permits/GPS Survey	\$ 2,500	\$ 4,200	\$ 6,000	\$ 3,000	\$ 15,700	\$ 1,100	\$ 4,400			\$ 5,500
Contingency (5%)	\$ 780	\$ 4,241	\$ 6,059	\$ 3,029	\$ 14,109	\$ 1,046	\$ 4,184			\$ 5,230
<b>Qtly Expenses</b>	<b>\$ 20,280</b>	<b>\$ 106,026</b>	<b>\$151,465</b>	<b>\$ 43,169</b>	<b>\$ 320,941</b>	<b>\$ 27,195</b>	<b>\$ 108,780</b>			<b>\$ 135,976</b>
<b># Connected parcels</b>	<b>0</b>	<b>7</b>	<b>10</b>	<b>5</b>	<b>22</b>	<b>2</b>	<b>8</b>			<b>10</b>
<b>Grant Reimbursement</b>	<b>\$ 9,937</b>	<b>\$ 51,953</b>	<b>\$ 74,218</b>	<b>\$ 21,153</b>	<b>\$ 157,261</b>	<b>\$ 13,326</b>	<b>\$ 53,302</b>			<b>\$ 66,628</b>

4.4 Attach all written funding commitments from all project funding partners, including public, private, and non-profit or philanthropic sources.

See Appendix C for evidence of matching funds being held by Nevada County Fiber, Inc

4.5 If the grant request was approved for this project, is the remainder of the financing (the local match) in place for building this project? Yes

**NO, the local match funds are not yet in place.** If funds are not secured yet, what is the process to secure the funds and what is the timeline in which they will be obtained?

**YES, all of the local match is in place.** If yes, you must attach evidence that local match funds secured.

See appendix C for evidence of matching funds being held by Nevada County Fiber, Inc

4.6 Are there additional costs related to this project that are not eligible costs that will be incurred as part of the overall project costs for deploying broadband to this area? If yes, what are those costs?

Yes: ETA International Fiber Optic Installer Certification BICSI: 30 ITS CEC \$1,850.

4.7 Is this project part of a larger build for which the applicant is not requesting grant funds? Is there any additional relevant information regarding the investment in the area surrounding the grant project area?

If yes, please explain and/or attach proof of leveraged financing.

This is first phase of a continued expansion to the south and western areas of Banner Mountain as identified on page 10 in the Nevada County Broad as Deer Creek Strategy. Additional funding may be obtained from California Advanced Services Fund (CASF) as an alternative to Nevada County Last-Mile Broadband Grant. The preference is to utilize local Nevada County funding over the long lead time and complex CASF Grant process.

The long term vision for Nevada County Fiber, Inc is to first validate the approach to deploying affordable underground fiber optic, motivate, collaborate and support similar project areas in the County, and eventually transition Nevada County Fiber, Inc to a community owned entity that has the goal of connecting every property in the County at an affordable price to ensure the long term prosperity and public safety for Nevada County.

## **5. Financial and Governance Plan**

5.1 Describe the need for funding from the Nevada County Last-Mile Grant fund and why the project could not proceed without this funding. Refer to your stand-alone financial plan/budget and demonstrate the financial model with and without grant funding. Be as specific as possible.

Nevada County Fiber has determined that the best long term method for high-speed broadband in our community is to use underground fiber optic. Our community is located in a heavily forested area with significant changes in elevation which makes wireless connections very challenging. In addition, we can be at the risk of heavy winter snow and significant risk of wild-land fire which can damage above ground facilities impacting public safety and impact economic resilience as seen in other areas of the state that were impacted by wild-land fire.

It is widely understood that single-mode fiber optic has the highest bandwidth available, currently a single fiber can deliver 40 Gigabits per second for 6+ miles. In addition, fiber optic cable has a very long lifespan. According to Corning, one of the leading manufacturers there are fiber optic cables still in service since the 1980's. When the time comes to replace a fiber optic cable the costs are one of lowest as its relatively simple to remove the cable from the conduit and replace with a new one, no groundworks are required. The only downside to underground fiber optic is the capital cost of installing the underground conduits.

The reason why AT&T, Comcast, Wave have not continued to build out high-speed broadband is the high capital cost when compared the return on investment. Subscribers are often unable or unwilling to make large capital contributions of \$12,000-\$14,000 which is the cost after the providers own subsidy based on their projected subscriber rates. In general providers remain unwilling to invest capital in areas with an ROI that may take 10+ years when there are higher density areas with a lower capital cost per home.

The Nevada County Last-Mile Broadband Grant will allow Nevada County Fiber, Inc to accelerate the construction of the fiber-optic network, deploy operations with carrier-class electronics and make a significant difference to the community. The matching investment from Nevada County Fiber, Inc will likely see a return on investment of 5-6 years provided the network reaches at least 100 subscribers. Projections indicate that as we approach 200 subscribers we will have the choice of expanding deployment to cover more subscribers in this

project area, or another area, or we may have the choice of lowering the monthly cost to subscribers, or increasing bandwidth. [DillonBeachInternet.com](http://DillonBeachInternet.com) is a great example of this where they have been able to provide higher bandwidth at a lower cost after they reached 300 subscribers.

Without the grant funding, the project would not be required to use prevailing wage which will reduce labor costs, but the construction will take significantly longer to complete and the return on investment is projected to be 8-10 years for the 25-35 subscribers addressed by the proposal.

5.2 Provide an organizational chart, applicant's history including experience relevant to the proposed project, and an indication of readiness to build, manage, and operate the proposed broadband project. Include resumes of key officers and management personnel.

Nevada County Fiber, Inc is a newly formed California Corporation. For the initial projects the primary officer will be Andrew Wilkinson supported by a network of advisors and consultants. As the number of subscribers grows the organization will evolve accordingly.

Andrew Wilkinson has a unique combination of skill sets which is an ideal combination for rural fiber-optic broadband. He obtained a degree in Mechanical Engineering in 1984, has designed and built 5 homes with skills in all trades. He has constructed 12KV one-mile long PG&E line extension to bring primary PG&E to his property and neighbors never failing to pass a single PG&E construction inspection. The PG&E inspector was so impressed that he made the comment 'You could probably teach Hansen Bros a few tricks!'

After emigrating from the UK he joined the Hewlett Packard Networking Business in 1996 and worked in various roles in the Ethernet switching and Wi-Fi business for almost a decade. In 2000 he obtained US Patent 6,108,310 which HP used in their Network Management Software. Before taking a corporate-level role across all the HP business units and was involved in mergers and acquisitions, and business & financial planning. Prior leaving HP he was a sales operations function leader for the splitting of the Hewlett Packard Corporation into HP, Inc and Hewlett Packard Enterprise and worked for a short time in Beijing, China supporting the creation of the partnership with prestigious Tsinghua University to create the new H3C delivery solution to the China enterprise market.

Prior to starting Nevada County Fiber, Inc he held the volunteer role of Chief Financial Officer for Spiral Internet and explored several financial and business models to move the \$35M project into construction. During the same period he was also the Vice President of Sales and Marketing for Tallac Networks, a cloud networking startup focused on Software Define Branch Automation and cloud networking.

He has two California Contractor License: A General Engineering and Class B Building and has a large well-equipped workshop and numerous pieces of construction equipment including an excavator, tracked loader, tracked chipper, direction drill and many attachments and will be fully dedicated to Nevada County Fiber, Inc.

In June 2019 he completed a broadband feasibility study for the Tahoe basin that was funded by the Economic Development Agency, and administered by the Tahoe Prosperity Center..

He is an active member of the Citizens Oversight Committee for the Measure B Bond approved for Nevada Union Joint High School District in 2016, and the Vice President and acting Treasurer for Friends of Banner Mountain.

The long term vision is to demonstrate that our rural community can obtain high-speed fiber-optic broadband and develop this into a community-owned model that can continue to grow and deliver broadband to the entire community, and ensure long term economic development, resiliency and public safety during periods of extreme winter or wild -and fire.

## 6. Community & Economic Development Impact

6.1 Describe the economic and community development potential of the project, including how the project will provide opportunities for existing business retention and expansion, new business attraction, increased jobs, and/or other expanded business and community opportunities such as improve public safety, health care delivery, service to economically distressed area, and improved educational access.

*This question is intended to understand how the applicant worked with the local community in identifying areas of greatest need and determining specific community impacts of broadband connectivity. **Narrative here should explain the expected results the project will have on the specific community, not just a general explanation of the positive impact of broadband.***

There is overwhelming need for a significant improvement in local broadband and to demonstrate this I will provide short examples of real stories in my local community, this is a sampling from the more than sixty homeowners who have expressed interest.

Please see [www.NevCoFiber.com](http://www.NevCoFiber.com) for video testimonials from Jeff Peach, retired teacher and active with the Firewise Coalition, and John Paye both of whom are active community members

(a) Marcy: She is looking to purchase a home in our community, but has yet to find a home that has adequate and robust reliability. Her realtor sent her a picture of the sign I posted at the Red Dog Rd mailboxes about my plan to offer fiber optic and she was so motivated to tell her story as she felt it would help with my grant application. She works remotely in healthcare as an Infection Prevention Manager, and her husband is a videographer and their #1 need is fast and robust access.

*Quote: "I have to believe there are plenty of people like us who could positively contribute to the community but are constrained by the lack of internet infrastructure. It seems like being part of the 21<sup>st</sup> century economy requires connectivity....Anyway, if there is any way our experience with being thwarted in moving to Nevada City is helpful to your application, please let me know"*

(b) Diane: Dianne and her husband are both retired, and Dianne has some well-managed health challenges. They have known about my strong desire to improve broadband for our local community. Their concerns are more focused on safety, which has been compounded by the recent PSPS power cuts where they found that their once reliable traditional phone line stopped working. They are finding their AT&T DSL service to be slow and unreliable and concerned that this could impact their ability to stay in the home if the emerging telemedicine solutions are not available to them due to their weak broadband connection

*Quote: We're seniors with some medical issues so it's important to have access to everything. With the recent PSPS we didn't have any service at all even though we have a generator. That's the first time that's happened and it was unnerving. We couldn't get any info regarding*

*fires or emergencies in our area. For the first time our landline didn't work either... We sending positive thoughts that this happens. We will be the first to sign up for it for sure!"*

(c) Jeff: He moved here with his family three years ago from the Bay area to Nevada County to enjoyed an early retirement in the peace and tranquility of the forest just off Red Dog Rd. Unfortunately, he was one of the people that was denied access to AT&T DSL even though the prior owner had service. He was eventually able to obtain wireless service after making a significant capital investment.

(d) Zach: He was born and raised locally, works in elderly care and is a musician in his spare time. He has taken the bold step of creating an impressive sound studio, and the missing ingredient is high-speed broadband that will allow his 21<sup>st</sup> studio to be on the world stage.

(e) Christo: He recently became aware of the project and is a professional network engineer who is willing to offer his help.

*Quote "I am a fellow network engineer....If there is any way I can help with the fiber internet project, feel free to call. I work from home so this project is incredibly important to me"*

(f) Erina: Frustratingly they did not realize that local broadband was so problematic before purchasing their home on Banner. Her husband is a professional musician and has to drive to town to upload and download large files. They are active internet users with several smart home devices but are growingly frustrated with the poor bandwidth and lack of options.

*Quote "We are beyond excited at the prospect of having high-speed internet...I have looked into every other possibility, which right now is only satellite internet, though my understanding from people who have had it, is that it is barely an improvement from DSL. This has been the single most frustrating situation in regards to choosing to live outside of the city limits"*

See Appendix A for more details and community feedback

### **Opportunity to improve Public Safety**

Having studied the details of last year's Paradise Fire my observation is that one of the major factors that contributed to the chaotic evacuation was the ability for the various emergency services to monitor what was happening on the roads in real-time. If they had the ability to monitor realtime and ensure clear communications with the community where available it seems apparent that the evacuation os likely to have been less problematic.

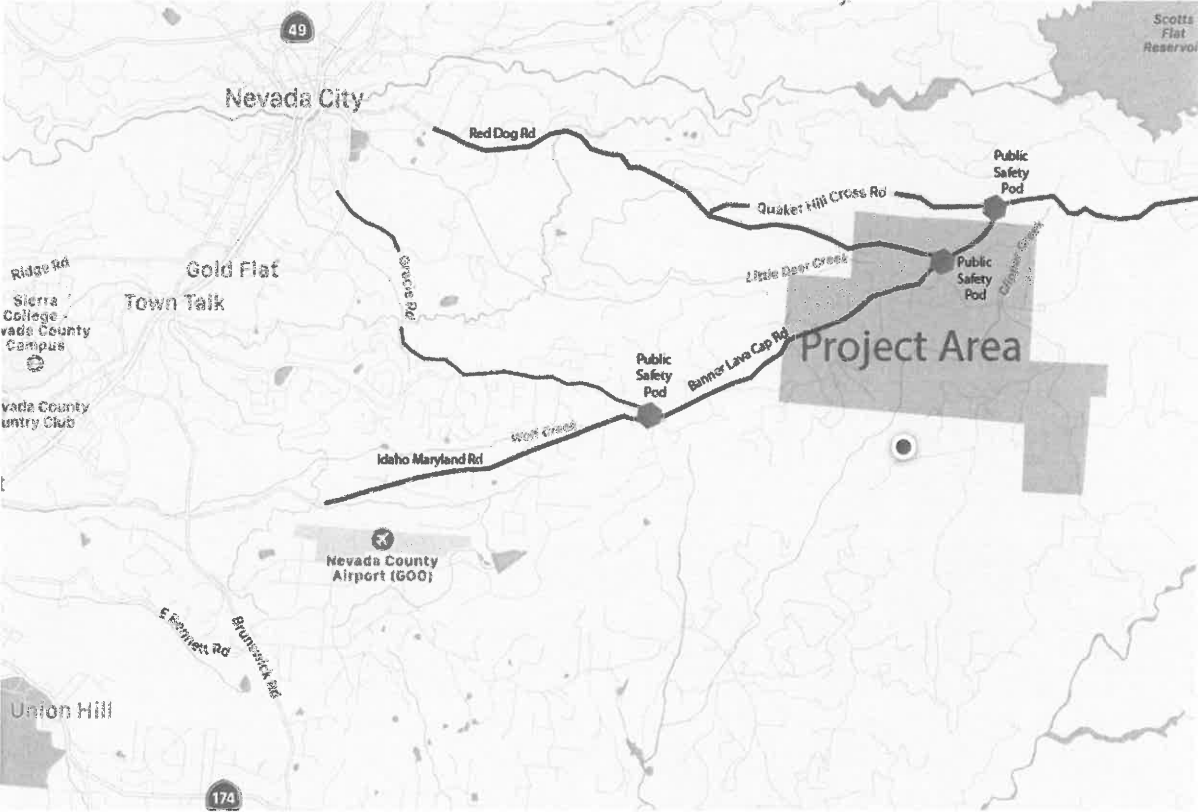
As an additional benefit to the community, I am proposing that consideration is given to the following proposal that can be achieved with the availability of high-speed underground fiber-optic network.

### **Public Safety Pods**

These would be located at major atrial road intersections. They would contain high-resolution video cameras that could be remotely powered on during a wild-fire event to monitor traffic in high resolution. For example the intersection of Quaker Hill Cross Rd and Banner Quaker Hill Rd which is a primary evacuation route from Cascade Shores, a second location would be Banner Lava Cap and Idaho Maryland which is major evacuation route off Banner Mountain & Cascade shores. I anticipate that the capital cost of such a solution would be relatively low with a high value to the community.

The concept could be enhanced with remote powering on a series Code Red Wi-Fi access points along major evacuation routes which would allow community to connect directly to a local network for direct communications with the public which ultimately could provide residents with evacuation routes which can be dynamically adapted according to wire conditions and traffic volume.

Ultimately having a dedicated independent fiber optic loop that covers major evacuation routes which operates independently of the traditional telecommunications companies would position Nevada County as having the best public safety infrastructure available and a model for others to follow.



6.2 Describe any partners or subcontractors associated with the project's deliverables related to deployment and service delivery. Please describe each party's role in the project. Please include copies of any applicable executed contracts or anticipated contractual language and/or insurance requirements.

**AT&T:** The master contract has been signed with AT&T Enterprise Fiber Optic to provide backhaul service to the internet with managed router and security. The lead enterprise sales rep and his manager are aware that Nevada County Fiber, Inc will be using the fiber optic service to provide broadband to the local community many of whom are currently DSL customers. They shared that DillonBeachInternet has been very successful with a similar approach. I have also briefed Alice Perez and Bryant Milesi from AT&T External Affairs. AT&T Engineering has completed a site visit and are currently developing the construction plan, for an assumed spring deployment.

**Nevada County Clerk-Recorder** With many easements to be recorded for parcels that the fiber optic network crosses I will be collaborating with Gregory Diaz to find ways to optimize the submission and recording process to save project costs and the County staff time.

**Ground Penetrating Radar:** Rich Soto will provide advice, consulting and when needed ground scans to identify underground utilities. This will supplement the 811 Dig Alert program that will be used extensively during periods of construction.

**CPA/Accountant:** Scott Robertson of RWS Certified Public Accountants will be the CPA for Nevada County Fiber and provide financial advice and guidance.

**Construction Advice & Consulting:** Stan Eckdahl retired VP of Engineering from Wave Broadband has been providing advice during the planning for the grant application and will continue to support the project during construction and operations.

**Nevada County Contractors Association:** The Executive Director Barbara Bashall has a wealth of resources to help navigate the prevailing wage requirement.

**GIS Assistance** The project planning is based on GIS (Geographic Information Systems) data with assistance being provided by Lisa Lackey who provided parcel data for use within Autocad for planning and data visualization.

**GPS/Survey** Tim Schad Licensed Surveyor #6021 owner Initial Point will provide survey advice and consulting when required and assist as needed with the GPS data from as-built conduits and facilities location. Tim is one of the leading surveyors for major cellphone providers and has surveyed hundreds of locations for new cellphone towers, including locations for 5G expansion

**USA North 811** Nevada County Fiber will become a member of USA North 811 and provide location assistance when required. During construction, USA North 811 will be utilized as required to avoid damage to existing underground utilities

**Networking design & configuration:** Professional services from the equipment manufacturer will be available as required to ensure a robust and reliable network design. The backhaul provider will provide network security management to mitigate potential DDoS attacks and similar network issue that could impact subscribers. The equipment manufacturer has 24x7 support staff available for any unexpected issues.

**Middle Mile** Praxis Associates Michael Ort has developed several important middle mile projects including Digital 395 and are willing to provide advice regarding options and considerations when engaging with middle mile providers. The current project is constrained by only one backhaul provider, but as the subscriber base expands the need to have a second backhaul provider will grow to ensure that there is fail over for moments when the primary backhaul is temporarily not available, or when the need arises for load balancing across multiple networks.

#### **Collaboration with similar local networks**

**(a) Beckville Networks:** Mike McLaughlin who created and runs Beckville Networks is an active collaborator and happy to provide advice and assistance with network design and seek areas of mutual support. For example, Nevada County Fiber can provide assistance with underground construction needed to expand the point to point Beckville Network.

**(b) Dillon Beach Internet:** I was introduced to Brandt Kuykendall who like myself was not satisfied with the availability of high-speed broadband. He also approached AT&T and was able to obtain an enterprise-class connection which he has now expanded to more than 300 subscribers using Mimosa point to point wireless. <https://www.dillonbeachinternet.com/>

**(c) Local wireless service providers:** There are several elevated locations within the project areas that could be used to provide additional/improved wireless foot print to subscribers further to the south. As an additional community benefit, I will happily collaborate the company's such as Smarter Broadband and Exwire to help make bandwidth available.

**(d) Cellular Carriers:** One of the many challenges that cellular carriers have when expanding their cellular coverage is access to robust fiber optic backhaul. I will be approaching organizations like Crown Castle who specialize in identifying locations for major carriers to make them aware that in the project area we will have the capability of providing dedicated backhaul, and local introduction to property owners.

#### **Community Broadband Advocates**

Our community has many broadband advocates. These include people like Andrew Haley who used to live in the Sherwood Forrest community and now is in the Willow Valley area, both of which are in need of improved broadband, he is keen to hear how this project proceeds and is willing to assist in working with the community. Michael Anderson worked for many years helping to be the \$16M CASF Grant approved which is now being constructed by Race Communications, and is very supportive of all activities that can improve broadband, especially community models. Tim Corkins is a local business owner and active with the Nevada County ERC and a strong advocate for the economic development benefits that high-speed broadband enables. John Lorange is an active community member willing to provide support and collaboration to help deliver on the Nevada County Broadband Strategy.





**PROJECT INFORMATION**  
TOTAL PROJECT AREA 2,179 ACRES  
FOREST ZONED TPZ 520 ACRES  
NET EFFECTIVE AREA 1,659 ACRES  
TOTAL NUMBER OF PARCELS 280  
AVERAGE PARCEL SIZE 8.4 ACRES  
ELEVATION RANGE 3200'-3,898'

**REFERENCE CHART**

PROJECT AREA

COMCAST SERVICE AREA

CONTACT WITH PROPERTY OWNER

Project Name and Address  
**NEVADA COUNTY FIBER**  
17347 DUSTY DRIVE  
NEVADA CITY, CA 95959  
(530) 263 5014  
www.NevCoFiber.com

Project Name and Address  
**BANNER MOUNTAIN SOUTH**  
NEVADA COUNTY, CA

Project  
Date DEC 3, 2019  
Scale 1:9000

