NORTHEASTERN
BROADBAND DEMAND AGGREGATION
CONNECT

FINAL REPORT

for

California Emerging Technology Fund
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by

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EXECUTIVE SUMMARY

A. Introduction

Center for Economic Development at California State University, Chico (CSUC) led a regional project to promote the expanded availability of broadband (high-speed) Internet service throughout seven (7) of northern California's counties: Butte, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Tehama. CSUC was tasked with three objectives:

- Survey the project area to determine the aggregated demand for broadband service;
- Outreach to Internet Service Providers (ISPs) and Wireless Internet Service Providers (WISPs) to determine the current and projected availability of broadband service and develop a preferred infrastructure plan for the project area; and
- Determine the level of jurisdictional policy and procedural support for the expansion of broadband services across the region.

B. Household Demand Survey Results

1. Demographics

Table 1. Total Households Surveyed by County

County	Total Number of Households	Surveys Completed	Percent of Total Surveys
Butte	96,215	768	41.8
Lassen	13,130	49	2.7
Modoc	5,189	30	1.6
Plumas	15,594	65	3.5
Shasta	77,609	594	32.4
Siskiyou	24,126	157	8.6
Tehama	27,606	173	9.4
Totals	**259,469**	**1836**	**100.0**

Aggregated household survey respondents were:

- Female (50.5%);
- White (81.6%);
- Had at least a four year degree (30.5%);
- Had an annual household income of at least $65,000.00, (30.2%);
- Had a landline telephone (99.0%), a computer (72.7%), a cell phone (68.4%), a personal satellite television service (42.5%), and/or cable television (36.2%);
- Stated Internet access as being important or extremely important (58.4%); and
- Had some type of home Internet access (68.4%).

2. Demand & Pricing

Table 2. Internet Services by Type as Subscribed to by Survey Respondents.

The majority of household respondents had DSL Broadband as the primary source of Internet Service to their homes (55.0%).

Type of Internet Service	Number of Respondents	Percent
DSL Broadband	682	55.0
Cable TV modem	178	14.4
Wireless broadband (antenna)	164	13.2
Telephone dial-up	149	12.0
Satellite service (any speed)	47	3.8
Accelerated dial-up	18	1.5
ISDN	1	0.1
Totals	**787**	**99.9**

Table 3. Reported Availability of Broadband Service for Households.

Of those without broadband service, more than one-third (40.5%) said it was not available where they live; also, the top two reasons cited for not subscribing to Internet service are:

a) do not need Internet access at home; and
b) do not own a computer.

Availability of broadband service	Number of Respondents	Percent
No broadband service	731	40.5%
Have broadband via DSL or Satellite	1072	59.5%
Total	**1803**	**100.0%**

Table 4. Monthly Cost of Household Internet Service.

More than one-third (34.0%) paid between $20.00 - $39.99 per month for Internet service to their home, and 30.4% said it was too expensive.

Amount per month	Number of Respondents	Percent
< $20.00	283	26.3%
$20.00 - $39.99	364	34.0%
$40.00 - $59.99	214	20.0%
$60.00 or more	212	19.7%
Totals	**1072**	**100.0%**

C. Business Demand Survey Results

1. Demographics

Table 5. Total Small Businesses Surveyed by County.

County	Total Number of Businesses	Surveys Completed	Percent of Total Surveys
Butte	10,696	294	36.8
Lassen	1,136	30	3.8
Modoc	506	20	2.5
Plumas	1,287	47	5.9
Shasta	10,170	249	31.1
Siskiyou	3,134	88	11.0
Tehama	2,563	72	9.0
Totals	**29,492**	**800**	**100.0**

Business survey respondents were:

- Female (52.2%);
- White (83.8%);
- Had at least a four year degree (33.3%);
- Had an annual household income distribution of at least $65,000.00 (35.2%);
- Over three-fourths of businesses were located within one mile of a city or town (85.1%)
- Retail industry was identified as the category with the highest percentage of respondents (16.2%), followed by construction (8.0%), and finance/insurance/real estate (7.9%);
- Had a landline telephone (97.6%), a personal computer (84.1%), Internet (75.4%), cell phone (59.1%), Wireless Broadband Internet (23.9%);
- Stated Internet access as being important or extremely important (76.2%); and
- Had some kind of home Internet access (73.4%), and
- The majority of business respondents did not know their Internet speed (66.0%).

2. Demand & Pricing

A majority of all small businesses have broadband via DSL Broadband (61.3%).

Table 6. Type and Percentages of Service, per Respondent.

Type of Service	Number of Respondents	Percent of all Respondents	Percent of respondents with service
DSL Broadband	393	49.1	61.3
Wireless WiFi broadband (antenna)	74	9.3	11.5
Cable TV modem	56	7.0	8.7
Satellite service (any speed)	33	4.1	5.1
T-1	31	3.9	4.8
DS-3 (fiberoptic)	6	0.8	0.9
Wireless Cell phone Broadband	5	0.6	0.8
Accelerated dial-up	4	0.5	0.6
ISDN	2	0.3	0.3
Gigabit Ethernet	1	0.1	0.2
Total	**641**	**80.1**	**100.0**

Table 7. Monthly Cost of Small Business Internet Service.

Amount per month	Number	Percentage
Less than $20.00	146	26.2
$20.00 - $39.99	144	25.9
$40.00 - $59.99	126	22.6
$60.00 - $99.99	85	15.2
>$100.00	56	10.1
Totals	**557**	**100.0**

Table 8. Reported Availability of Broadband Service for Businesses.

Of those without broadband service, slightly more than two-thirds of the small business respondents said they do not need the Internet for their business (68.7%), and 40.3% said they do not own a computer.

Availability of broadband service	Number of Respondents	Percent
No broadband service	731	40.5%
Have broadband via DSL or Satellite	1072	59.5%
Total	**1803**	**100.0%**

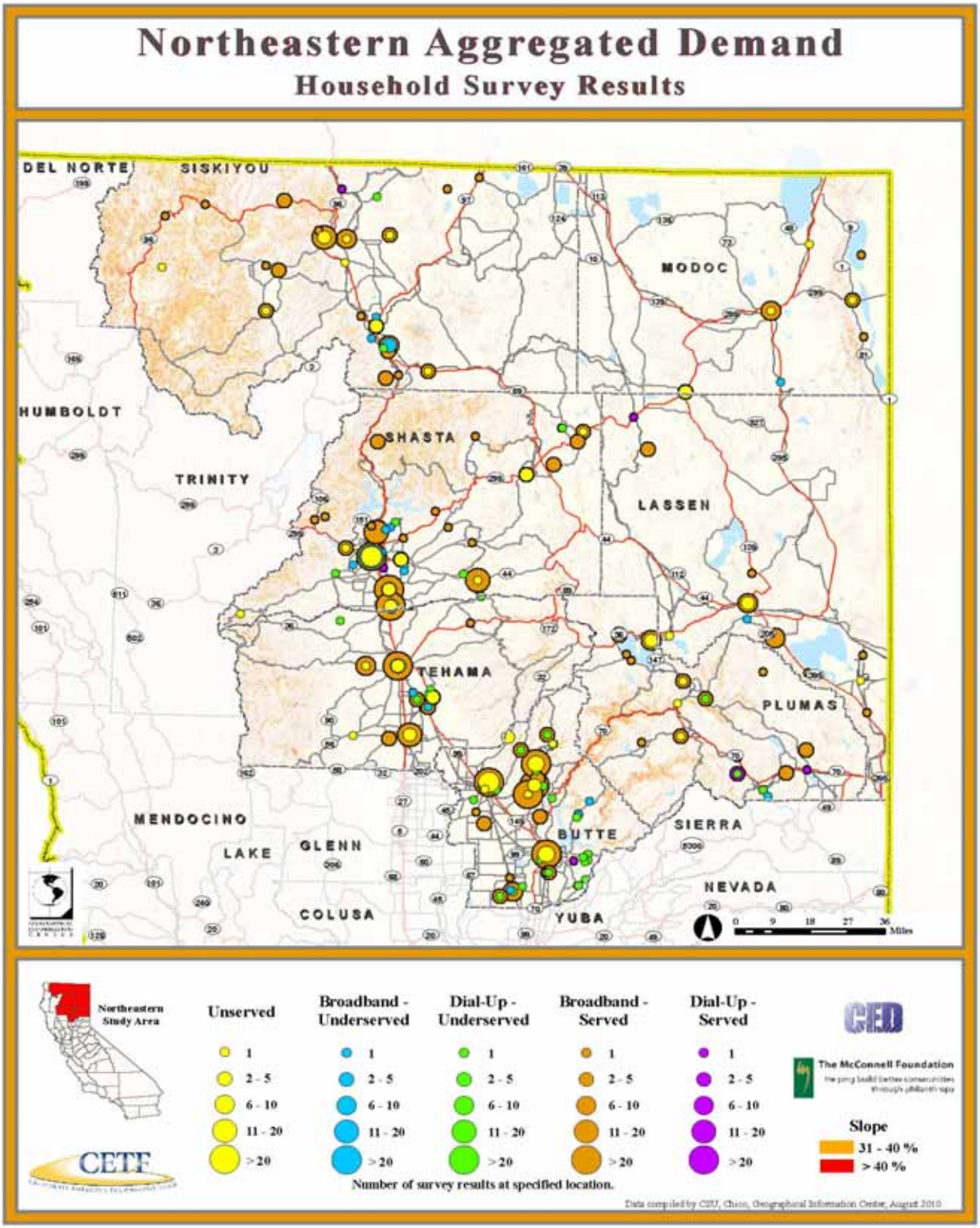
D. Overall Survey Implications

The overall implications of the survey results are significant and, despite a scattered population distribution, resemble those of the Gold Country Connect Project findings.

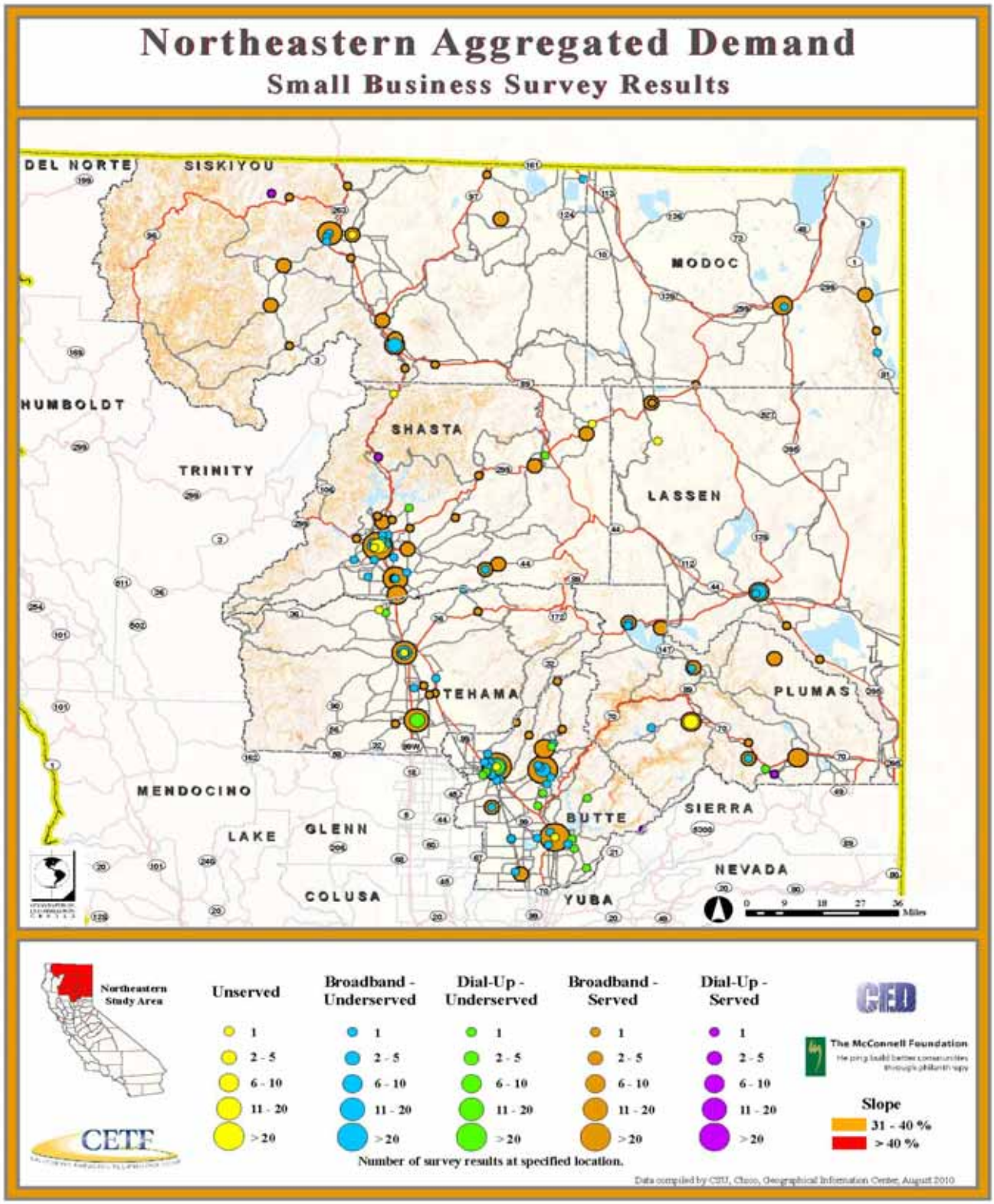
- 59.5% of households and 83.2% of businesses do have Internet access; conversely,
- 40.5% of households and 16.8% of businesses do not have Internet access;
- 69.4% of households and 82% of businesses said Internet access is either extremely important, important or somewhat important;
- 88.7% of households and 84.9% of businesses said they would not be willing to pay more for a faster Internet connection;
- However, 95+% said the Internet is not too expensive;
- Calculated as a percentage of the total population aggregated over the entire project area, there are 237,790 households and 5,225 businesses in seven of California's northeastern counties that:
    - do not have broadband and want it; or
    - have it, and are unsatisfied with their current service.

The following two maps portray the demand for household and business broadband and dial-up Internet, identified as **served**, **underserved** and **unserved**.

Map 1. Northeastern Aggregated Demand Household Survey Results



Map 2. Northeastern Aggregated Demand Small Business Survey Results



E. On-line Mapping Application

Concurrent with the conduct of the Business and Household Survey and the representation of that information on static maps, the CSUC Geographical Information Center (GIC) developed an on-line web-based application that allows both users and developers of broadband services to determine both the demand for services as well as the current supply of broadband.

Throughout the period of this effort, this on-line application has undergone a number of enhancements and changes to make the tool more easily usable and understood by both those needing broadband as well as those providing broadband infrastructure.

The current tool can be found at:
http://www.northeasternbroadband.org.

F. Infrastructure & Alternative Scenarios

Throughout the course of this study, there were several efforts to capture the extent of the existing broadband infrastructure.

The beginning of the project started with the initial statewide broadband maps, named the “Baker Maps” from the name of the company that compiled the data. These initial maps were prepared based on wireline service provider information on subscriber addresses that were geo-coded by speed tier. The coverage areas were then aggregated to the census tract level for public display. Map 3. shows the Baker Map display for the Northeastern California Connect project area at project inception.

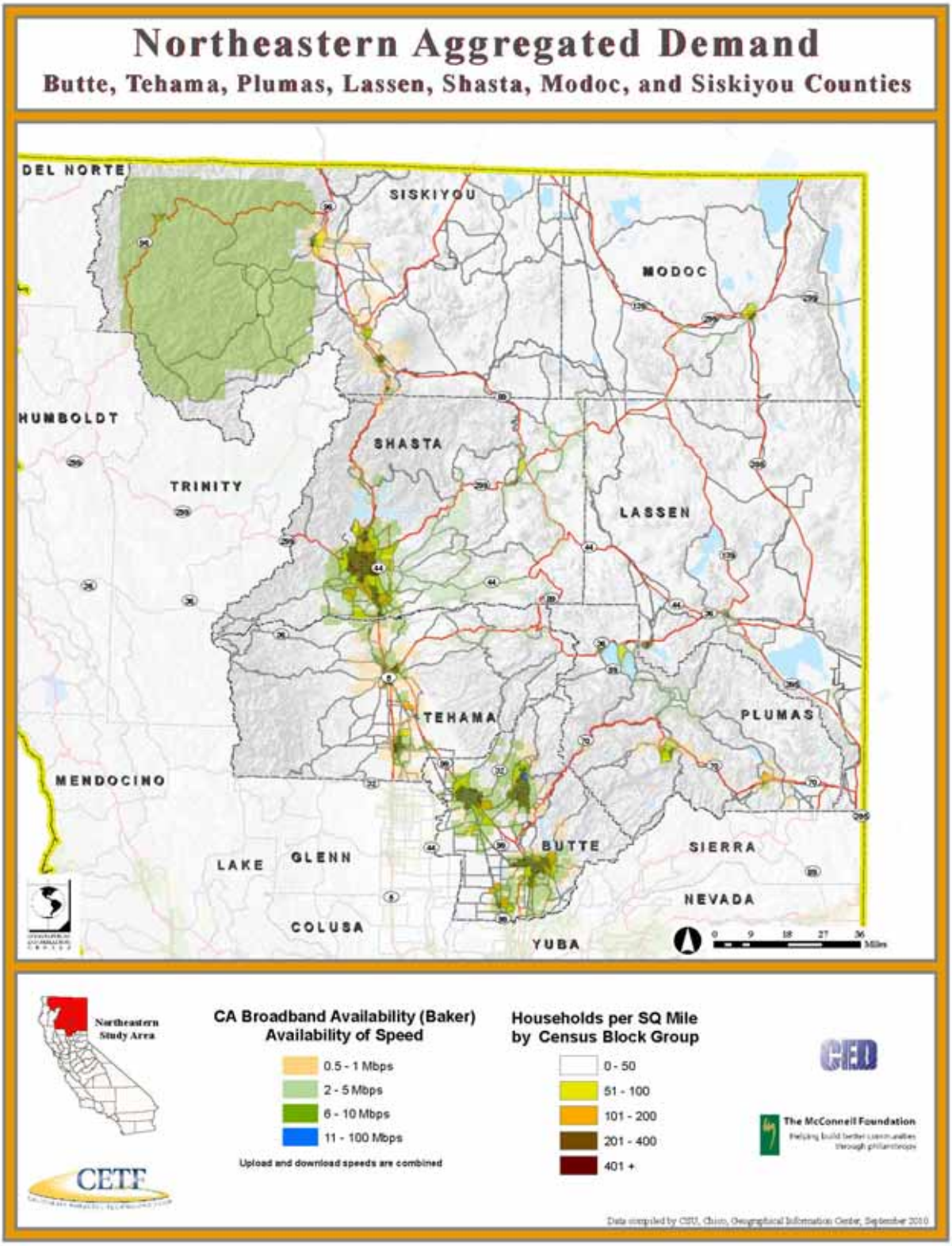
Mid-way through the NCC project, the ARRA Broadband Infrastructure funding opportunity arose. The California Public Utilities Commission (CPUC) allowed any Internet Service Provider (ISP), wireless or wire line, submitting an ARRA application to request a subsidy of up to 10% of the project costs from the California Advanced Services Fund (CASF) on an award contingency basis; i.e., no federal award, no CASF funding. The restriction to applying for this funding was that it could only be made for an area where there was no previous broadband coverage, either wireline or wireless. In an effort to identify the extent of coverage, now to include wireless services, a data call went out to wireless ISPs to provide generalized coverage maps of their service areas. By submitting coverage areas, wireless ISPs could, in effect, “protect” their coverage areas from being encroached upon by a new provider that could be using a combination of federal (ARRA) and state (CASF) funding to build out infrastructure. Map 4 identifies the aggregate coverage areas submitted under this one-time effort.

Finally, the National Telecommunications and Information Agency (NTIA) released funding in early 2010 to states initiating the development of a National Broadband Map.

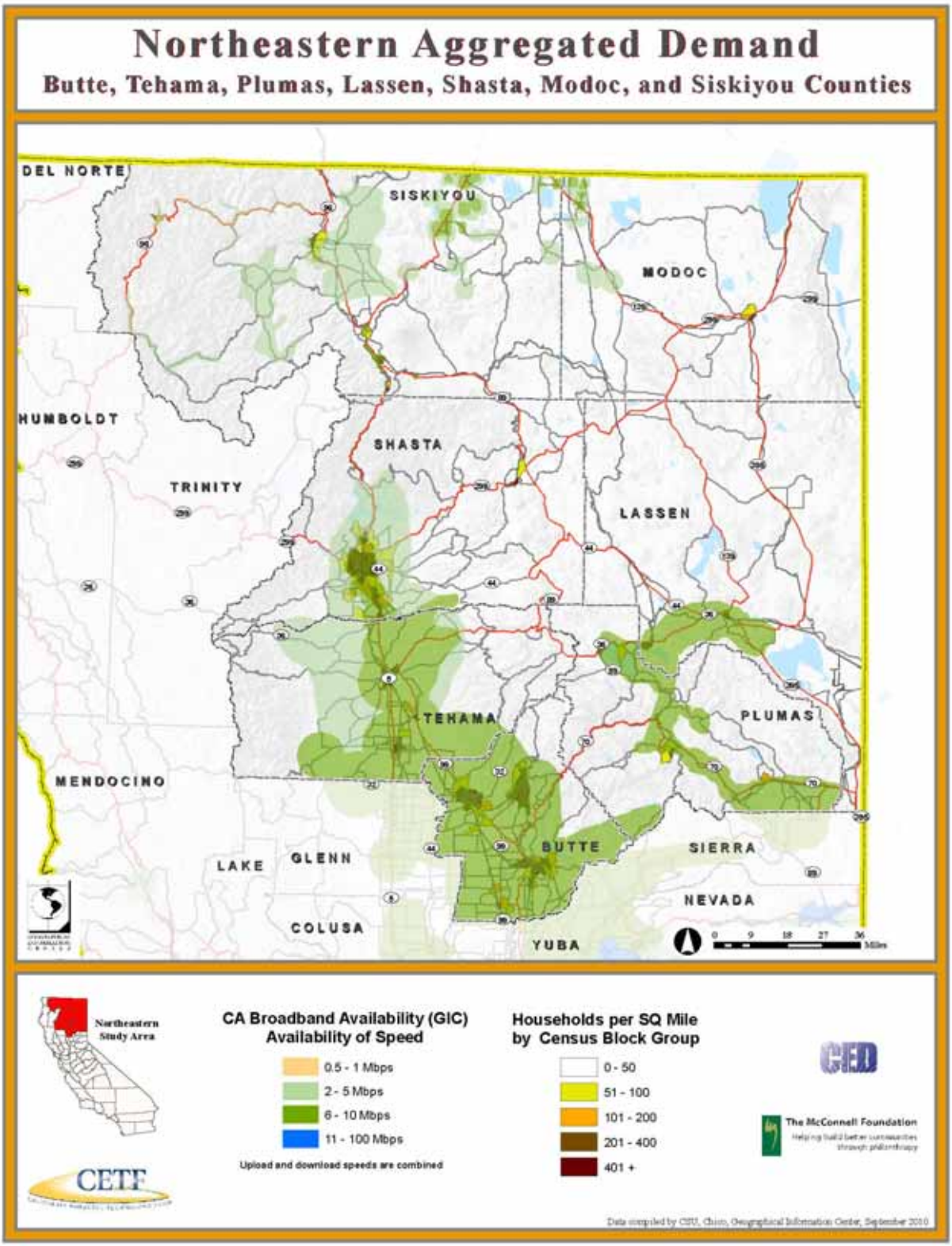
The initial data call to all providers went out from the California Public Utilities Commission to submit the necessary data by which California could develop its next generation statewide broadband map. Map 5 shows the results of that initial data call and represents the latest information on the broadband infrastructure coverage available as of the time of this report.

Each of these maps cover the same geographic extent and also show the major population centers as defined by Households per Square Mile. There are some interesting differences in each of these coverage maps, most notably between Maps 4 and 5. This is because Map 4. represents an extent of wireless coverage that was prepared and delivered using an assumed range based upon the location of wireless transmitters. Map 5. represents data identified to a particular location and geocoded to a specific street address where applicable.

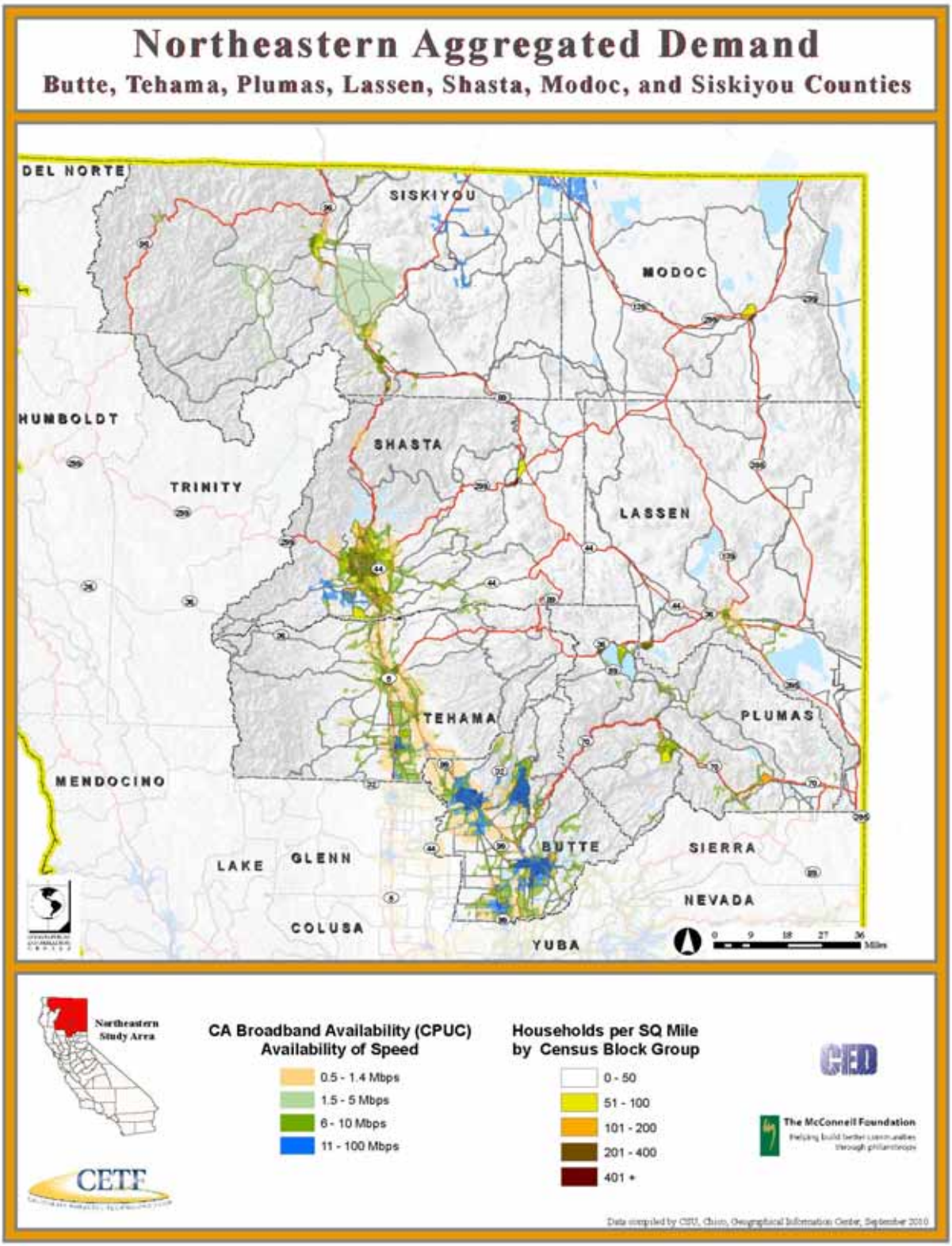
Map 3. Initial Baker Broadband Infrastructure Map for NCC Project Area



Map 4. Infrastructure Coverage Resulting from CASF Data Call



Map 5. NCC Project Area Infrastructure Coverage Map (Summer 2010)



G. ARRA Project Applications

In an effort to build out infrastructure to provide broadband coverage throughout the NCC region, a number of applications were submitted by a variety of service providers. The proposed projects covered both middle mile and last mile solutions. To date, none of these projects has been funded, but they do represent the market's reaction to the need for broadband. These applications represent industry's best solutions to making broadband available to residents and businesses throughout the NCC region. The following summarizes the projects submitted to either the Department of Commerce or the Department of Agriculture for ARRA funded broadband infrastructure development:

1. ARRA Proposed Projects - Round 1, August 2009.

The NorCal Broadband Access Consortium developed ten separate applications prior to submission to ARRA for Round 1 funding, and only eight were submitted. Although nine of these projects were included in the Governor's List of Recommended Projects (Appendix --), none were awarded Round 1.

- ✓ Mediabon (Broadband Associates/CENIC), 3 separate Middle Mile Applications;
- ✓ Siskiyou Broadband Consortium (Siskiyou County EDC, Ericsson, Root Automation, Snowcrest, Western Blue); 3 separate applications, one each for Middle Mile, Last Mile and Public Computing Centers;
- ✓ Valley Internet, PNC.

2. ARRA Proposed Projects - Round 2, March 2010

Seven independent applications were submitted, and *to date* four have been awarded.

- ✓ Cal-Ore Telecommunications, Central Siskiyou County; ***Awarded August 2010***
- ✓ Central Valley Independent Network (CENIC), 18 Central Valley Counties; ***Awarded August 2010***
- ✓ Exwire, Eastern Nevada County;
- ✓ Plumas Sierra Telecommunications, Lassen, Plumas and Sierra Counties; ***Awarded August 2010***
- ✓ Siskiyou County Economic Development Council, Siskiyou County;
- ✓ SmarterBroadband, Western Nevada County; ***Awarded August 2010***
- ✓ Valley Internet/Personal Network Computing, Lake, Napa, Solano Counties, (Re-application).

H. Alternative Scenarios

In addition to the projects submitted under ARRA, the area that was not specifically addressed with a market-based solution during the period of the study was Modoc County. Looking at the CPUC map (as well as the GIC map) this area stands out as the one neglected opportunity where there are a significant number of potential subscribers (households).

Interestingly, it has come to our attention recently (late summer 2010) that Frontier Communications has completed installing fiber along the 299 E corridor to supply broadband coverage to Shasta, Lassen and Modoc counties. Beginning in Redding, an underground conduit of dark fiber connects above ground just outside Redding to new fiber optic cable attached to existing utility poles, continuing along Rt. 299 Eastbound through Burney, Alturas and Cedarville, to the state line at California/Nevada border.

I. Community Meetings

1. Fact Finding Meetings. CSUC conducted a series of Fact Finding meetings to elicit input and support for the project from January to May 2009 throughout the 12-county project area. The Fact Finding meetings included city and county officials, as well as business owners and residents, plus representatives from both regional and local Internet service providers (ISPs) and wireless Internet service providers (WISPs). The purpose of the fact finding meetings was to begin identifying how many businesses and residents wanted more or better access to high speed Internet service (demand), locate where service existed (supply), and where service was either inadequate or unavailable (opportunity). Comments were solicited from participants for the development and use of both household and business random telephone interview surveys. Participants suggested including questions seeking different types of Internet services used, how often, when, for what purposes, how much per month, at what speeds, etc. Attendees from all the Fact Finding Meetings appreciated the broadband demand aggregation efforts being undertaken.

2. Sustainable Adoption Strategy Meetings. In response to CETF's request for CSUC to facilitate a Northeast Broadband regional consortium application to ARRA stimulus funds, CSUC invited over 200 participants to attend a regional community workshop to identify sustainable broadband adoption strategies for the NCC project area. This meeting was held on August 4th, 2009, and input was gathered from county stakeholders regarding methods and processes to promote sustainable broadband adoption and further close the digital divide. Workshop attendees identified five (5) major themes where broadband is most needed:

    - Distance/E-learning
    - Library E-centers/Public Computing Centers
    - Public Access/Public Safety
    - Partnerships
    - Tele-health, Telemedicine

J. Public Policy and Procedures

As a result of community meetings, individual ISP meetings, ARRA consortium application meetings and group broadband adoption meetings conducted through the

course of this effort, the following emerged as the major public policy issues and procedural bottlenecks for expanding broadband services into the region:

1. CEQA Standards. Anecdotally, several Internet Service Providers complained of the need to comply with California's Environmental Quality Act study and reporting requirements. The cost to both develop and defend a detailed CEQA report for the expansion of broadband infrastructure was cited as the single greatest impediment (from a policy/legal standpoint) to the development of service. This requirement was portrayed as an onerous cost that had to be factored into an ISP's Return on Investment calculation. It was suggested that "if anything could be done", making CEQA compliance easier or more streamlined would go a long way towards helping broadband services expand through the construction of additional infrastructure.
2. Permitting. Close in the number of complaints to the issues raised by CEQA, the service providers also identified county and city permitting issues as a major inhibitor to broadband expansion. Again, anecdotal evidence would suggest that a number of service providers had run into onerous planning and permitting costs as impacting the ability to expand coverage areas. Some counties appear to be offering a fast tracking of permitting applications but at exorbitantly higher costs, suggesting that these counties are looking at permitting as a revenue generation activity instead of a public safety activity.
3. Use of Federal Towers and Lands for Wireless. Finally, given the large amount of federal lands that are included within the Northeastern Broadband Demand Aggregation project area, not allowing wireless transmission antennae to be mounted on forest service (or other Federal) towers, or not allowing providers to install antennae on towers erected on federal lands were also cited as major inhibitors to getting wireless service out to more remote locations.

K. American Reinvestment and Recovery Act (ARRA)

On February 19, 2009, Congress passed the American Recovery and Reinvestment Act (ARRA) allocating $778 billion dollars in economic stimulus funds, of which $7.2 billion dollars was dedicated for broadband infrastructure deployment, public computing centers, and sustainable broadband adoption programs. The ARRA broadband funds for infrastructure were awarded to qualified ISPs and WISPs whose projects met a minimum of three main criteria: a) provision of at least 20% match funds; b) completion of the project within three (3) years; and c) meeting the definitions of "rural" and/or "remote"; unserved and/or underserved. It was strongly recommended that regions submit "shovel ready" projects to meet the requirements of the Notice of Funds Availability (NoFA; available early June 2009, officially published on July 9, 2009 for inclusion in the Federal Registry).

1. ARRA (Round 1)

Beginning in June 2009, and at CETF's request, CSUC facilitated regional discussions for interested ISPs and WISPs to develop a regional consortium to submit applications to either, or both, the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) or the U.S. Department of Agriculture's Rural Utility Services (RUS) for ARRA stimulus funds. CSUC contacted over 200 local and regional ISPs and WISPs, and conducted twelve (12) round-table discussions and planning meetings over a ten (10) week period, attended by thirty-two (32) ISPs and WISPs. Initially, four (4) providers shared "shovel ready projects," while most others had not heard of the ARRA Broadband Stimulus program.

What began as suspicious interest among the service providers evolved into mutually effective supportive problem solving, and of the initial thirty-two (32) ISPs and WISPs, six (6) providers ultimately collaborated on a consortium-based proposal.

However, during the waning hours of application preparation and the approaching August 14th, 2009 deadline, the parties realized that each had different needs and solutions for the region. Ultimately, seven (7) separate individual applications were submitted, but all applicants cross-referenced their membership in the regional *NorCal Broadband Access Consortium*. CSUC provided letters of support to each applicant supporting their respective technologies, local solutions, and unique contribution to the overall Consortium *(see copies of letters attached in Appendix XX).*

While all seven *NorCal Access Broadband Consortium* member applications were included in Governor's Schwarzenegger's Short List of Recommended Applications for ARRA Round 1(see Appendix X) Awards, none actually received a Notice of Award from either NTIA or RUS.

2. Plumas Sierra Telecomm

However, a group of individuals from the education, private and utility service sectors within Plumas, Lassen and Sierra counties asked CSUC to facilitate a series of community-based, roundtable meetings exploring the possibility of creating a broadband cooperative. Four (4) meetings were held during the winter months of November 2009 through January 2010. The incumbent rural electric cooperative's telecommunications subsidiary, Plumas Sierra Telecommunications (PST), achieved unanimous support from not only the original group's members, but also the surrounding communities for the formation of a broadband cooperative with which to pursue ARRA Round 2 funding.

3. ARRA (Round 2)

On January 22, 2010, NTIA and RUS formally announced the second round of funding opportunities for three different categories of applications: 1) Comprehensive Community Infrastructure; 2) Public Computing Centers; and 3) Sustainable Broadband Adoption programs. While many qualifying criteria from ARRA Round 1 were kept, modified and new qualifying criteria were added in ARRA Round 2 resulting in a different collection of applications. Most notable of the different qualifying criteria were: a) eligible entities now included everyone, not limited to a select group of suggested entities; and b) challengers bore the onus of proof when contesting an applicant's proposed project area.

CSUC again launched efforts to build a region-wide consortium to pursue broadband stimulus funds, and organized two region wide meetings. The first, held one week later on February 5, 2010, was attended by sixteen (16) individuals (invitations were sent to more than seventy-five entities, including ISPs and WISPs who had participated in ARRA Round 1 consortium meetings, as well as additional individuals identified between ARRA Round 1 and Round 2; over two dozen responded initially). By meeting's end, none were willing to join a new consortium, citing extremely onerous reporting requirements required by the government if an application is selected for award and a basic lack of staff and resources to actually submit a completed application. Lacking interest on the part of the service providers, a second meeting, scheduled for the following week, was cancelled.

4. ARRA Results

As of this writing (August, 2010), three (3) of the *NorCal Access Broadband Consortium* applications have received Notices of Award: CENIC/CVIN[1] ($46.6 million), Plumas Sierra Telecommunications ($13.8million), and SmarterBroadband ($4.2 million). Final announcements for Notices of Awards are anticipated by the end of September, 2010.

5. Lessons Learned

The process of engaging with the various Internet Service Providers at a detailed level as part of the ARRA Broadband Infrastructure Grant application process resulted in the following observations, conclusions, and lessons learned:

[1] CENIC submitted an application to ARRA Round 1, partnering with Broadband Assoc., whose operating name "Mediabon" was the lead applicant. This application was not funded. However, CENIC then partnered with Central Valley Independent Network (CVIN) for ARRA Round 2 and since has received a Notice of Award for both a middle mile and a last mile infrastructure application.

a) Actual coverage areas as well as *Advertised* speeds for Internet access vs. actually *available* Internet access speeds proved a major hurdle for all parties involved. The providers acknowledged that they can install a tower and transmit a signal for a 3-mile signal radius with a clear line-of-sight, and they will advertise that they provide service for that area. However, the "signal" cannot bend around corners or follow the contours of the earth. The peaks and valleys of the surrounding terrain can block or degrade the signal, resulting in various pockets within this 3-mile signal radius remaining either unserved or under served, while other pockets within that same 3-mile radius enjoy clear signal reception.

b) While the ARRA Round 1 application qualifications encouraged partnerships, such partnerships were in fact required for ARRA Round 2, eliminating single provider applications. Unfortunately, the extremely tight time frame for applications made it difficult for the service providers to connect and negotiate mutually acceptable partnerships.

c) During ARRA Round 1 it became clear that despite an enormous effort on the part of the Governor's Broadband Task Force (January 2008) to identify and streamline efforts to deploy improved or increased broadband access throughout the state of California, only licensed telecommunications companies (ILECs and CLECs) qualified for CASF subsidy funding. The California Public Utility Commission (CPUC), however, temporarily allowed non-licensed service providers to apply for CASF matching funds, for which all of the *NorCal Broadband Access Consortium* member applications were approved, contingent upon ARRA award approvals. Efforts are currently underway to permanently allow this expanded use of funds and CSUC heartily endorses these efforts.

d) Applicants who ultimately submitted proposals for infrastructure projects to ARRA Rounds 1 and 2 represent the best business-case scenarios for increased and/or expanded broadband services. However, none of these business-cases could be possible without benefit of additional, external funding being made available via loan, grant or a combination of the two. Both the NTIA and RUS Notice of Funds Availability announcements referred to this as the "but for" clause: "but for additional funding supplied by the ARRA Broadband Stimulus Programs, this project would not be possible" (NoFA, July 2009, January 2010). In other words, none of the proposed projects submitted under the ARRA Broadband Infrastructure program could be cost justified as stand-alone private initiatives.

e) Despite all parties best efforts, attempting to identify a preferred scenario for infrastructure deployment throughout the NCC project area proved highly naïve. While some ISPs and WISPs were at least willing to discuss issues surrounding access to better broadband services, most did not partake citing extremely sensitive proprietary data, and refused to release any service coverage information or customer subscribership information. Additionally, all the ISPs and WISPs are at the mercy of market conditions, and therefore depend highly on previously established vendor relationships for cost effective acquisition of equipment, none daring to

consider pooling resources. Furthermore, the variance in network solutions and topological disparities---low valleys, rugged terrain, dense forestation, high desert, to name but a few---prevented formulation of one single, or "cookie cutter", method or formula by and through which an ISP or WISP could design and reasonably cost a network solution for increased access to broadband services.

L. Conclusions and Recommendations

1. Conclusions:

a) As shown in the results of the broadband demand aggregation studies, approximately 40.5% of households and 16.8% of businesses throughout the northeastern counties currently do not have access to high speed Internet services. Factoring a conservative 20% "take" rate, this translates economically to potential annual revenue of $35 million. The difficulty in fully achieving this lies in the fact that the potential is aggregated across all seven counties, with a disparate population spread out across a large geographic area containing challenging terrain; there is no one single pocket of population that justifies the private business investment.

b) However, despite these challenges, there are opportunities for local civic and government leadership to develop local public-private partnerships. Across the nation local communities have created their own utility service organization offering Internet service at speeds faster and more competitively priced than the existing ISPs.[2]

c) Further, at a price point of $30-$40 per month for basic service, there is *currently* no compelling reason for a household or a business to sign up for high speed Internet (broadband) service. However, once a majority of business and communications transactions are conducted via the Internet, households and rural communities will "feel" left out unless they have connectivity with the rest of the country. At that point, the lack of connection will become the compelling need for the acquisition of broadband services. As CSUC's two sustainable adoption meetings discovered the major applications for broadband are:
   - Distance Education
   - Libraries and E-Learning Centers for those who cannot afford high speed Internet access
   - Public Access to Government Services and Public Safety Access
   - Public and Private Partnership Opportunities
   - Tele-health and Tele-medicine Applications

2. Recommendations:

[2] *Broadband News*, January and April 2010.

a. Redirect focus of future investments to build infrastructure. It is likely that additional broadband demand aggregation studies conducted in other counties throughout the state will net similar results. Redwood Coast Connect, Gold Country Connect, Central Sierra Connect, and Northeastern & Upstate California Connect projects have reported where there is demand for broadband, as well as where there is supply, and now efforts should be continued to support activities to make it happen.

b. Leverage the information produced thus far to galvanize people in organizing community rallies, events, workshops and forums for better broadband.

c. Compare the results of all the broadband demand aggregation study areas for a more comprehensive view of California's broadband demand aggregation. This picture can be used as a baseline to compare the future demand for and supply of broadband services.

d. Local, regional, government entities need to be more directly and proactively involved in attracting ISPs and WISPs to rural, remote regions, and can do so by:

   - Facilitating deployment of better network services within each county;
   - Reducing or removing the impediments to permitting and design review, especially for wireless projects where the required infrastructure footprint is significantly smaller than a wireline infrastructure project;
   - Think pro-business (not necessarily industry), and change external perceptions towards rural counties to enable the attraction of companies and organizations looking to establish a customer base outside the urban areas;
   - Stop being the regulators of land use, rather become the leaders in promoting better connectivity, e.g. wired county buildings, such as the Lake County Courthouse.
   - Being a model broadband user, e.g., encouraging county residents and businesses to seek and use county services on-line, reducing overall carbon footprints;
   - Offer tax incentives to companies who promote telecommuting.

e. GIC's website, www.northeasternbroadband.com, needs to be supported and maintained as a resource for use by users to identify potential service providers and by service providers to identify potential consumers.

f. Sustainable broadband adoption efforts should be focused on the percentage of the market/population that wants broadband services, and is willing to pay for it, and not be deterred by those who see no need for the Internet or who do not own a computer.

THE NORTHEASTERN CALIFORNIA CONNECT BROADBAND DEMAND AGGREGATION PROJECT

The Center for Economic Development (CED), housed within the California State University, Chico Research Foundation (CSUC), under contract from the California Emerging Technology Fund (CETF), led the Northeastern California Connect (NCC) Broadband Demand Aggregation study. This project included the following seven (7) counties: Butte, Lassen, Modoc, Plumas, Shasta, Siskiyou and Tehama. The McConnell Foundation, Redding, CA provided a 1:1 funding match to CETF for the NCC project.

A. Contract Requirements

CED's Scope of Work (SOW) included three tasks:

- Survey the project area to determine the aggregated demand for broadband service;
- Outreach to Internet Service Providers (ISPs) to determine the current and projected availability of broadband service and develop a preferred infrastructure plan for the project area; and
- Determine the level of jurisdictional policy and procedural support for the expansion of broadband services across the region.

B. Project Partners

CED partnered with two CSUC Research Foundation affiliate organizations to deliver random telephone interview surveys and develop web-based maps to show aggregated demand for broadband and broadband coverage in the region. The Program for Applied Research and Evaluation (PARE) designed and conducted random telephone surveys to identify the demand for high-speed Internet service(s). Results from the surveys were used by the Geographical Information Center (GIC) to produce broadband demand maps in the twelve (12) northern California counties. GIC also designed an online mapping tool to show the broadband demand aggregation results and service provider information regarding current broadband speeds. The online mapping tool originally prototyped for the Gold Country Connect Project was significantly improved and expanded throughout the course of this study. Last, CED developed a database of more than two-hundred (200) Internet Service Providers (ISPs) and Wireless Internet Service Providers (WISPs) located throughout northern California, from whom GIC requested service coverage information. GIC received and mapped service coverage areas for thirty (30) different entities. All of the ISPs and WISPs who submitted data did so voluntarily; none are registered telecos, and do not carry Incumbent Local Exchange Carrier (ILEC) or Competitive Local Exchange Carrier (CLEC) licenses.

C. The Project Area

Spanning a total of 25,717 square miles, with the two northernmost counties bordering the state of Oregon and the three easternmost counties bordering the state of Nevada (see map of Project Areas, Appendix XX), the NCC project area covered seven (7) counties comprised of overwhelmingly rural regions, with only two major urban centers: Chico in Butte County, and Redding in Shasta County. Total population was 578,136 at the time of the study, for an average population density of 22.5 persons per square mile (Table 9).

Table 9. Total Square Mileage and Population, by County.

County	Land Area (~sq. miles)	Total Population	Population Density (per sq. mile)
Butte	1,677	220,673	131.6
Lassen	4,721	35,569	7.5
Modoc	4,203	9,685	2.3
Plumas	2,614	20,602	7.8
Shasta	3,852	183,095	47.5
Siskiyou	6,347	45,903	7.2
Tehama	2,958	62,609	21.1
Region Total	26,372	578,136	21.9

D. Approach

Phase I: Aggregated Demand

a. Fact Finding Meetings

CED conducted multiple fact finding meetings involving representatives from each of the counties in the study area, to elicit both input on and support for the demand aggregation studies. Initially identifying over four hundred participants and more than two hundred service providers, the fact finding meetings occurred between February and June 2009. Though there was an immediate and direct initial response from potential attendees, actual meetings held at the county level experienced poor attendance (7 meetings scheduled, 1 per county; 4 meetings witnessed between 10-12 attendees, and 1 meeting cancelled due to no-shows).

At the fact finding meetings, CSUC staff presented information on the structure and goals of the broadband demand aggregation studies as proposed by CETF. It was explained that the studies would identify how many businesses and residents wanted more or better access to high speed Internet service (demand), locate where service exists (supply), and identify where service is either inadequate or unavailable (opportunity). Comments were solicited from participants for the development and use of both household and business random telephone interview surveys. Participants suggested including questions seeking information on:

- different types of Internet services used;
- how often used;
- when used;
- for what purpose/s;
- how much is paid per month for an Internet service subscription; and
- what speeds are offered by ISPs and WISPs, etc.

Also, given the disproportionately low number of Spanish speaking residents and business owners in the state's northernmost counties, these surveys were conducted only in English.

b. Data Collection & Survey Questionnaire Development

Data collection for this project focused on assessing demand for broadband Internet connectivity by households and small businesses in the seven county project area. Survey questions for both the household and business questionnaire were based on: (1) a review of the Redwood Coast Connect survey questionnaire; and, (2) survey questions used in the Gold Country Broadband Survey conducted in 2008. Additionally, adjustments to the survey questions were made based on input provided at public meetings with broadband providers and consumers held in each of the seven counties prior to the inception of the telephone surveys. The study populations in the seven NCC counties consisted of households and small businesses with land line (hard wired) telephone services. The household telephone data collection period began on July 8, 2009, and was completed on August 1, 2009. The telephone survey of businesses began on June 3, 2009 and ended on July 13, 2009.

c. Community Outreach: Sustainable Adoption Strategy Meeting

In response to CETF's request for CED to facilitate a Northeast Broadband regional consortium application to ARRA stimulus funds, CED also convened a regional community workshop to identify sustainable broadband adoption strategies for the NCC project area on August 4th, 2009.

Over two hundred (200) invitations were extended to county leaders, county and city elected officials, administrative and information officers, librarians, community colleges, K-12 school superintendents and staff, workforce investment boards, EDCs, ISPs,

WISPs public safety officials, hospital and medical professionals, and other interested parties drawn from previous outreach and fact finding meetings. 38 replied, and 26 actually attended, a ratio of 5:1, males to females.

Participants at the workshop recognized the same benefits of improved broadband access. Workshop surveys were positive overall, with many attendees asking for more opportunities to continue the discussion around broadband adoption (see Table 10*.)*

Input was gathered from these county stakeholders regarding methods and processes to promote sustainable broadband adoption and further close the digital divide. Craig Settles, internationally known community broadband expert and published author, was the guest speaker at the workshop. Mr. Settles helped attendees understand what broadband is, facilitated how to start looking for solutions and how to overcome the problems many face. The main barriers to improved broadband access as presented by workshop attendees are:

- lack of comprehension or understanding of what broadband is;
- not enough money;
- too few ISPs or WISPs willing to extend their networks beyond the urban centers;
- lack of resources; and,
- lack of staffing.

The workshop members cited five compelling themes where broadband is most needed[3]:

- Distance/E-learning
- Library E-centers/Public Computing Centers
- Public Access/Public Safety
- Partnerships
- Tele-health, Telemedicine

Soon after the workshops, CSUC located an article dated five years earlier citing the same issues (Broadband On-line, 2004), demonstrating that little has been done since to address these core issues.

[3] These five (5) themes were also identified by members at the Upstate California Connect (UCC) Project's Sustainable Broadband Adoption Strategy meeting, held in Colusa County, July 23, 2009.

Table 10. Participants' Feedback, Sustainable Broadband Adoption Workshop, Redding, CA.

McConnell Foundation, Lema Ranch
Tuesday, August 4, 2009

Average Scores (1-8, 8 being highest)	
Content	6.
Structure	6.
Flow	6.
Presentations	6.
Environment/Facility	7.
Effectiveness of Speakers	7.

What did you like most about today's workshop?

- Craig Settles' attitude
- Craig Settle's presentation
- Connections with attendees from various organizations
- Exposure to people in different facets of broadband interest.
- Connecting with others who have similar goals
- Ability to learn from other participants. Ideas for using broadband if it were available were informative.
- Collaboration.
- Interaction with presenters and other attendees
- Good ideas
- How to implement discussion.
- Networking with other counties about possibilities.
- Collaboration and networking
- Main speaker
- Coming together and sharing different ideas from many different domains.

What did you like least about today's workshop?

- Air Conditioning too high
- Connection to ARAA took too much time. Took group off topic.
- Needed to be longer
- Second workshop identifying the how was less worthwhile for our table. No one else from my county attended.
- Not enough time- too much info
- More handouts but will supplement with web sites
- Long drive

Additional comments

- Thanks for allowing me to participate
- Very good!
- Follow up and ongoing networking would be useful. Last session on some barriers other than broadband calls for processes to address/overcome these barriers.
- I need more info on processes to obtain benefits for me.

d. Telephone Surveys

Telephone surveys were used to develop a statistical sample of broadband demand for households and small businesses. Respondents to the surveys were selected randomly from a database purchased for the study area (See Study Methodology at Appendix XX for details). Surveys were conducted by CSUC students, seven days a week, from 9 a.m. - 9 p.m., and five attempts were made per phone number to complete a survey.

In prior random-dial surveys, there was a 4:1 call ratio (four different telephone numbers dialed before a single survey was completed); for this study, there was a 10:1 call ratio due to cell phone portability. Many respondents answered their cell phone from regions outside the state of California, citing they were either temporarily located somewhere else (i.e. college and/or university students), or were no longer living in the Northeastern county area but chose to retain their 530-area code cell phone number. Also, a survey was disqualified if a question was not answered regarding broadband, Internet services or telecommunications.

Responses to demographic questions, however, were considered additional information, and not critical to a completed survey. Most notably, 6.9% "refused to answer" the question regarding household income, with the highest percentage category (44.4%) reporting a household income between $25,000 and $34,999.00, and the second highest category percentage (32.2%) having a household income of less than $25,000.00. This demographic information was not statistically significant regarding education and income as factors in determining the demand for broadband, unlike a national survey conducted by Pew Charitable Trust Foundation wherein the lack of income and lack of education were significant factors.

1836 household surveys and 800 business surveys were completed, for a combined total of 2636 completed surveys, with a 95% degree of confidence, and =/- 2-3% margin of error.

e. Data Analysis and Mapping

Survey results were analyzed by Dr. James Fletcher of CSUC's Program for Applied Research and Evaluation, summarized and compiled in Section XX. While each county surveyed produced identifiable differences in behavioral uses of Internet services, the overwhelming similarity among all seven counties appears in the aggregate lack of broadband service, or 40.5% of households and 16.8% of businesses cited they had no Internet services at all. Also, 25% of households and 18% of businesses without service said they either did not own a computer and/or did not need the Internet.

Results from a national survey by the Pew Charitable Trust Foundation (2009) indicate between 8 - 10% of the nation's population choose not to subscribe to the Internet service, yet data for the Northeastern counties indicate that respondents refused Internet access as a lifestyle choice more than three times as much. It is possible that

this number is skewed due to a disproportionately higher number of retirees in Shasta County than the other six counties.

Also, survey results indicate clear disparities between the residential and business life of each individual county when responses are segregated by county. Responses were arranged by questions, by answer, by county, than when compared via cross tabs, the following county-wide behaviors became apparent (see Appendix for Crosstab tables). Below follows the summary list of behavioral uses of Internet services, by county.

- Significantly larger % of businesses in Butte and Shasta counties switched their ISP during 12 months prior to the survey than did other 5 NCC counties.
- Significantly larger % of businesses in Lassen, Modoc, Plumas, Siskiyou and Tehama counties report having satellite television than Butte and Shasta.
- Significantly larger % of businesses in Butte, Plumas and Siskiyou rated Internet access extremely important than did other 4 NCC counties.
- Significantly smaller % of businesses in Plumas and Tehama reported having Internet access at their homes than did other 5 NCC counties.
- Larger % of businesses in Modoc, Plumas and Siskiyou reported accessing the Internet at a library than did other 4 NCC counties.
- Significantly larger % of businesses in Modoc reported American Indian/Native American as ethnicity than did other 6 NCC counties.
- Significantly larger % of households in Modoc and Siskiyou county said they did not have cell phones than did respondents in the other 5 NCC counties.
- Significantly larger % of households in Butte county said they have cable television than did other 6 NCC counties.
- Significantly smaller % of households in Butte county have satellite television than do other 6 NCC counties.
- Significantly smaller % of households in Modoc, Plumas and Siskiyou County said they have video games than did other 4 NCC counties.

Phase II: Providers, Infrastructure Data, and Alternative and Preferred Infrastructure Scenarios

A. Broadband Service Providers

Developed by CED in Phase I, GIC requested updated service coverage information from ISPs and WISPs who had previously submitted service coverage data to GIC for the California Broadband Task Force Broadband Availability Maps (aka, the Baker Maps). Thirty (30) ISPs and WISPs responded, submitting service coverage data for the Northeastern counties, shown in the broadband supply Maps # X-X).

The ISPs and WISPs from whom data was received either: a) had some working knowledge of geographic mapping software (i.e., GoogleEarth) to know how to capture their service coverage areas; or b) were willing to work with GIC to learn how to use geographic mapping software. The most often cited reasons for not submitting service

coverage data were a) refusal to release proprietary data (there was no response from any of the larger carriers, AT&T, Comcast, Frontier and Qwest); and b) many of the service providers identified did not track nor know how to accurately portray their service coverage areas.

The Northeastern service coverage areas mapped by GIC for the broadband supply aggregation were done for the ARRA Round 1 NorCal Broadband Access Consortium, which was outside the scope of work originally specified in the broadband demand aggregation studies. While each service provider who participated in the ARRA Round 1 application process agreed to an hourly fee for work performed by GIC (ten applicants), to date only three ARRA applicants have actually paid for services rendered; those who have not paid cited not being awarded an ARRA broadband stimulus grant, hence GIC has not been compensated for their efforts.

A few static or sample maps follow below, but as this is a dynamic database, the most current and best images to identify broadband supply, or service coverage area, are found in the GIC website: www.northeasternbroadband.org.

B. Infrastructure Data

Throughout the course of this study, there were several efforts to capture the extent of the existing broadband infrastructure.

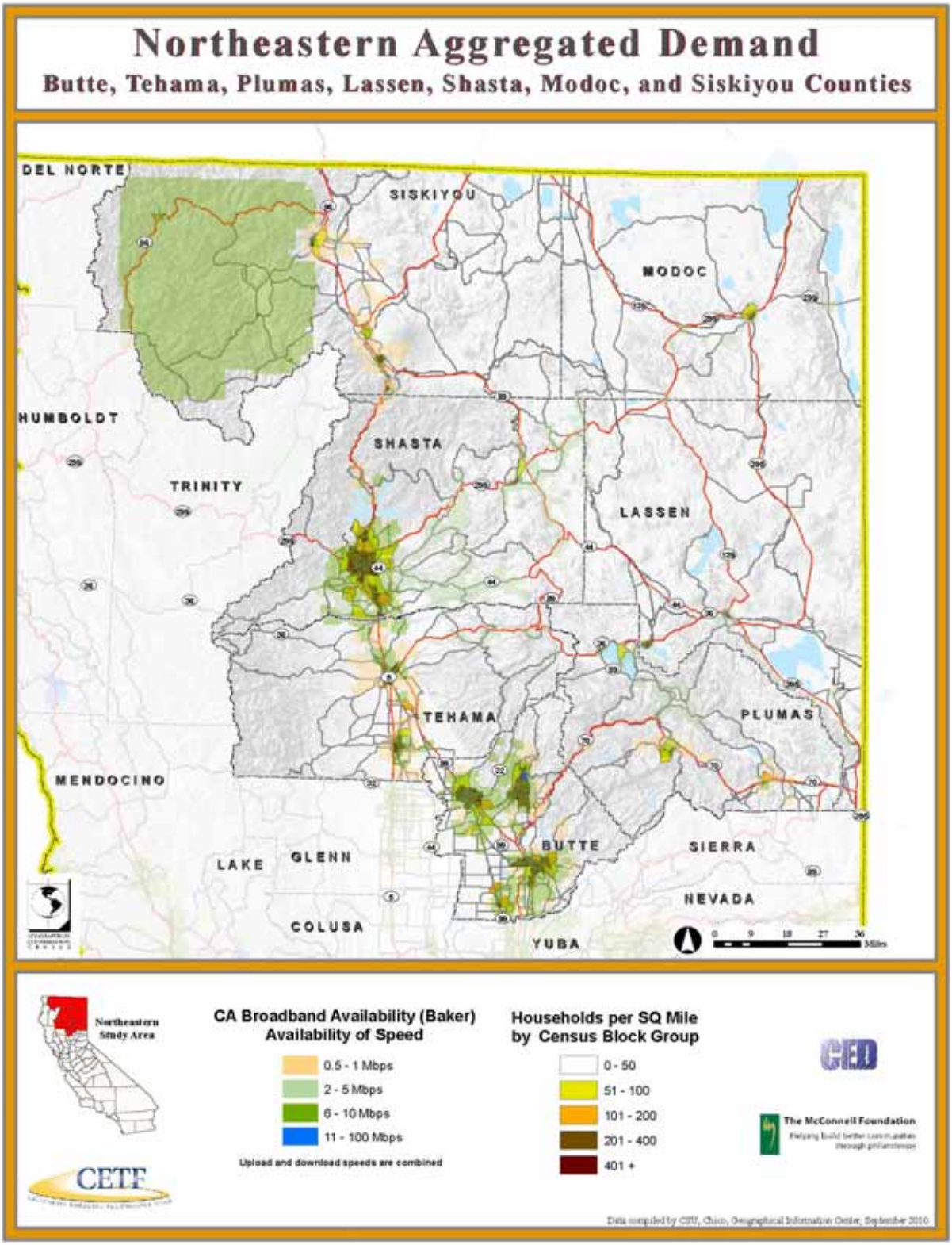
The beginning of the project started with the initial statewide broadband maps, named the "Baker Maps" from the name of the company that compiled the data. These initial maps were prepared based on wireline service provider information on subscriber addresses that were geo-coded by speed tier. The coverage areas were then aggregated to the census tract level for public display. Map 6 shows the Baker Map display for the Northeastern California Connect project area at project inception. Maps 7 through 13 show this same information at the county level.

Mid-way through the NCC project, the ARRA Broadband Infrastructure funding opportunity arose. The California Public Utilities Commission (CPUC) allowed any Internet Service Provider (ISP), wireless or wire line, submitting an ARRA application to request a subsidy of up to 10% of the project costs from the California Advanced Services Fund (CASF) on an award contingency basis; i.e. no federal award no CASF funding. The restriction to applying for this funding was that it could only be made for an area where there was no previous broadband coverage, either wireline or wireless. In an effort to identify the extent of coverage, now to include wireless services, a data call went out to wireless ISPs to provide generalized coverage maps of their service areas. By submitting coverage areas, wireless ISPs could, in effect, "protect" their coverage areas from being encroached upon by a new provider that could be using a combination of federal (ARRA) and state (CASF) funding to build out infrastructure. Map 14 identifies the aggregate coverage areas submitted under this one-time effort. Maps 15 through 21 show this same information at the county level.

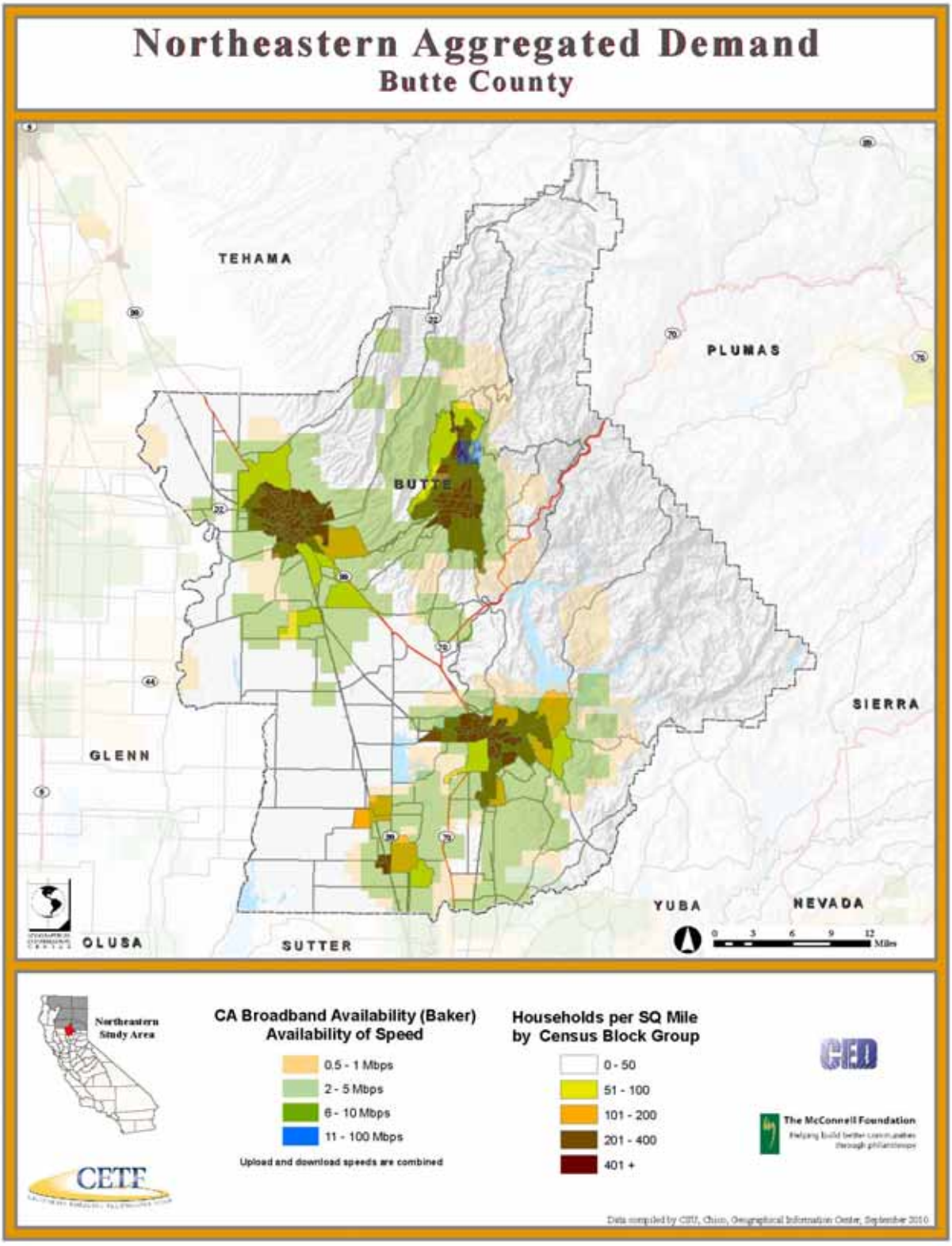
Finally, the National Telecommunications and Information Agency (NTIA) released funding in early 2010 to states initiating the development of a National Broadband Map. The initial data call to all providers went out from the California Public Utilities Commission to submit the necessary data by which California could develop its next generation statewide broadband map. Map 22 shows the results of that initial data call and represents the latest information on the broadband infrastructure coverage available as of the time of this report. Maps 23 through 29 show this same information at the county level.

Each of these maps coverage the same geographic extent and also show the major population centers as defined by Households per Square Mile. There are some interesting differences in each of these coverage maps, most notably between the maps detailing the CASF data call (Maps 14 to 21) and the maps showing the verified coverage information for the CPUC initial submission to the National Broadband Map (Maps 22 through 29). This is because the GIC data call maps represent an extent of wireless coverage that was prepared and delivered using an assumed range based upon the location of wireless transmitters. The CPUC maps represent data identified and verified to a particular location and geocoded to a specific street address where applicable.

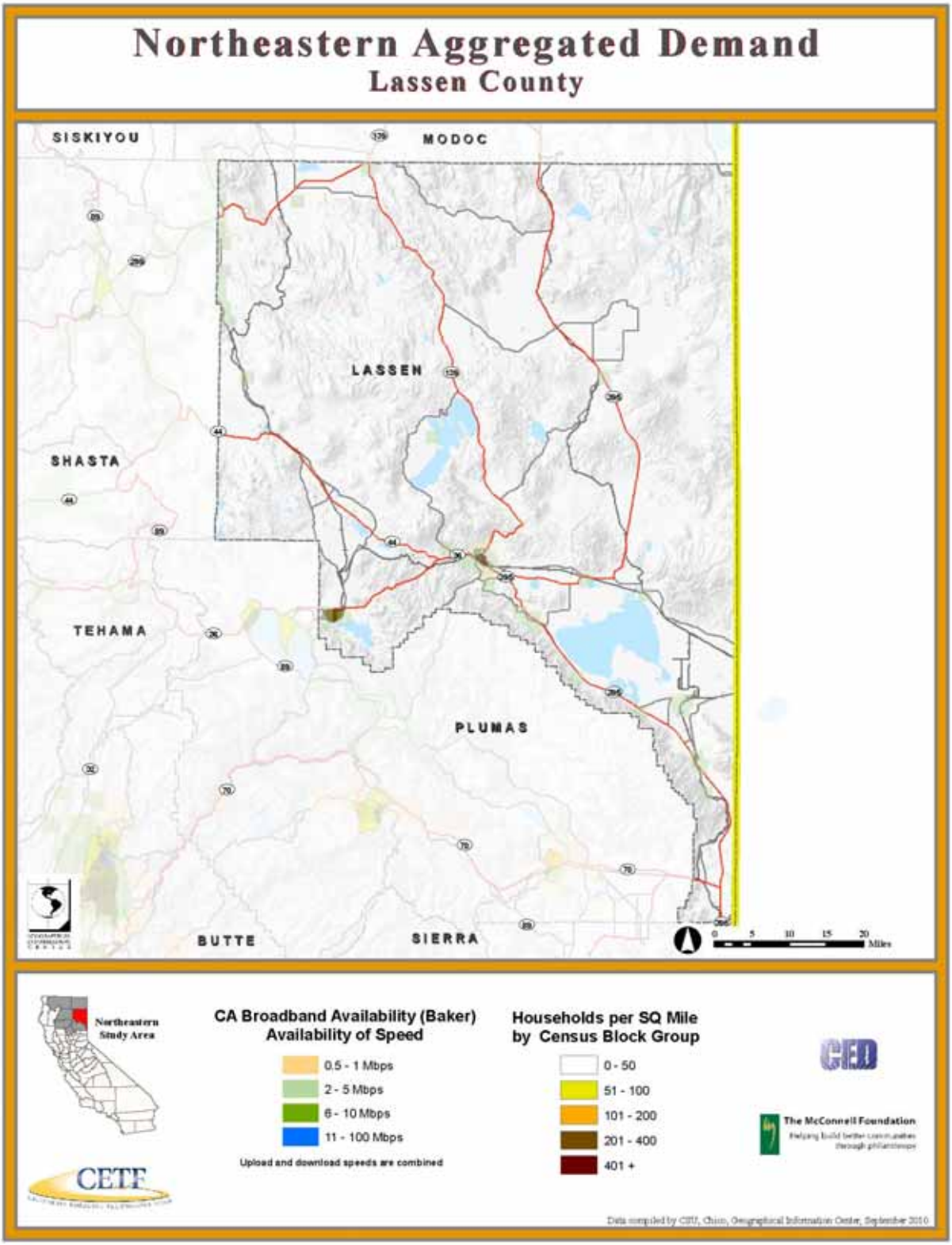
Map 6. Initial Baker Broadband Infrastructure Map for NCC Project Area



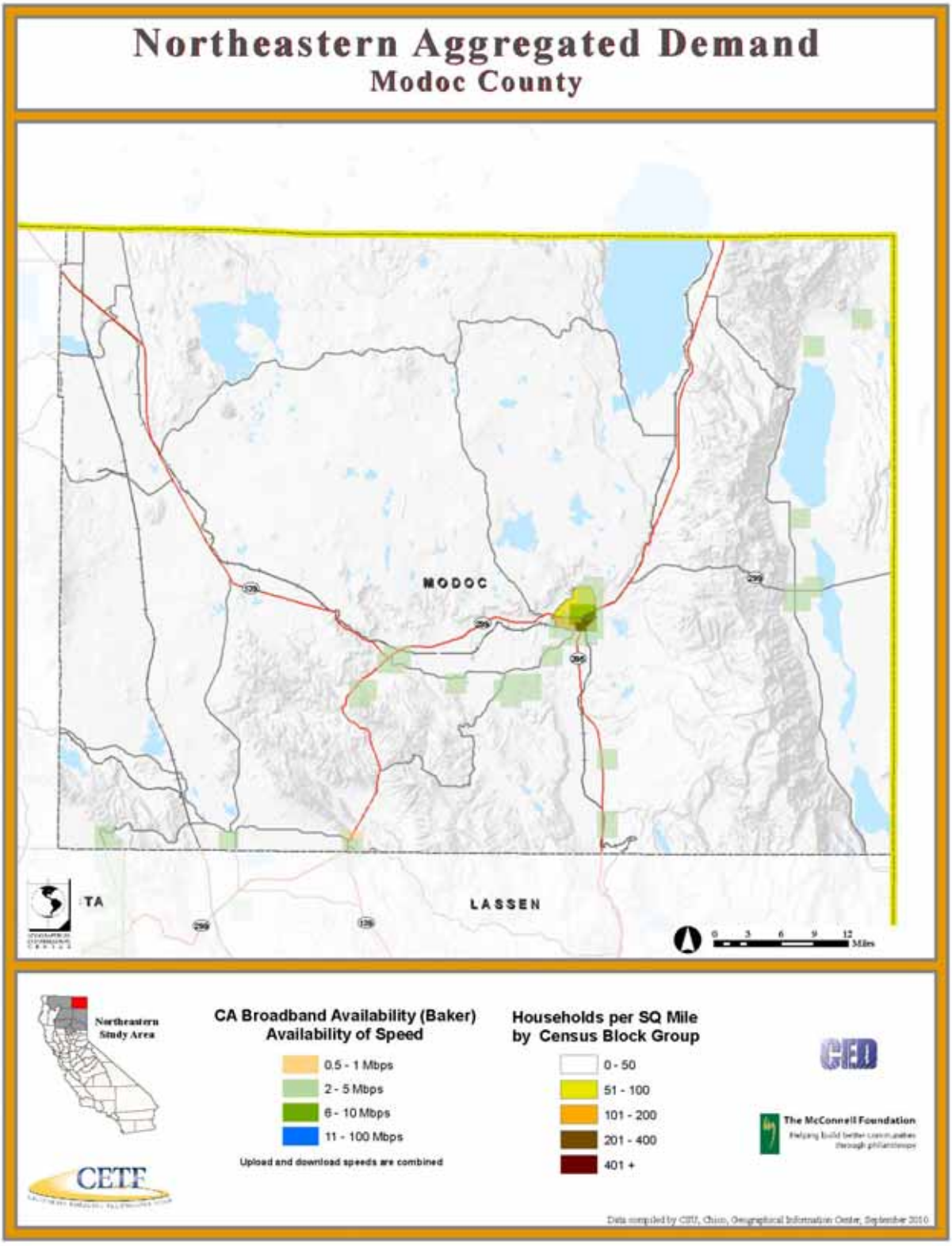
Map 7. Initial Baker Broadband Infrastructure Map for Butte County



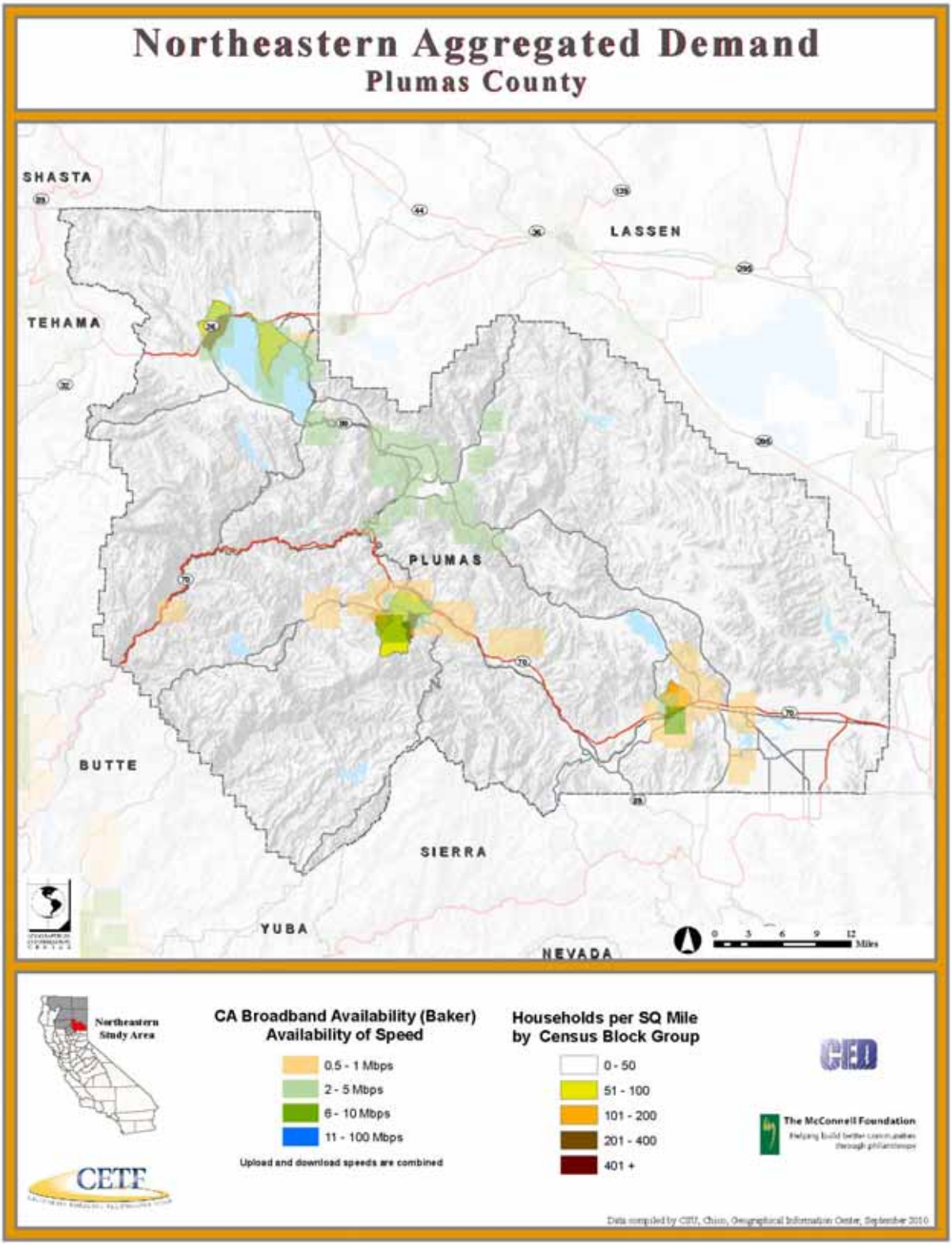
Map 8. Initial Baker Broadband Infrastructure Map for Lassen County



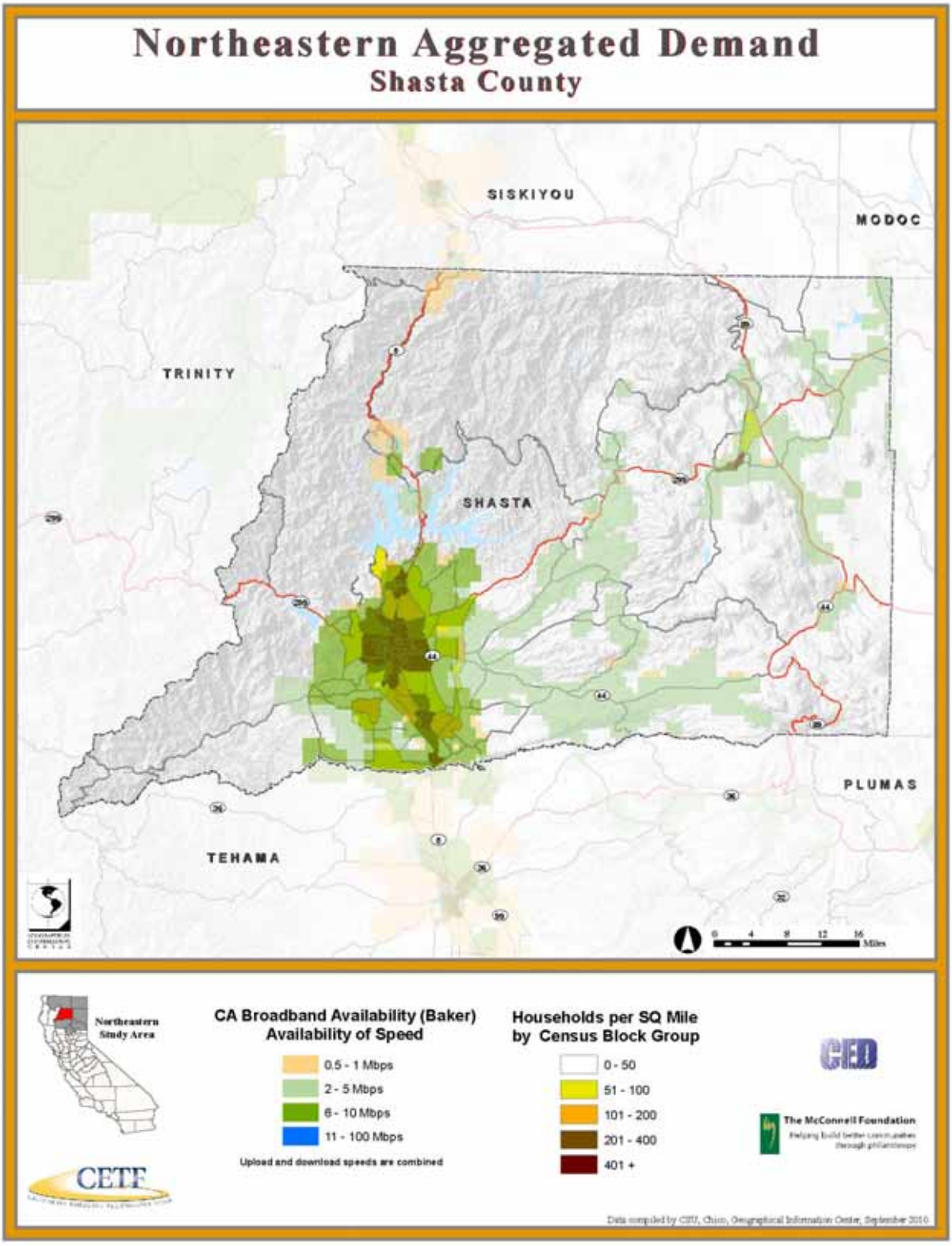
Map 9. Initial Baker Broadband Infrastructure Map for Modoc County



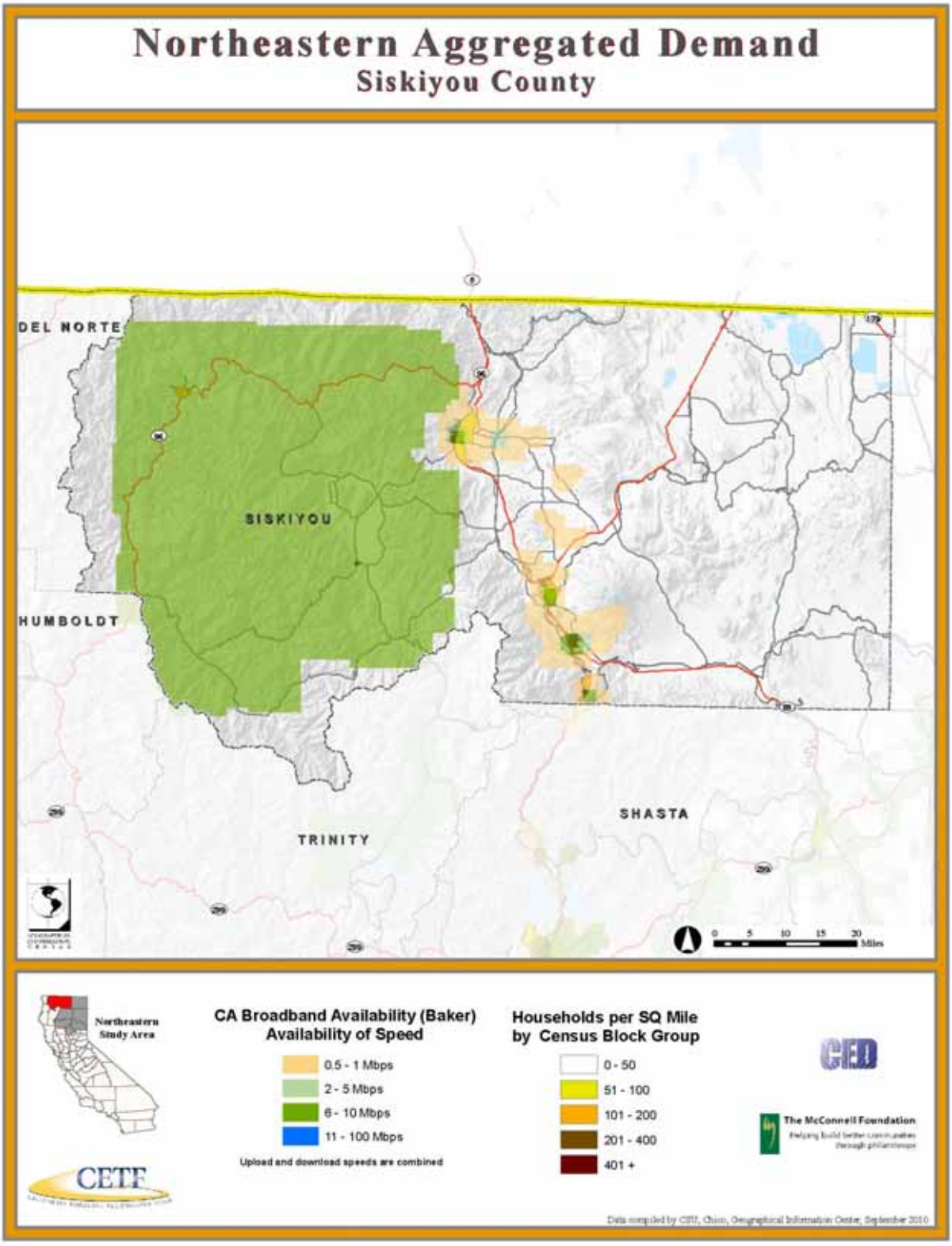
Map 10. Initial Baker Broadband Infrastructure Map for Plumas County



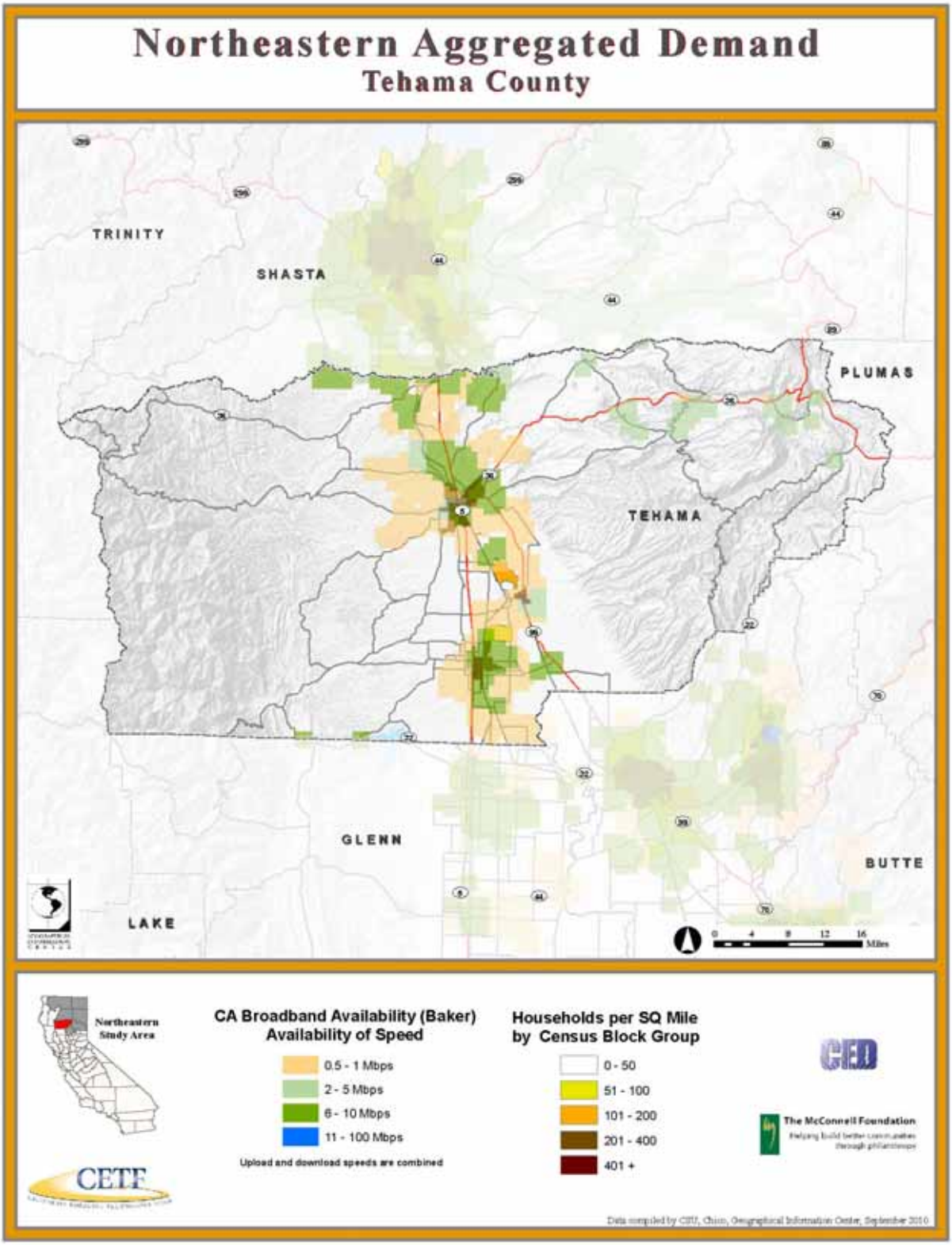
Map 11. Initial Baker Broadband Infrastructure Map for Shasta County



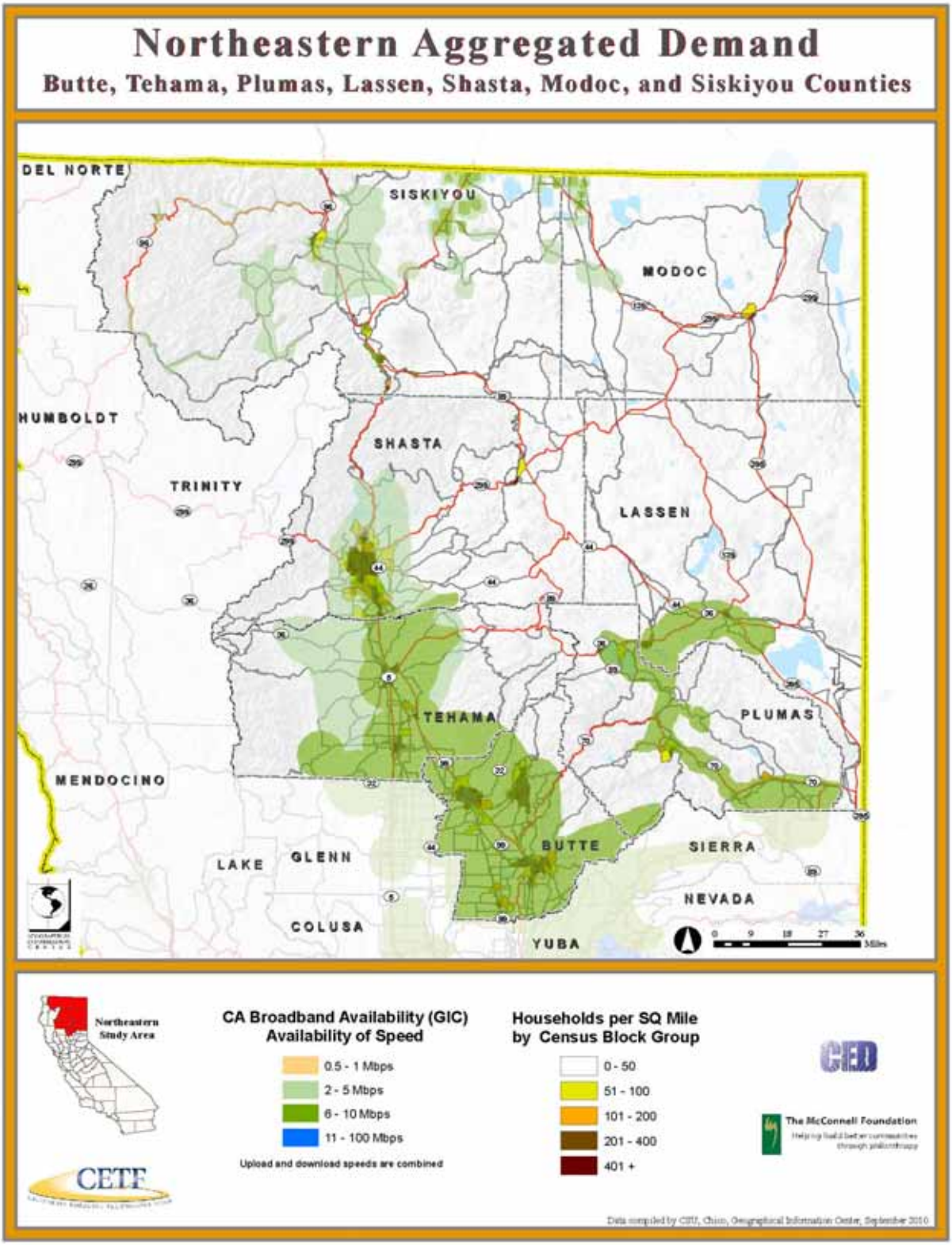
Map 12. Initial Baker Broadband Infrastructure Map for Siskiyou County



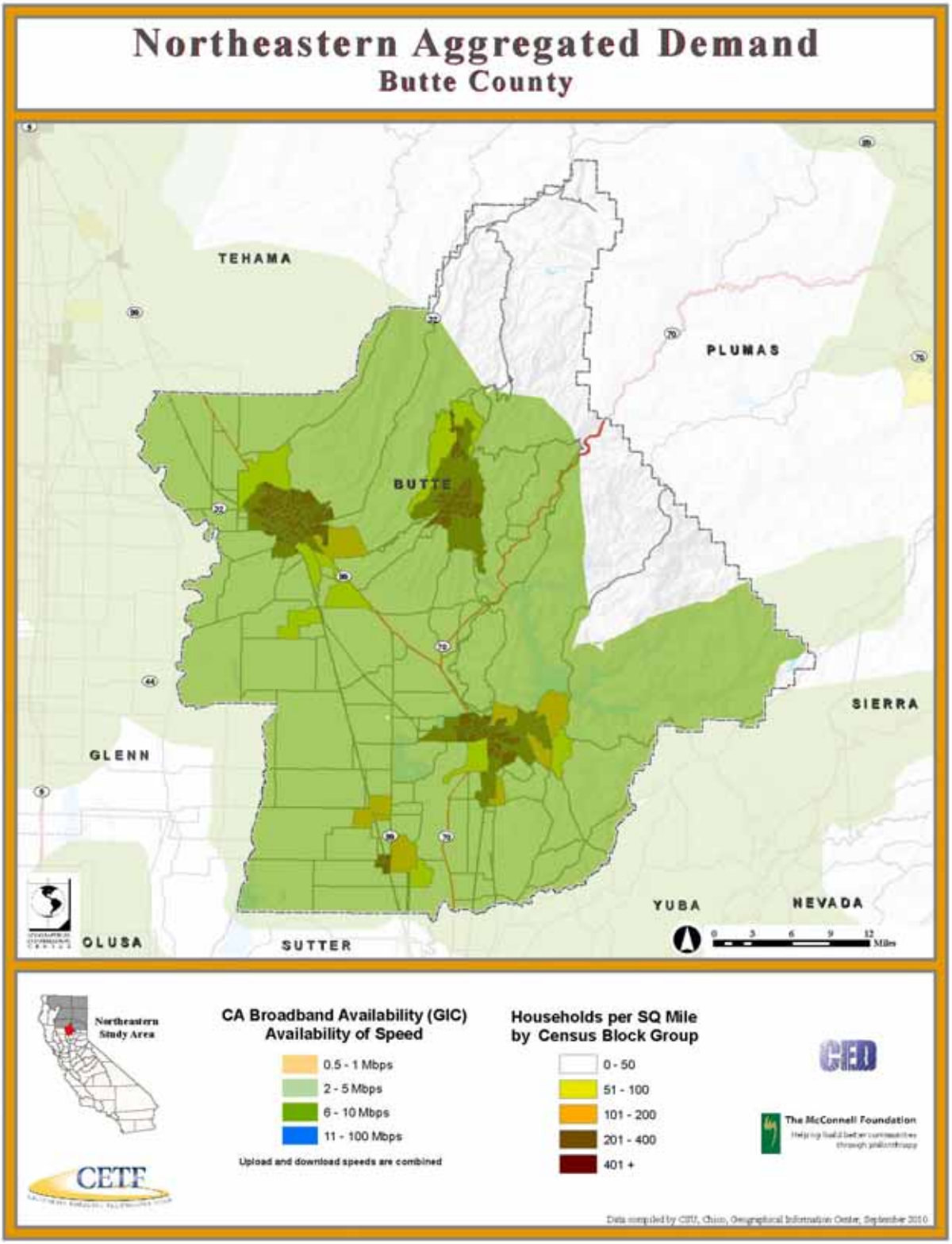
Map 13. Initial Baker Broadband Infrastructure Map for Tehama County



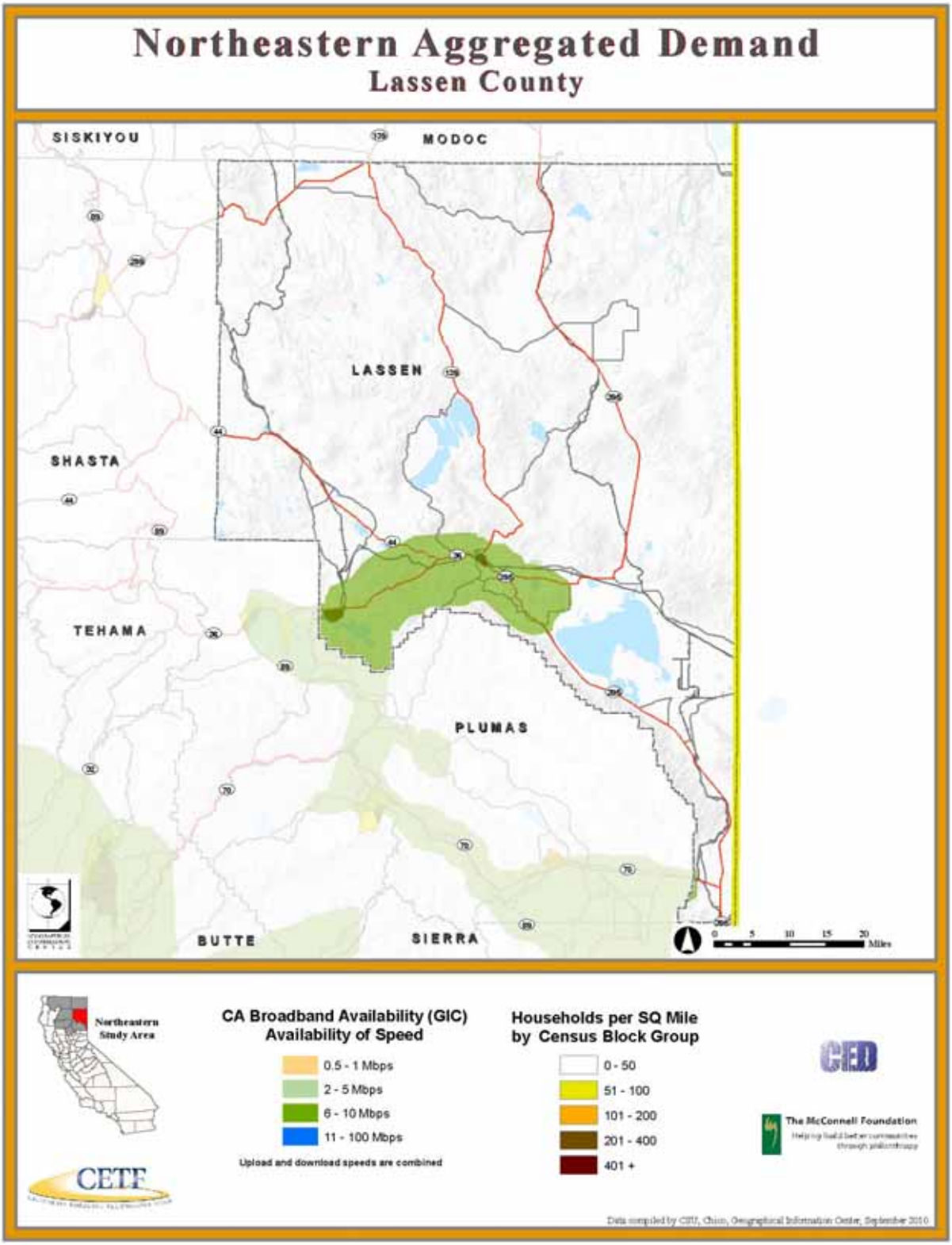
Map 14. CASF Data Call Map (Summer 2009)



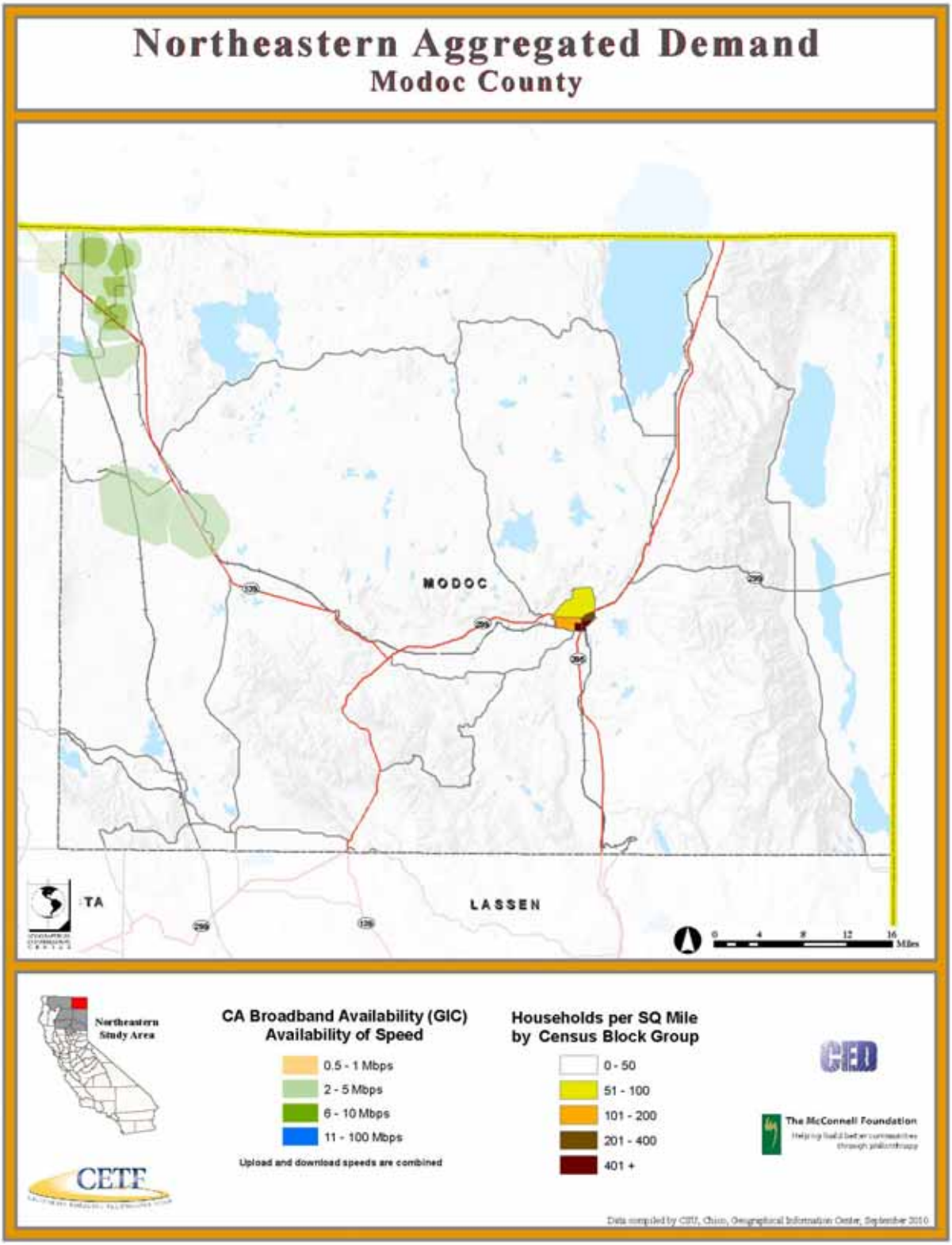
Map 15. CASF Data Call Map, Butte County (Summer 2009)



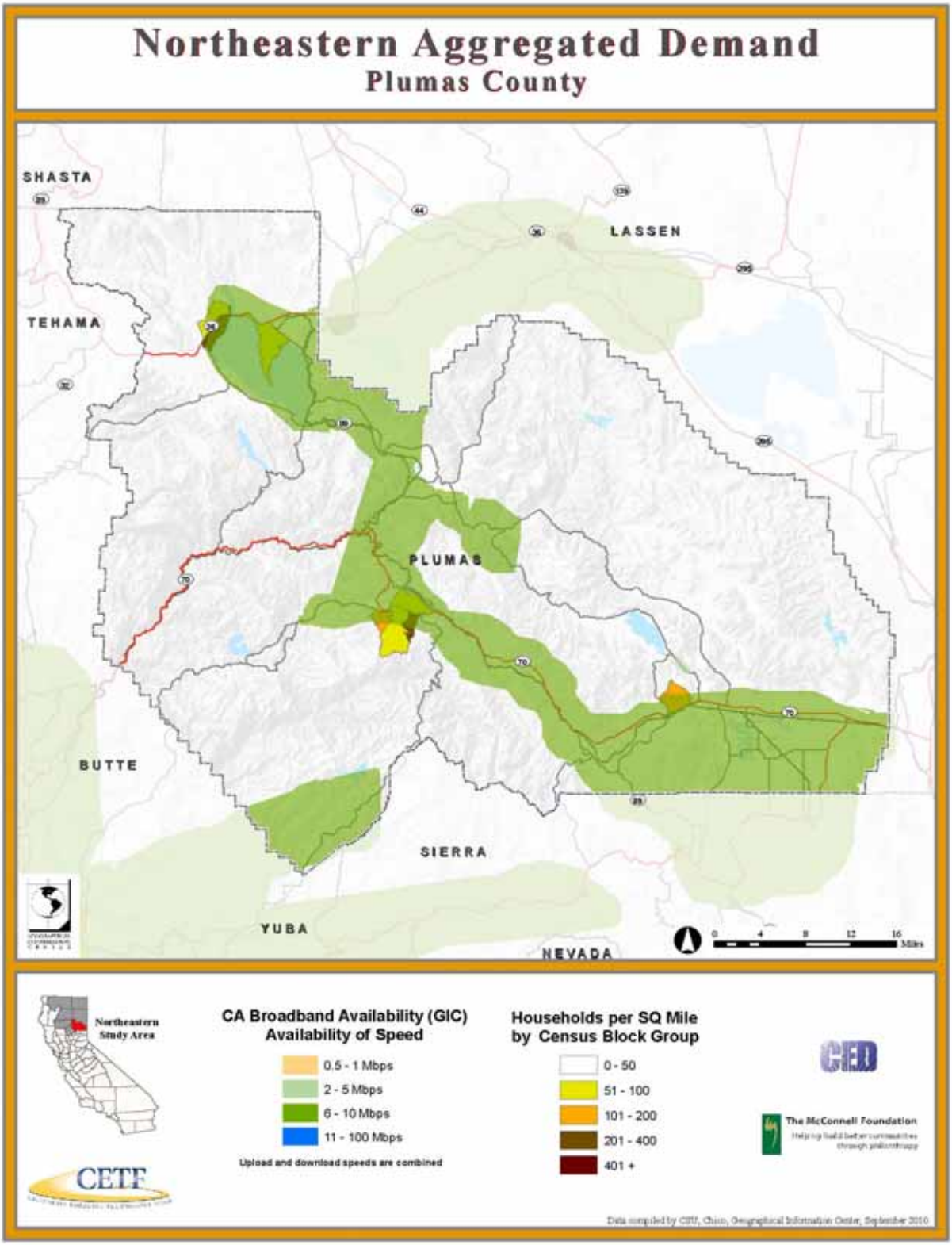
Map 16. CASF Data Call Map, Lassen County (Summer 2009)



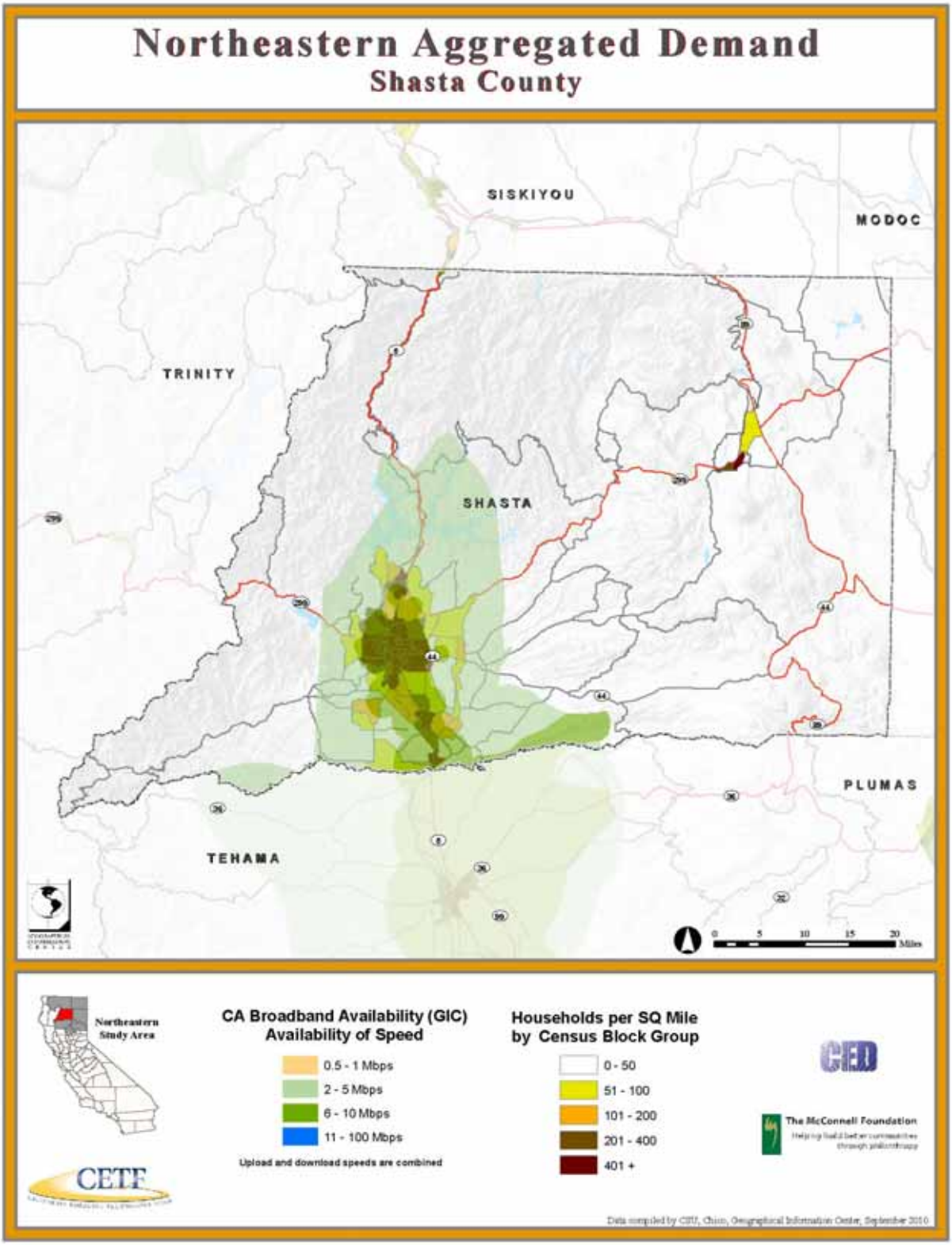
Map 17. CASF Data Call Map, Modoc County (Summer 2009)



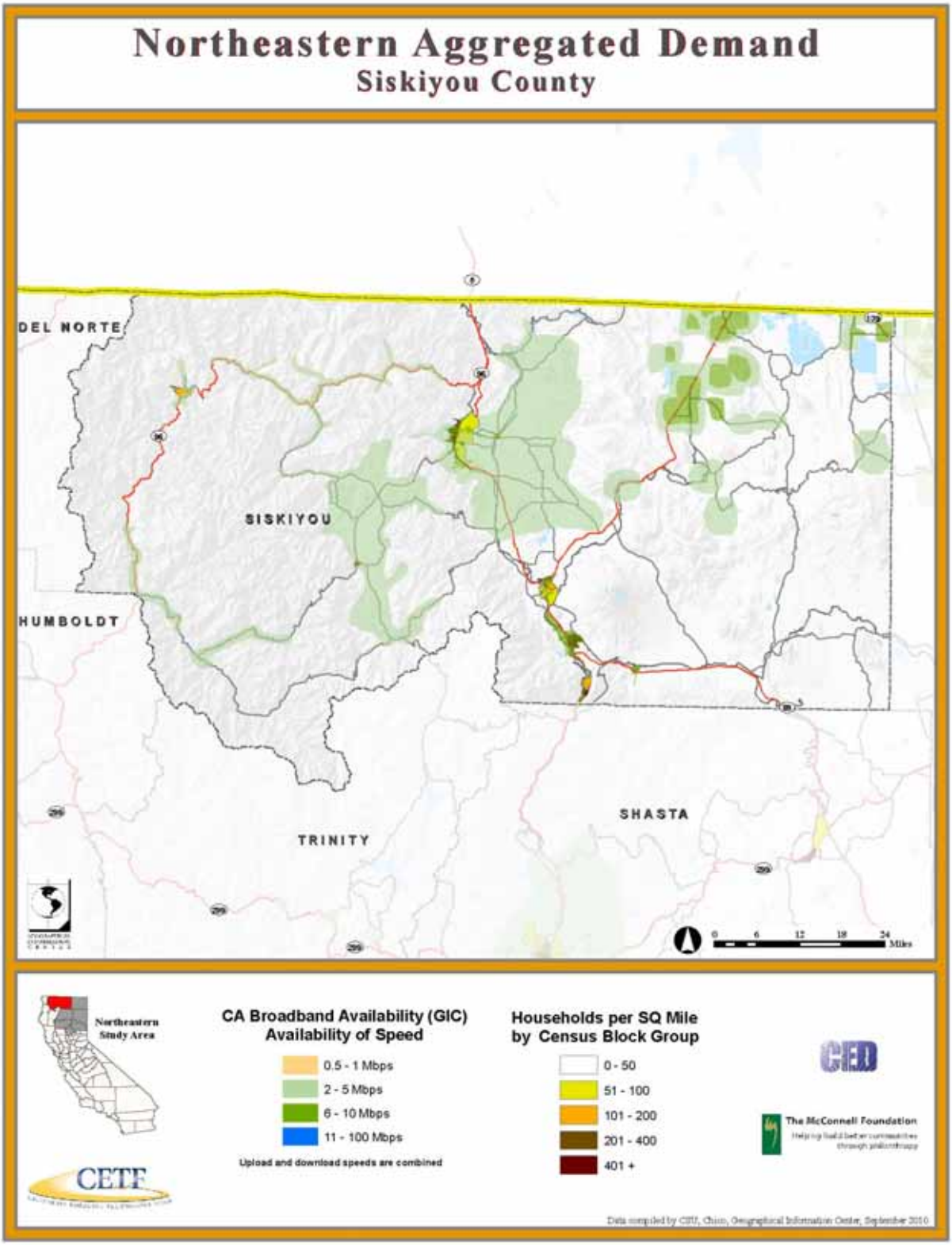
Map 18. CASF Data Call Map, Plumas County (Summer 2009)



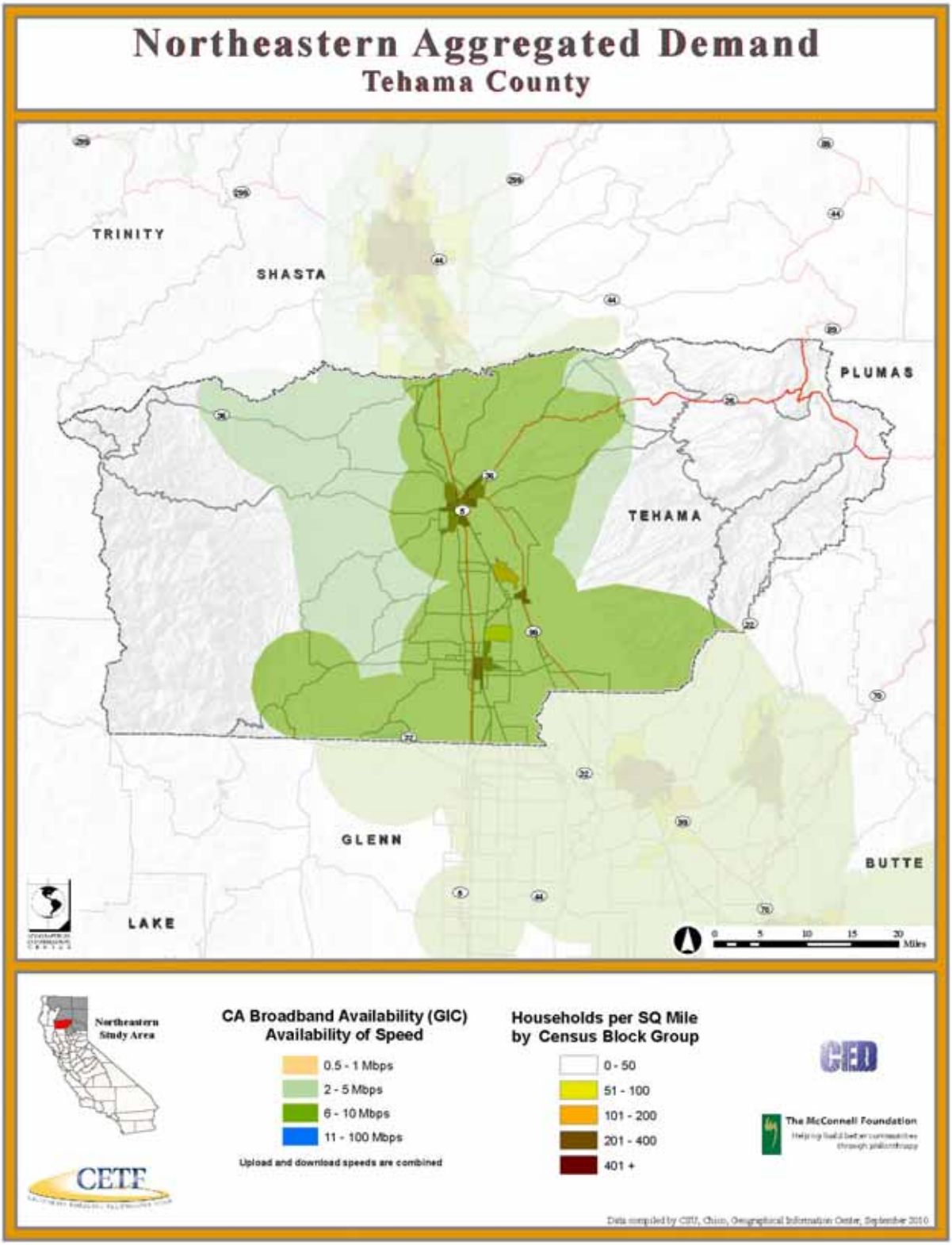
Map 19. CASF Data Call Map, Shasta County (Summer 2009)



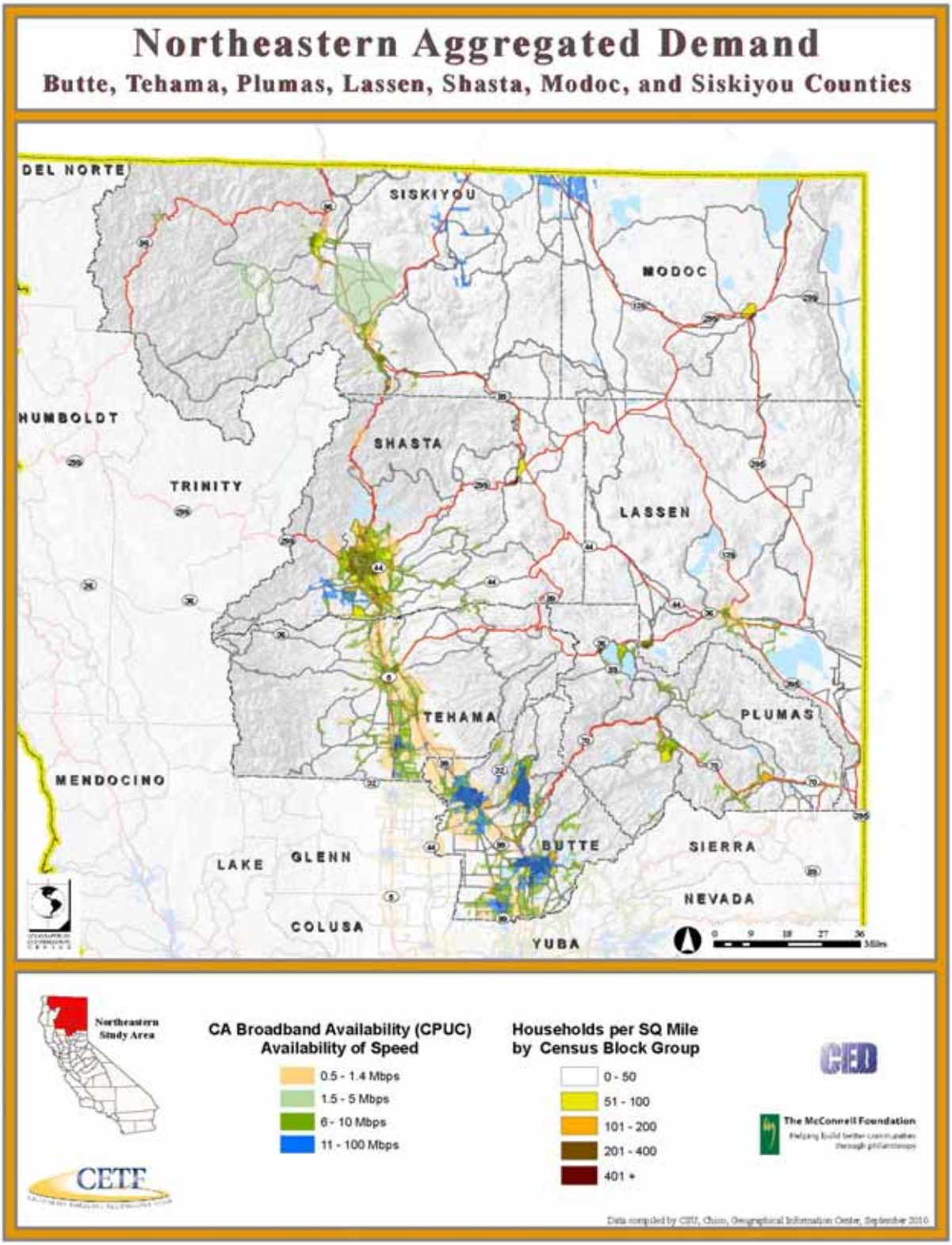
Map 20. CASF Data Call Map, Siskiyou County (Summer 2009)



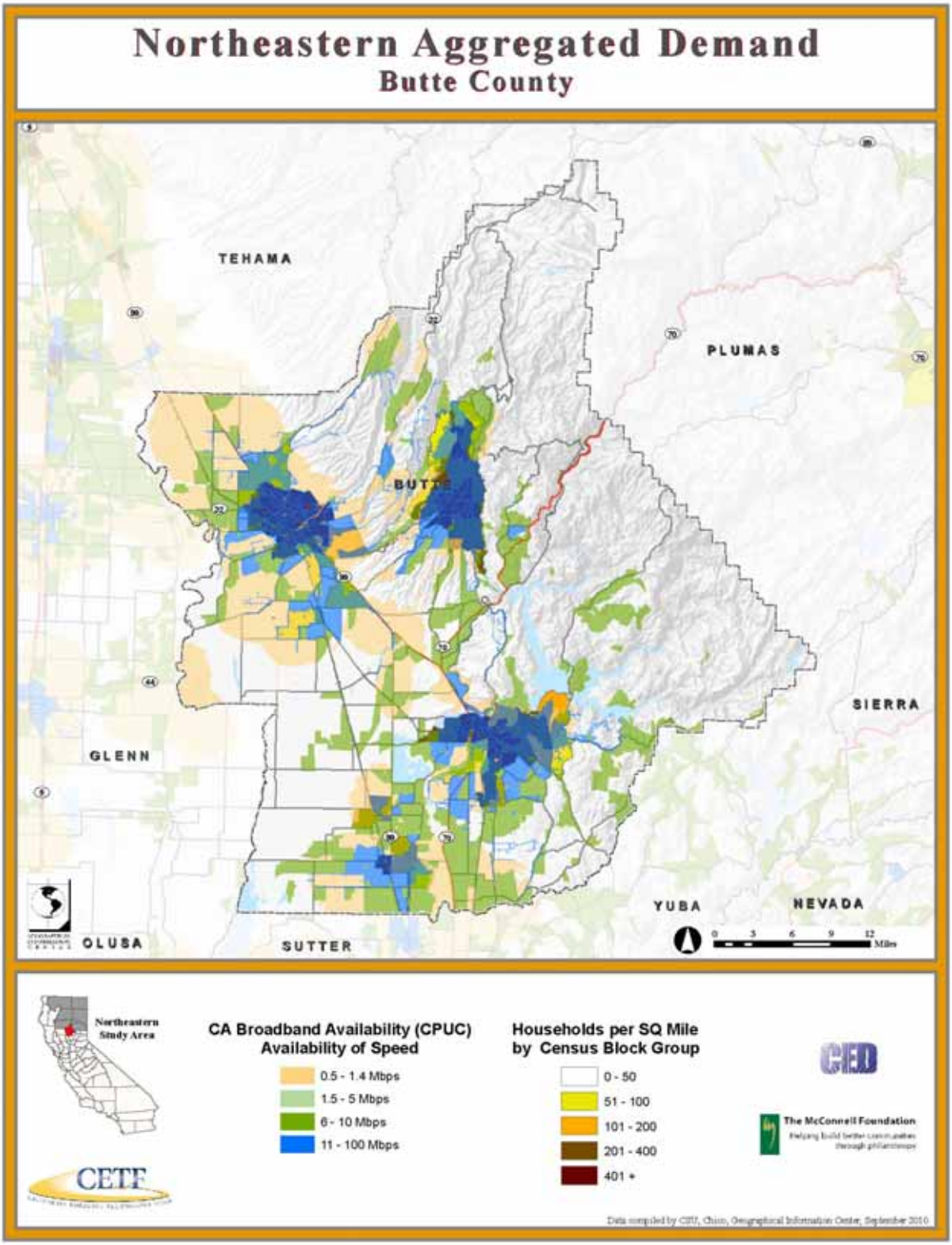
Map 21. CASF Data Call Map, Tehama County (Summer 2009)



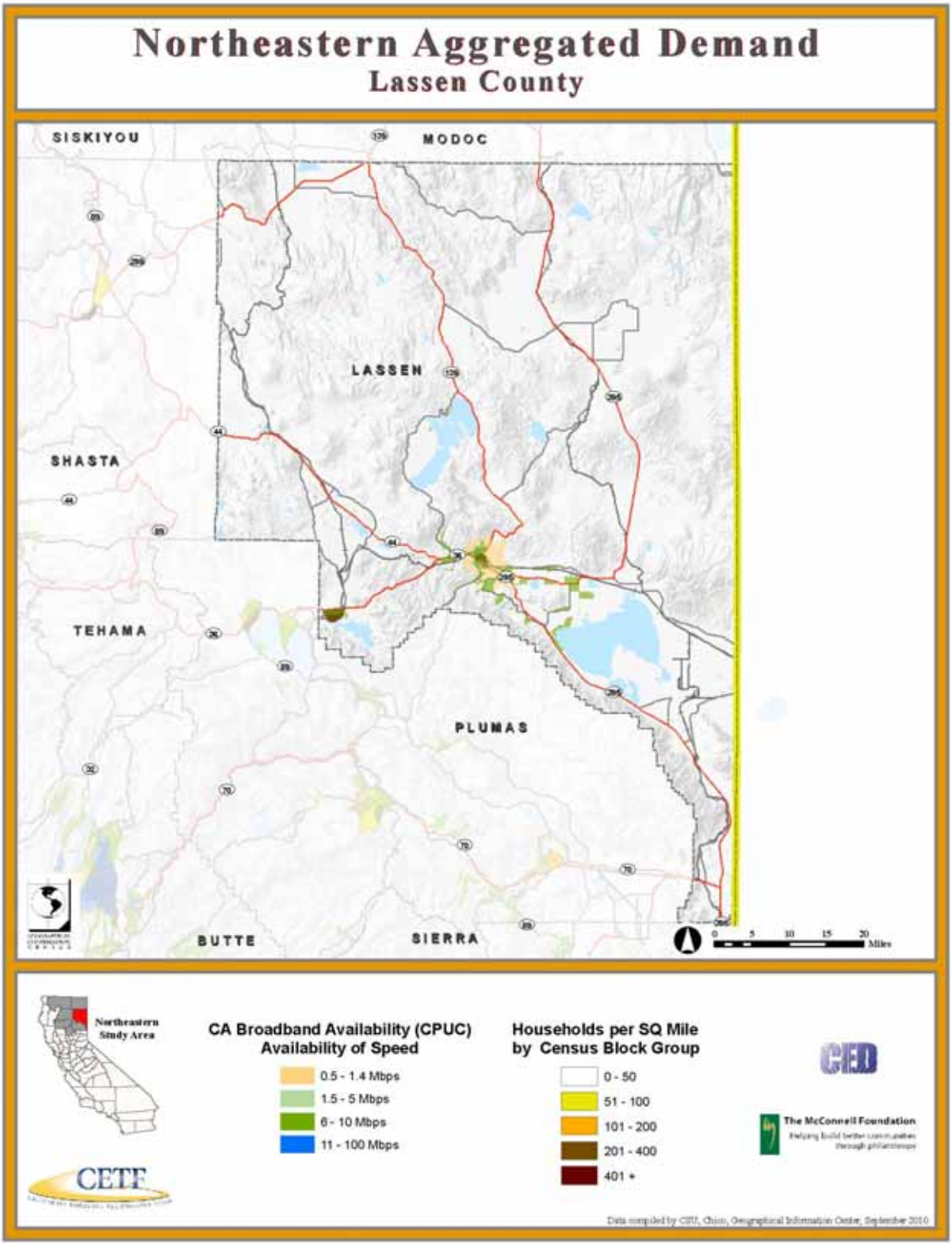
Map 22. CPUC Infrastructure Coverage Map (Summer 2010)



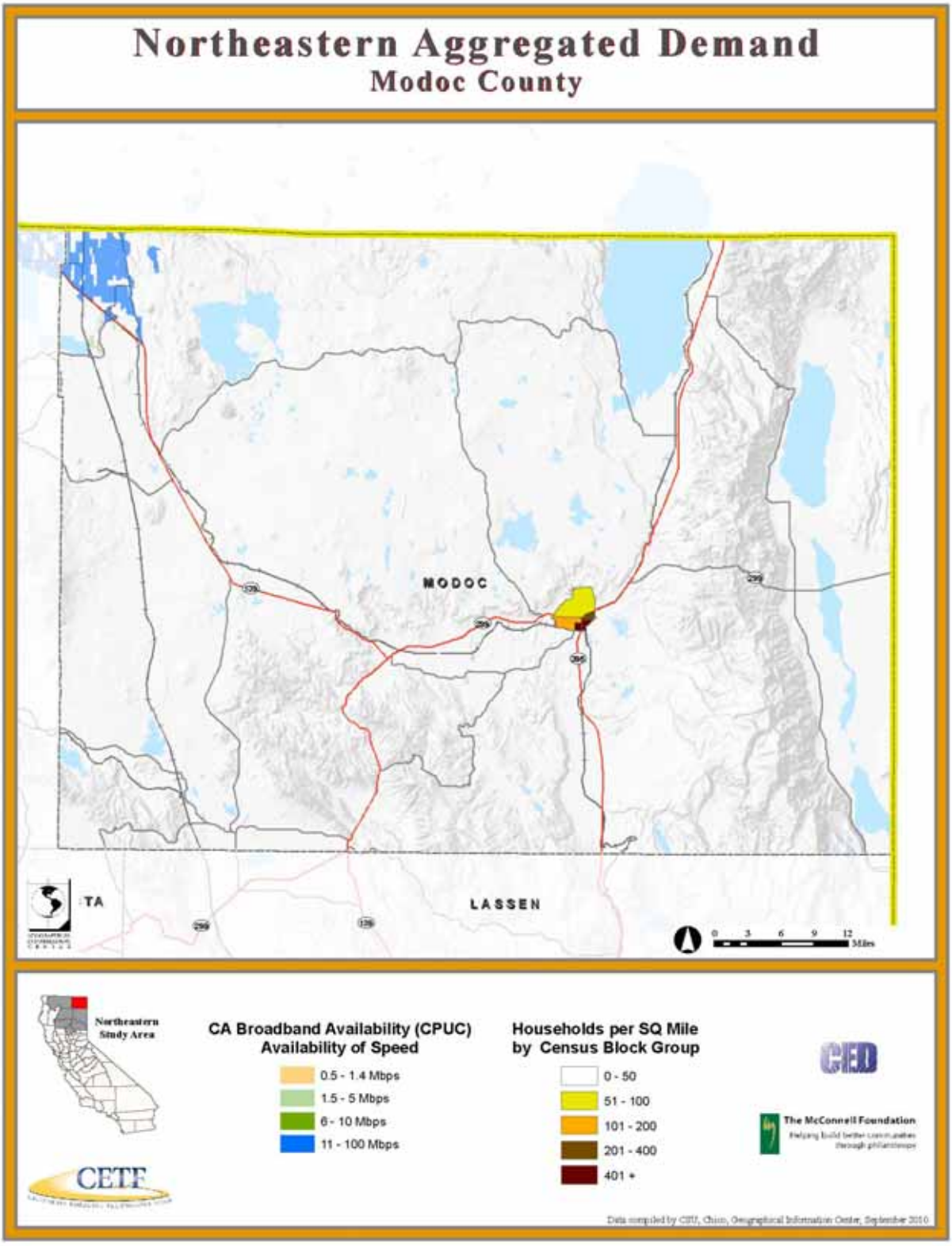
Map 23. CPUC Infrastructure Coverage Map, Butte County (Summer 2010)



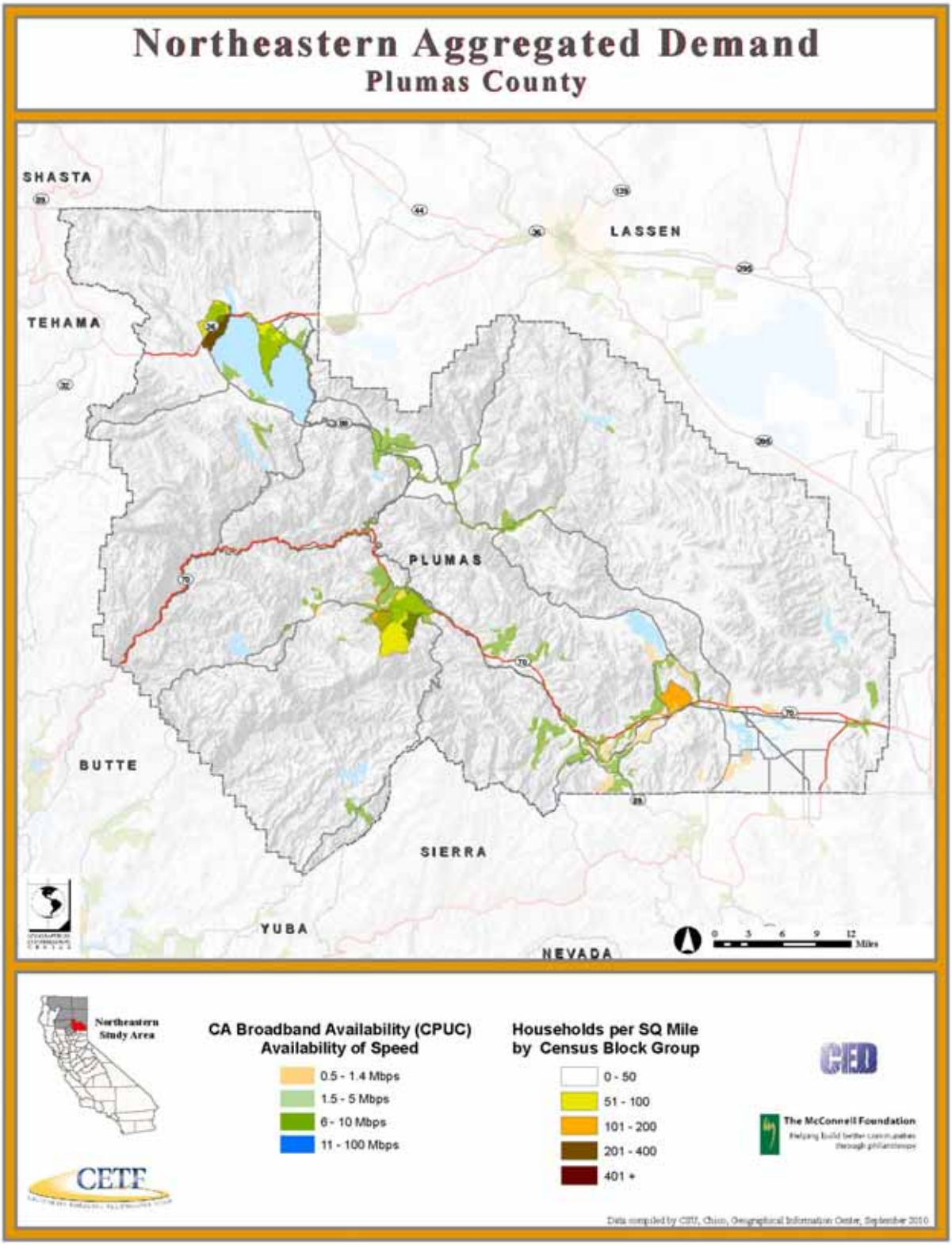
Map 24. CPUC Infrastructure Coverage Map, Lassen County (Summer 2010)



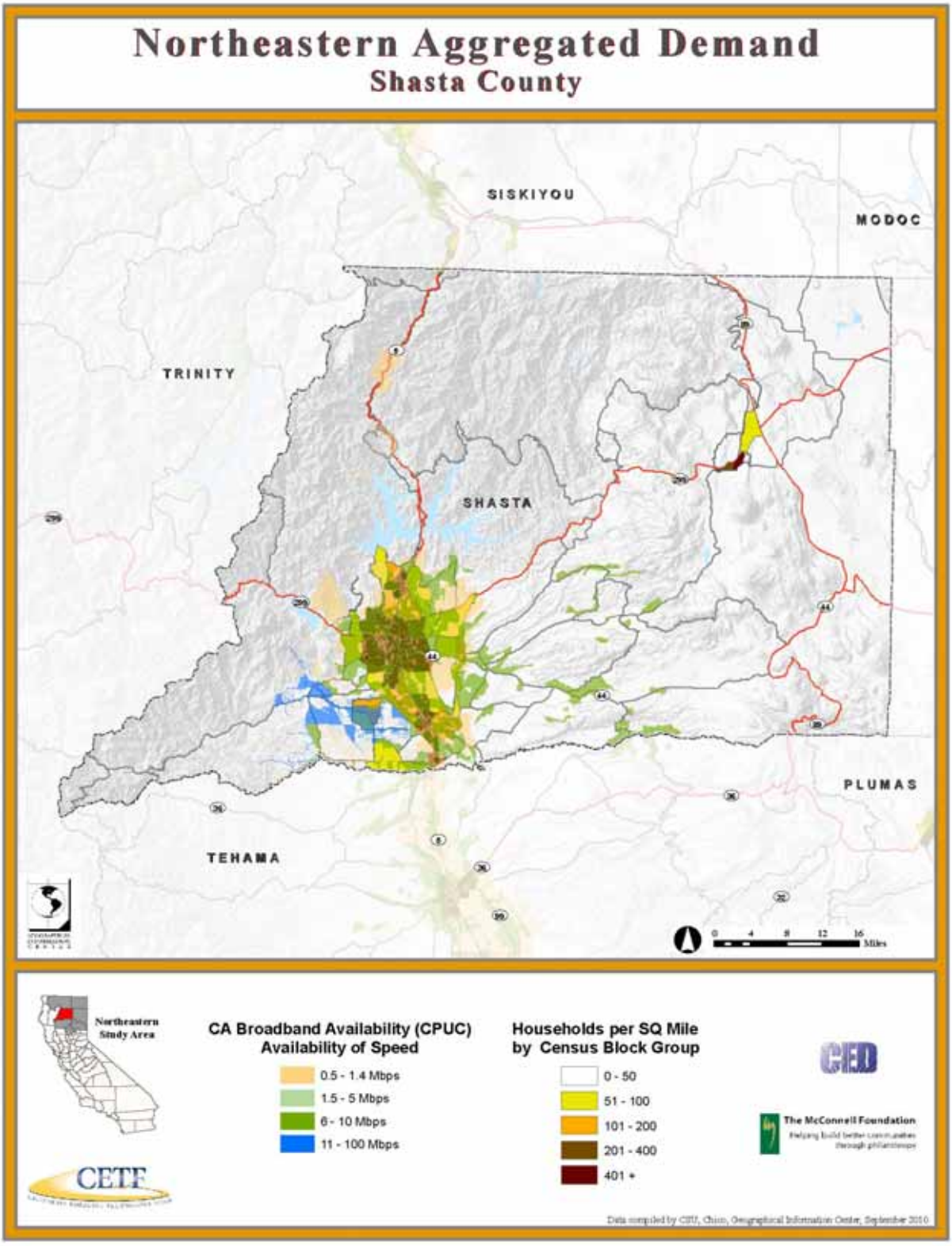
Map 25. CPUC Infrastructure Coverage Map, Modoc County (Summer 2010)



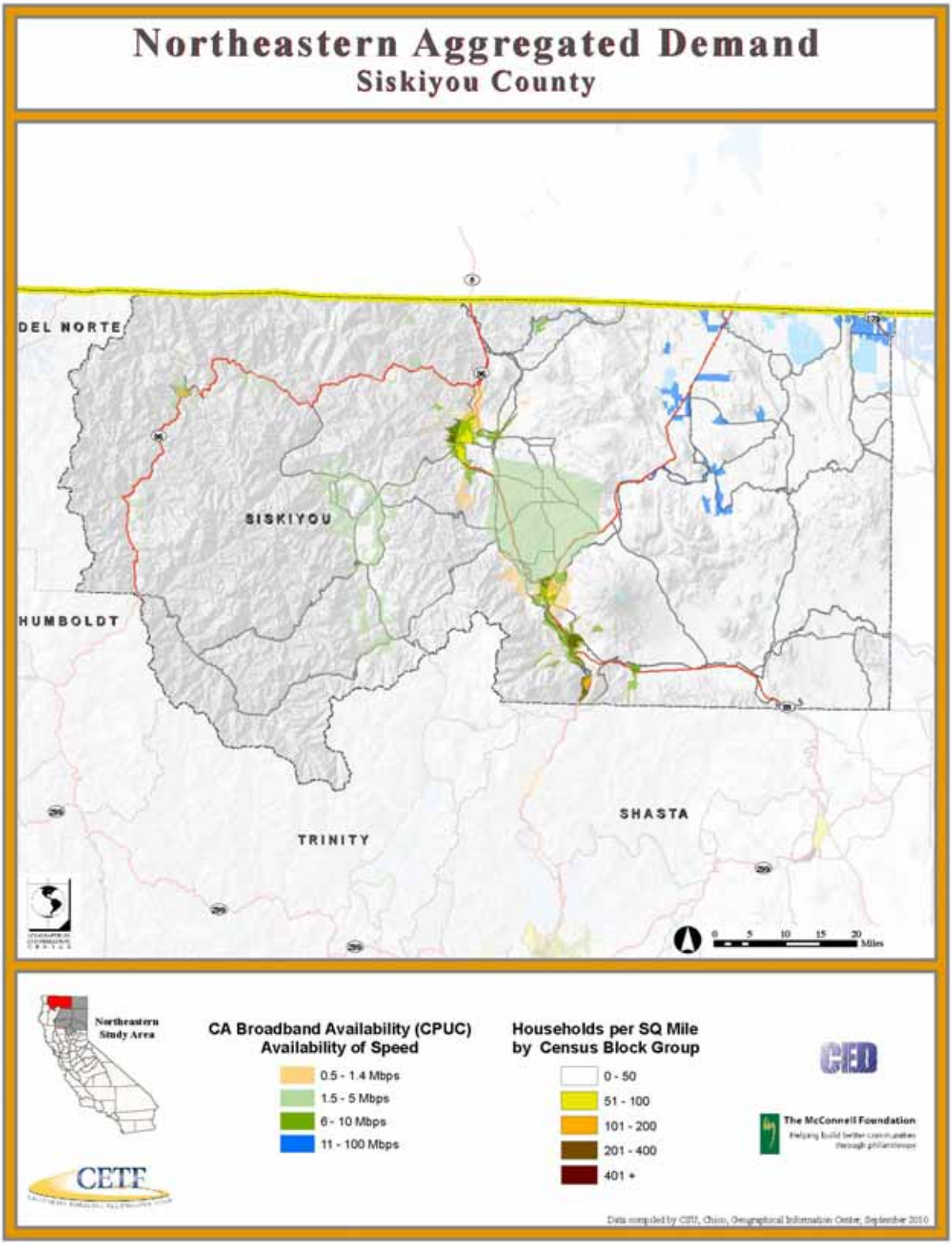
Map 26. CPUC Infrastructure Coverage Map, Plumas County (Summer 2010)



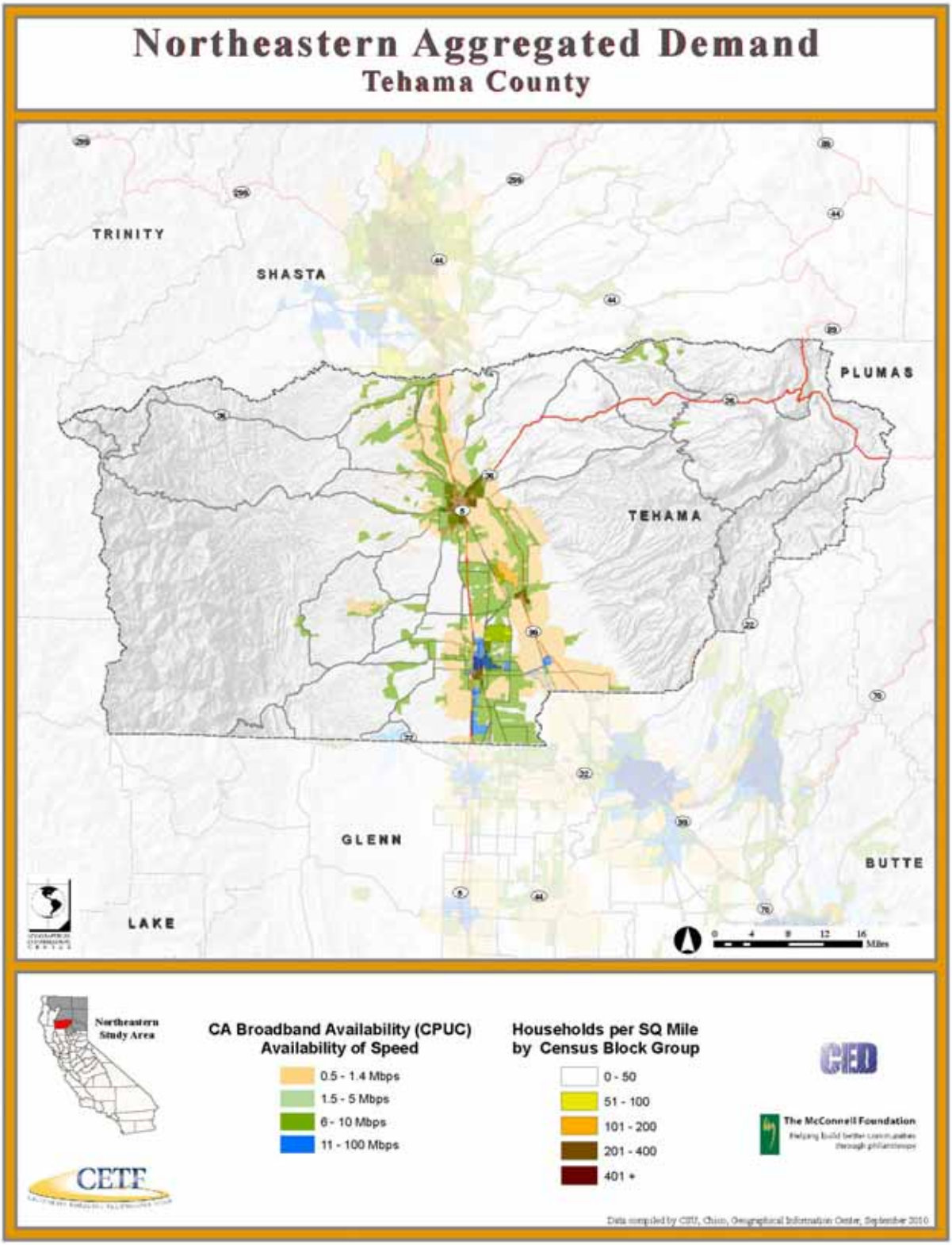
Map 27. CPUC Infrastructure Coverage Map, Shasta County (Summer 2010)



Map 28. CPUC Infrastructure Coverage Map, Siskiyou County (Summer 2010)



Map 29. CPUC Infrastructure Coverage Map, Tehama County (Summer 2010)



C. Alternative Infrastructure Scenarios

i. Need

In its final report issued in January 2008, **"***The State of Connectivity: Building Innovation Through Broadband,***"** the California Broadband Task Force recommended seven key actions to help our state achieve fast, reliable and affordable broadband services. The first recommendation was:

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

In making this recommendation, the Task Force stated, "Advancing new incentives for deployment and improving existing programs will create a world-class broadband infrastructure for California."

In February 2011, the Federal Communications Commission (FCC) created 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 and the first is:

"At least 100 million homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speed of at least 50 megabits per second."

While there has not been a focused statewide initiative to bring high-speed broadband infrastructure to all California, over the past three years there have been efforts to move forward on the California Task Force and NBP recommendations. Most notably, the following three projects:

1. The *Central Valley Next Generation Broadband Infrastructure Project* (CVNGBIP, www.cvngbip.org)
2. The *Plumas-Sierra Rural Electric Cooperative* (www.psrec.coop)
3. The *Digital 395 Project* (www.digital395.com)

They are currently being implemented with grant assistance from the federal American Recovery and Reinvestment Act (ARRA) Broadband Programs) and the California Advanced Services Fund (CASF), as well as private investment. They will bring significant middle-mile and last-mile broadband capacity and capabilities to 23 counties in the Central Valley and Sierras.

Over the past three years the CPUC has approved CASF funding for several projects in Northern California. One of the most notable is the Route 36 Project being implemented by IP Networks. This project will provide a middle mile fiber route along Route 36 through Humboldt and Trinity counties connecting the coast to the I-5 corridor.

Unfortunately, many of the CPUC approved projects have not been implemented because they did not receive grant funding from the ARRA program.

Today, 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) still do not have a comprehensive, integrated, open access,

And, none of the counties has a comprehensive last-mile infrastructure in place. In essence, these counties are underserved. In fact, the Federal Communication's (FCC) Sixth Broadband Deployment Report reported that eight entire counties in California are unserved. Four of these unserved counties are in the 16 Northern California (Modoc, Siskiyou, Tehama and Trinity).

As part of the California Emerging Technology Fund's (CETF) program rural regional consortia were created to promote the expanded availability of broadband Internet services. Four of these regional consortia are associated with the 16 counties in Northern California. CETF funded these four consortia to undertake studies to determine broadband demand aggregation, supply and existing plans to bring broadband to each of the 16 counties. These regional efforts align as shown in this figure:

Redwood Coast Connect Consortium	Del Norte, Humboldt, Mendocino, and Trinity
Northeastern California Connect Consortium	Butte, Lassen, Modoc, Plumas, Shasta, Tehama, and Siskiyou
Upstate California Connect Consortium	Colusa, Glenn, Lake, and Sonoma
Connected Capital Area Broadband Consortium*	Yolo

** The Connected Capital Area Broadband Consortium also includes Sacramento, Sutter, and Yuba counties. They are not considered here as part of rural Northern California.*

The following provides a snapshot profile and a comparison of the 16 counties in Northern California to the State of California, and the entire United States.

The 16 counties encompassed have a 2010 population of 1,633,967. Of this total 622,555, or 55.4% live in 42 incorporated cities and towns in the counties. The population for this entire region represents 4.39% of the population of the State while the region covers 43,298 square miles, or 27.76% of the State's geography. Whereas, there is an average of 238.9 persons per square mile statewide, the average for this region is 37.7 persons per square mile. The diversity of geography in these 16 counties presents challenges to the deployment of broadband infrastructure.

Land

- California covers 155,959 square miles or 4.4% of the USA
- 16 Northern Counties cover 43,298 square miles or 27.76% of California

Population

- California's populations is 37,253,956 or 12.07% of the USA
- 16 Northern Counties' population is 1,633,967 or 4.39% of California

Number of Households as of 2010

- California households are 12,577,498 or 10.82% of the USA
- 16 Northern County households are 631,402 or 5.02% of California

Median Household Income

- The USA median household income is $50,221
- California' median household income is $58,925 or 17.33 higher than USA
- 16 Northern Counties' median household income ranges from $33,546 to $61,985

Persons Living Below the Poverty Levels

- 14.3% in the USA
- 14.2% in California
- From 9.5% to 22.1% in the 16 Northern Counties

Number of Firms as of 2009

- The USA has 28,524,226 firms.
- California has 3,532,132 firms or 12.4% of the US firms.
- 16 Northern Counties have 151,564 firms, or 4.29% of the California firms.

Potential Number of Anchor Institutions

The 16 Northern California counties have 109 potential anchor institutions identified to be part of the NCBP. This number includes 40 Hospitals, 20 K-12 County Office of Education sites 14 Community College sites, 16 County/Main Libraries, 16 Public Safety Answering Points, and three (3) California State University campuses.

Redwood Coast Aggregation Studies

The Redwood Coast Rural Action (RCRA), a regional network of community leaders in partnership with the California Emerging Technology Fund (CETF), undertook a broadband aggregation study in 2009. This study was envisioned to be the first phase in an ongoing initiative to make broadband Internet available to all residents in the Redwood Coast Region. The study focused on analyzing:

- Demand–including willingness to pay, the relative importance of broadband to homes and businesses, present uptake rates, and potential for and challenges to demand aggregation.

- Supply–including mapping of current coverage, identifying unserved and underserved communities, and identification of critical missing infrastructure.

- Current policy climate, including identifying policy barriers to rural deployment as well as opportunities for advocacy.

According to the January 2009 Redwood Coast Connect Report:

Demand for Broadband: "Participants (63%) consider Internet access at home to be either of critical importance or very important. Those who do not subscribe to Internet at home cite a lack of availability and excessive cost as the primary reasons for not subscribing."

Supply of Broadband: The Report found that over 90% of the study population has a personal computer. However, sixty-nine percent of the respondents were not being served by broadband access (either no Internet access, or access by dialup only).

Keys to Bringing Broadband into this Region: The Report implies the key to moving forward is to develop a "middle mile" fiber-based infrastructure through these four counties to provide: 1) backhaul transport to key hubs north, south and east, 2) diversity and redundancy, and 3) "last mile" service providers connectivity to this infrastructure so they can provide customers with cost-effective broadband services.

The Report cites the important role that community anchor institutions, libraries, schools and colleges, emergency services entities and major health care facilities, as well as, government agencies play as pillars to justify and ensure the sustainability of such an infrastructure.

Finally, the Report points out that research confirms that few communities in rural parts of the country are economically viable service areas for broadband providers. That is why they are unserved and underserved today. Consequently, the Report suggests the need to provide some one-time capital funding to jump-start providing this needed "middle mile" infrastructure to the Redwood Coast Region.

The Broadband Needs of Community Anchor Institutions

As recognized in the recent American Recovery and Reinvestment Act broadband program and as pointed out in the Redwood Coast report, community anchor institutions form the keystone to making the case for building out a comprehensive middle mile infrastructure to serve every region in the state, including all of Northern California.

Anchor institutions are unique in that they serve local citizens not only with their own services and resources but draw on the resources and services of other like institutions across the region, state, country and globe. Consequently, they have recognized they not only need access to the Commodity Internet, but need network interconnectivity amongst themselves. The following is a summary of the status of networking interconnectivity by anchor institution type within California.

California K-Graduate Education Institutions Interconnected via CENIC

The California research and education community has over 40 years of experience of providing connectivity and interconnectivity between and amongst educational institutions. In September 1969 UCLA Professor Leonard Kleinrock and his colleagues successfully passed data over telephone lines between UCLA, Stanford and UC Santa Barbara for the first time and as a consequence launched the networking era we now enjoy.

Since the early 1970s the two public university systems (UC and CSU) and the private universities (Stanford, Caltech and USC) have been interconnected within the State and with sister institutions nationally through a variety of research and education networking consortia. In 1997 they formed a not for profit organization, the Corporation for Education Network Initiative in California (CENIC). Within a few years they were joined by the California Community College System and the K-12 System. For nearly 15 years CENIC has provided the backbone (“middle mile”) networking capability connecting all 10 UC campuses, the three private universities, all 23 CSU campuses, 117 CC districts and campuses, and all 58 County Office of Education designated sites that are part of K12HSN (an organization formed to be the equivalent of systems offices only for networking) to each other statewide, to other regional research and education network nationally and internationally and to the Commodity Internet.

These 211 sites are considered the anchor sites on the CENIC statewide network infrastructure connecting them each other statewide, to other research and education institutions nationally and internationally and to the Commodity Internet. In essence, nearly 10 million students, faculty and staff associated with these anchor sites have connectivity worldwide via CENIC. In the case of the K12HSN, utilizing CENIC networking, each County Office of Education (COE) has the responsibility to connect

their school districts and sites to the COE hub site. The same is true for Community College District offices.

CENIC owns and operates statewide fiber-based backbone that directly connects to 67 of the 211 anchor sites to the backbone via fiber including: all 13 research universities, 15 of the 23 CSU campuses, 20 of the 117 CCC anchor sites, and 19 of the 58 COE anchor sites (NOTE: these numbers include the Central Valley sites now under development, expected to be completed mid-summer 2013); and leased circuits to the remaining 8 CSU campuses, 97 CCC districts and 39 County Offices of Education.

Consistent with the National Broadband Plan, the goal of CENIC has been to provide direct fiber off its statewide backbone to all 211 research and education anchor sites providing a minimum of 1GE service to each anchor site.

Network Interconnectivity of California Libraries

The California State Library *"Strategic Plan: July 2010 to June 2013",* sets forth as one of its goals:

> *"Ensure libraries in the state have effective connectivity, content and tools to access resources."*

Within this goal one of the key objectives is for broadband connectivity to be increased by 50% for 75% of public libraries in the state by June 2013.

Within California State Library's strategic plan there is a 5-year Library Services and Technology Act plan that has a goal of technological access for all. To move towards that goal each library is called on to develop library services that provide all users access to information through local, state, regional, national, and international electronic networks.

The libraries in the 16 counties belong to a regional cooperative, NorthNet Library System. While it is a vision of NorthNet to interconnect all the libraries in these 16 counties, currently there is not any network connectivity among these libraries.

NorthNet's goal is to expand broadband capacity and interconnect all 16 main and their branch library sites in Northern California. The 16 main library anchor sites in the NorthNet Library System need to have direct fiber connections to the "middle mile" backbone at 1 GE capability. Equally important these 16 anchor sites need to be connected other major library facilities in Central California and to the California State Library in Sacramento in a comprehensive and integrated fashion.

California Telehealth Network (CTN)

One of the seven actions recommended by the California Broadband Task Force was:

"Create a statewide e-health network "

This recommendation is currently being pursued as the California Telehealth Network (CTN) project. The CTN is the result of the work of a statewide coalition of healthcare, technology, government, and other stakeholders that in 2007 pursued and secured a $22.1 million three-year grant from the FCC Rural Health Care Pilot Program grant to use telecommunications and health care technology to significantly increasing access to acute, primary and preventive health care in rural California. The California Emerging Technology Fund, and UnitedHealth/PacifiCare provided additional funds.

The University of California, through the UC Davis Medical Center, has been managing the project. An advisory council, consisting of experts from state government, rural healthcare, telemedicine and technology, has provided project guidance. Management of the CTN is now being transitioned to an independent 501(c) 3 non-profit corporation.

In February 2011 it was announced that 25 medical facilities were hooked up to the California Telehealth Network. CTN has awarded AT&T a $27 million to provide the circuits to the health sites during the three-year pilot period.

CTN's long-range goal is to connect over 800 rural and underserved health facilities across the state. Of the FCC Rural Health Pilot Project Certified Eligible Sites in California there are 124 health sites on the list from across the 13 Northern California counties. There are 40 major hospitals in the 16 counties that are potential anchor sites.

The ability of the CTN to reach all 124 sites in Northern California and do so with greater capacity is dependent upon a robust "middle mile and "last mile" infrastructure across all 16 counties.

California Public Safety Interoperability Communications Network

One of the six goals in the "*National Broadband Plan"* is:

> *"To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network."*

The NBP further stated "broadband can bolster efforts to improve public safety and homeland security by allowing first responders to send and receive video and data, by ensuring all Americans can access emergency services and improving way Americans are notified about emergencies."

To successfully have a nationwide, wireless, interoperable network there also needs to be nationwide, fiber-based, infrastructure to provide the transport of video and data from one location to another in the nation. In part, the American Recovery and Reinvestment Act Broadband Program was designed to build “middle mile” broadband infrastructure in underserved and unserved areas of the country that connected anchor institutions like Public Safety Answering Points via fiber.

California has been working at the issue of interoperability for the past decade. The California Statewide Interoperability Executive Committee (CalSIEC) was created in 2003 and operates under the California Emergency Management Agency (CEMA). In 2008 the California Emergency Management Agency issued the California Statewide Communications Interoperability Plan (CalSCIP). CalSCIP. CalSCIP is the first-ever comprehensive initiatives- based strategy that will be implemented to advance interoperable communications capabilities of California’s public safety community. This plan is to be updated every two years.

The California vision is to:

> *“By 2017, ensure all local, regional, tribal, state and Federal public safety first-responders and designated public service organizations operating with California are able to communicate in real time across disciplines and jurisdictions to respond effectively during day-to-day operations and major incidents.”*

To assist in carrying out this vision CalSIEC is divided into regional planning areas. The CalSIEC Northern Planning Area of California (NPAC) encompasses 18 counties plus the Tribal entities within these counties. Fourteen (14) of the 16 counties in the NCBP (except Sonoma and Yolo) are part of NPAC.

For Northern California, NPAC has set 2013 as the target date to achieve the state’s vision of interoperability. Consultants for NPAC have developed an NPAC Point-to-point Concept for interconnectivity. The first phase calls for interconnecting the major PSAPs in each county to serve as anchor sites for the NPAC network. In Phase 2 NPAC Radio sites would be linked into one of the anchor sites.

The Need: Summary and Conclusion

As the summaries of the three research studies show the deployment and adoption of broadband throughout the 16 Northern California counties lags the rest of the state. And current projects in process, including the Route 36 project, represent a singular strategy based on a return on investment model, resulting in patchwork quilt development.

The California Broadband Task Force has called for a:

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

In making this recommendation, the Task Force stated, "Advancing new incentives for deployment and improving existing programs will create a world-class broadband infrastructure for California."

The current patchwork quilt approach will not result in the full deployment of high-speed broadband infrastructure throughout Northern California for years to come, if ever. As a consequence, the special needs of the anchor institutions may never be met in this region of the state.

While the population of these 16 counties represents 4.39 percent of the total population of the state of California, its geography is 27.76 percent of the state. In addition the topography of these counties is diverse and varied. Consequently, deploying broadband is a challenge of distances between population centers, and traversing this rugged terrain calls for considering new strategies for getting the job done.

Therefore, CED recommends that a new set of comprehensive and workable strategies be developed and implemented to bring broadband capabilities to these 16 rural counties.

Such strategies for Northern California may call for different incentives and more significant changes to existing programs than envisioned by the Task Force and that actually have been implemented to date.

ii. Strategies

CED does not claim in-depth expertise in the field of telecommunications/broadband. Nor is its staff steeped in knowledge of successful strategies that have been employed in other fields that might be adapted to this circumstance. What follows is our best attempt to outline a set of potential strategies based on common sense and some research into historical approaches used to deploy other infrastructure capabilities (i.e. electricity and telephone services) in rural counties throughout the country over the last century.

There a wide range of strategies that might be considered in this instance. CED has identified four basic strategies that should form the foundation of a complete set of strategies. These include:

- Develop a Comprehensive Plan;
- Select or Create the Organization(s) to Implement the Plan;
- Identify and Name Facilitation and Monitoring Groups; and,
- Formulate an Appropriate Funding Plan.

STRATEGY #1 - Develop a Northern California Broadband Plan

The first basic component of an overall set of strategies is to develop a comprehensive *Northern California Broadband Plan (NCBP)* to set the stage for implementing a robust, comprehensive, integrated, and open access fiber-optic middle-mile and a combination fiber-optic and wireless last-mile infrastructure throughout these 16 Northern California counties.

At the foundation there must be a comprehensive integrated middle mile fiber-based infrastructure that crosses all 16 counties and has the capacity needed today and the growth potential for the long-range future. Once this 16-county “middle mile” blueprint is known, meaningful deployment can begin.

Also, with this foundation a “last mile’ plan can be developed and implemented for each of the 16 counties with the assurance that end users will ultimately have robust connectivity to the worldwide Internet.

The NCBP for this new Northern California Infrastructure should include direct fiber connectivity to major anchor institutions including K-12 County Office of Education sites, Community College districts and campuses, California State University campuses, major county-based Public Safety Answering Points, and major Hospitals. Equally important this broadband infrastructure will provide robust and cost-effective network access for local, state and federal government agencies, hundreds of businesses and thousands of households throughout the 16 counties.

Such a new Northern California infrastructure would be linked to the Central Valley Next Generation Broadband Infrastructure Network, the Plumas-Sierra Network Infrastructure and the Digital 395 Network currently being implemented resulting in 36 counties from the most northern counties of Del Norte, Siskiyou, and Modoc as far south as Kern and Inyo counties encompassing counties in the Redwood Coast, Northeastern California, Upstate California, the San Joaquin Valley and the eastern Sierras being linked in a cohesive fashion.

The timing is right to employ this strategy.

In 2010, the State Legislature passed Senate Bill 1040 increasing funding for the California Advanced Services Fund (CASF) by an additional $125 million to support broadband deployment statewide and to position California to maximize opportunities under the new National Broadband Plan released by the Federal Communications Commission.

On June 9, 2011, the White House issued an Executive Order creating the White House Rural Council dedicated to rural economic development. Sixteen (16) percent of the American population lives in rural counties that present enormous economic potential for the country. The Council's role is to find ways to expand access to capital necessary for economic growth, promote innovation, improve access to health care and education, and expand outdoor recreational activities on public lands. Promoting the growth of rural infrastructure, including broadband infrastructure, is among the Council's key tasks.

By preparing the NCBP, the CPUC and the White House Rural Council would have access to a comprehensive, integrated, open access, middle-mile and last-mile infrastructure plan that covers the communities in 16 rural counties that could serve as a model for the country.

STRATEGY #2 - Select or Create Organization(s) to Implement the Plan

The second basic component of an overall set of strategies is to select or create the vehicle(s) to implement the *Northern California Broadband Plan (NCBP).* As stated, the NCBP would be comprised of a comprehensive 16 county middle mile infrastructure and 16 individual county "last mile" infrastructure plans. The strategic vehicle(s) model to implement the 16-county "middle mile" infrastructure may differ from that used to implement the individual county "last mile" plans. The following addresses them separately.

Models for Deploying the Middle Mile of the NCBP

There is a continuum of potential models to implement the *"middle mile"* infrastructure of the NCBP. Three potential models are outlined here.

A.1 Current Provider Model. There are a number of telecommunications companies already providing middle mile capacity to various parts of the Northern California. In many instances they have in place segments of fiber-based infrastructure that could be part the NCBP comprehensive, robust, integrated and diverse "middle mile" infrastructure that interconnects all 16 counties. As stated earlier, past deployment has been a patchwork quilt with some communities being served and others not. And, one company's infrastructure may not normally interconnect with another company's build.

For this model to be effective in the future two significant changes would need to happen. First, all future deployment of "middle mile" fiber would be implemented to meet the requirements of the overall NCBP and its design. This would be an absolute requirement in all instances that involve the use of state or federal funds.

Second, long-term agreements would need to be struck among and between the providers for the use of their existing fiber-based infrastructure to serve as segments in the NCBP. These agreements would be based on a set of standards and expectations that would apply to all such agreements.

An advantage of this model is that it builds the “middle mile” infrastructure using the companies that have already invested in this region of the state. A disadvantage will be the challenge of executing a series of complex contractual agreements to achieve the comprehensiveness and integrated requirements desired for the NCBP. Another disadvantage could be that current providers would not take on deployment of new segments that they cannot justify the return of investment to their stockholders.

A.2 Joint Build Model A second model is to create a joint venture among the current telecommunications providers, the state, the 16 counties and other investors to build and deploy the NCBP “middle mile” infrastructure across the 16 counties. These entities would pool their resources including existing fiber-based infrastructure and funds to deploy the infrastructure. Once the infrastructure is in place the assets (strands of fiber) would be appropriated back to the participants based on the percentage of their investment.

With the exception of contracting with a third party to provide the O&M for the fiber, each investor would be free to use its assets as it determines.

One advantage of this model would be the assurance that the entire middle mile infrastructure would be installed. A second advantage is that it should reduce the need for a series of complex agreements among current providers. The major obstacle to this model might be the reluctance of current providers to pool a portion of their fiber assets.

A.3 Cooperative Model A third model is to create a broadband cooperative among the current telecommunications providers, the state, the 16 counties and other investors to build and the NCBP “middle mile” infrastructure across the 16 counties and then to manage and operate this infrastructure as a unified system.

These entities would pool their resources including existing fiber-based infrastructure and funds. If current providers’ fiber can serve as segments of the NCBP, they would invest or sell that fiber to the cooperative. The cooperative would secure the necessary funds through grants, loans and private investors to deploy the entire middle mile infrastructure as well as to underwrite the start-up of operations.

After a brief start-up subsidy the cooperative would sustain itself with revenue from providing middle mile backhaul services to last mile providers and other backhaul providers.

An advantage of this model would be the unification of the effort throughout the life of the fiber. The major disadvantage is the challenge of start-up and sustaining the entity.

Models for Deploying Last Mile Infrastructure in Each County

There is a continuum of potential models to implement the *"last mile"* infrastructure of the NCBP in each of the 16 counties. Two potential models are outlined here.

B.1 Current Provider Model. There are a number of telecommunications companies already providing last mile services to various communities in the 16 Northern California counties. As stated earlier, past deployment has been a patchwork quilt with some communities being served and others not. For the most part, deployment has been based on a company's assessment that it can garner a return on its investment and maintain a sustainable business.

By having each county develop a "last mile" plan as part of the NCBP, future deployment can be mapped to the county plan and priorities. This can be especially true when state or federal funds come into play to create the infrastructure.

B.2 County Broadband Authority Model. Another model would have a county create a Broadband Authority, similar to a transportation or fire authority that some counties have in place. Under this model the Broadband Authority would construct, install, own, manage, operate, maintain, repair or replace the "last mile" infrastructure throughout the county.

The county Broadband Authority would be responsible for all aspects of the "last mile" plan.

STRATEGY #3 - Commission Group(s) to Facilitate and Monitor Implementation of NCBP Plan

The third basic component of an overall set of strategies is to have in place the right groups to facilitate and monitor the implementation of the *Northern California Broadband Plan (NCBP).*

State Level

In its final report issued in January 2008, *"The State of Connectivity: Building Innovation Through Broadband,"* the California Broadband Task Force recommended seven key actions to help our state achieve fast, reliable and affordable broadband services. The State Legislature and Governor have the ultimate responsibility to facilitate and monitor

the successful achievement of the Task Force's recommendations. In as much as the *Northern California Broadband Plan (NCBP)* is to be developed and implemented in accordance with the Task Force's Report the State Legislature and Governor should endorse and facilitate the successful implementation of the NCBP. Once the NCBP is actually developed formal endorsements by the State Legislature and Governor should be secured.

At the state level monitoring the successful implementation of NCBP should be the responsibility of the California Public Utilities Commission (CPUC). Its programs including the California Advanced Services Fund (CASF) should use the NCBP as the guide for administrating such programs in Northern California.

Regional Level

As part of the California Emerging Technology Fund's (CETF) program rural regional consortia were created to promote the expanded availability of broadband Internet services. Four of these regional consortia are associated with the 16 counties in Northern California. CETF funded these four consortia to undertake studies to determine broadband demand aggregation, supply and existing plans to bring broadband to each of the 16 counties. These regional consortia align as shown below:

Redwood Coast Connect Consortium	Del Norte, Humboldt, Mendocino, and Trinity
Northeastern California Connect Consortium	Butte, Lassen, Modoc, Plumas, Shasta, Tehama, and Siskiyou
Upstate California Connect Consortium	Colusa, Glenn, Lake, and Sonoma
Connected Capital Area Broadband Consortium*	Yolo

** The Connected Capital Area Broadband Consortium also includes Sacramento, Sutter, and Yuba counties. They are not considered here as part of rural Northern California.*

The membership of these consortia is composed of government entities (county, city/town, unincorporated districts, state and federal), Native-American communities, educational institutions, libraries, public safety entities, health delivery facilities, community and non-profit organizations, local businesses, telecommunications providers, electric utilities, and other organizations. It is anticipated these four regional consortia will receive funding from the CPUC's Rural and Urban Regional Broadband

Consortia Account (Consortia Program) to promote the widespread availability of high-speed broadband advanced services in the counties with their region. Therefore, it make sense to have these four consortia have the responsibility to work together to develop the NCBP, especially the “middle mile” infrastructure, then to facilitate its implementation and advise the CPUC and others on the progress of actual implementation.

County Level

The leadership of each county should be active participants in their respective regional consortium to ensure that the “middle mile” component of the NCBP is going to serve their county. In addition, with the assistance of the regional consortium each county needs to develop a “last mile” plan, facilitate its implementation and monitor the progress being made.

Community Level

The leadership of the community and community groups should be active participants in their respective regional consortium to ensure that the “middle mile” component of the NCBP is going to serve their community. Likewise they should be involved in the county’s development and implementation of the county “last mile” plan.

STRATEGY #4 - Formulate a Funding Plan for the Implementation of the NCBP

The fourth component of an overall set of strategies is to formulate a comprehensive funding approach to ensure the implementation of the *Northern California Broadband Plan (NCBP)* in a cohesive fashion and timely manner.

The current funding programs for broadband at the federal and state levels are based on “a finger in the dike” approach concentrating heavily on filling the unserved and unserved areas based on the providers’ advertised broadband speeds for specific census blocks. Furthermore, these programs seek only to meet the minimum speed standards of today and are not overly concerned about the long-range capacity needs. In essence, these funding programs foster the current patchwork quilt deployment of broadband nationwide and within California.

While these funding programs have met very localized needs they may or may not satisfy the long-term goal of providing all California advanced high-speed broadband capacity and capabilities. This fact becomes quite evident in the 16 counties in Northern California. Over the past three years the CPUC approved CASF funding for several projects in Northern California. Aside from the Route 36 Project being implemented along Route 36 through Humboldt and Trinity counties, many of the CPUC approved

projects have not been implemented because they did not receive grant funding from the ARRA program.

To successfully implement the NCBP, there needs to be a significantly different funding approach for the “middle mile” component of the NCBP and some adjustments to the current programs to enable the effective deployment of the county-based “last mile” plans.

Funding Plan for Middle Mile of NCBP

As stated in Strategy #1, at the foundation of the NCBP is based on deploying a comprehensive integrated “middle mile” fiber-based infrastructure that crosses all 16 counties and has the capacity needed today and the growth potential for the long-range future. Given the vast geography, 43,298 square miles; the diverse topography, rugged mountain ranges that border the Upstate Valley on the west, east and north; and, the spread out population of 1.6 million citizens, the traditional federal and state programs that rely solely on telecommunications providers justifying a return on investment will not work.

The implementation of the “middle mile” infrastructure across the 16 northern counties calls for a funding approach similar to what was done in building out the Interstate Highway system. The Interstate Highway System came to be because the federal and state governments agreed that such an infrastructure was needed to advance the economy of the nation and the quality of life for the citizens.

It was determined that the federal and state governments had to shoulder the financial costs. In that instance there was a 90%-10% federal to state match. In the case of the NCBP it is proposed the match be reversed 90% state and 10% federal. This is consistent with the Task Force recommendation to *“Build out high-speed broadband infrastructure to all Californians.”*

Given the State Legislature’s passage of Senate Bill 1040 increasing funding for the California Advanced Services Fund (CASF) by an additional $125 million to support broadband deployment statewide now is the time to make the case for 90% state funding for the NCBP “middle mile” infrastructure.

At the same time a special appeal should be made to the recently created White House Rural Council to find the federal funds for the 10% match. This new Council is dedicated to rural economic development and to find ways to expand access to capital necessary for economic growth, promote innovation, improve access to health care and education, and expand outdoor recreational activities on public lands by promoting the growth of rural infrastructure, including broadband infrastructure. The 16 counties in Northern

California, through implementation of the NCBP, provide a perfect example for the Council to demonstrate the achievement of its goals.

Strategies: Summary and Conclusion

If the 16 rural counties in Northern California are ever to achieve true broadband capacity and capabilities equivalent to the urban and suburban areas of California, it is going to take a special focused effort. In Part B four basic strategies have been outlined as the cornerstones of an overall set of strategies. While these strategies need more development and refinement, they offer a beginning.

i. ARRA Proposed Project Applications - Round 1, August 2009. In an effort to build out infrastructure to provide broadband coverage throughout the NCC region, a number of applications were submitted by a variety of service providers. The proposed projects covered both middle mile and last mile solutions, including an application for a Public Computing Center and a Sustainable Broadband Adoption grant. The NorCal Broadband Access Consortium developed seven separate applications prior to submission to ARRA for Round 1 funding, yet only five were submitted, all of which were included in the Governor's List of Recommended Projects (Appendix --). To date, none of these projects has been funded, but they do represent the market's reaction to the need for broadband, and the industry's best solutions to making broadband available to residents and businesses throughout the NCC region. The following summarizes the projects submitted to either the Department of Commerce or the Department of Agriculture for ARRA funded broadband infrastructure development:

   - ✓ Mediabon (Broadband Associates/CENIC): Middle Mile, 11-county Fiber Optic Backbone, serving community anchor institutions throughout Butte, Colusa, Glenn, Lake, Lassen, Modoc, Plumas, Sierra, Shasta, Sutter and Yuba counties; $210 million.

   - ✓ Siskiyou Broadband Consortium (Siskiyou County EDC, Ericsson, Root Automation, Snowcrest, Western Blue): 3 separate applications, one each for Middle Mile, Last Mile and Public Computing Centers; $25.89 million.

   - ✓ Valley Internet, PNC: Last Mile, Wireless Network to Lake, Colusa, Glenn, Napa and Solano Counties; $6.42 million.

ii. ARRA Proposed Projects - Round 2, March 2010. Six independent applications were submitted, and *to date* four have been awarded.

   - ✓ Cal-Ore Communications, Inc.: Wireless broadband services to central Siskiyou county, predominantly unserved; $1.34 million. ***Awarded August 2010***

- ✓ Central Valley Independent Network (CENIC): 1,371-mile fiber optic backbone through 18 Central Valley counties; $46.6 million. ***Awarded August 2010***

- ✓ Exwire: Last Mile fixed wireless broadband via WiMax technology to >4,000 homes, businesses and anchor institutions in Nevada County's eastern region, primarily serving the Lake Tahoe Basin; $5.25 million.

- ✓ Plumas Sierra Telecommunications: Middle Mile network project, 169 miles of new fiber optic cable delivering high speed Internet service for e-health care, advanced learning opportunities and economic development in 18 community anchor institutions, seven government facilities, two community colleges, two healthcare providers, a district hospital, a prison and Feather River College; $13.8 million. ***Awarded August 2010***

- ✓ Siskiyou County Economic Development Council: Last Mile fiber-optic backbone to provide currently unavailable DSL-technology to multiple communities in central Siskiyou county, serving >2,000 households and businesses; $12.5 million.

- ✓ SmarterBroadband: Last Mile project for fixed wireless service to Grass Valley, Nevada County, one of California's more geographically challenging areas; $1.8 million. ***Awarded August 2010***

- ✓ Valley Internet, PNC: Re-application to offer wireless high-speed Internet to Lake County's >8,000 households and businesses that do not currently have access; broadband connectivity will be free of charge to all anchor institutions within coverage area; $5.47 million.

iii. In addition to the projects submitted under ARRA, the area that was not specifically addressed with a market-based solution during the period of the study was Modoc County, the one county with the least amount of coverage. However, it has come to our attention recently (late summer 2010) that Frontier Communications has completed laying fiber along Route 299 to supply broadband coverage to the Shasta, Lassen and Modoc counties. This new fiber run begins in Redding, passes through the northwestern corner of Lassen county, continues along Rt. 299 Eastbound into Modoc County through Burney and Alturas, on to and through Cedarville, servicing Surprise Valley, to terminate just inside Nevada's western border. Looking at the CPUC map (as well as the GIC map) this area stands out as the one neglected opportunity where there are a significant number of potential subscribers (households), and CSUC shared this news at a Modoc County Board of Supervisors meeting, and the Alturas City Council meeting, September, 2010.

Phase III: Final Report

The final phase was to produce this final report.

AGGREGATED DEMAND SURVEY RESULTS SUMMARY

Detailed results of the household surveys are provided in Appendix C; detailed results of the business surveys are provided in Appendix D. A summary of some of the more significant results appear in the following sub-sections.

A. Household Demand for Broadband Services

1. Demographics

Each survey respondent was asked their education level, race/ethnicity and household income. It was not the study's purpose to correlate demand for broadband service with these demographic characteristics, per se; these demographics were captured for general information and characterization of the respondents using or demanding broadband services. For the NCC project area, a total of 1,836 household surveys were completed, and the majority of respondents were in either Butte County (41.8%), or Shasta County (32.4%); 78.7% of the households lived within one mile of a city or town. A slight majority of respondents for the household surveys were female (50.5%), an overwhelming majority were Caucasian (81.5%) with at least some college, and/or a four-year degree or higher. The top two industries listed as employment setting were education (5.4%) and health care (5.0%), followed next by government (3.5%). When asked of employment status, 25.4% replied they were employed full-time, 9.2% said they were employed part-time, 45.3% responded they were retired, and 11.3% said they were unemployed. 32.3% said they earned less than $25,000.00, a slightly higher third (37.6%) earned between $25,000.00 and $64,999.00; 23.3% earned more than $65,000.00 per year. Also, the majority of respondents (69.9%) earned less than $64,999 per year, indicating that the lack of higher education and/or the lack of higher income are not significant factors in determining demand for broadband services.

2. Telecommunications Devices

Almost all of the household survey respondents (99.0%) said they had a land-line telephone service in their home, 72.7% reported owning a computer and 68.4% had a cell phone. Satellite television (42.5%), cable television (36.2%), video game system (27.5%), and wireless Internet (17.4%) comprised the entire list of telecommunications devices surveyed.

3. Internet Access at Home

During the survey period, more than two-thirds (69.3%) had some type of Internet access, with DSL Broadband cited as the type of Internet service used most often (55.0%), followed by cable t.v. modem (14.4%), wireless broadband (antenna, 13.2%), and telephone dial-up (12.0%). Nearly half (44.6%) said that Internet access is extremely important, and of the respondents surveyed without Internet access (unserved), the top three reasons were cited as:

a) Not available where I live (38.7%);
b) Too expensive (30.4%); and
c) Don't need broadband service (25.6%)

Of those without Internet service (although available, opted to not subscribe), the top two responses given were:

a) I don't need Internet at home (21.2%); and
b) I don't use a computer (19.3%).

4. Internet Access Outside the Home

Over half (55.8%) of the household respondents said they had access to Internet outside the home, most having access at either work (44.0%), wireless hot spots (32.9%), someone else's home (32.3%), or libraries (25.5%). Interestingly, these results correspond with those of Gold Country Project Connect, with libraries as the third highest rated location for Internet access outside the homes of Alpine, El Dorado, Nevada and Sierra counties.

5. Satisfaction and Willingness to Pay

Most (81.9%) of all the respondents with Internet service said they are satisfied or very satisfied with their Internet service, and only 7.3% said they were somewhat dissatisfied, dissatisfied and very dissatisfied. 60.3% paid either $39.99 or less per month, and contrary to Gold Country Connect project findings, 88.7% said they were not willing to pay more for a faster Internet connection.

B. Business Demand for Broadband Services

1. Demographics

A total of 800 business surveys were completed, the majority of respondents were in either Butte County (36.8%), or Shasta County (31.1%), and 85.1% of the businesses were located within one mile of a city or town. A slight majority of respondents for the business surveys were female (52.2%), an overwhelming majority were Caucasian (83.8%) with at least some college (40.4%), and/or a four-year degree (22.5%). When asked about the household income distribution of the business survey respondents, 30.55% refused to answer. Of those business respondents who did provide an answer to this question, 34.4% made less than $64,999 per year, and 35.2% earned more than $65,000.00 per year, with the income distribution range of $75,000.00-$99,000.00 as having the highest percentage of respondents (11.1%). The single highest reported industry in which the small businesses were located was retail (16.2%), seconded by construction (8.0%), followed in third place by finance, insurance, real estate (7.9%).

2. Telecommunications Devices

Nearly identical to results from the household surveys, businesses listed having as the top four telecommunications/services:

f. landline telephone (97.6%);
g. personal computer (84.1%);
h. Internet (75.4%);
i. Cell phone (59.1%).

3. Internet Access at Business

83.2% of businesses surveyed said they have some type of Internet service, the majority (61.3%) of businesses reported having DSL broadband, followed by 11.5% who had wireless WiFi broadband. 5.6% had dial-up service, and when asked what was the download speed of their Internet service, 66% said they did not know or were not sure. Regarding level of importance, 63.8% said Internet access was extremely important, and 12.4% said it was important.

Of those without Internet service (again, like households), the five (5) top reasons cited for not having Internet service were:

a) I don't need the Internet, 68.7%;
b) I don't use a computer, 40.3%;
c) I can access the Internet at other places, 8.2%;
d) I can't get Internet access at my business, 5.2%; and,
e) Internet access is too expensive, 4.5%.

Of the respondents who do not have Internet access at their workplace, 11.1% said they would like to connect their businesses to the Internet if service becomes available to their locations.

4. Internet Access Outside the Business

About three-fourths of all businesses (73.4%) said they had access to Internet service outside their business, of which 83.7% had access at their homes, and 24.0% use wireless hot spots.

5. Satisfaction and Willingness to Pay

When asked about their level of satisfaction, 89.7% said they were either satisfied or very satisfied with their Internet service provider. Similarly, 84.6% said they were either very satisfied or satisfied with the reliability of their Internet service. Highest percentage category of an Internet monthly service was $20.00 or less, of 26.2%. Yet when asked if they were willing to pay more for a faster Internet connection, 82.7% said no.

C. Gross and Net Potential Markets

When aggregated over all seven counties, there is an opportunity for new or better broadband services, amounting to 40.5% of the overall household population and 14.3% of all the small businesses. Roughly translated, this equates to $35 million in potential annual revenue, from all seven counties combined. Because this demand is aggregated over the entire project area, it is difficult to identify or prove a sound business case for either new or improved infrastructure in any one specific locale. Further compounding the dilemma of deploying better broadband services to this region is that 25.3% of the households surveyed without broadband service do not want it, leaving an aggregated net result of 15.2% who do not want it.

However, given the high response from those who are dissatisfied or slightly dissatisfied with their Internet service (underserved), those who do not have access to Internet of any kind, including broadband services (unserved), and are willing to pay more for service, there presents a stronger opportunity for public - private partnerships. Where county and civic governments can engage and work with both ISPs and WISPs (supply), as well as the end users (the demand), the shared burden of the overall infrastructure investment costs and network management becomes more possible.

SUPPLY INFRASTRUCTURE

The existing supply infrastructure during the study was limited to major telecommunications providers and a small number of WISPs.

A. Pre-Project Status

Major telecommunication companies in the NCC project area include AT&T, Frontier, Sprint, Qwest and Verizon, and the sole cable provider, Comcast. These companies offer broadband services to the more densely populated areas of Chico, Corning, Red Bluff, Redding, Susanville, Quincy, Yuba City, and Marysville. DSL (digital subscriber line), Direct TV and Dish Network/TV (satellite) offer simply Internet services. Also, a small number of WISPs offer wireless Internet services to the smaller communities such as Alturas, Chester, [*for Upstate report*: *Colusa, Lakeport, Kelseyville],* Oroville, Portola, Weed, Williams, and Yreka. Broadband via fiber optic is not currently available to these locations.

The main transportation artery from the Sacramento Valley to the Oregon border is the I-5 corridor, traveling north-south via the NCC project area's western counties, Butte, Shasta, Siskiyou and Tehama. Also in a north/south direction, Route 99 travels from Red Bluff (Tehama County), through Butte County to points south. Cell phone companies have used these main arteries as plot-lines for cell towers, however, despite flat sections of terrain where typically a line-of-sight is adequate for clear signal reception, cell phone signals are still dropped due to the distance some towers stand from each other, falling outside the recommended (or preferred) 3 mile radius. As discovered in the Gold Country Project, Internet users living near or traveling along this corridor are able to subscribe to a high-speed Internet service via mobile broadband access cards (available from AT&T, Sprint or Verizon) for home computers and laptops. However, although services are advertised at 10 Mbs or higher, actual speeds vary tremendously, depending on time of use and or type of data transmission.

B. Broadband Providers in the Project Area

1. General Coverage

There is, also, a fiber optic backbone infrastructure owned and maintained by Corporation for Education Network Initiatives in California (CENIC) that connects three of northern California universities: CSU, Chico; University of San Francisco (USF); and Stanford University. Installed in the early 1990s, this fiber optic backbone was planned as an initial test to link universities for information-sharing. Hugely successful in enabling these universities to share their respective on-line libraries and course selections, CENIC expanded its network throughout California, reaching as far north as Humboldt State University in Humboldt County, as far northeast as Modoc County (K-12), and as far south as San Diego. CENIC also has become the sole network provider

that offers Internet access at an extraordinary discount (as high as 40% less than competitive market prices) for all of the secondary, K-12 schools along these routes. Additionally, while there is dark fiber currently available within CENIC's backbone, due to extremely stringent licensing rules per the educational discount (known as the E-rate), CENIC does not offer any dark fiber to private enterprise for for-profit use.

2. Wireless Internet Service Provider Coverage

A small group of dedicated/persistent wireless providers are attempting to fill the gaps between the more urban, densely populated network areas and the more remote, rural areas that fall outside of cell phone tower reach.

Gold County Connect Project efforts listed the "rapid expansion of cell phone 3G broadband networks, and future 4G (Long Term Evolution) networks" as offering speeds considerably higher than what is currently available, and as predicted by that report, such 4G networks are having a direct impact on WISPs ability to remain competitive due to advances in the portable, hand-held personal data devices (PDA). As witnessed during the random telephone survey process, cell phone portability allows service subscribers considerable geographic freedom, and correspondingly, so do cell phone subscribers have access to the Internet via their cell phones, Blackberries, IPhones, etc., not requiring an Internet service to be offered strictly via hard wired or terrestrial-based infrastructure. How the WISPs can remain competitive was not intended as part of the original scope of work for the broadband demand aggregation studies, however, it was discovered that with the exception of Chico and Redding, given the extreme topological challenges ISPs and WISPs face, and the scattered population distribution across the entire NCC project area, smaller independent WISPs actually have a better and more direct access to consumers within their areas, offering wireless Internet service coverage to places the larger, land-based telecommunications and cable companies choose not to cover.

For example, AT&T offers telecommunications and Internet service to Quincy, the Plumas county seat, but has not extended service to Plumas County's more remote communities such as Taylorsville, or Indian River, or even Grae Eagle. Land-line telephone service is available, allowing for DSL, but no fiber has been laid, hence consumers served by Plumas Sierra Telecommunications (PST) often complain of slow speeds and bogged circuits. Sierra and Lassen Community colleges, and the Alliance for Workforce Development have expressed growing concerns about not being able to offer course training and certifications to students remotely as course curriculum and data files require more bandwidth than is currently available via DSL. While PST leases spectrum from AT&T and is therefore able to at least offer a wireless Internet service to its existing customer base, this still is limited as certain microwave frequencies used to transmit a wireless signal cannot bend at right angles, so therefore are unable to reach residents and or businesses nestled against a hill, or hidden deep behind dense forestation.

Similarly, both DM Tech based in Corning, or Valley Industrial Wireless of western Tehama County offer wireless Internet services, but these are re-sellers of existing bandwidth, and are limited by how much spectrum they can access via AT&T. However, as of August 2010, Frontier Communications has completed running fiber optic cable along Rt. 299's existing utility lines, now connecting Redding to Cedarville, via Burney and Alturas, terminating at the eastern most edge of Modoc County. Frontier will be launching a sales and marketing campaign October 2010 to alert consumers to its new package of offerings.

3. Wild Cards

Since the Gold Country Connect Project final report was issued, and over the course of the NCC broadband demand aggregation study, there have arisen at least two other initiatives that could have a direct impact on current Internet access issues, likely resulting in a direct impact on adoption of broadband services.

In February of 2009, Google, the largest search engine organization in the world, announced its "Fiber to the Community" project. Requesting proposals from communities around the country, Google intends to invest its own capital to deploy a 100 Gigabit-fiber network, offering Internet access speeds (upload and download) as much as 10x more than what most Internet service subscribers get, use and think they need. Google's proposal application format was succinct, and responses were expected to be as succinct. Leaving all otherwise quantifiable variables open for interpretation/debate/discussion (no set number of winning proposals, not set time frame on when winning communities would be notified, no set dollar amount on how much exactly would be invested, etc.), should Google follow through on this effort, the resulting impact on the immediate community is largely unknown, not to mention the potential ripple effect on mass-data transmission nationwide and worldwide.

In addition to the ARRA stimulus funding for broadband infrastructure deployment, on February 12, 2010, California Senator Alex Padilla proposed new and revised language to amend Senate Bill 1040, allowing increased access to California Advanced Service Funds for more local development and deployment of broadband infrastructure networks. The revisions as proposed include:

- increasing the amount of available funding in the *Broadband Infrastructure Revolving Loan Funds Facility Account* from $100,000,000.00 to $225,000,000.00;
- Apportioning $20,000,000.00 into the Broadband Infrastructure Grant Account;
- $2,000,000.00 into the Rural and Urban Regional Broadband Consortia Account;
- $3,000,000.00 into the Broadband Infrastructure Revolving Loan Funds Facility Account.

Unfortunately, these revisions currently do not go far enough to increase greater access by ISPs and WISPs, as these entities still fall outside the criteria for "qualified broadband providers". Perhaps as SB 1040 progresses through the California Assembly, additional revisions will be made.

PUBLIC POLICY AND PROCEDURES

A. Existing Broadband Policies and Procedures

1. CEQA Standards. Anecdotally, several Internet Service Providers complained of the need to comply with California's Environmental Quality Act study and reporting requirements. The cost to both develop and defend a detailed CEQA report for the expansion of broadband infrastructure was cited as the single greatest impediment (from a policy/legal standpoint) to the development of service. This requirement was portrayed as an onerous cost that had to be factored into an ISP's Return on Investment calculation. It was suggested that "if anything could be done", making CEQA compliance easier or more streamlined would go a long way towards helping broadband services expand through the construction of additional infrastructure.

2. Permitting. Close in the number of complaints to the issues raised by CEQA, the service providers also identified county and city permitting issues as a major inhibitor to broadband expansion. Again, anecdotal evidence would suggest that a number of service providers had run into onerous planning and permitting costs as impacting the ability to expand coverage areas. Some counties appear to be offering a fast tracking of permitting applications but at exorbitantly higher costs, suggesting that these counties are looking at permitting as a revenue generation activity instead of a public safety activity.

3. Use of Federal Towers and Lands for Wireless. Finally, given the large amount of federal lands that are included within the Northeastern Broadband Demand Aggregation project area, not allowing wireless transmission antennae to be mounted on forest service (or other Federal) towers, or not allowing providers to install antennae on towers erected on federal lands were also cited as major inhibitors to getting wireless service out to more remote locations.

OTHER RELATED ACTIVITIES

CA Grange

In November of 2009, CETF received a call from the California State Grange's Director of Government Affairs inquiring about broadband partnerships throughout state of California. CETF forwarded this inquiry to its Rural Consortia Project Leaders, and CSUC responded. Over the course of the ensuing months, CSUC and the California Grange president have met and discussed opportunities for the Grange to participate in expansion of broadband throughout the rural communities.

Started in Humboldt County in 1867 by a band of concerned farmers, the Grange established a collective, hence stronger, voice to negotiate better rates with the railroad for transport of local produce. Today, the National Grange boasts a membership of 200,000 citizens, farmers, business owners, families and retirees from coast to coast. According to the CA Grange president, it is probably the easiest fraternal order in which to gain membership, and is also probably California's best kept secret. The average age of the California Grange's current membership is 67 years old, and 2009 was the first year in 30 that the Grange not only saw an increase in membership (versus a steady decline in its prior 29 years), but that the average age of the new members is considerably younger than its existing membership. Should the California ---and all Granges---convert their membership to e-mail, postage costs would drop considerably.

In June 2010, it was agreed that the Grange could draft an executive order encouraging all the individual Granges (of which there are 180 throughout California) to promote broadband awareness and ultimately broadband adoption. The CA Grange President also encouraged CSUC staff to consider the local Grange halls for community meetings, rallies, etc., regarding broadband efforts, reiterating its commitment to supporting broadband awareness and adoption.

LESSONS LEARNED

The process of engaging with the various Internet Service Providers at a detailed level as part of the ARRA Broadband Infrastructure Grant application process resulted in the following lessons learned:

1. Actual coverage areas as well as *advertised* speeds for Internet access vs. actually *available* Internet access speeds proved a major hurdle for all parties involved. The providers acknowledged that they can install a tower and transmit a signal for a 3-mile signal radius with a clear line-of-sight, and they will advertise that they provide service for that area. However, the "signal" cannot bend around corners or follow the contours of the earth. The peaks and valleys of the surrounding terrain can block or degrade the signal, resulting in various pockets within this 3-mile signal radius remaining either unserved or under served, while other pockets within that same 3-mile radius enjoy clear signal reception.

2. While the ARRA Round 1 application qualifications encouraged partnerships, such partnerships were in fact required for ARRA Round 2, eliminating single provider applications. Unfortunately, the extremely tight time frame for applications made it difficult for the service providers to connect and negotiate mutually acceptable partnerships.

3. During ARRA Round 1 it became clear that despite an enormous effort on the part of the Governor's Broadband Task Force (January 2008) to identify and streamline efforts to deploy improved or increased broadband access throughout the state of California, only licensed telecommunications companies (ILECs and CLECs) qualified for CASF subsidy funding. The California Public Utility Commission (CPUC), however, temporarily allowed non-licensed service providers to apply for CASF matching funds, for which all of the *NorCal Broadband Access Consortium* member applications were approved, contingent upon ARRA award approvals. Efforts are currently underway to permanently allow this expanded use of funds and CSUC heartily endorses these efforts.

4. Applicants who ultimately submitted proposals for infrastructure projects to ARRA Rounds 1 and 2 represent the best business-case scenarios for increased and/or expanded broadband services. However, none of these business-cases could be possible without benefit of additional, external funding being made available via loan, grant or a combination of the two. Both the NTIA and RUS Notices of Funds Availability announcements referred to this as the "but for" clause: "but for additional funding supplied by the ARRA Broadband Stimulus Programs, this project would not be possible" (NoFA, July 2009, January 2010). In other words, none of the proposed projects submitted under the ARRA Broadband Infrastructure program could be cost justified as stand-alone private initiatives.

5. Despite all parties best efforts, attempting to identify a preferred scenario for infrastructure deployment throughout the NCC project area proved highly naïve. While some ISPs and WISPs were at least willing to discuss issues surrounding access to better broadband services, most did not partake citing extremely sensitive proprietary data, and refused to release any service coverage information or customer subscribership information. All ISPs and WISPs are at the mercy of market conditions and independent equipment suppliers, and therefore depend highly on previously established vendor relationships, none daring to consider pooling resources. Additionally, the variance in network solutions and topological disparities---low valleys, rugged terrain, dense forestation, high desert, to name but a few---prevented formulation of one single, or “cookie cutter”, method or formula by and through which an ISP or WISP could design and reasonably cost a network solution for increased access to broadband services. Furthermore, for an WISP to share locations of its transmitters and receivers meant risking not just outside competition using same or similar locations, but worse, the degradation of signal transmission due to multiple suppliers in one location.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

b. As shown in the results of the broadband demand aggregation studies, approximately 40.5% of households and 16.8% of businesses throughout the northeastern counties currently do not have access to high speed Internet services. Factoring a conservative 20% "take" rate, this translates economically to potential annual revenue of $20 million. The difficulty in fully achieving this lies in the fact that the potential is aggregated across all seven counties, with a disparate population spread out across a large geographic area containing challenging terrain; there is no one single pocket of population that justifies the private business investment.

c. However, despite these challenges, there are opportunities for local civic and government leadership to develop local public-private partnerships. Across the nation local communities have created their own utility service organization offering Internet service at speeds faster and more competitively priced than the existing ISPs.[4]

d. Further, at a price point of $30-$40 per month for basic service, there is *currently* no compelling reason for a household or a business to sign up for high speed Internet (broadband) service. However, once a majority of business and communications transactions are conducted via the Internet, households and rural communities will "feel" left out unless they have connectivity with the rest of the country. At that point, the lack of connection will become the compelling need for the acquisition of broadband services. As CSUC's two sustainable adoption meetings discovered the major applications for broadband are:

- Distance Education
- Libraries and E-Learning Centers for those who cannot afford high speed Internet access
- Public Access to Government Services and Public Safety Access
- Public and Private Partnership Opportunities
- Tele-health and Tele-medicine Applications

Recommendations:

1. Redirect focus of future investments to build infrastructure. It is likely that additional broadband demand aggregation studies conducted in other counties throughout the state will net similar results. Redwood Coast Connect, Gold Country Connect, Central Sierra Connect, and Northeastern & Upstate California Connect projects

[4] *Broadband News*, January and April 2010.

have reported where there is demand for broadband, as well as where there is supply, and now efforts should be continued to support activities to make it happen.

2. Leverage the information produced thus far to galvanize people in organizing community rallies, events, workshops and forums for better broadband.

3. Compare the results of all the broadband demand aggregation study areas for a more comprehensive view of California's broadband demand aggregation. This picture can be used as a baseline to compare the future demand for and supply of broadband services.

4. Local, regional, government entities need to be more directly and proactively involved in attracting ISPs and WISPs to rural, remote regions, and can do so by:

   - Facilitating deployment of better network services within each county;
   - Reducing or removing the impediments to permitting and design review, especially for wireless projects where the required infrastructure footprint is significantly smaller than a wireline infrastructure project;
   - Think pro-business (not necessarily industry), and change external perceptions towards rural counties to enable the attraction of companies and organizations looking to establish a customer base outside the urban areas;
   - Stop being the regulators of land use, rather become the leaders in promoting better connectivity, e.g. wired county buildings, such as the Lake County Courthouse.
   - Being a model broadband user, e.g., encouraging county residents and businesses to seek and use county services on-line, reducing overall carbon footprints;
   - Offer tax incentives to companies who promote telecommuting.

5. GIC's website, www.northeasternbroadband.com, needs to be supported and maintained as a resource for use by users to identify potential service providers and by service providers to identify potential consumers.

6. Sustainable broadband adoption efforts should be focused on the percentage of the market/population that wants broadband services, and is willing to pay for it, and not be deterred by those who see no need for the Internet or who do not own a computer.

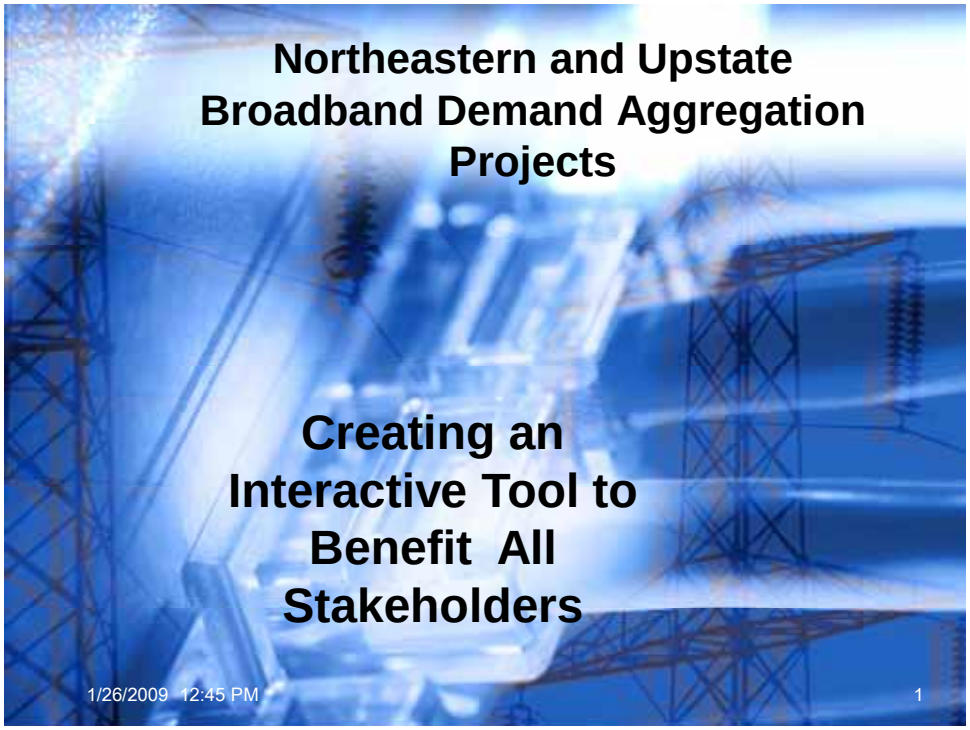
APPENDICES

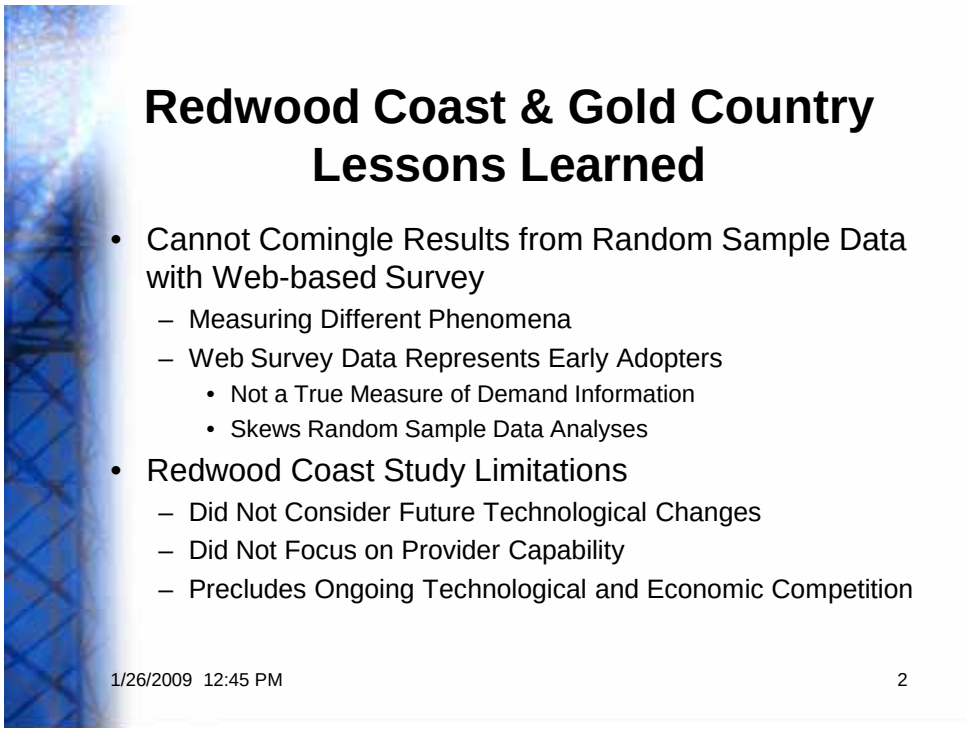
Appendix A1:
A1: Project Partnership Team

- Jim Fletcher, Ph.D., Director, Program for Applied Research and Evaluation (PARE), CSU, Chico
- Jason Schwenkler, Director, Geographical Information Center, CSU, Chico
- Don Krysakowski, Assistant Director, Center for Economic Development, CSU, Chico
- Cathy Emerson, Broadband Project Manager, Center for Economic Development, CSU, Chico

Appendix A2:

A2: Presentation Given to CETF on January 26, 2009





Northeastern and Upstate Project Solutions

- Use Random Residential and Business Surveys (Separate from Web-based and On-site Public Meeting Surveys)
  - Better Picture of True Demand
  - Better Picture of Ability of Users to Support Costs
- Outreach Activities Board and with Stakeholders in Each County
  - Awareness of Survey Approach
  - Stakeholders to Validate Need for Survey If Asked
  - Training of Stakeholders in How to Interpret Results
- Create Interactive Web-based GIS Tool for Broadband Supply and Demand Analyses
  - Map Supply Data into GIS
    - Sources and Availability
    - Granularity
  - Tie Survey Results Data to GIS
    - Spatial Representation of Demand Patterns
    - Identify Geographic Areas with the Ability to Support Broadband Costs

Interactive Web-based Tool

- Map(s) of Region(s) With Various Layers of Information:
  - Where Broadband Currently Exists
  - Where Broadband Does Not Exist
  - Areas that are Underserved by Broadband
- Supported by Economic Data:
  - Demand Information
  - Elasticity of Demand As Factored By Cost

Users/Uses of the Tool

- Broadband Providers
  - Use the economic planning data in the tool to help determine whether they can viably support Broadband expansion into an area.
  - Greater incentive to participate as a partner
- Economic Development Stakeholders
  - Identify Areas from the tool where increased demand could result in more Broadband interest
  - Target advocacy efforts
- CPUC
  - Use the tool to assist in determining the best use of subsidy funds to support the promotion of Broadband into an area.
  - Help Evaluate Return on Investment (ROI)

Longer Term Issues

"Once and Done" vs. Planning Tool

- Collection and storage of all GIS data into a single database, in accordance with a standard set of collection protocols
  - Allows for Multi-County Regional Analyses
  - Allows for Multi-Regional Analyses of Scale
- Provides for Consistent Survey Questions and Data
- Update and Maintain Demand Information Through Follow-up Surveys
  - Measure Changing Demand Patterns
  - Evaluate Adoption Rates and Usage

Appendix A3

A3: Presentation to CETF at Rural Connections Workshop
May 14, 2009

Northeastern and Upstate Connect Broadband Demand Aggregation Projects

Don Krysakowski
Assistant Director, Center for Economic Development
CSU, Chico Research Foundation
14 May 2009

Project(s) Status

- Start – January 2009
- Initial Review of Existing Projects
  - Revise Survey Approach – True Random Sample Survey
  - Approach to Mapping with ISPs
    - Proprietary Data
    - Competitive Environment
    - Unique Cost Structures
  - How to Report/Display Results
    - Summary Report and Static Maps?

Project(s) Status

- Revised Approach – **Demand Side**
  - Survey Data
    - Interactive Web Site vs. Static Maps and Report
      - Geographic Information System Mapping Tool
      - Test Information Display (Using Gold Country Survey Data)
      - Separate Upstate and Northeastern Project Sites
    - Accessible by all Stakeholders
      - CPUC & CETF
      - Local and Municipal Governments
      - Internet Service Providers
      - Public

Project(s) Status

- Revised Approach – **Supply Side**
  - Public/Private Partnership
    - Internet Service Providers
      - Unique and Separate Cost Structures
      - Business Decisions to Serve
    - Had ISPs Review the Broadband Demand Survey
      - Favorable Comments
      - Some Revisions to Questions and Wording
      - Willingness to Use
    - Facilitate Decision Making by ISPs

Project(s) Status

- Revised Approach – **Solutions**
  - Expand Mapping Tool
    - Analyze Coverage Areas
    - Estimate Homes and Businesses
      - Unserved
      - Served
      - Connected
    - Use for Return on Investment Calculations
      - ISPs for Build-out
      - CETF/CPUC for Subsidy
  - Non-prescriptive Solutions
    - Ability to Vary Input Parameters
      - Cost
      - Price / Revenue
    - "What If" Scenario Analyses

Project(s) Status

- Demand Survey
  - Revised and Updated
  - Reviewed by ISPs
  - Pre-test at Community Meetings
  - Release Next Week
- Supply Data
  - Outreach to ISPs
  - ARRA Information Provided
  - Facilitating Supplier Meetings
- Coverage Mapping
  - Unserved Areas Solicited from Community Meetings
  - Base Maps Being Developed
  - On-line Mapping Tool Undergoing Testing

Project(s) Status

- ISP Comments from Community Meetings
  - Small ISPs don't like monopolistic policies of AT&T
  - Small ISPs build out local infrastructure and AT&T will cherry pick the best clients by undercutting rates
  - Need backhaul alternatives (read: competition)
  - Don't need the bandwidth that Qwest requires to tap into their backbone
  - Is the Government going to subsidize my competitors
  - Does ARRA or CASF funding imply exclusivity for subsidized areas? Will I be shut out if I can't apply for stimulus or subsidy funding?

Project(s) Status

- Next Steps
  - Collect and Post Survey Data
    - Conduct Surveys and Post Results
    - Second Round of Community Meetings
      - Present Results
      - Demonstrate Mapping Tool
      - Community Involvement to Make Mapping Better
  - Facilitate ISP Meetings
    - Coverage Mapping Information Being Solicited
    - Efforts to Build Consortium
      - ARRA Subsidy Submission
      - CASF Subsidy Submission
  - Post and Refine On-line Mapping and Analysis Tool
  - Develop On-line Scenario Analysis and ROI Toolset

Issues

- Backhaul vs. Last Mile – Who Gets Priority
- Will the ISP's play nice with each other?
  - Can we develop consortia groups to address the issues of Rural Broadband collectively?
  - Will the ARRA Stimulus Funding rules support or hinder collective activity?
- Can the Mapping Tool be used to effectively promote Broadband Demand Aggregation?
  - Community Level Feedback and Input
  - Work with ISPs or Create Unique Solutions
- Follow-on Support Needed
  - Education, Training and Direct Technical Assistance
  - Lack of Coverage or Lack of Marketing – Who Knows What is Available
- Snapshot vs. a Movie?
  - Once and Done vs. Progress Tracking

Appendix B

B: Project Area Map

Appendix C
C: Household Survey Results

Household Demand for Internet Service

Data for the household survey were collected utilizing a telephone survey questionnaire (Appendix A) and random digit dialing (RDD) for selection of households. Analyses of the household telephone survey data were completed to identify (1) distances from towns or cities, (2) households with and those without broadband services, (3) satisfaction with ISPs (Internet service providers), and (4) access to broadband services at places of employment. As shown in Table 1 and Figure 1, 78.7% of household respondents in the seven northeast counties of California live within one mile of a city or town. More than half (59.5%) had broadband service at the time of the survey (Table 2), and only 8.4% of household survey respondents said they were not satisfied with their current Internet service or were undecided regarding their level of satisfaction (Table 3). Those households with no Internet service were identified through mapping the survey data. This data is presented for each county in Map 1 through Map 7.

Table 1. Estimated distance that household survey respondents for the seven northeast counties live from a city or town (Q19).

Estimated distance	Number	Percent
Within one mile	1400	78.7
Outside of one mile	379	21.3
Total	**1779**	**100.0**

Figure 1. Estimated distance that household survey respondents for the seven northeast counties live from a city or town (Q19).

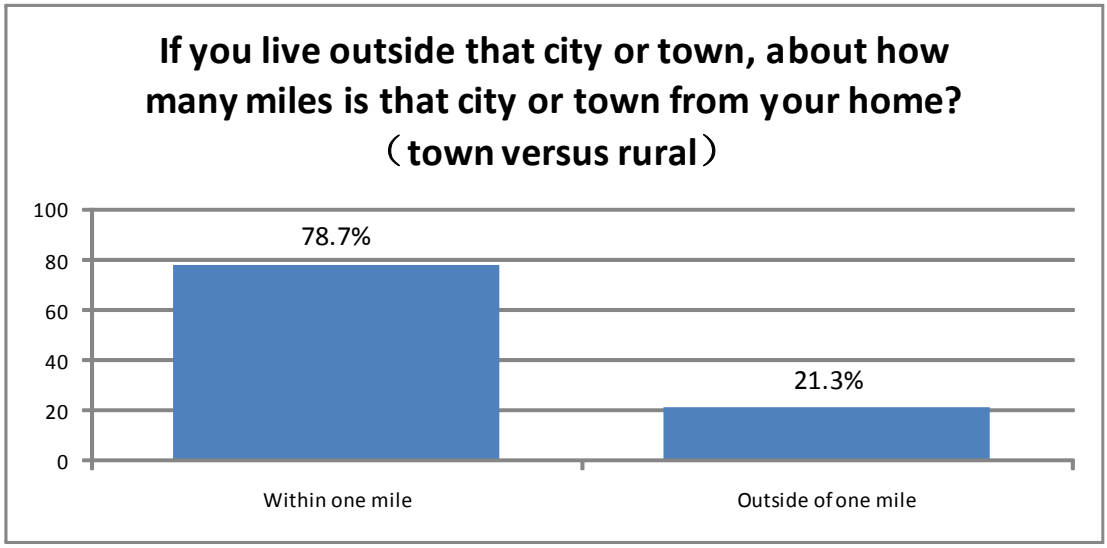


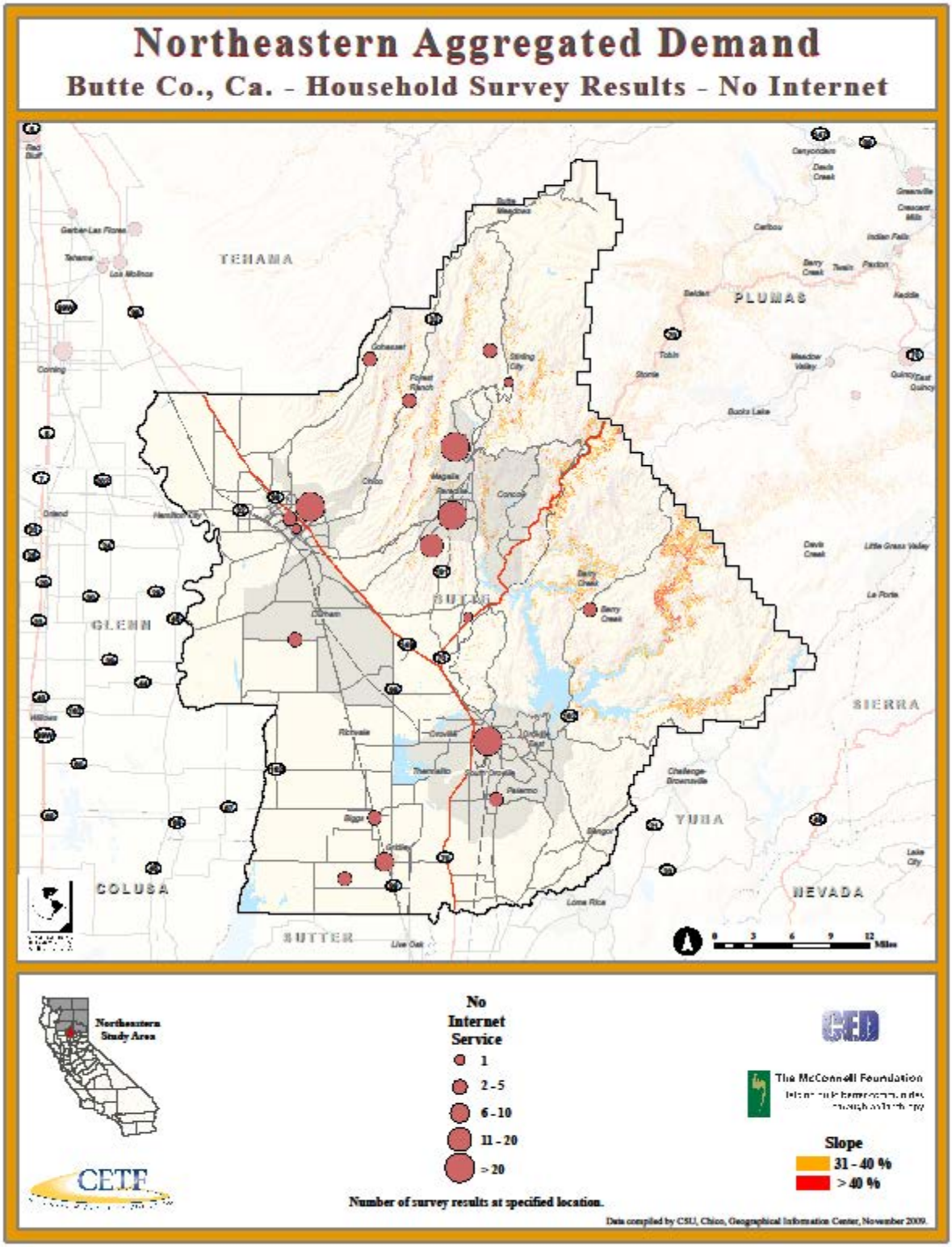
Table 2. Reported availability of broadband service for household survey respondents in the seven northeast counties.

Availability of broadband service	Number	Percent
No broadband service	731	40.5
Have broadband via DSL or Satellite	1072	59.5
Total	**1803**	**100.0**

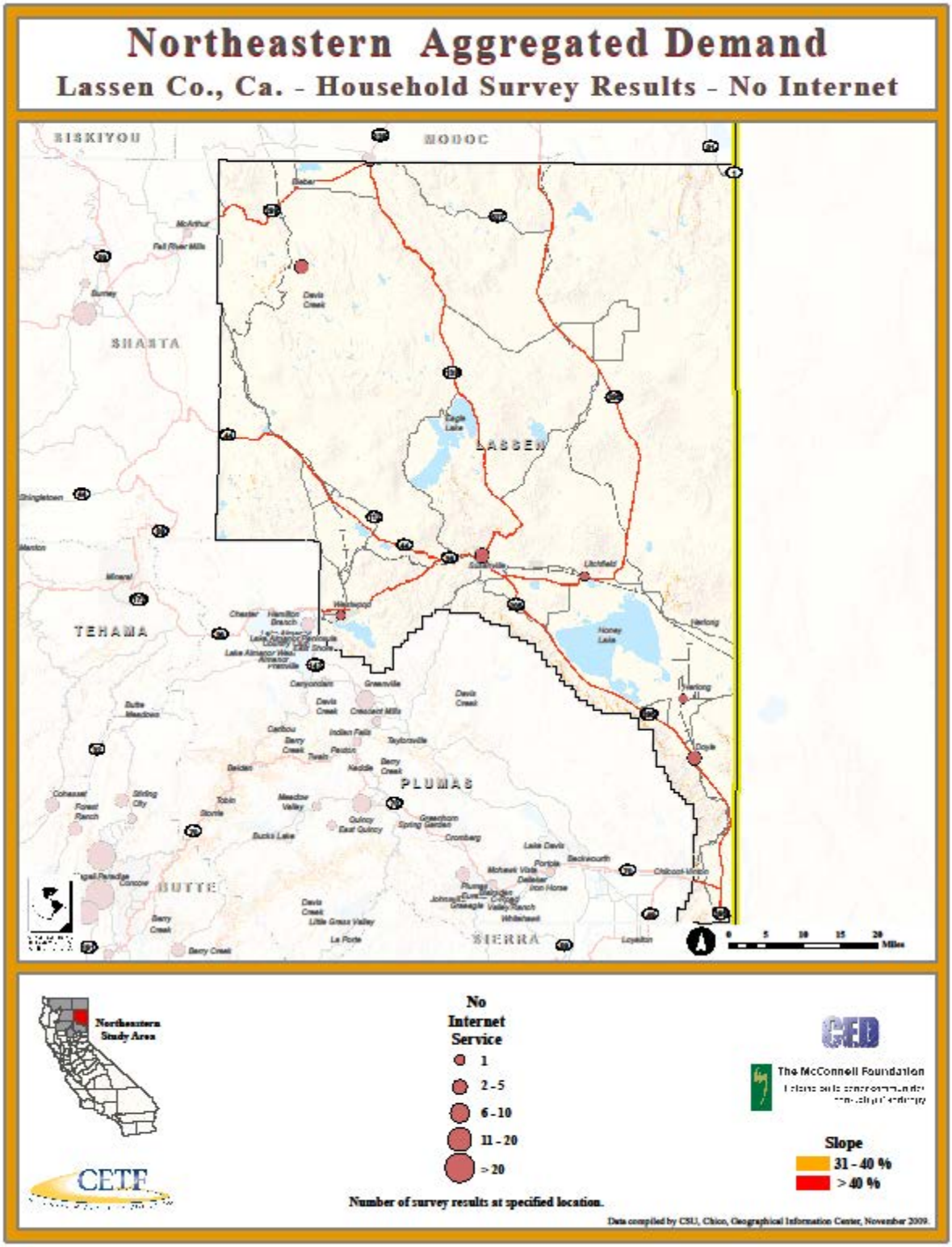
Table 3. Satisfaction of household survey respondents in the seven northeast counties with their current Internet service provider (ISP).

Satisfaction with current ISP	Number	Percent
Not satisfied or unsure	90	8.4
Satisfied	981	91.6
Total	**1071**	**100.0**

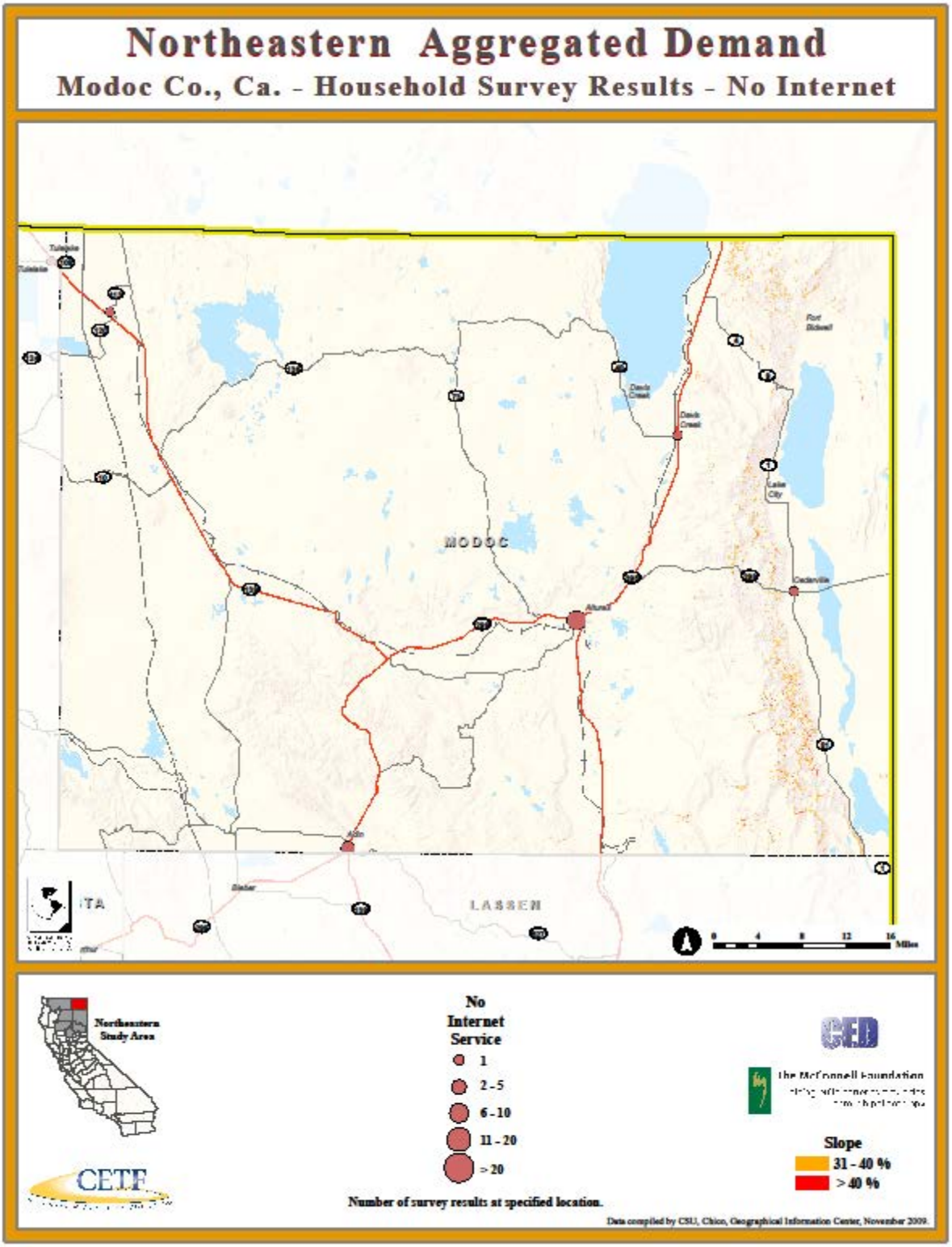
Map 1. Locations of households in Butte County with no Internet service.



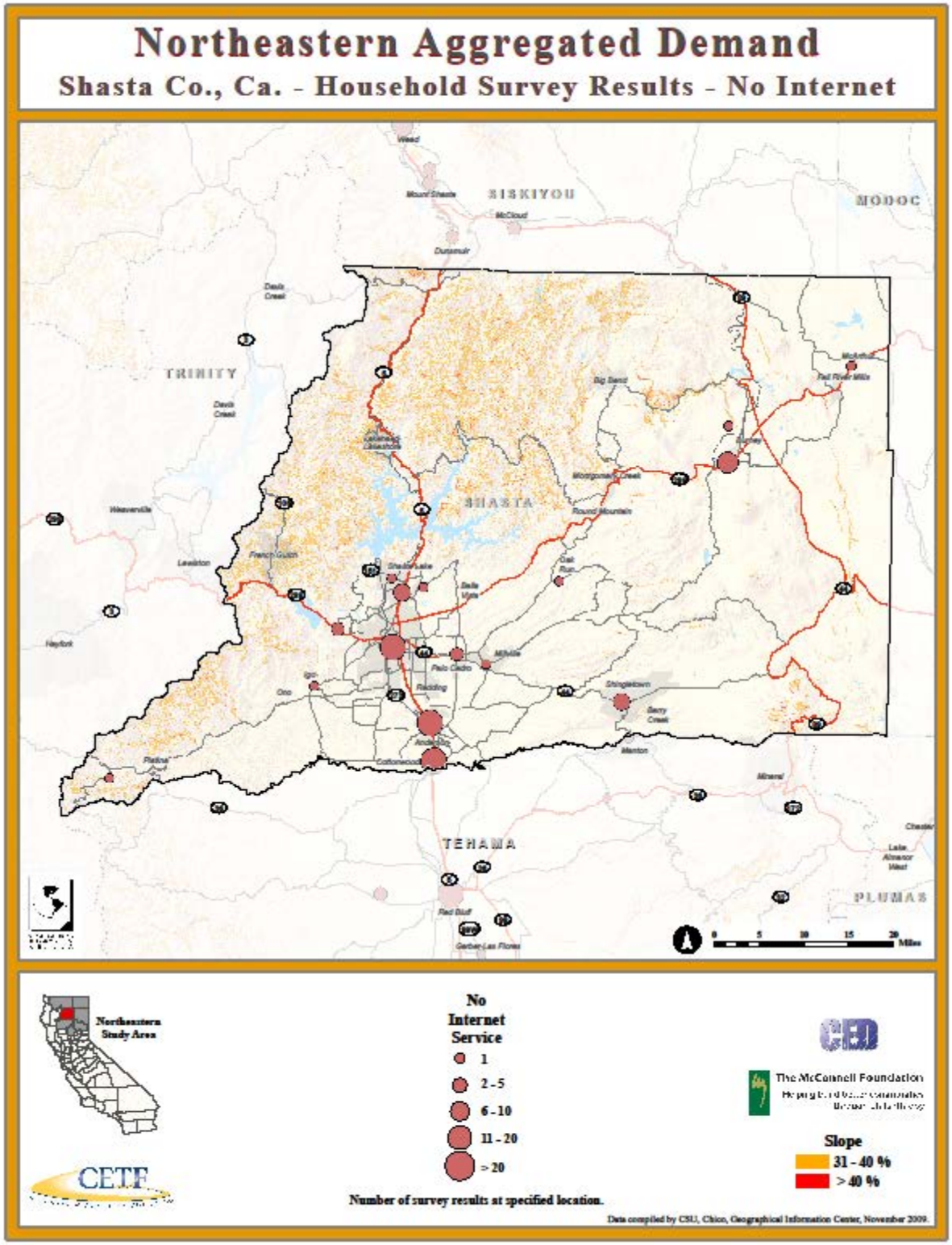
Map 2. Locations of households in Lassen County with no Internet service.



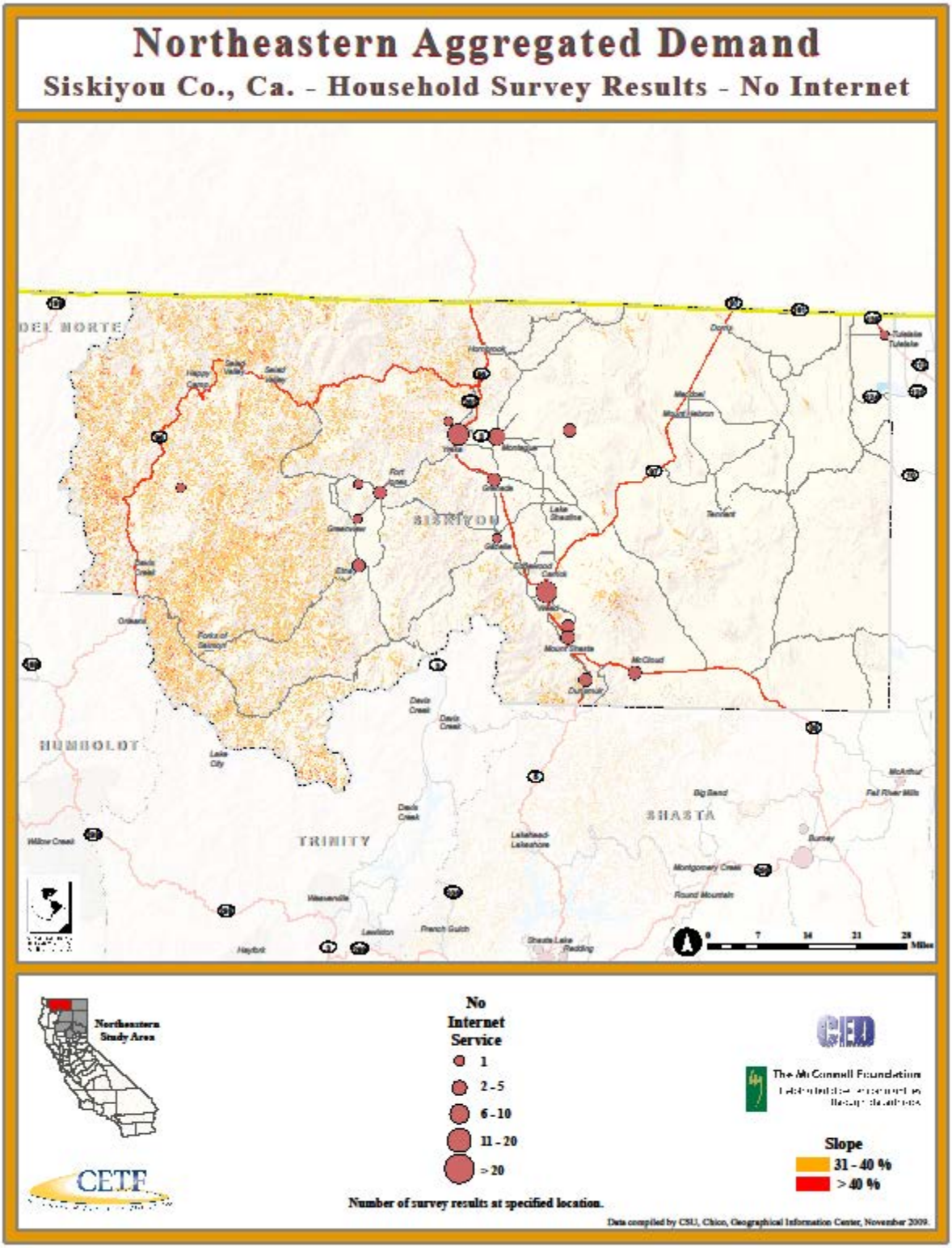
Map 3. Locations of households in Modoc County with no Internet service.



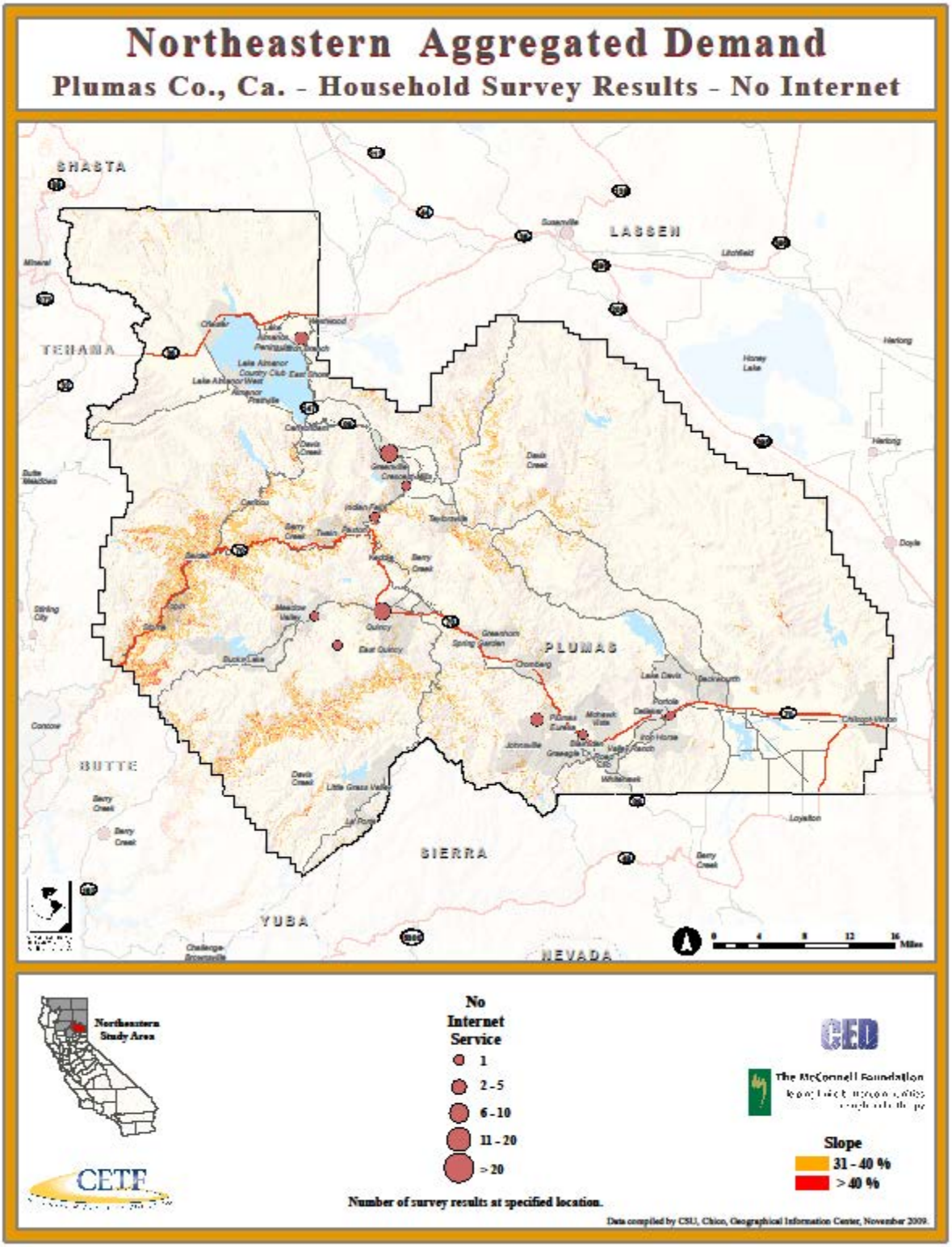
Map 4. Locations of households in Shasta County with no Internet service.



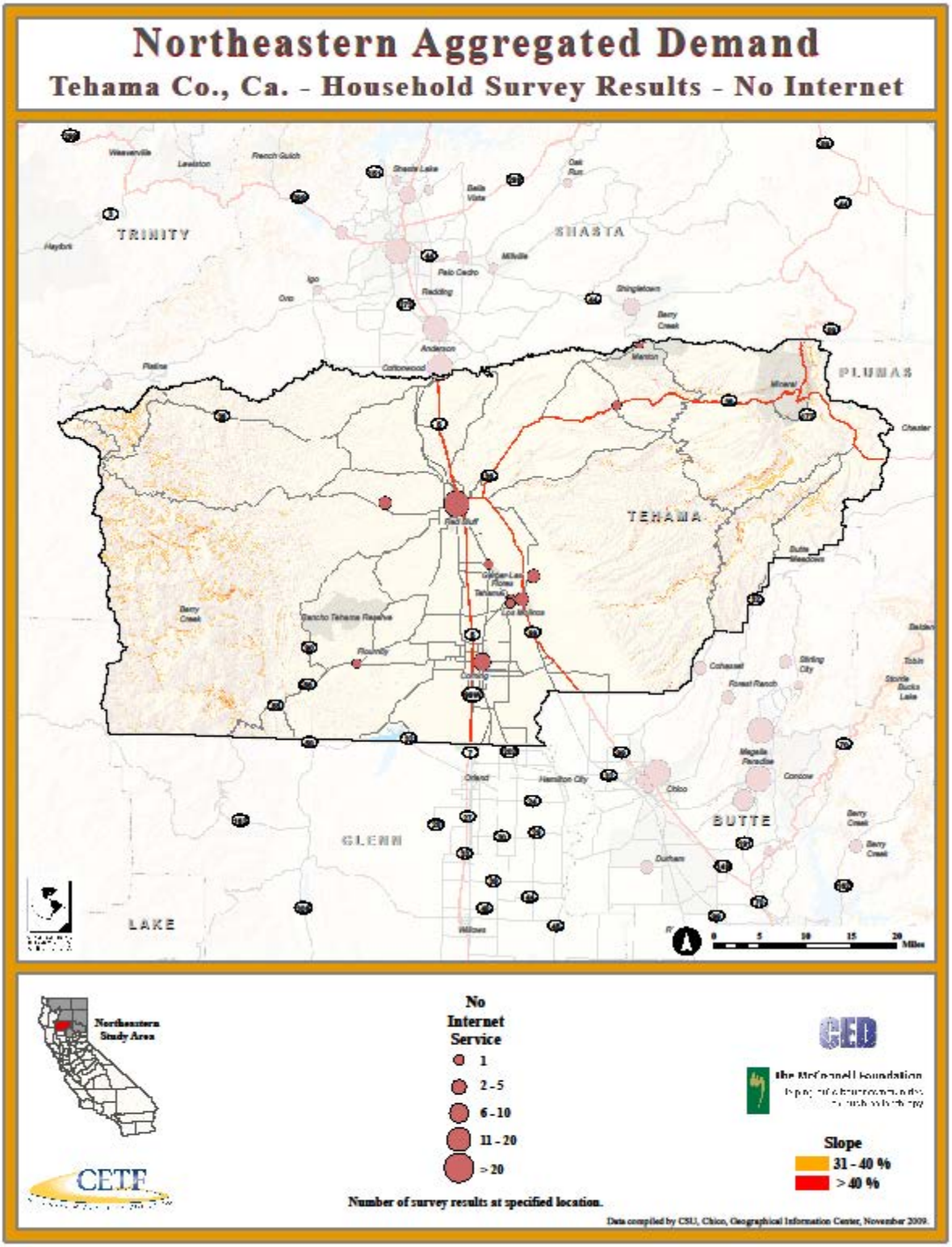
Map 5. Locations of households in Siskiyou County with no Internet service.



Map 6. Locations of households in Plumas County with no Internet service.



Map 7. Locations of households in Tehama County with no Internet service.



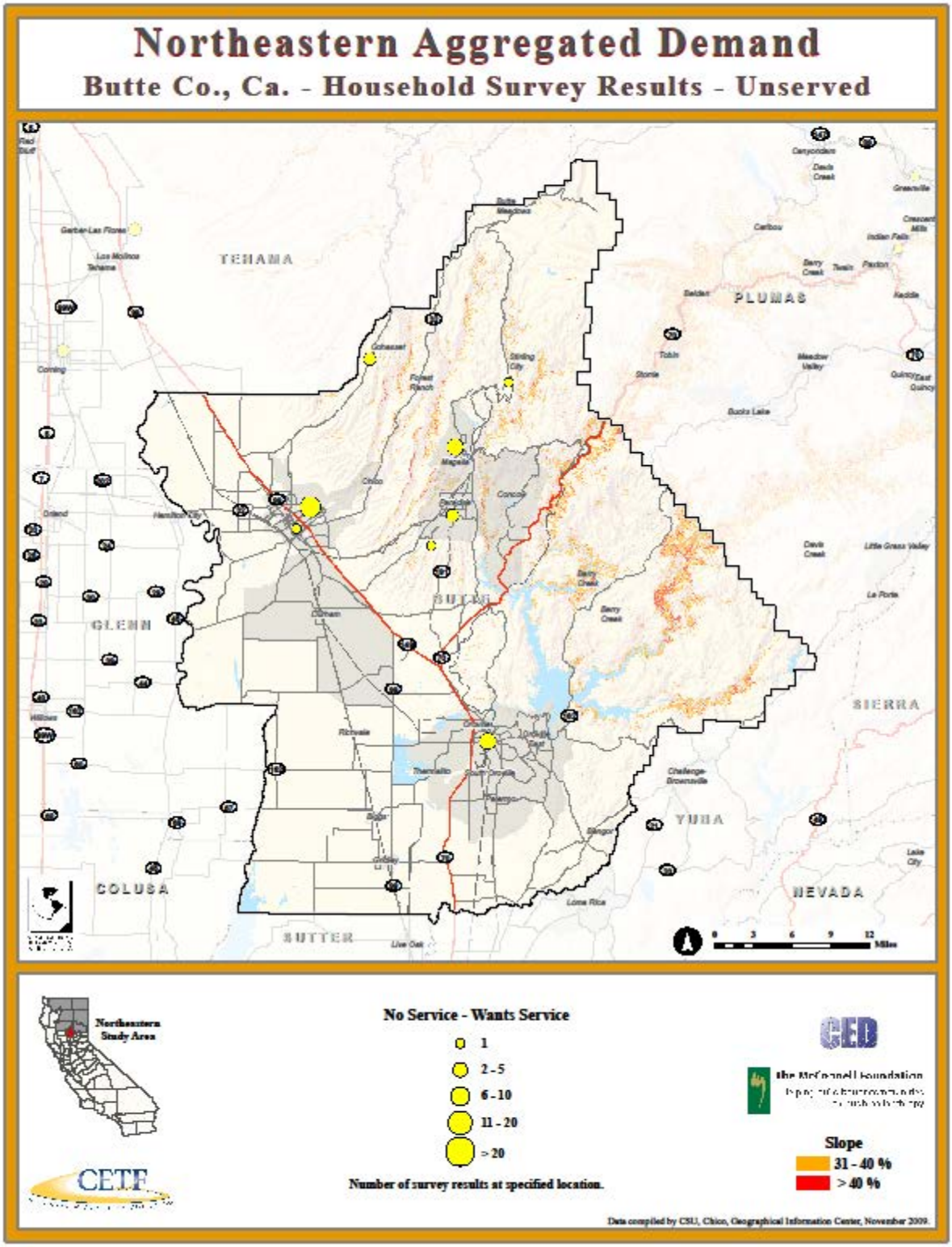
Segmentation of Households
Household survey respondents were segmented into six groups based on (1) the type of Internet service they had at the time of the survey and (2) their willingness to pay for broadband service. As shown in Table 4, 31.6% of households in the northeast counties did not have Internet service at the time of the survey. Of these, 6.3% said they want Internet service (**unserved households**). Map 8 through Map 14 show the locations of these unserved households in each of the seven counties. Important to note is that one-quarter (25.3%) of the households in the seven northeast counties have no Internet service and do not want it.

Some households in the northeast counties want better service. A total of 4.7% of households in this region currently have broadband service and want to pay more for a faster connection, and 3.2% have dial-up service and want to pay more for faster service. This group of 7.9% of all households in the northeast counties is **underserved**. Map 15 through Map 21 show the locations of these underserved households in the region.

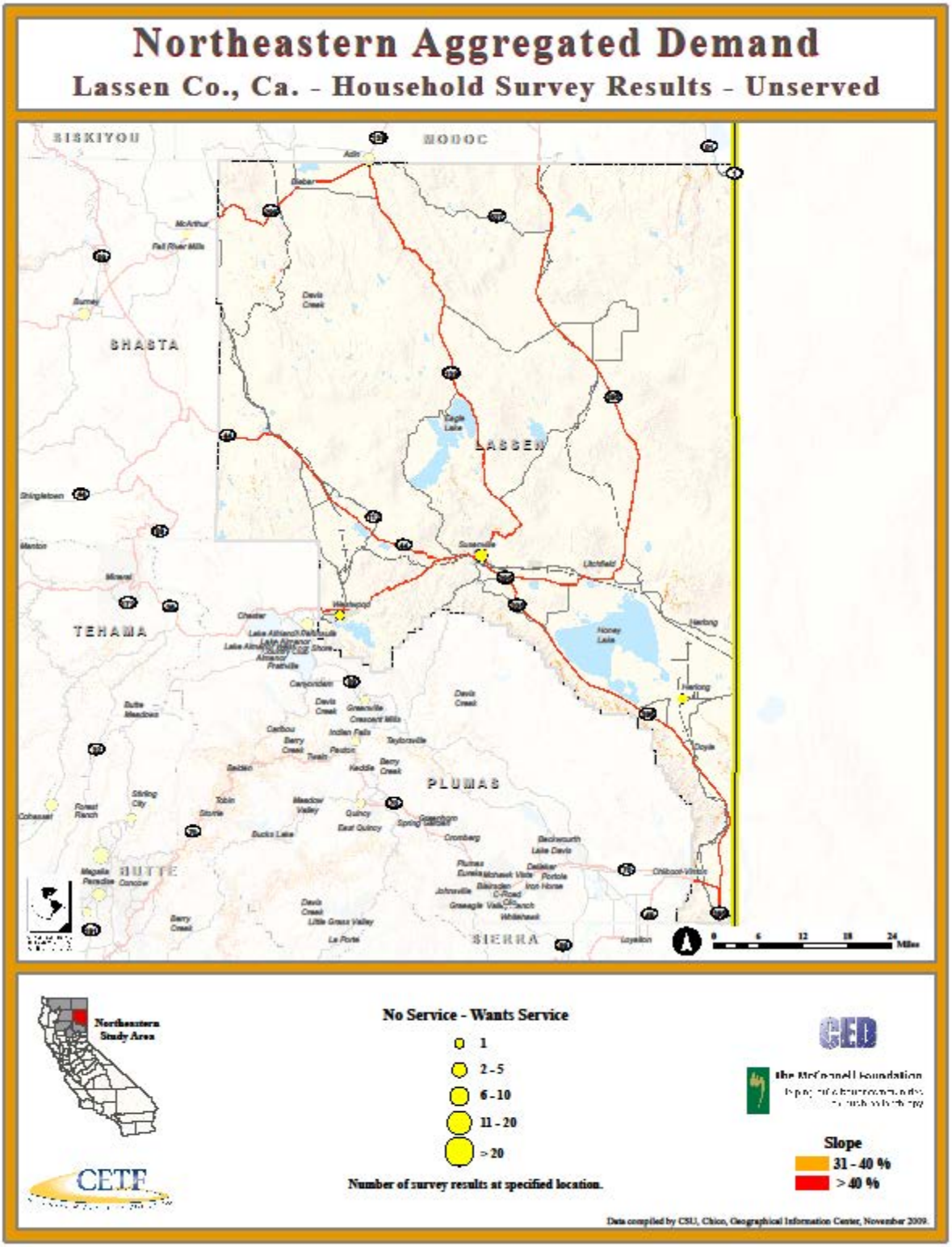
Table 4. Willingness of northeast households to pay for Internet service.

Segments based on willingness to pay	Number	Percent
Have broadband service and don't want to pay more for a faster broadband connection	918	54.8
Have broadband service and want to pay more a faster connection (***underserved***)	78	4.7
Have dial-up connection and don't want to pay more for a faster connection	96	5.7
Have dial-up connection and want to pay more for a faster connection (***underserved***)	54	3.2
Have no Internet service and don't want it	424	25.3
Have no Internet service and want it (***unserved***)	105	6.3
Total	**1675**	**100.0**

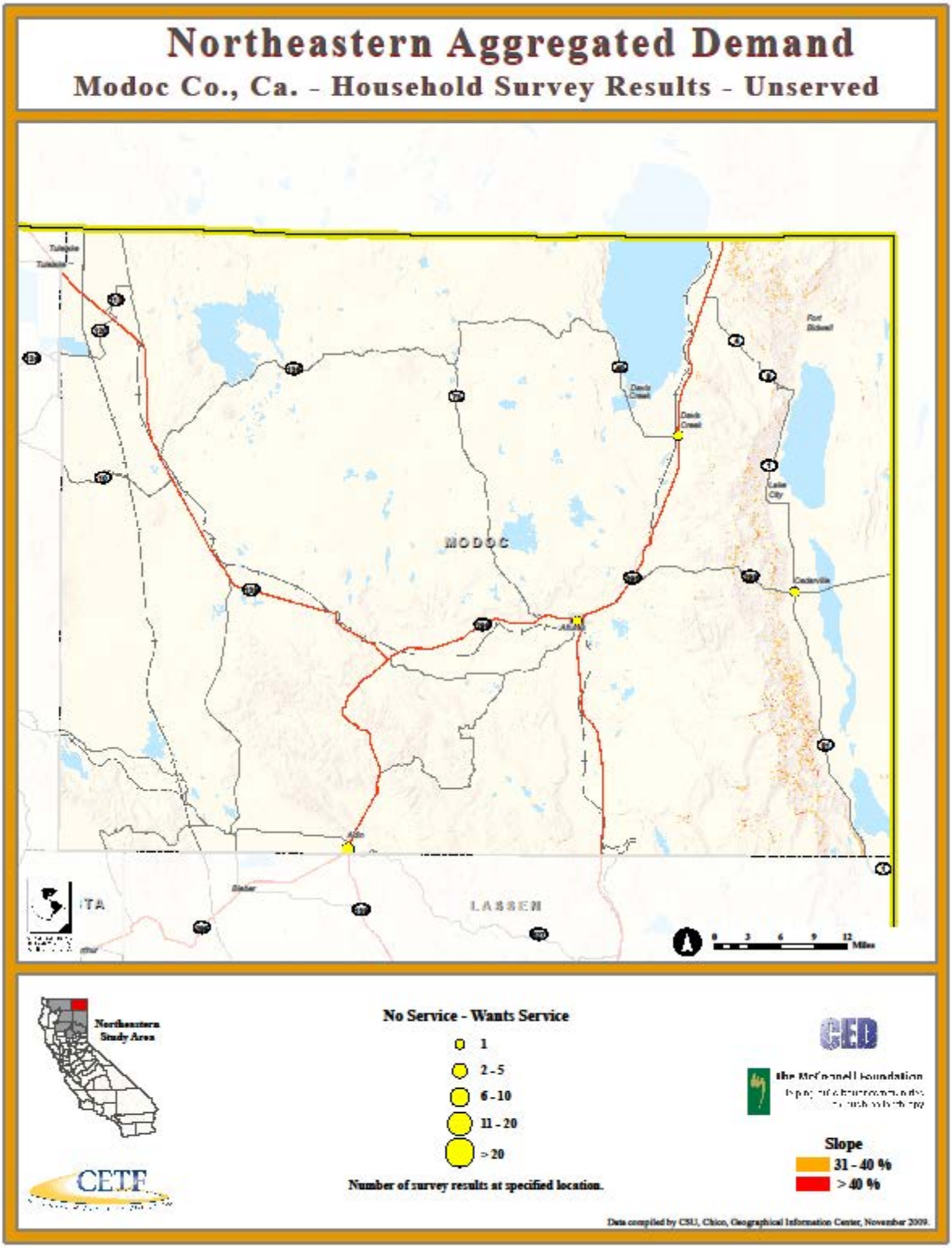
Map 8. Locations of households in Butte County that are unserved.



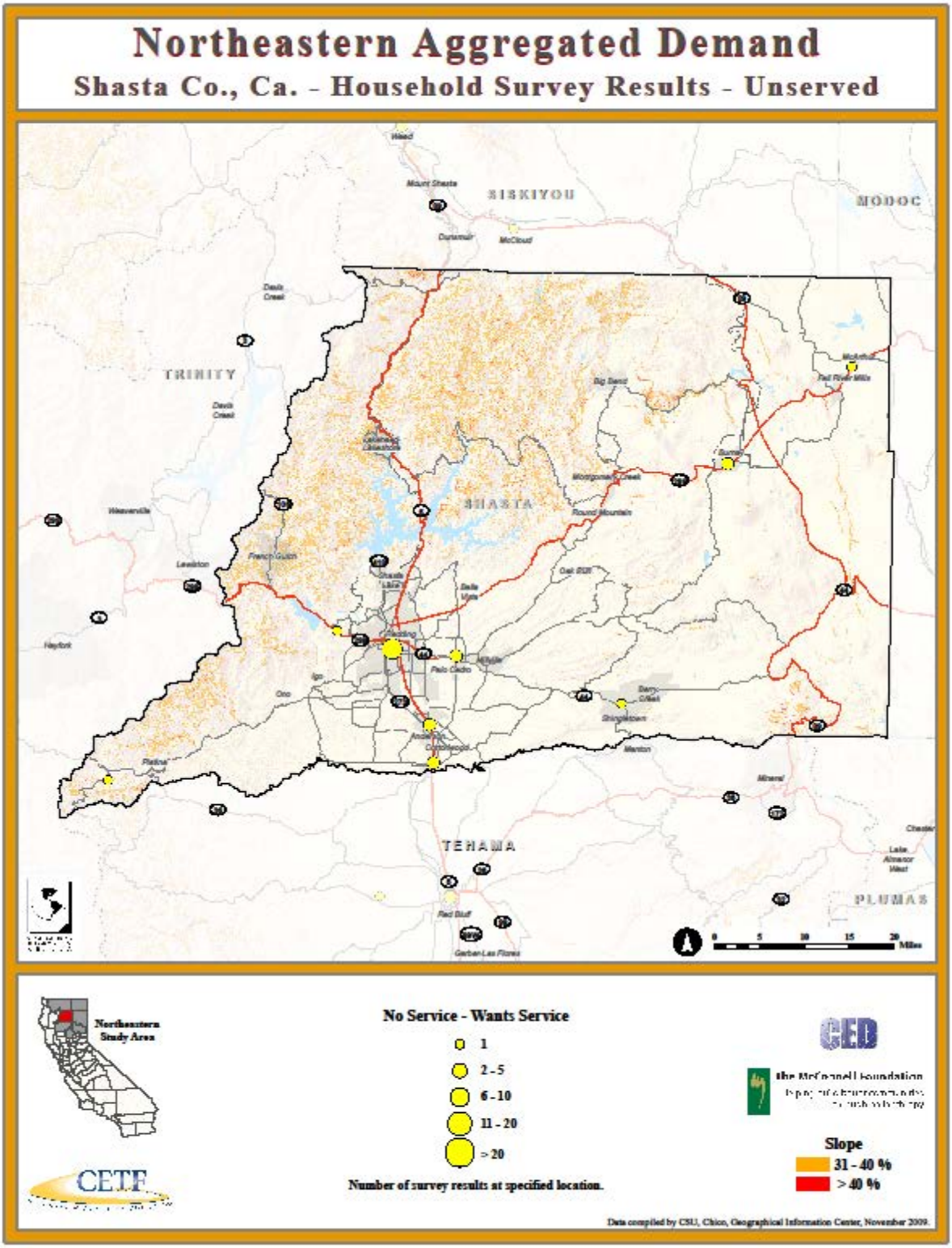
Map 9. Locations of households in Lassen County that are unserved.



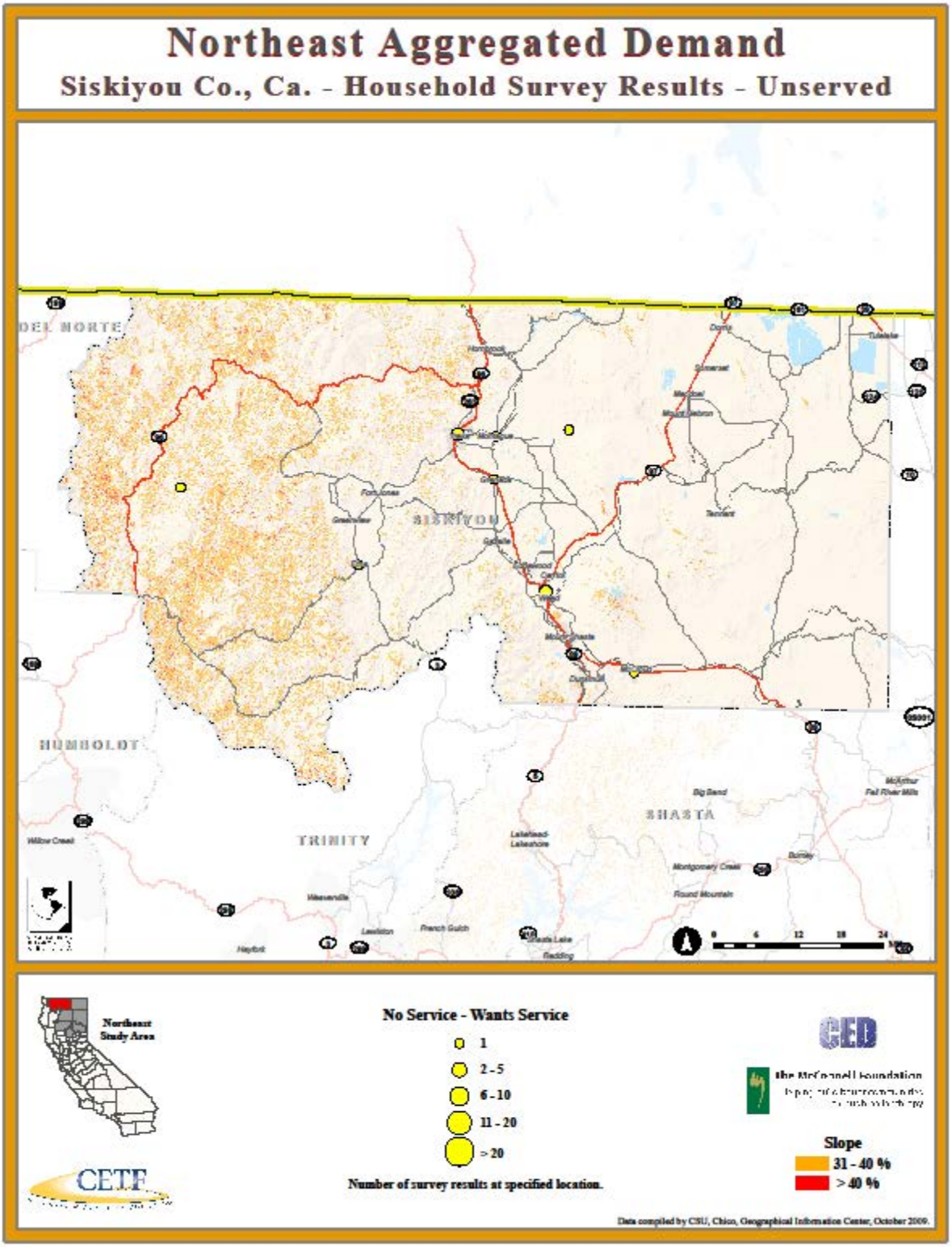
Map 10. Locations of households in Modoc County that are unserved.



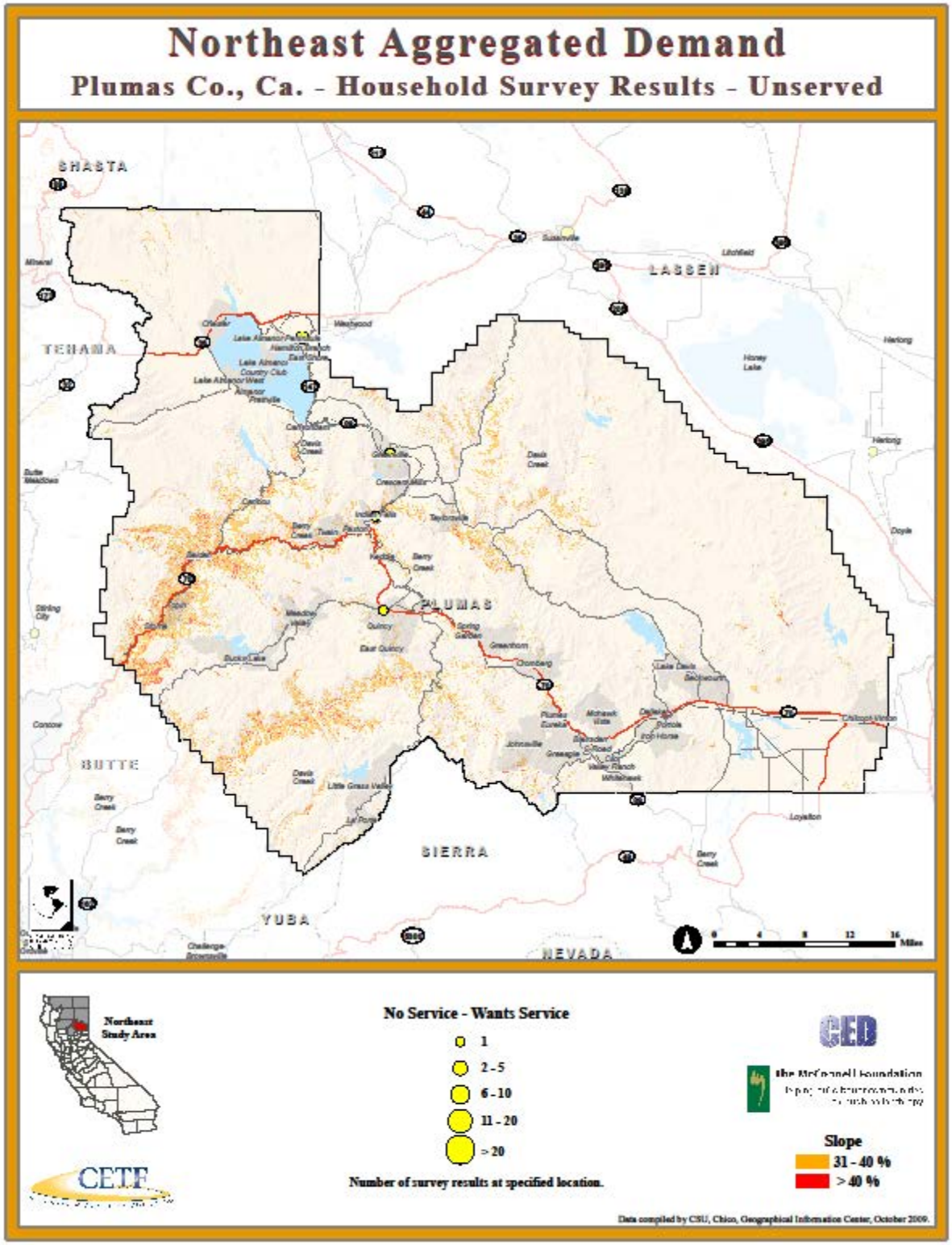
Map 11. Locations of households in Shasta County that are unserved.



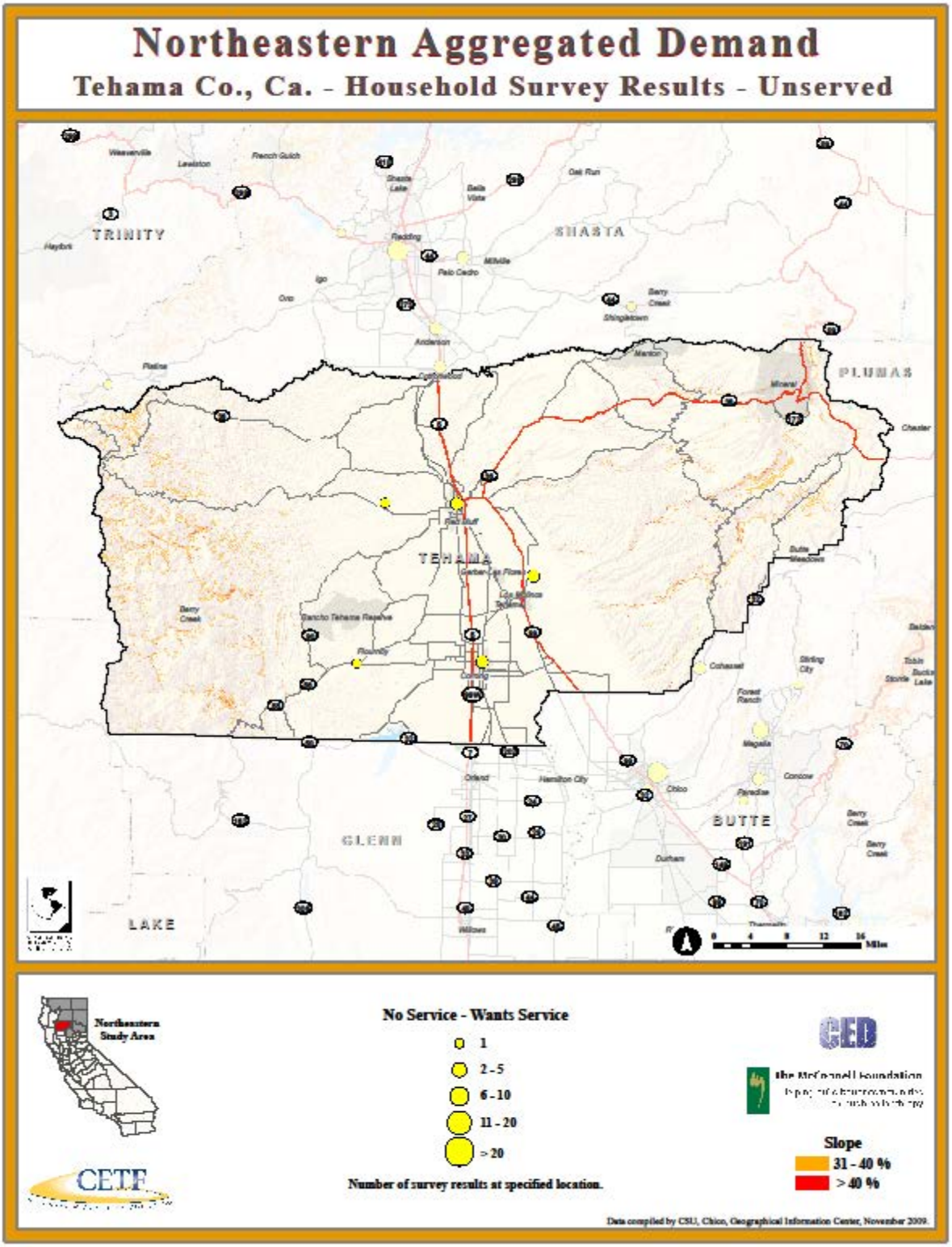
Map 12. Locations of households in Siskiyou County that are unserved.



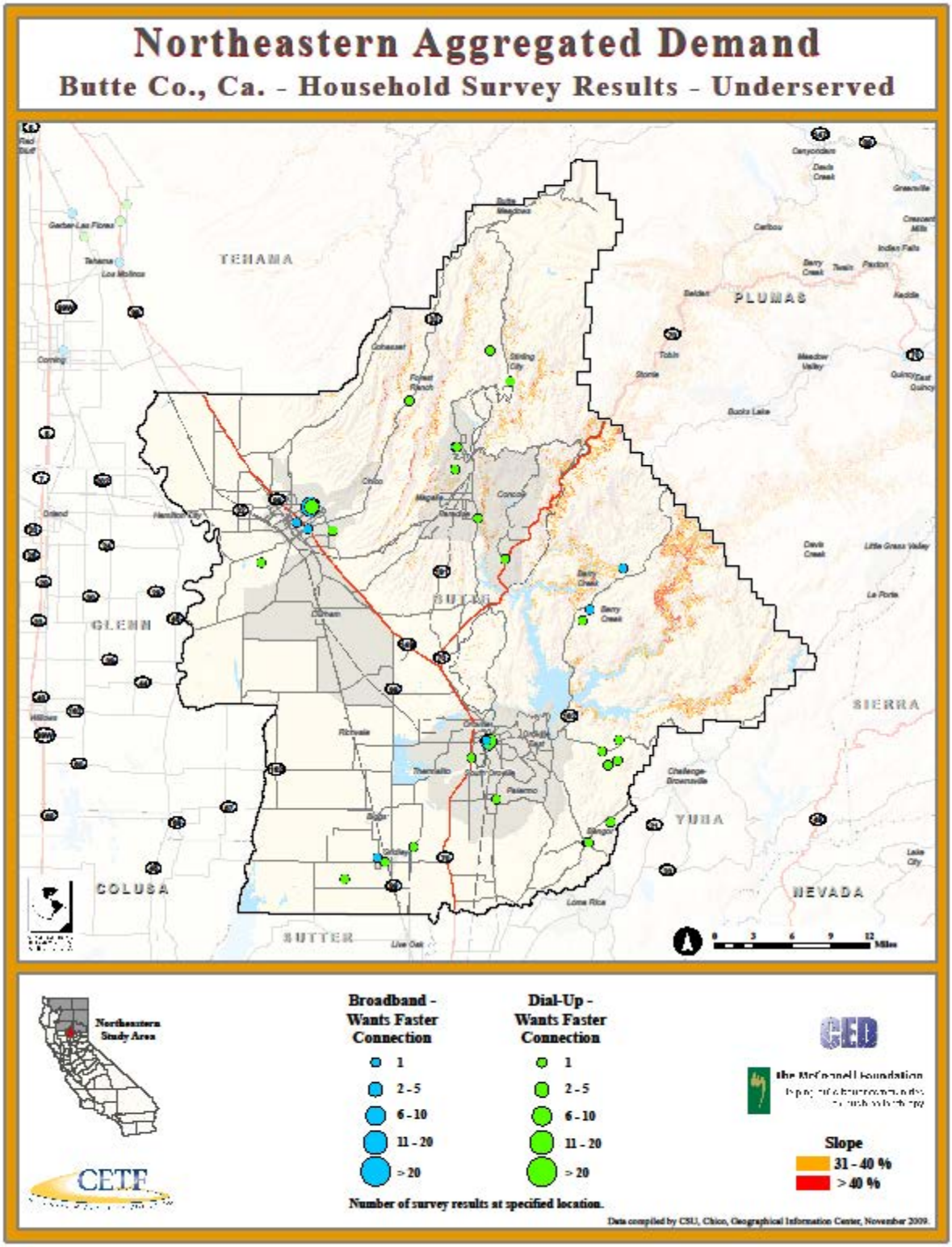
Map 13. Locations of households in Plumas County that are unserved.



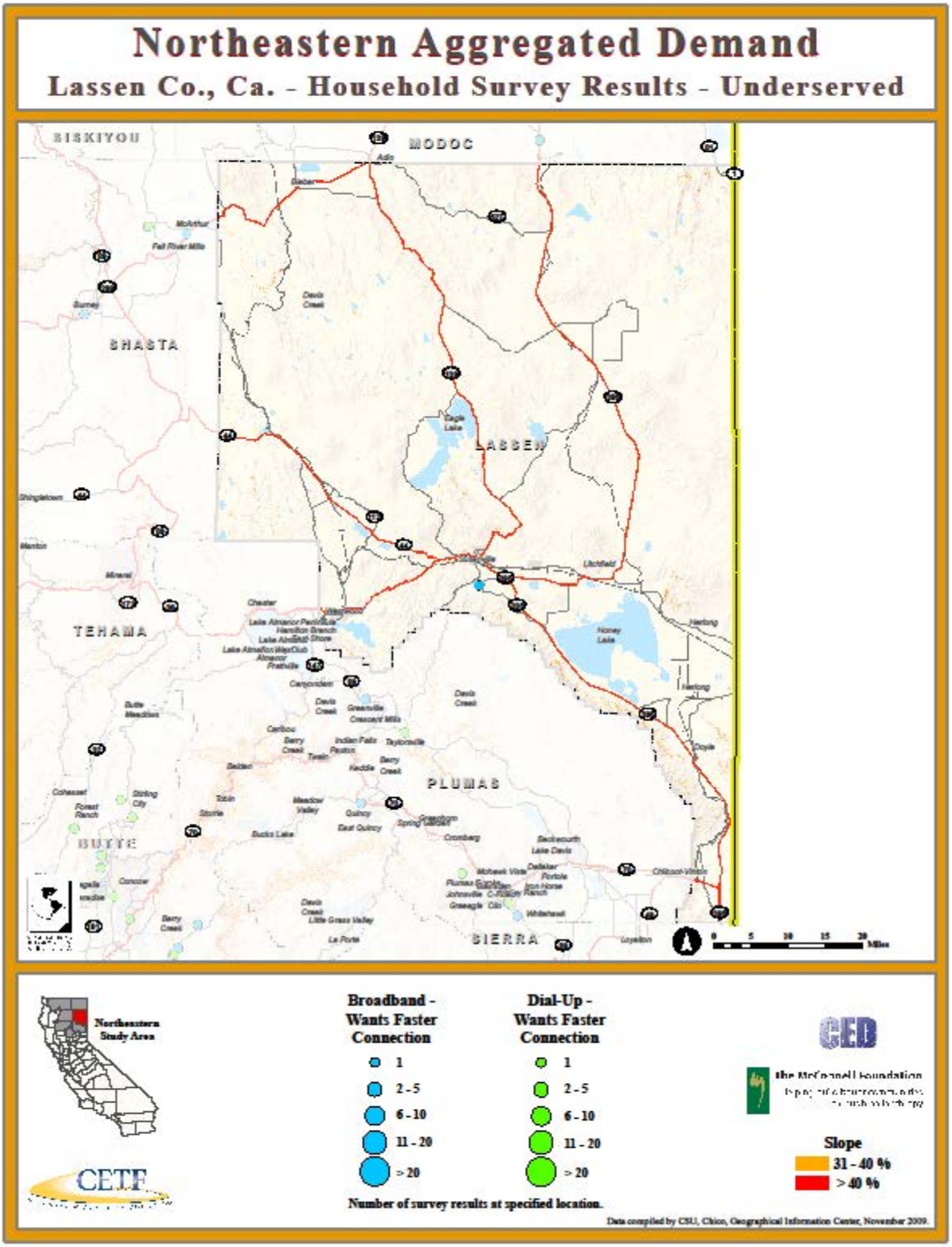
Map 14. Locations of households in Tehama County that are unserved.



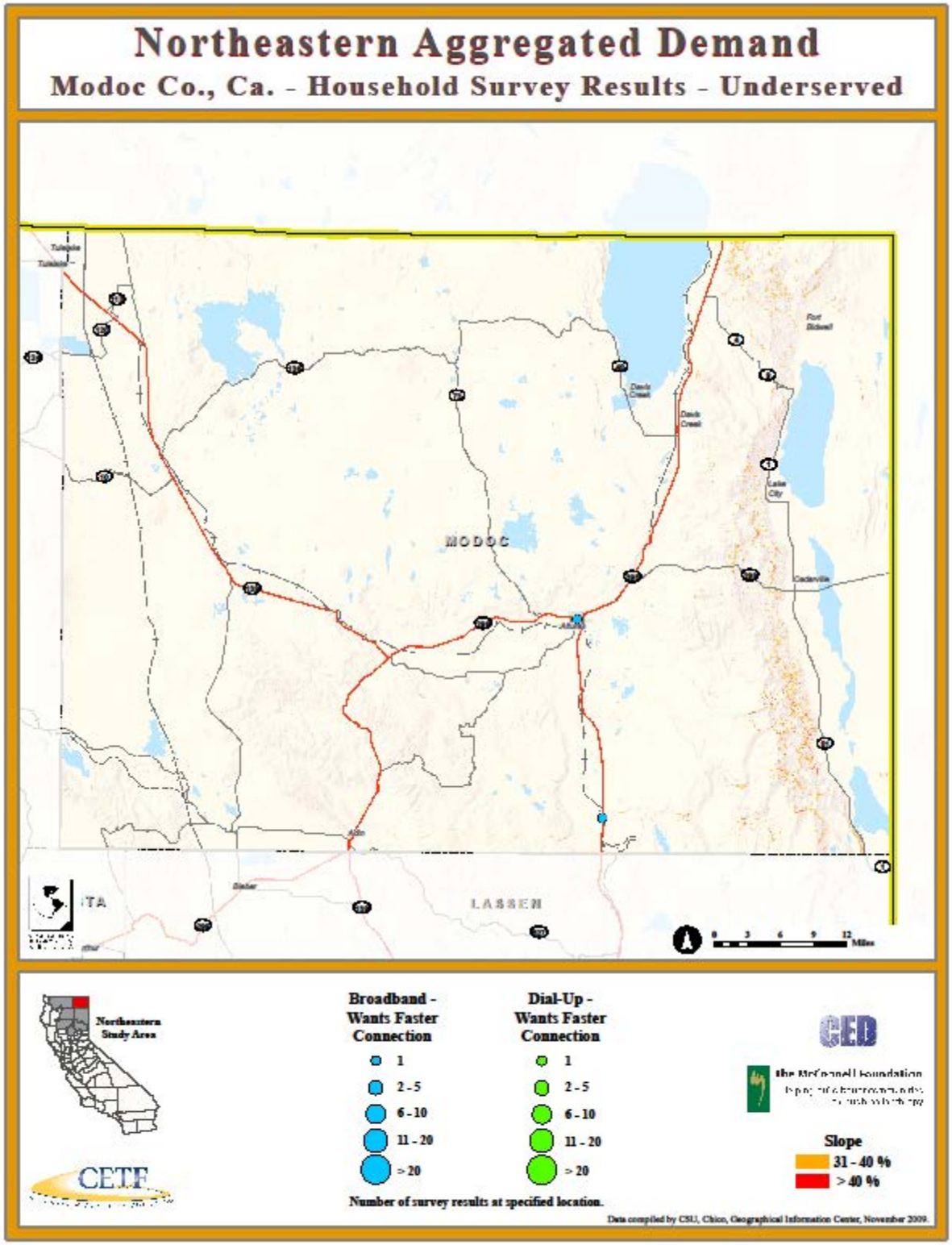
Map 15. Locations of households in Butte County that are underserved.



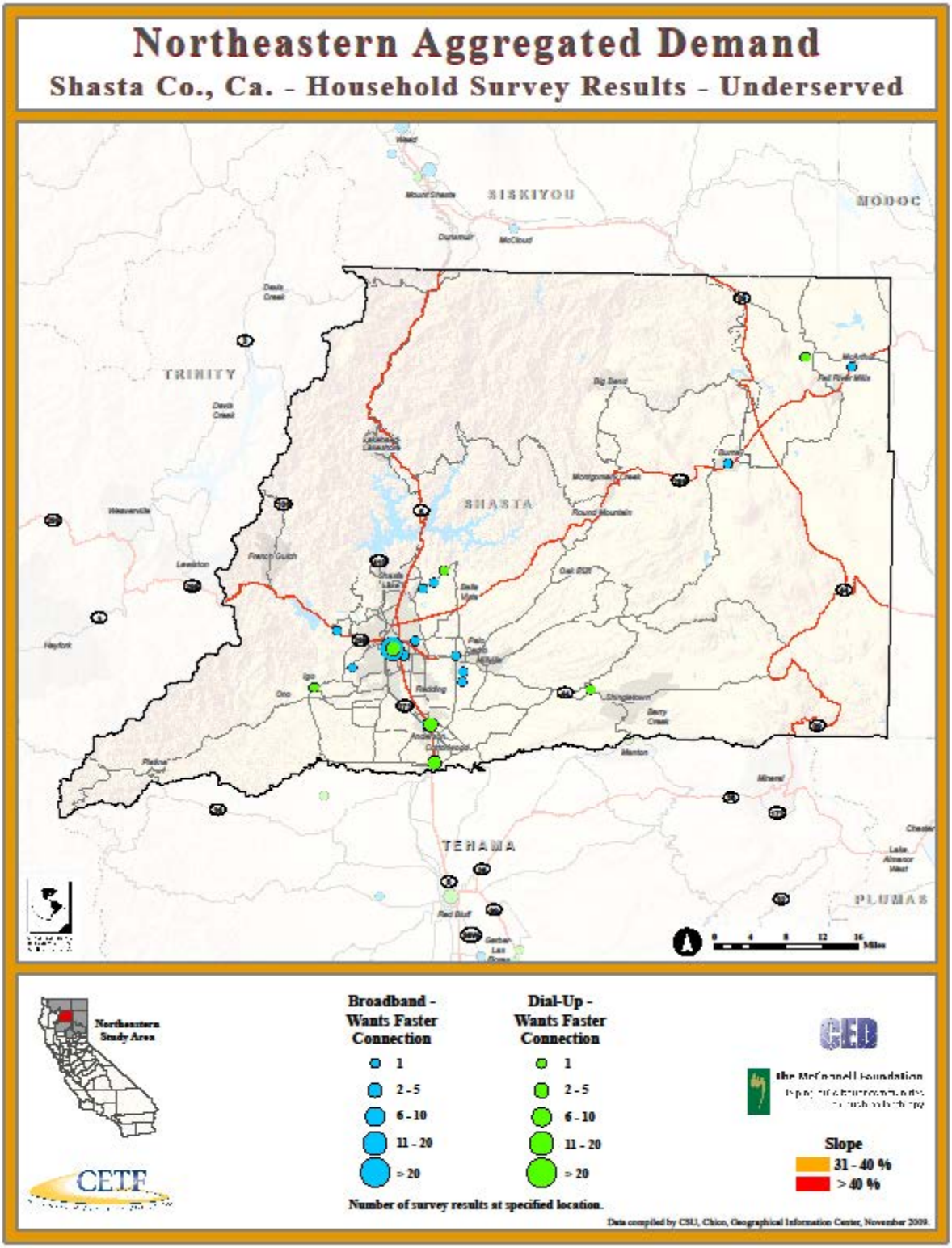
Map 16. Locations of households in Lassen County that are underserved.



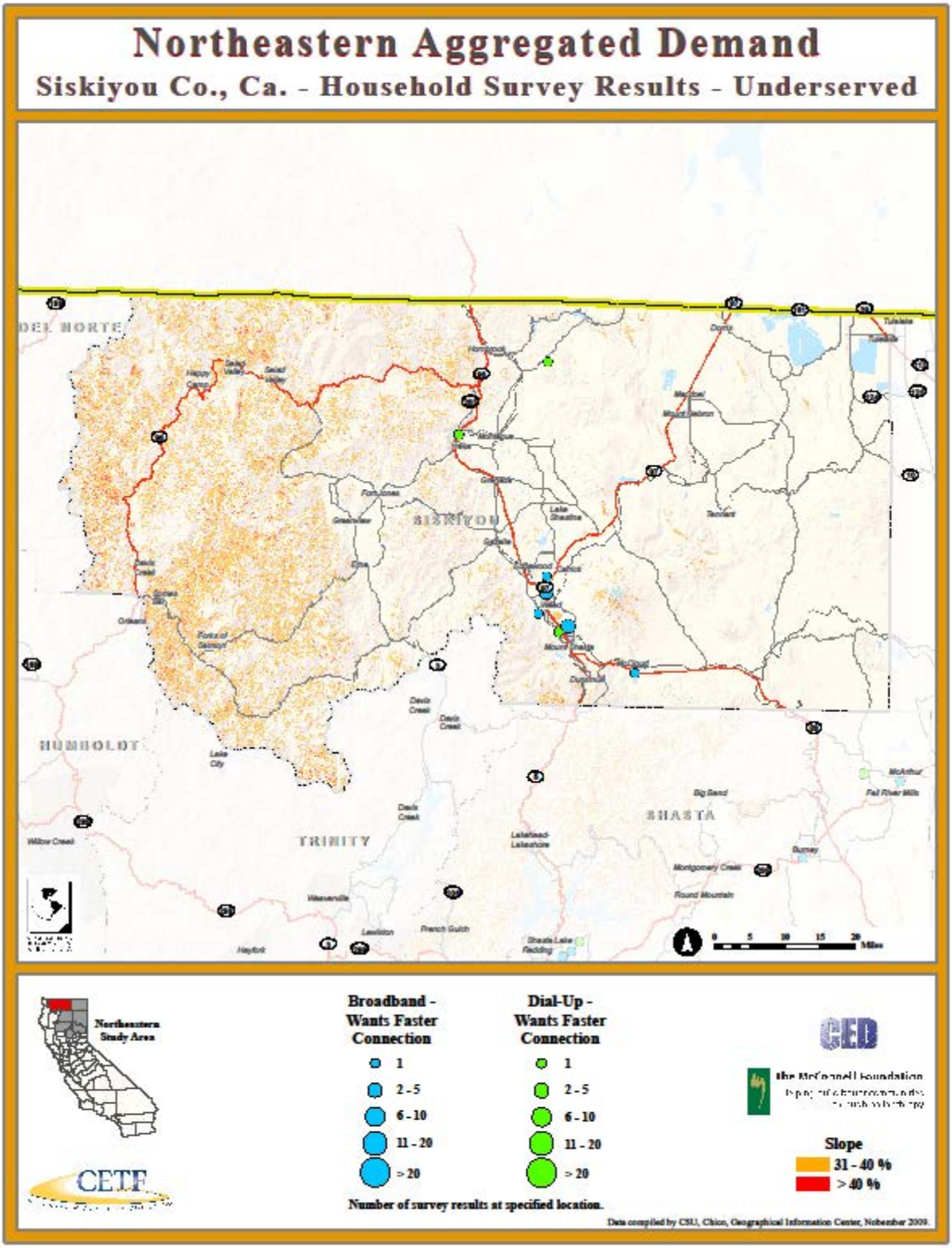
Map 17. Locations of households in Modoc County that are underserved.



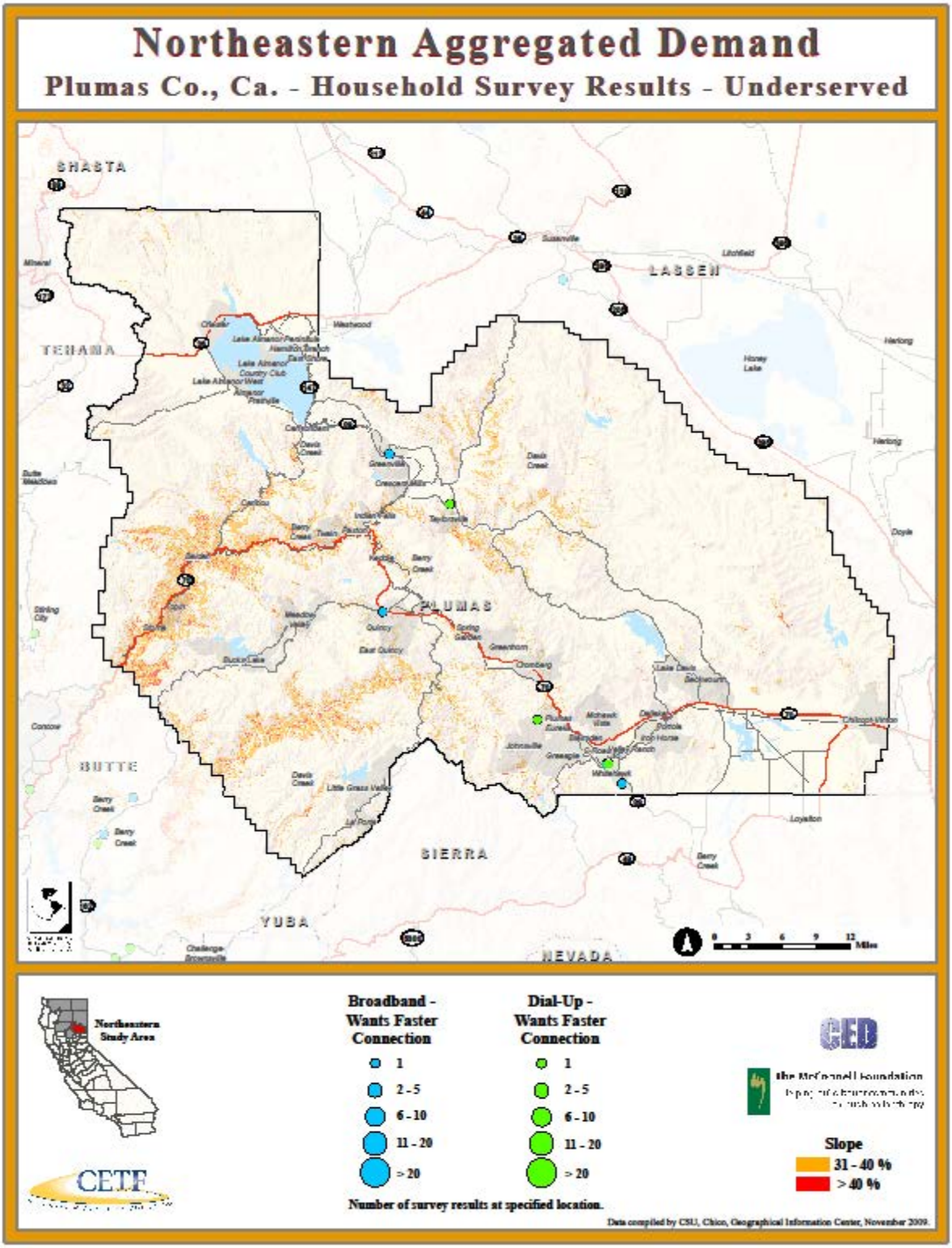
Map 18. Locations of households in Shasta County that are underserved.



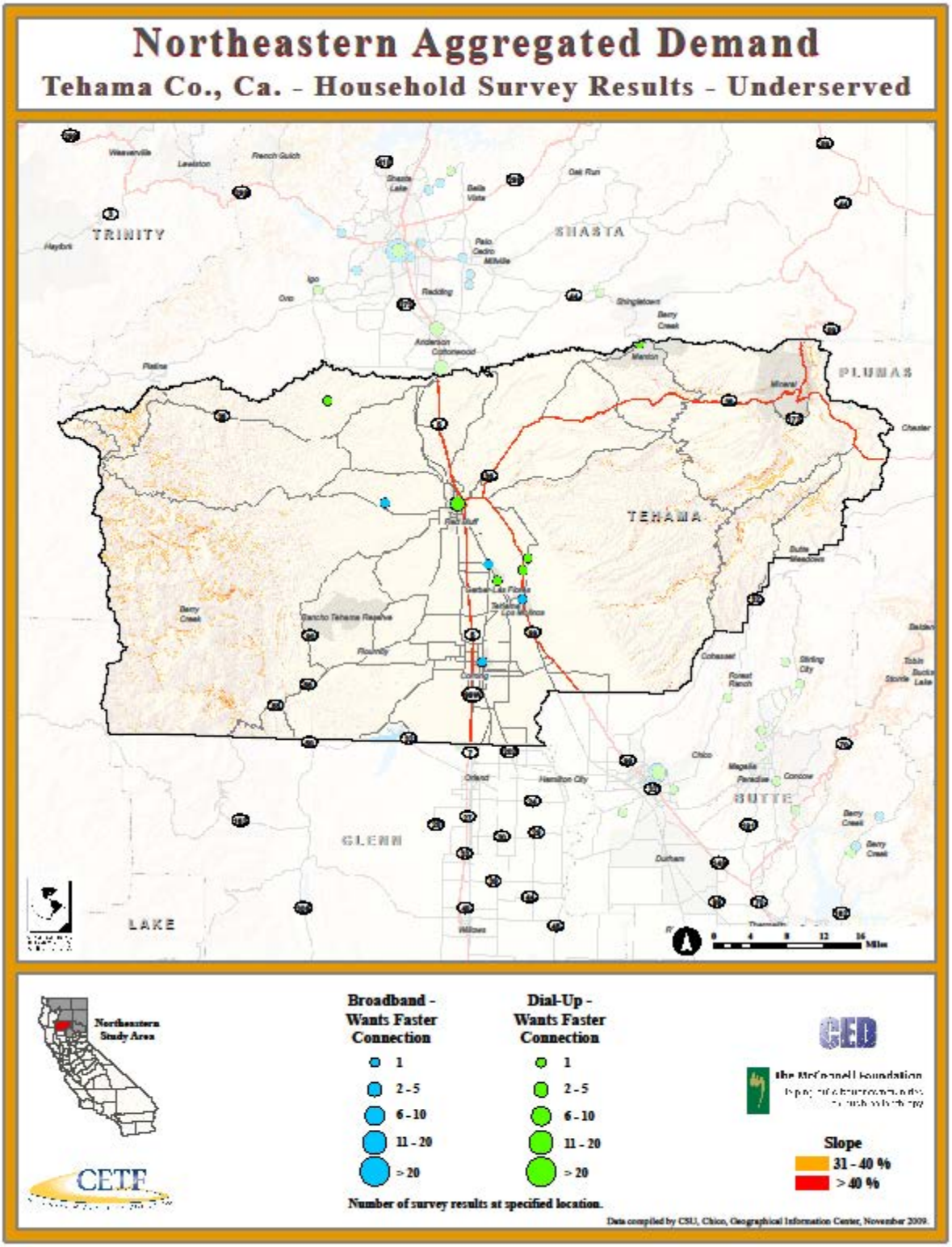
Map 19. Locations of households in Siskiyou County that are underserved.



Map 20. Locations of households in Plumas County that are underserved.



Map 21. Locations of households in Tehama County that are underserved.



Additional Analyses of Household Survey Results

A multinomial logistic regression analysis (LOGIT) was run on household survey responses for the **importance of Internet access at home** (dependent variable). First, responses for "importance of Internet access at home" were recoded to a value of "1" for extremely important, "2" for important, "3" for somewhat important and "4" for not important. The independent variables (survey questions) in the LOGIT model that best explain the variance (differences) in the "importance of Internet access at home" included:

- Which of the following telecommunications services/devices do you have at your home? (Personal computer)
- Do you have Internet access at your home?
- For which of the following do you use the Internet? (I do not use the Internet)
- For which of the following do you use the Internet? (Purchasing items/services on-line)
- For which of the following do you use the Internet? (Selling items/services on-line)
- For which of the following do you use the Internet? (Accessing government services and information)
- For which of the following do you use the Internet? (Accessing health care services)
- For which of the following do you use the Internet? (Uploading or downloading music, webcasts, podcasts, or video)
- For which of the following do you use the Internet? (Taking on-line classes)
- Are you currently employed full-time or part-time?
- On average, about how many hours per day do you spend on the Internet at home?

As shown in Table 5, these eleven independent variables explained 68.8% of the variance (differences) (Nagelkerke pseudo r-square = .688) in household survey respondents' importance ratings for Internet access at home.

Table 5. Model fitting information, pseudo r-square, and likelihood ratio tests for the LOGIT model of the importance of Internet access at home.

Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	Log Likelihood	Chi-Square	Degrees of Freedom	Sig.
Intercept Only	3456.211			
Final	1679.387	1776.823	152	**.000**

Pseudo R-Square

Cox and Snell	.635
Nagelkerke	**.688**
McFadden	.395

Likelihood Ratio Tests

Effect	Model Fitting Criteria Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	Degrees of Freedom	Sig.
Intercept	1679.387	.000	0	.
Q1_3	1691.996	12.608	4	.013
Q3	1703.043	23.656	4	.000
Q16_1	1703.092	23.704	4	.000
Q16_4	1702.672	23.285	4	.000
Q16_5	1691.452	12.065	4	.017
Q16_7	1698.482	19.095	4	.001
Q16_8	1690.127	10.739	4	.030
Q16_10	1697.848	18.460	4	.001
Q16_11	1692.302	12.915	4	.012
Q20	1720.637	41.249	20	.003
Q22a	1866.981	187.594	96	.000

More in-depth analyses of the variables included in this LOGIT model revealed the following differences in importance ratings for home Internet access:

1. A significantly higher percentage of household respondents who had personal computers at home (59.1%) rated Internet access extremely important than the respondents who didn't have personal computers at home (9.8%).
2. A significantly higher percentage of household respondents who had Internet access at home (61.5%) rated Internet access extremely important than the respondents who didn't have Internet access at home (6.3%).
3. A significantly lower percentage of household respondents who didn't use Internet at home (5.2%) rated Internet access extremely important than the respondents who used Internet at home (57.1%).
4. A significantly higher percentage of household respondents who purchased items/services on-line (69.5%) rated Internet access extremely important compared with the respondents that indicated some other reason for using

Internet at home (19.4%).

5. A significantly higher percentage of household respondents who sold items/services on-line (77.2%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at home (37.3%).
6. A significantly higher percentage of household respondents who accessed government services and information (71.8%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at home (24.5%).
7. A significantly higher percentage of household respondents who accessed health care services (72.5%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at home (32.6%).
8. A significantly higher percentage of household respondents who uploaded or downloaded music, webcasts, podcasts, or video (73.8%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at home (31.1%).
9. A significantly higher percentage of household respondents who took on-line classes (80.2%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at home (38.5%).
10. A significantly higher percentage of household respondents who are full-time employed (64.1%), part-time employed (60.1%) and unemployed (57.7%) rated Internet access extremely important compared with the respondents that are retired (29.1%), and disabled (34.3%).
11. A significantly higher percentage of household respondents who spent more time on the Internet rated Internet access extremely important compared with the respondents that spent less time on the Internet.

A multinomial logistic regression analysis (LOGIT) was run on household survey respondents' **willing to pay more for a faster Internet connection at home** (dependent variable). As shown in Table 6, seven independent variables explained 30.0% (Nagelkerke pseudo r-square = .300) of the variance (differences) in whether household respondents were willing to pay for a faster connection at home. These were:

- Which of the following telecommunications services/devices do you have at your home?(Personal computer)
- Which of the following telecommunications services/devices do you have at your home?(Video game system)
- In your opinion, how important is Internet access at your home?
- Which of the following best describes the type of Internet service you have at your home (that is your primary Internet service)?
- Do you have access to the Internet at locations outside of your home?
- If you live outside that city or town, about how many miles is that city or town from your home?
- On average, about how many hours per day do you spend on the Internet at home?

Though the above seven variables helped to explain differences in respondents who were willing versus those who were not willing to pay more for Internet services, most of the variance (differences) is not explained by any of the other questions included in the telephone survey. Therefore, the LOGIT model is very weak and of limited use in segmenting northeast household respondents based on whether or not they are willing to pay for Internet service.

Table 6. Model fitting information, pseudo r-square, and likelihood ratio tests for the LOGIT model of the willingness to pay for a faster Internet connection at home.

Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	Log Likelihood	Chi-Square	Degrees of Freedom	Sig.
Intercept Only	353.163			
Final	267.365	85.798	16	.000

Pseudo R-Square

Cox and Snell	.134
Nagelkerke	.300
McFadden	.243

Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Degrees of Freedom	Sig.
Intercept	267.365	.000	0	.
Cnty	284.077	16.712	6	.010
Q1_3	274.566	7.201	1	.007
Q5a_2	277.865	10.500	1	.001
Q9	298.621	31.256	5	.000
Q16_8	272.582	5.216	1	.022
Q16_10	272.633	5.268	1	.022
Q23	279.517	12.152	1	.000

Appendix D
D: Business Survey Results

Business Demand for Internet Service

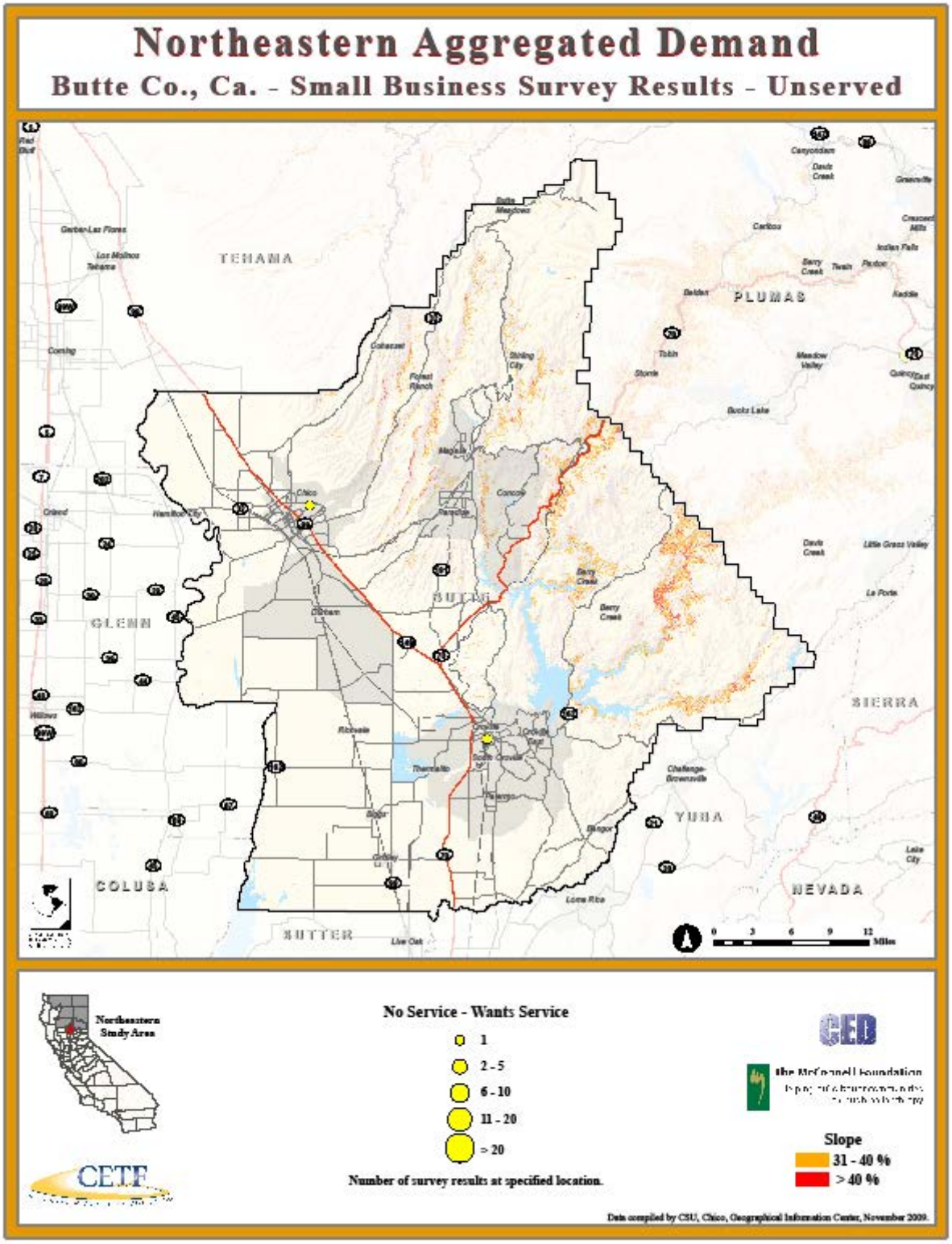
Business survey data were collected using the telephone survey questionnaire in Appendix B. Business survey respondents were segmented into six groups based on (1) the type of Internet service they had at the time of the survey and (2) their willingness to pay for broadband service. As shown in Table 7, 2.0% of the businesses said they had no Internet service, but wanted service (***unserved businesses***). Map 22 through Map 28 show the locations of these unserved businesses in the seven northeast counties. In addition, 66.1% of businesses surveyed said they had broadband service at the time of the survey and were not willing to pay more for a faster broadband connection. However, 11.2% said they had broadband and were willing to pay more for faster service and 3.0% said they had dial-up connections and were willing to pay more for faster service (***underserved businesses***). Map 29 through Map 35 show the locations of underserved businesses in each of the seven northeast counties.

Table 7. Business survey respondents willing to pay for faster Internet service crosstabulated by the type of Internet service utilized by each business at the time of the survey.

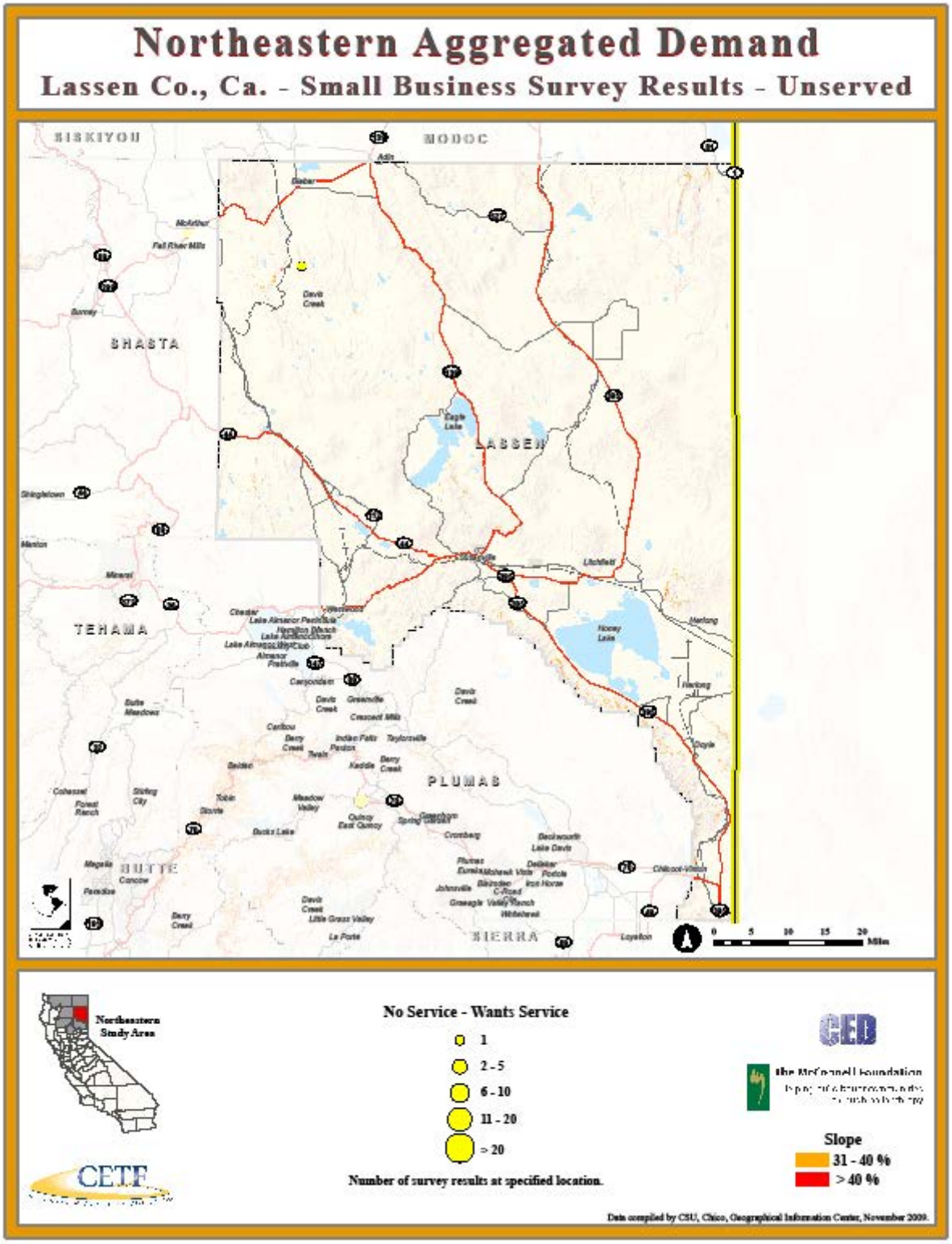
Segments based on willingness to pay	Number	Percent of all respondents	Percent of respondents who answered
Have broadband service and don't want to pay more for a faster broadband connection	465	58.2	66.1
Have broadband service and want to pay more a faster connection (***underserved***)	79	9.9	11.2
Have dial-up connection and don't want to pay more for a faster connection	17	2.1	2.4

Have dial-up connection and want to pay more for a faster connection (***underserved***)	21	2.6	3.0
Have no Internet service and don't want it	107	13.4	15.2
Have no Internet service and want it (***unserved***)	14	1.8	2.0
Total	**703**	**87.9**	**100.0**

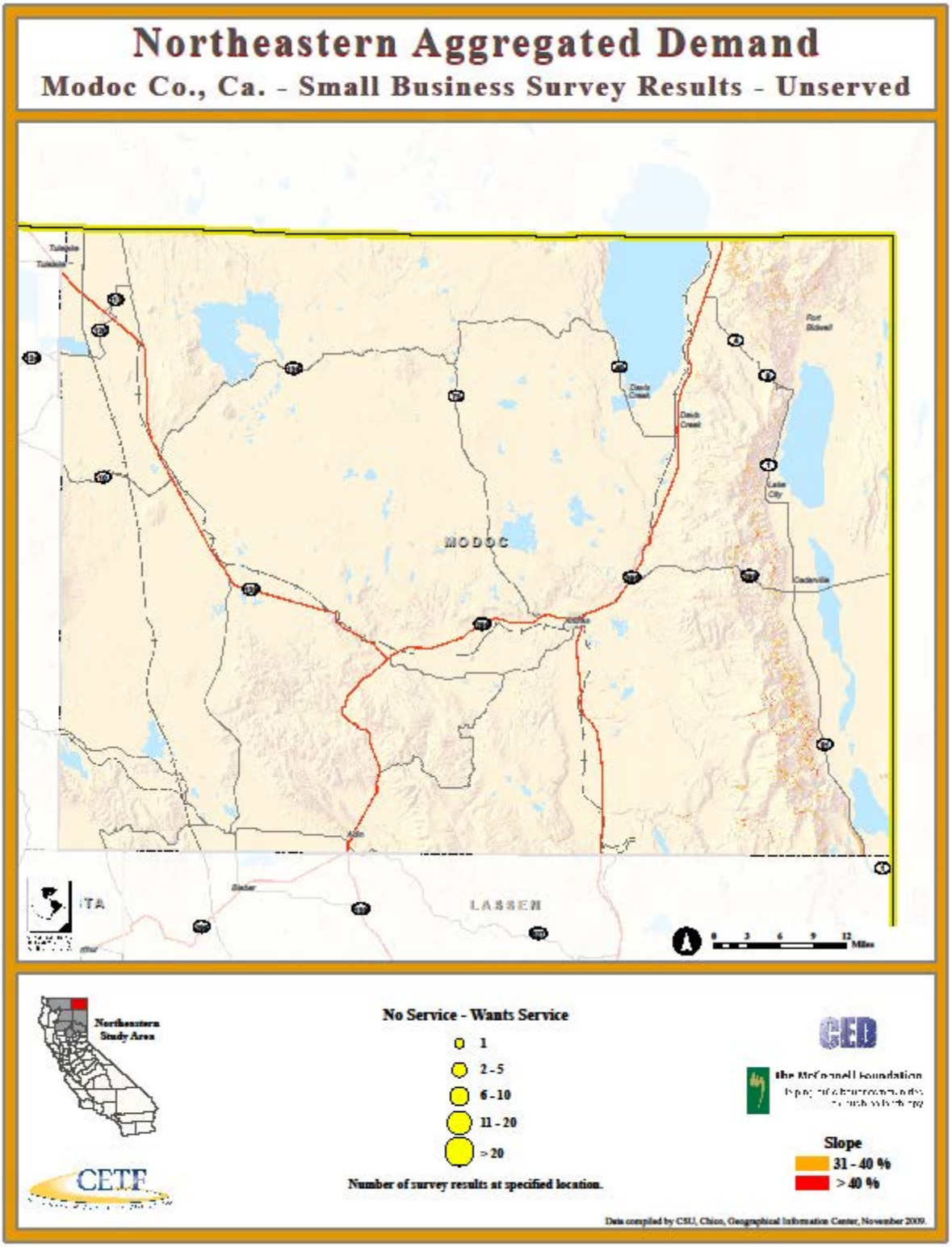
Map 22. Locations of businesses in Butte County that are unserved.



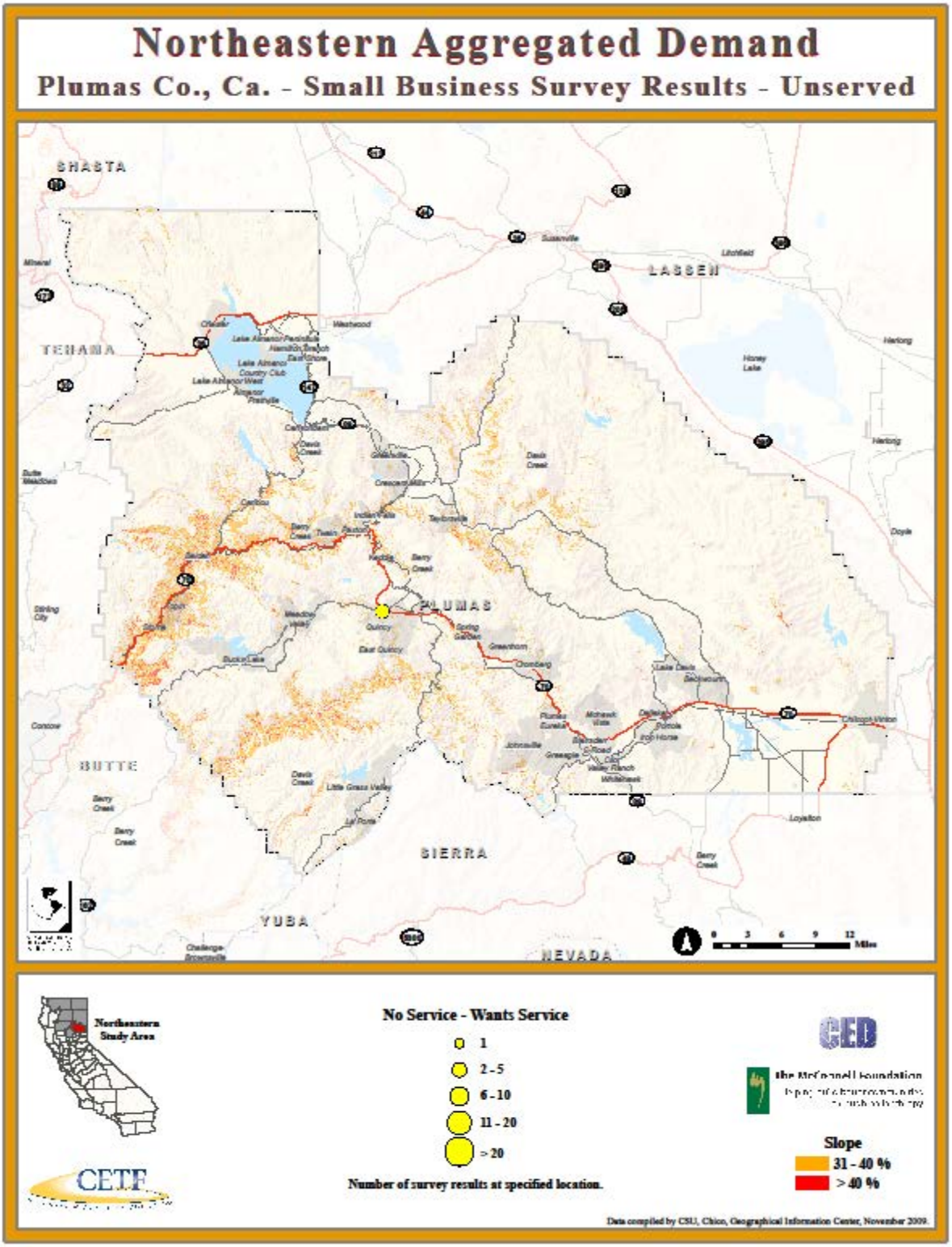
Map 23. Locations of businesses in Lassen County that are unserved.



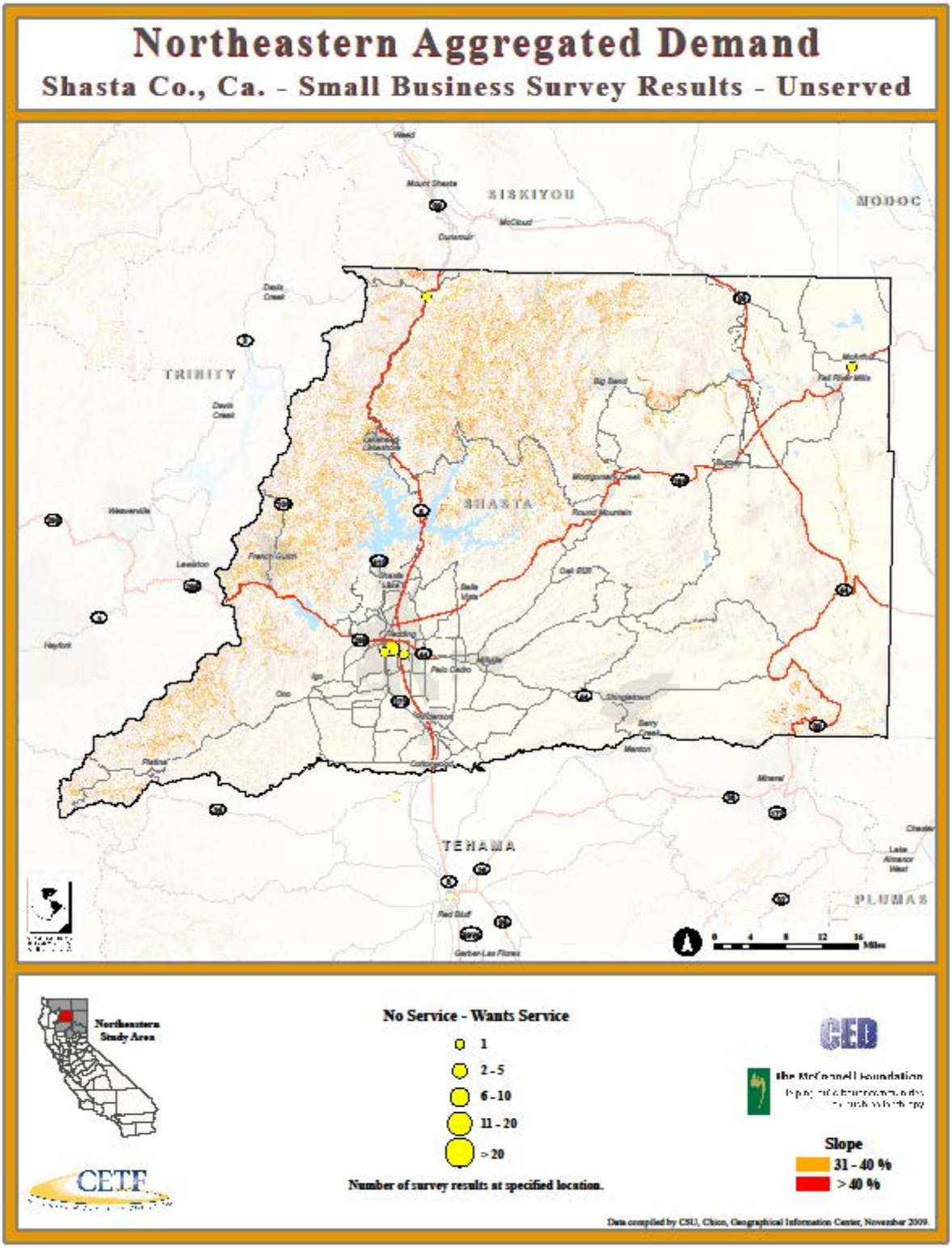
Map 24. Locations of businesses in Modoc County that are unserved.



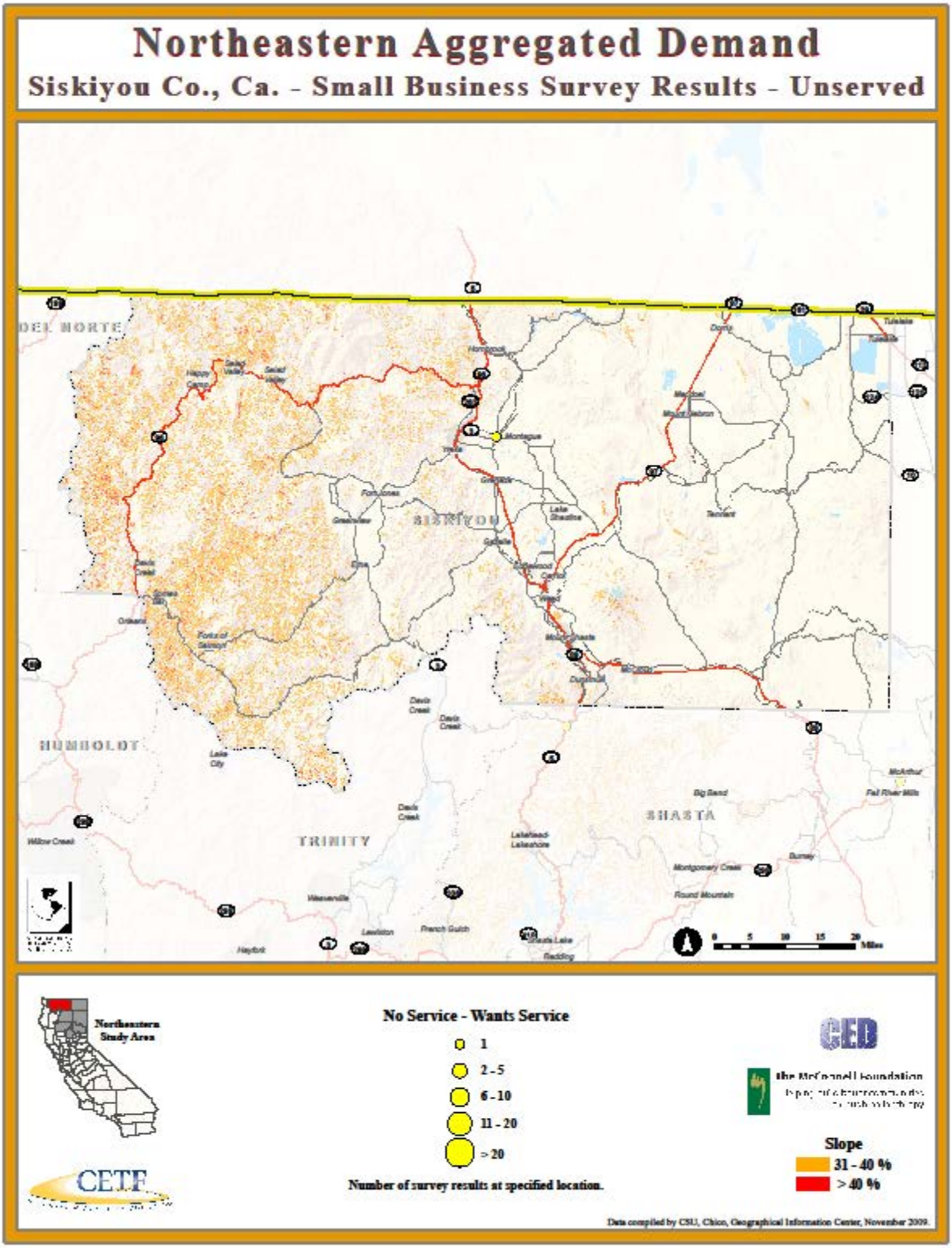
Map 25. Locations of businesses in Plumas County that are unserved.



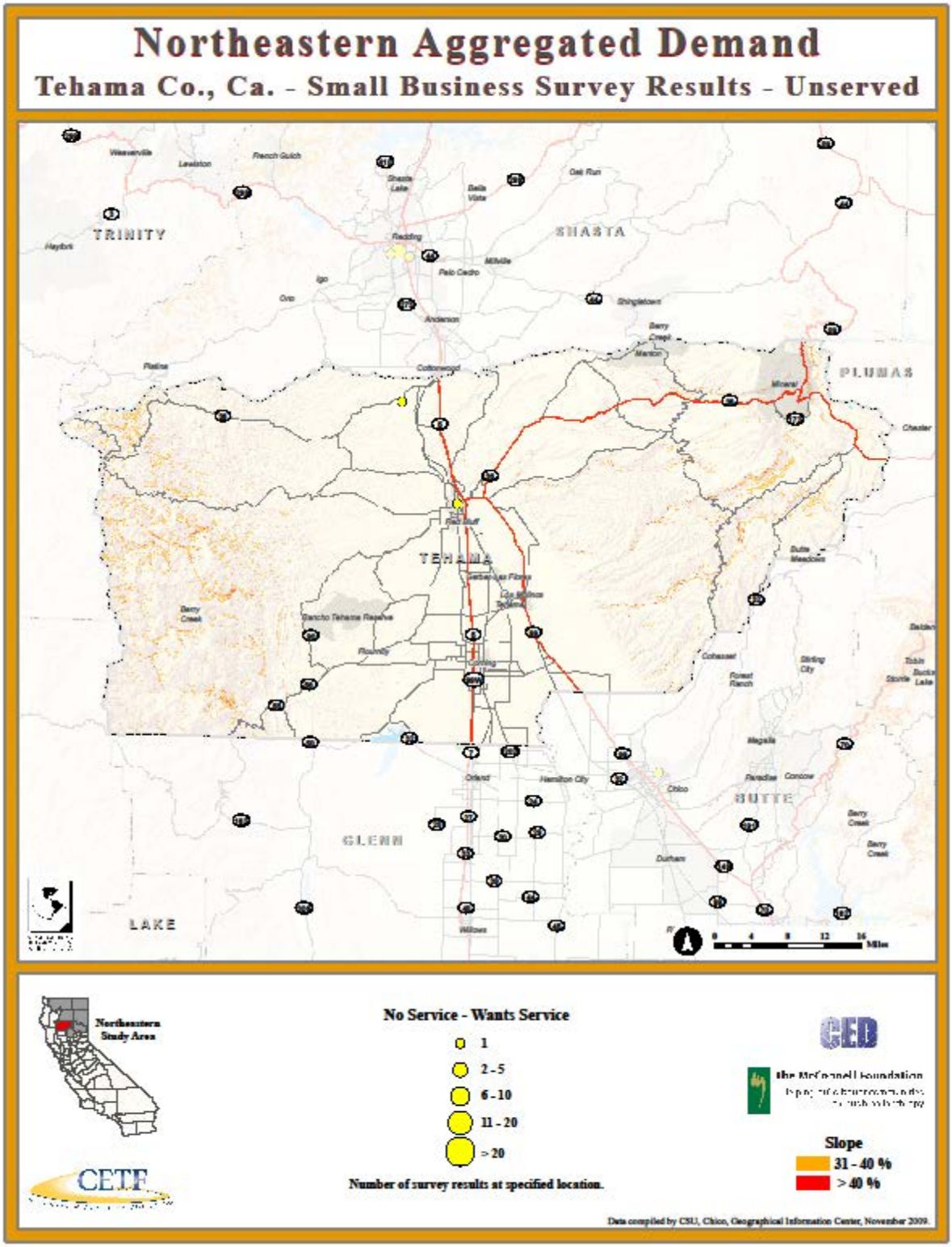
Map 26. Locations of businesses in Shasta County that are unserved.



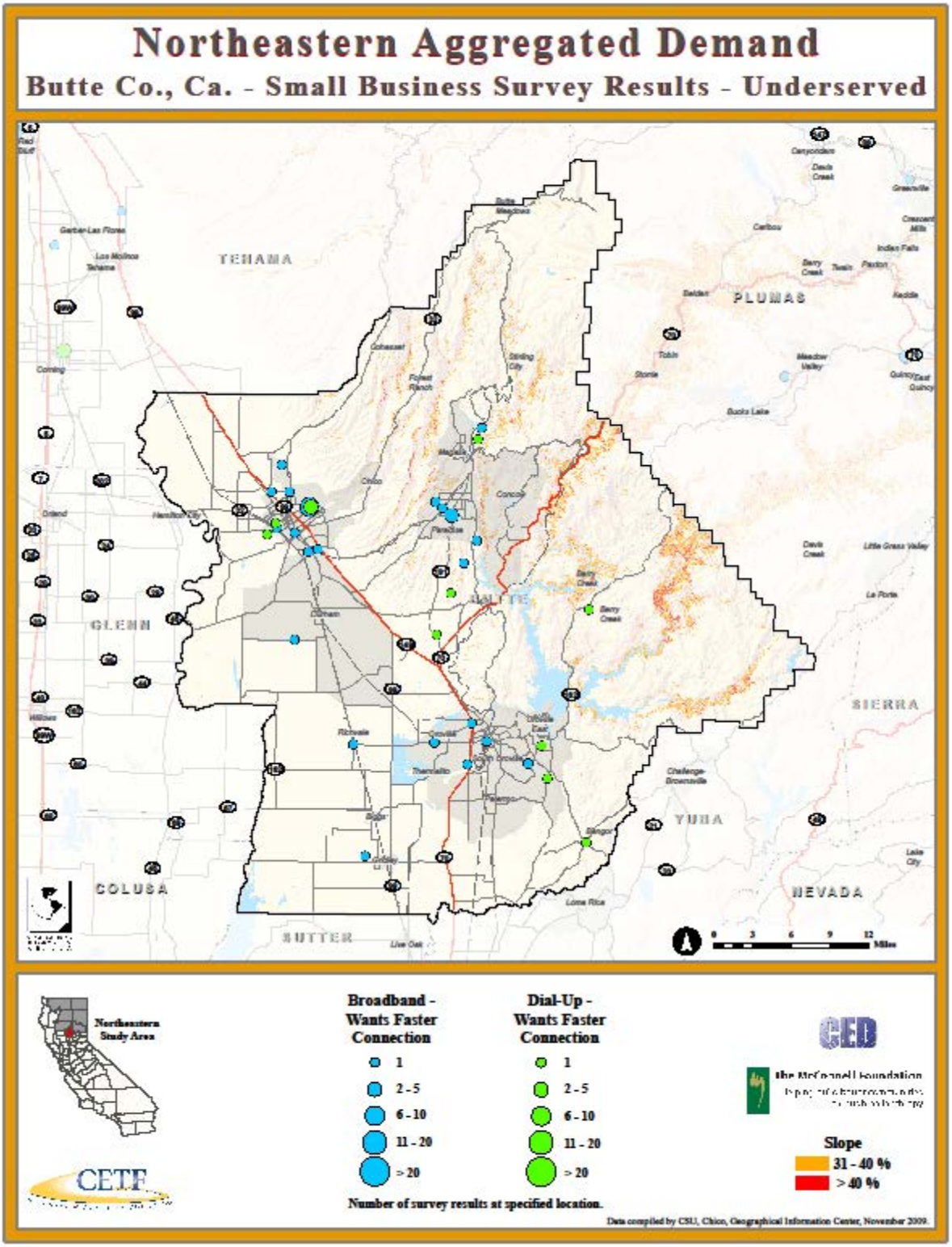
Map 27. Locations of businesses in Siskiyou County that are unserved.



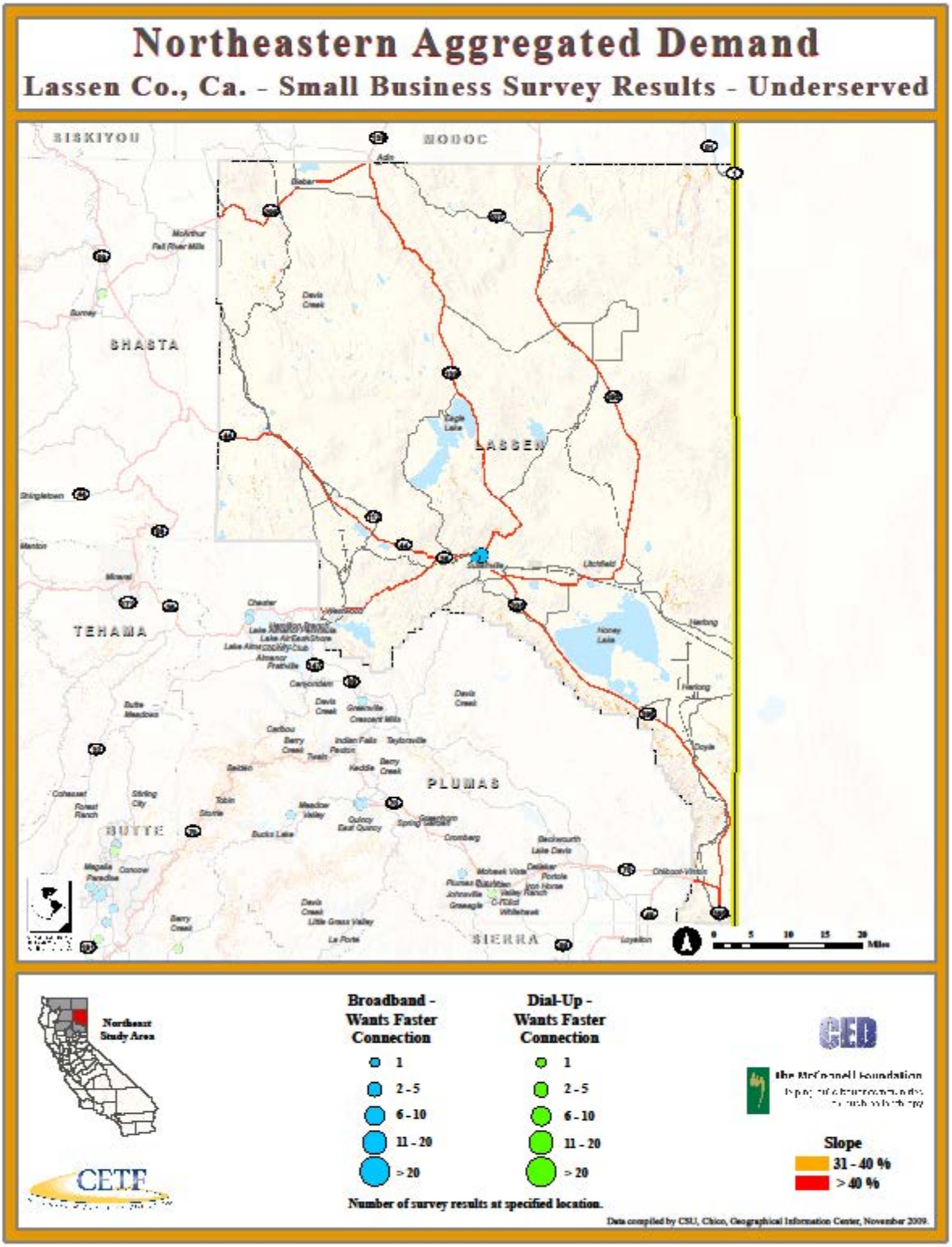
Map 28. Locations of businesses in Tehama County that are unserved.



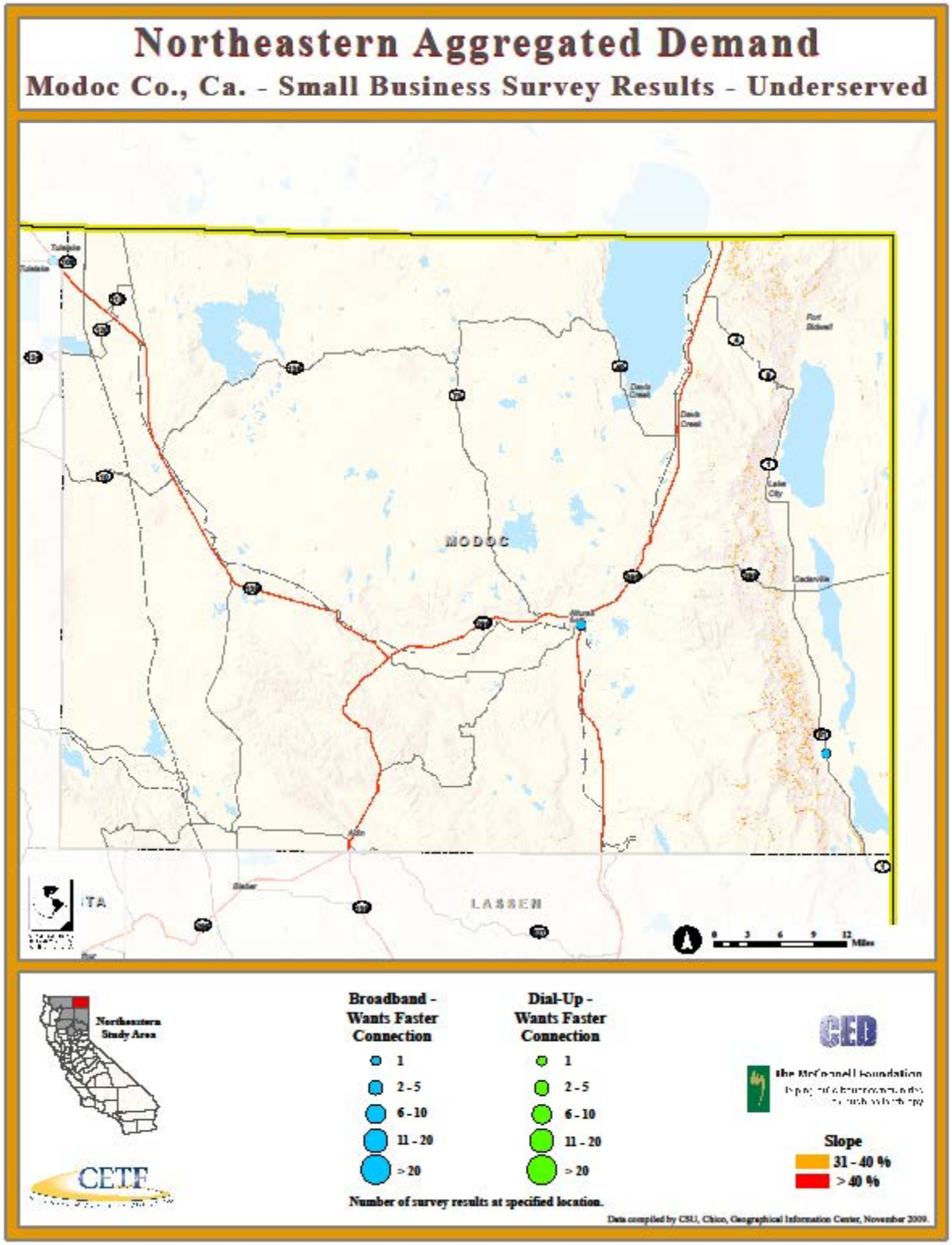
Map 29. Locations of businesses in Butte County that are underserved.



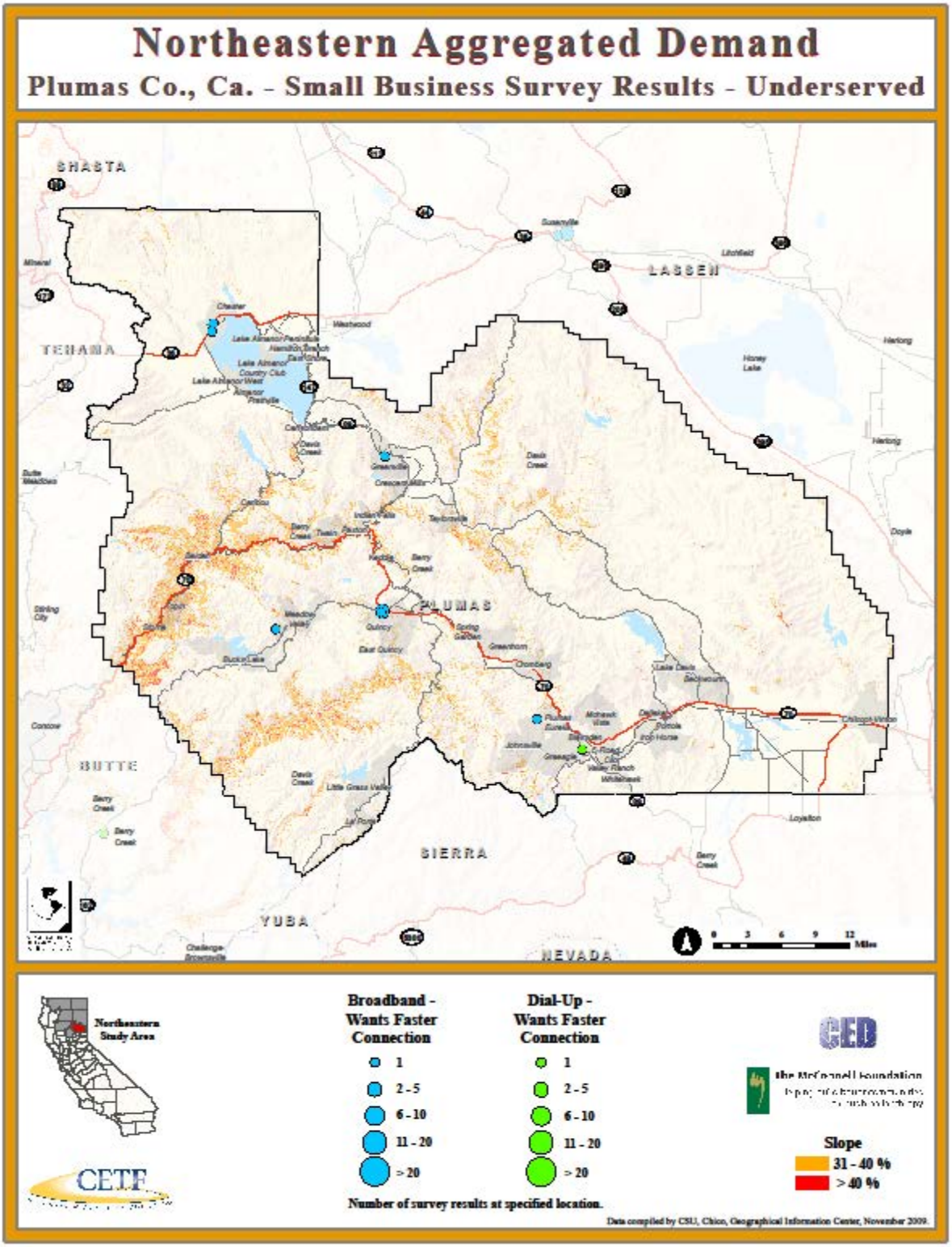
Map 30. Locations of businesses in Lassen County that are underserved.



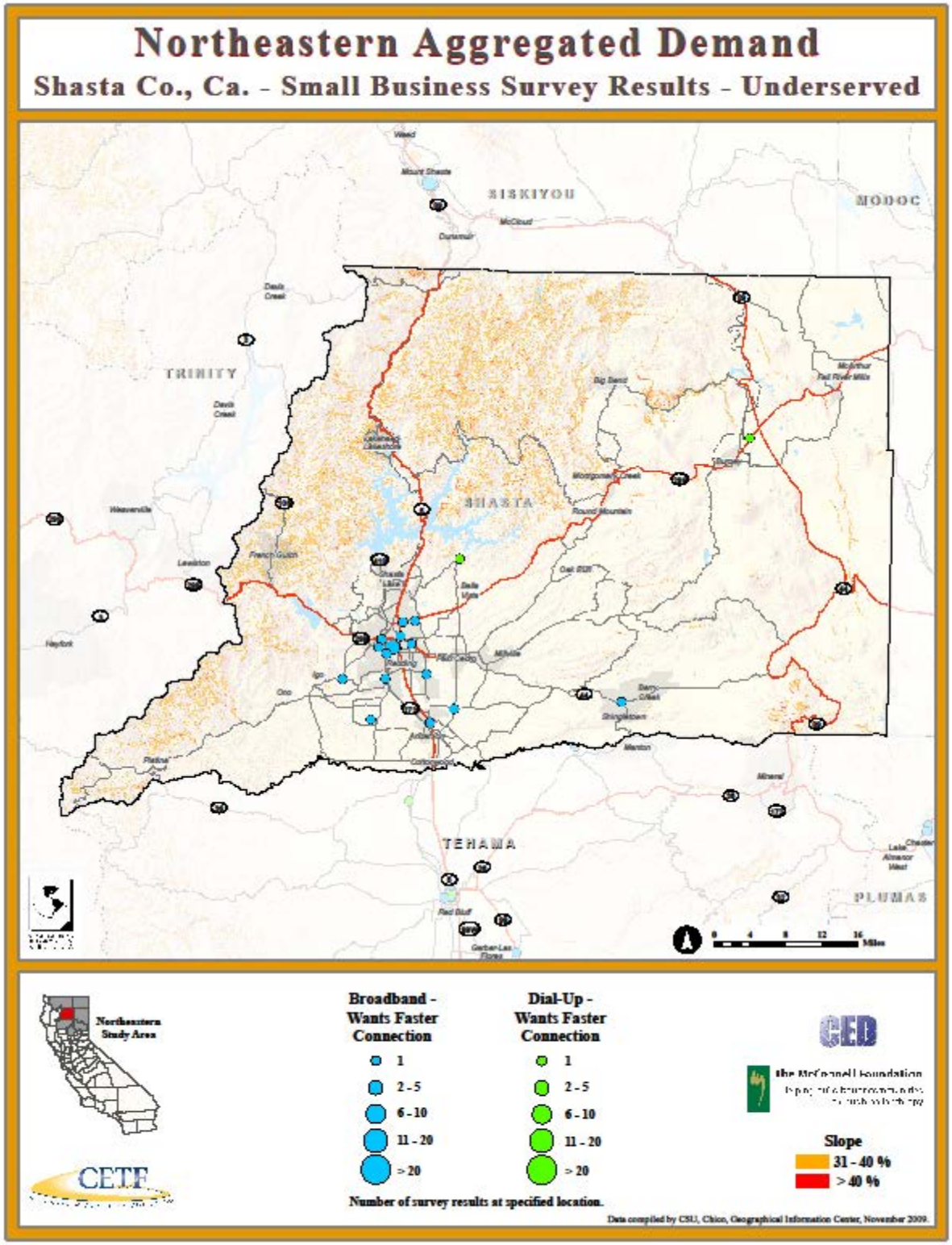
Map 31. Locations of businesses in Modoc County that are underserved.



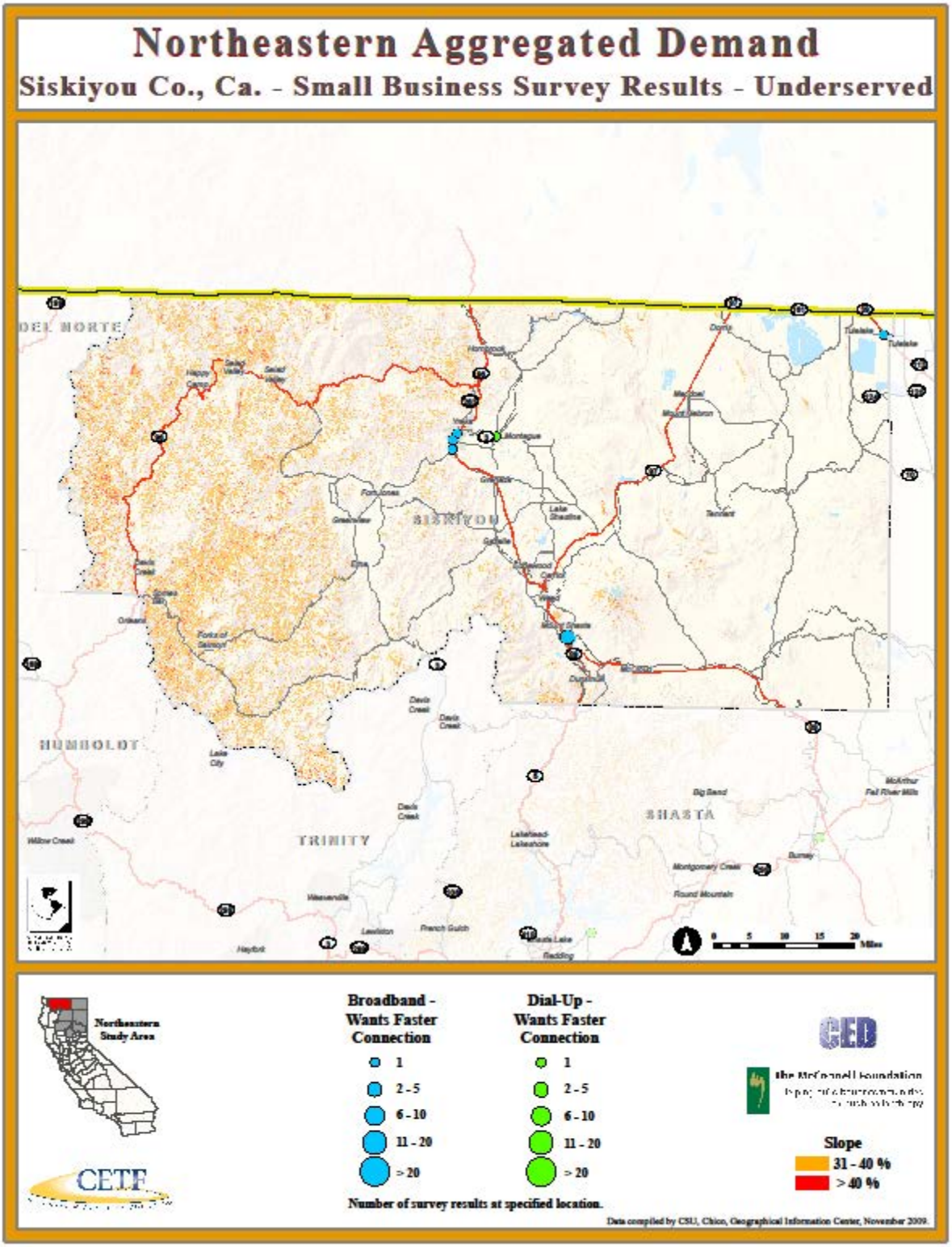
Map 32. Locations of businesses in Plumas County that are underserved.



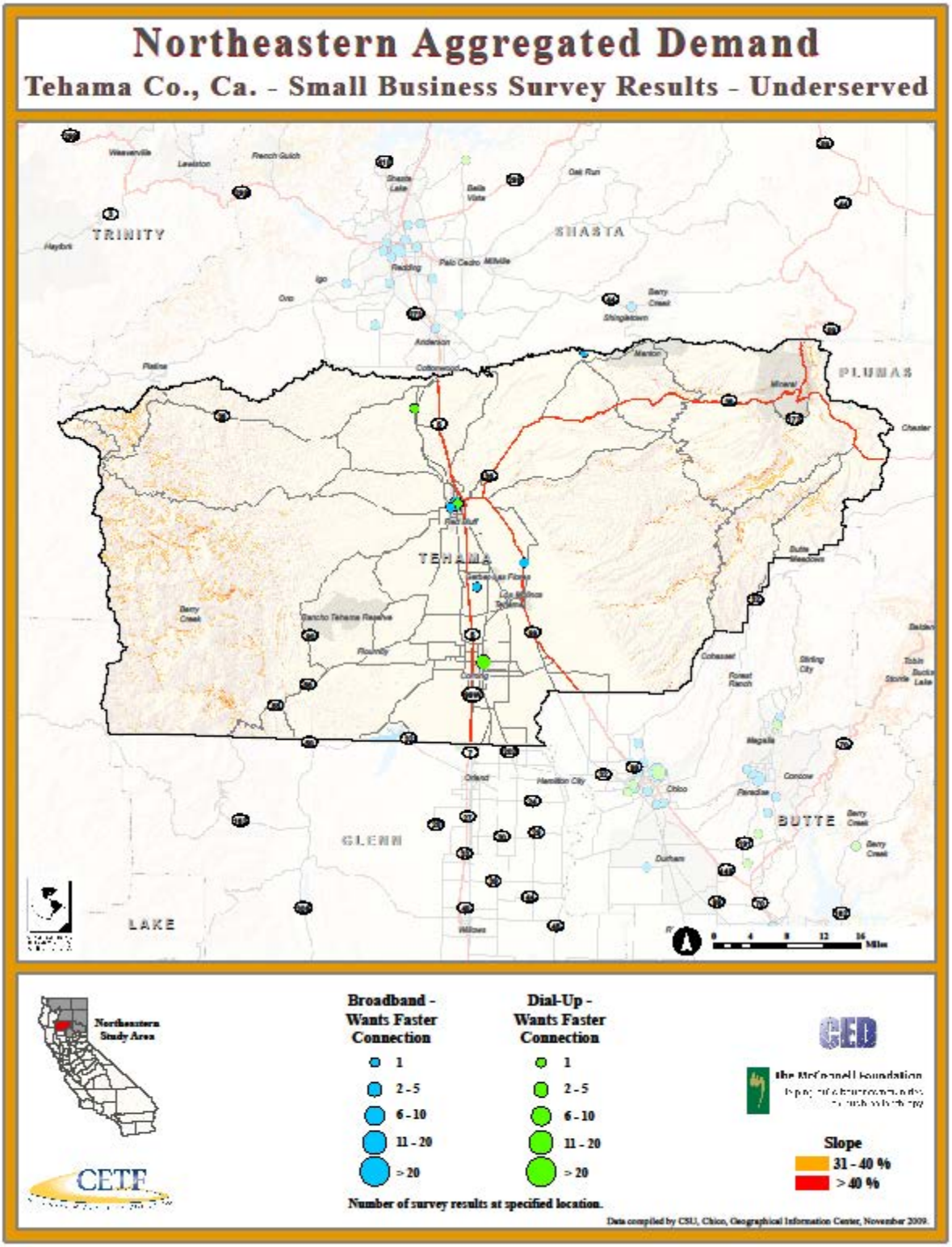
Map 33. Locations of businesses in Shasta County that are underserved.



Map 34. Locations of businesses in Siskiyou County that are underserved.



Map 35. Locations of businesses in Tehama County that are underserved.



Additional Analyses of Business Survey Results

A multinomial logistic regression analysis (LOGIT) was run on business survey responses for the **importance of Internet access at business** (dependent variable). First, responses for "importance of Internet access at business" were recoded to a value of "1" for extremely important, "2" for important, "3" for somewhat important and "4" for not important. The independent variables (survey questions) in the LOGIT model that best explain the variance (differences) in the "importance of Internet access at business" included:

- Which of the following telecommunications services/devices do you have in your business? (Radio/satellite radio)
- Which of the following telecommunications services/devices do you have in your business? (PDA/Blackberry)
- How satisfied are you with the reliability of your current primary Internet access?
- How satisfied are you with the download speed of your current primary Internet access?
- For which of the following do you use the Internet at your business? (Purchasing items/services on-line)
- For which of the following do you use the Internet at your business? (Company Web site)
- For which of the following do you use the Internet at your business? (Accessing health care services)
- For which of the following do you use the Internet at your business? (Accessing financial services and information)
- On average, about how many hours per day do you spend per day on the Internet at work?
- How much do you currently pay per month for Internet access at your business?

As shown in Table 8, these ten independent variables explained 66.2% of the variance (differences) (Nagelkerke pseudo r-square = .662) in business survey respondents' importance ratings for Internet access at business.

Table 8. Model fitting information, pseudo r-square, and likelihood ratio tests for the LOGIT model of the importance of Internet access at business.

Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	**Log Likelihood**	**Chi-Square**	**Degrees of Freedom**	**Sig.**

Intercept Only	413.702			
Final	213.826	199.876	54	**.000**

Pseudo R-Square

Cox and Snell	.511
Nagelkerke	**.662**
McFadden	.483

Likelihood Ratio Tests

	Model Fitting Criteria	**Likelihood Ratio Tests**		
Effect	**Log Likelihood of Reduced Model**	**Chi-Square**	**Degrees of Freedom**	**Sig.**
Intercept	213.826	.000	0	.
q1_6	227.016	13.190	3	.004
q1_7	231.844	18.018	3	.000
q9a	263.896	50.071	15	.000
q9b	246.117	32.291	15	.006
q17_3	227.352	13.527	3	.004
q17_5	247.053	33.228	3	.000
q17_7	231.618	17.793	3	.000
q17_8	232.423	18.597	3	.000
q22	226.676	12.850	3	.005
q8	223.705	9.879	3	.020

More in-depth analyses of the variables included in this LOGIT model revealed the following differences in importance ratings for business Internet access:

1. A significantly lower percentage of business respondents who had radio/satellite radio at business (11.1%) rated Internet access not important than the respondents who didn't have radio/satellite radio at business (19.6%).
2. A significantly higher percentage of business respondents who had PDA/Blackberry at business (90.6%) rated Internet access extremely important than the respondents who didn't have PDA/Blackberry at business (56.6%).
3. Most (75.6%) of the business respondents who rated Internet access as very important or important indicated that they were very satisfied or satisfied with their reliability of service.
4. Most (69.7%) of the business respondents who rated Internet access as very important or important indicated that they were very satisfied or satisfied with their download speed.
5. A significantly higher percentage of business respondents who purchased items/services on-line (86.1%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at business (13.9%).
6. A significantly higher percentage of business respondents who maintained company website on-line (63.9%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at business (36.1%).
7. A significantly lower percentage of business respondents who accessed health care services (39.9%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at business (60.1%).
8. A significantly higher percentage of business respondents who accessed financial services and information (70.5%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at business (29.5%).
9. A significantly higher percentage of household respondents who took on-line classes (80.2%) rated Internet access extremely important compared with the respondents that indicated some other reason for using Internet at home (38.5%).
10. A significantly higher percentage of business respondents who spent more time on the Internet rated Internet access extremely important compared with the respondents that spent less time on the Internet.
11. A significantly higher percentage of businesses that rated Internet access as extremely important pay more than $39.00 per month for access (53.7%) as compared with those businesses that rated access as extremely important and pay $39.00 or less per month for service (46.3%).

A LOGIT (logistic regression) analysis of businesses that were willing to pay for a faster Internet service revealed that five independent variables explained 46.5% (Nagelkerke

pseudo r-square = .465) of the differences in those who were willing to pay more and those who were not (Table 9). These variables (survey questions) were:

1. How satisfied are you with the download speed of your current primary Internet access?
2. Are you interested in training on potential workplace uses or applications of the Internet/Web?
3. If you already have Broadband Internet service, would you prefer to receive one bill for your phone and Internet?
4. In what year were you born?
5. Which of the following best describes the type of business that you own or manage?

Table 9. Model fitting information, pseudo r-square, and likelihood ratio tests for the LOGIT model of the willingness to pay for a faster Internet connection by businesses.

Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	528.964			
Final	341.602	187.362	34	.000

Pseudo R-Square

Cox and Snell	.284
Nagelkerke	**.465**
McFadden	.354

Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Degrees of Freedom	Sig.
Intercept	341.602	.000	0	.
q9b	445.402	103.800	5	.000
q13	355.115	13.513	2	.001
q14	368.673	27.071	5	.000
q23	358.233	16.631	1	.000
q18	385.922	44.321	21	.002

More in-depth analyses of the five independent variables in the LOGIT model revealed the following:

1. A significantly higher percentage of business respondents who are very dissatisfied with the download speed of their current primary Internet access (55.3%) would like to pay more for a faster Internet connection compared with the respondents that are very satisfied with the download speed of their current primary Internet access (4.5%).
2. A significantly higher percentage of business respondents who are interested in training on potential workplace uses or applications of the Internet/Web (27.3%) would like to pay more for a faster Internet connection compared with the respondents that are not interested in the training (15.8%).
3. Of the business respondents who rated Internet access as extremely important, a significantly higher percentage said they prefer to receive one bill for phone and Internet service (74.7%) or already have this billing arrangement (76.0%) compared with those who do not prefer this billing arrangement (63.6%).

Appendix E
Survey Data Collection and Methods

Data collection for this project focused on assessing demand for broadband Internet connectivity by households and small businesses in the seven county study area. The survey questions for both the household and the business surveys were developed from: (1) a review of the Redwood Coast Connect survey questionnaire, and (2) survey questions used in the Gold Country Broadband Survey conducted in 2008. Minor adjustments to the survey questions were made based in input provided at public meetings held in each of the seven counties with broadband providers and consumers prior to the inception of the telephone surveys.

Study Area and Population

The study area for this project includes Butte County, Lassen County, Modoc County, Plumas County, Shasta County, Siskiyou County and Tehama County (Map 36). The study populations in these counties consisted of households and businesses with land line (hard-wired) telephone services. The household telephone data collection period for the Northeast California Connect Survey began on July 8, 2009 and was completed on August 1, 2009. The telephone survey of businesses began on June 3, 2009 and ended on July 13, 2009.

Sampling Plan and Instruments

Questionnaire Pretest

Study area residents who attended public workshops in each of the seven counties of the study area were given the opportunity to review and comment on the telephone questionnaires for households and businesses. Minor adjustments in question wording were made on each of the two surveys based on comments and suggestions received from ISPs, public officials, and consumers.

Sampling Procedures - Households

Participants in the household (residential customer) telephone survey were selected through a random digit dial (RDD) procedure. A random sample of residential telephone numbers in the study area was purchased from Survey Sampling International (SSI) of Shelton, Connecticut (http://www.surveysampling. com). SSI is a global survey sampling company with offices in 15 countries and serves more than 1,800 clients, including nearly three quarters of the top research firms worldwide.

Calls to residential telephone numbers selected in the sample were made during targeted times:

(1) Weekday mornings
(2) Weekday afternoons
(3) Weekday evenings
(4) Weekend days (Saturday mornings and Sunday afternoons)

(5) Weekend evenings (Saturday and Sunday nights)

Each telephone number selected in the household RDD sample was called at least once during each targeted time to maximize the chances of reaching a person in each household. When a person was reached in a household, the telephone interviewer asked to speak with the person in that household age 18 or older who had the most recent birthday. Survey research results on random selection methods published in ***Public Opinion Quarterly***, the official research journal of the American Association for Public Opinion Research (AAPOR), report that the representativeness of samples selected through the most recent birthday method are equivalent to studies that utilize the full household enumeration method of random selection.

Sampling Procedures – Businesses

The Center for Economic Development at California State University, Chico, provided a list of all businesses in the study area to the Program for Applied Research and Evaluation. A random sample of businesses from each of the counties in the study area was selected from this list. Each business selected in the sample was called between the hours of 9:00 AM and 4:30 PM during weekdays (Monday through Friday). When a business was reached, telephone interviewers asked to speak to the person with the authority to make decisions regarding Internet access for that business. If that person was not available, suggested callback times were requested and follow-up calls were made. Each business selected in the sample was called up to five times to maximize the chances of reaching the appropriate representative for that business.

Working Assumptions

An initial working assumption for this project was that ISPs (Internet service providers) are the key decision makers regarding expansion and/or upgrades of broadband services to households and businesses within the study area. Therefore, data on demand for broadband services should be made easily accessible to and user friendly for all ISPs regardless of their size and/or technology. In addition, aggregation of demand needed to be presented at the community level. Thus, the project focus was on collecting statistically representative market demand data and presenting that data in a format that could be accessed and easily analyzed by ISPs.

Household Telephone Survey

As shown in Table 9, a total of 1836 household telephone interviews were completed for Northeast California Connect. As shown in Table 10, household sampling tolerances varied from +/- 3.5% in Butte County to +/-17.8% in Modoc County. The overall sampling error for the region is +/-2.3% with 95% confidence. Table 11 and Figure 2 show the number of household interviews completed by county as well as the percentage of total sample for each county in the study area.

Table 10. Number of completed telephone interviews for the Northeast California Connect Broadband Survey.

Sampling Method	Number of Completed Surveys
Household telephone survey	1836
Small business telephone survey	800
Total	**2636**

Table 11. Sampling tolerances for the Northeast California Connect Broadband Household Survey by county.

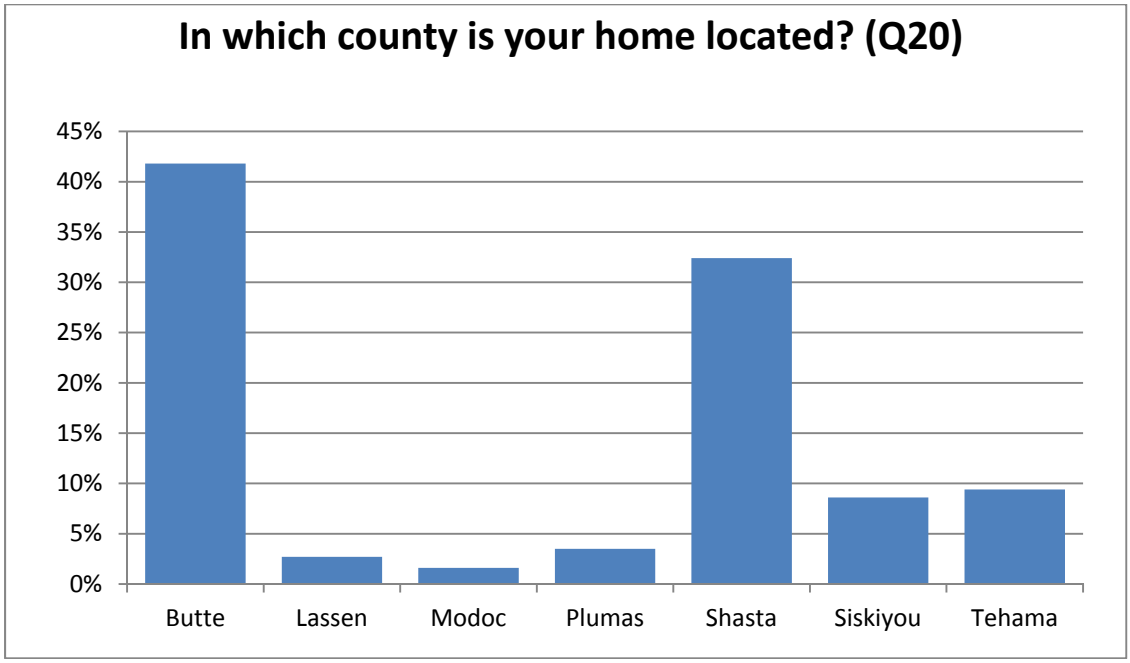
County	Number of households	Number completed	Sampling tolerance
Butte	96,215	768	+/-3.5%
Lassen	13,130	49	+/-14.0%
Modoc	5,189	30	+/-17.8%
Plumas	15,594	65	+/-12.1%
Shasta	77,609	594	+/-4.0%
Siskiyou	24,126	157	+/-7.8%
Tehama	27,606	173	+/-7.4%
Total	**259,469**	**1836**	**+/-2.3%**

Table 12. In which county is your home located (Q20)?

County	Number	Percent
Butte	768	41.8
Lassen	49	2.7
Modoc	30	1.6

Plumas	65	3.5
Shasta	594	32.4
Siskiyou	157	8.6
Tehama	173	9.4
Total	**1836**	**100.0**

Figure 2. Breakdown of household telephone sample by county.



Business Telephone Survey

Sampling Frame and Sampling Procedures

The sampling frame for the Northeast California Connect Broadband Survey of businesses consisted of a list of all businesses in each of the seven counties furnished by the Center for Economic Development at California State University, Chico. As shown in Table 12, the number of businesses in individual counties varied from +/-5.6% in Butte County to +/-21.5% in Modoc County. The sampling error for the entire region is +/-3.4% with 95% confidence. A random sample of businesses from each county was selected by importing the complete list for that county into Microsoft Excel™ and assigning a unique identifier number (case identification number) to each business. A random numbers program was used to select random numbers for each county list. The

businesses with the randomly selected numbers were pulled from the list and copied into a sample list for that county. The number of businesses sampled and the associated sampling tolerance (error) for each county are shown in Table 12. In addition, the percentage of the total survey sample is broken out by county in Table 13 and Figure 3.

Table 13. Sampling tolerances for the Northeast California Connect Broadband Business Survey by county.

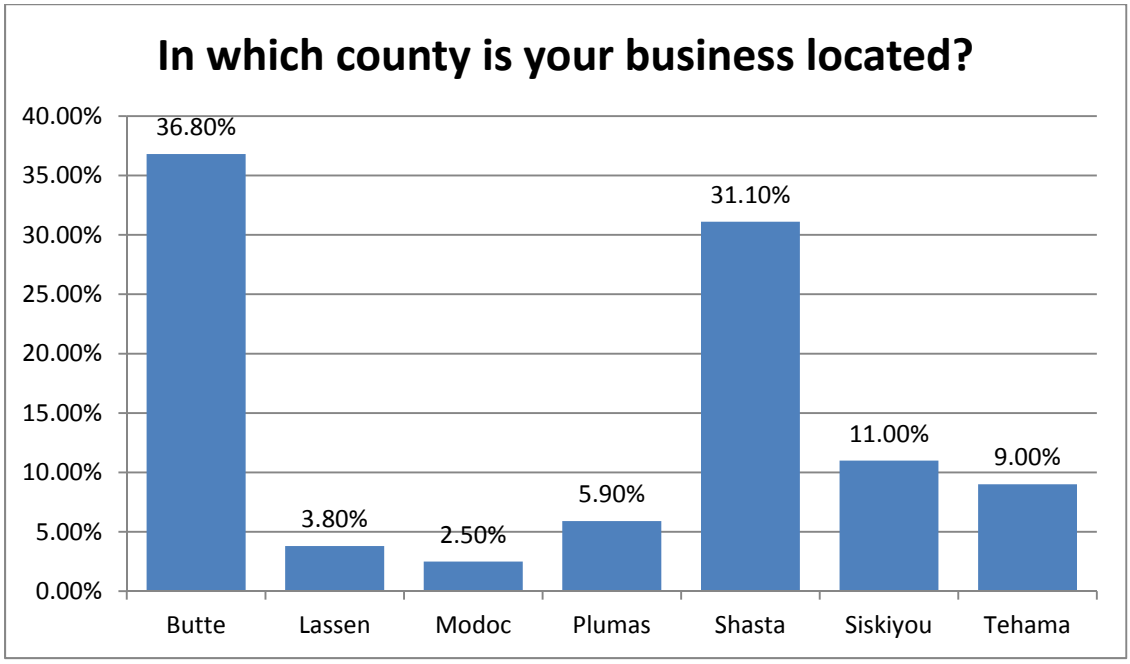
County	Number of businesses	Number of surveys completed	Sampling tolerance
Butte	10,696	294	+/-5.6%
Lassen	1,136	30	+/-17.7%
Modoc	506	20	+/-21.5%
Plumas	1,287	47	+/-14.0%
Shasta	10,170	249	+/-6.1%
Siskiyou	3,134	88	+/-10.3%
Tehama	2,563	72	+/-11.4%
Total	**29,492**	**800**	**+/-3.4%**

Table 14. In which county is your business located (percentage breakdown of the business survey sample) (Q21)?

County	Number	Percent
Butte	294	36.8
Lassen	30	3.8
Modoc	20	2.5
Plumas	47	5.9
Shasta	249	31.1
Siskiyou	88	11.0

Tehama	72	9.0
Total	**800**	**100.0**

Figure 3. In which county is your business located (percentage breakdown of the business survey sample) (Q21)?



Appendix E
E: Detailed Survey Results

Household Survey Results

Demographic Characteristics of Household Survey Respondents

Household survey respondents were asked three demographic questions:

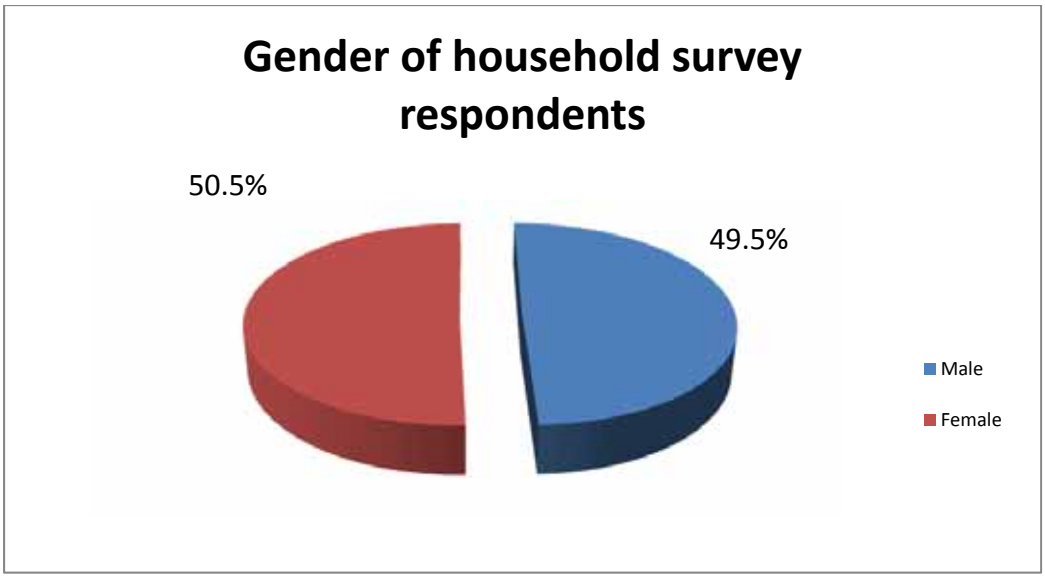
1. Highest level of education completed by the survey respondent
2. Race/ethnicity
3. Annual household income

In addition, the gender of each survey respondent was coded by the telephone interviewer (Table 13 and Figure 4).

Table15. Gender of household survey respondents (Q38).

Gender	Number	Percent
Male	909	49.5
Female	927	50.5
Total	**1836**	**100.0**

Figure 4. Gender of household survey respondents (Q38).



A total of 30.5% of the survey respondents in the study area reported having at least a four year college degree, and 11.1% said they hold an advanced degree (graduate or professional) (Table 14 and Figure 5). Just over 81% said they were white (Table 15 and Figure 6), and just over one-third (36.9%) reported combined household incomes of $55,000 or more per year (Table 16 and Figure 7).

Table 16. Which of the following best describes your highest level of education (Q35)?

Highest level of education	Number	Percent	Cumulative Percent
Did not complete high school	64	3.5	3.5
High school graduate or G.E.D.	474	25.8	29.3
Some college but no degree	642	35.0	64.3
Four-year undergraduate college degree (B.S., B.A., or equivalent)	356	19.4	83.7
Graduate or professional degree	203	11.1	94.7
Refused to Answer	97	5.3	100.0
Total	**984**	**100.0**	

Figure 5. Which of the following best describes your highest level of education (Q35)?

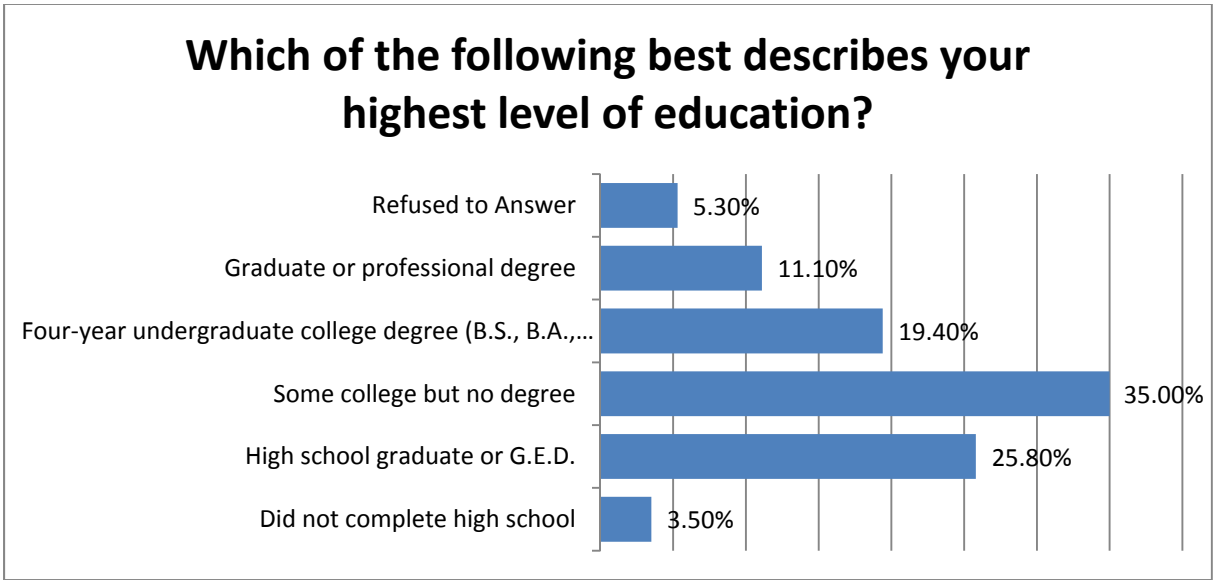


Table 17. Which of the following groups best represents your race or ethnicity (Q36)?

Race or ethnicity	Number	Percent
White	1499	81.6
American Indian/Alaska Native	52	2.8
Asian	18	1.0
Native Hawaiian/Pacific islander	3	0.2
Hispanic/Latino	72	3.9
Black/African American	16	0.9
Refused to Answer	118	6.4
Other	58	3.2
Total	**1836**	**100.00**

Figure 6. Which of the following groups best represents your race or ethnicity (Q36)?

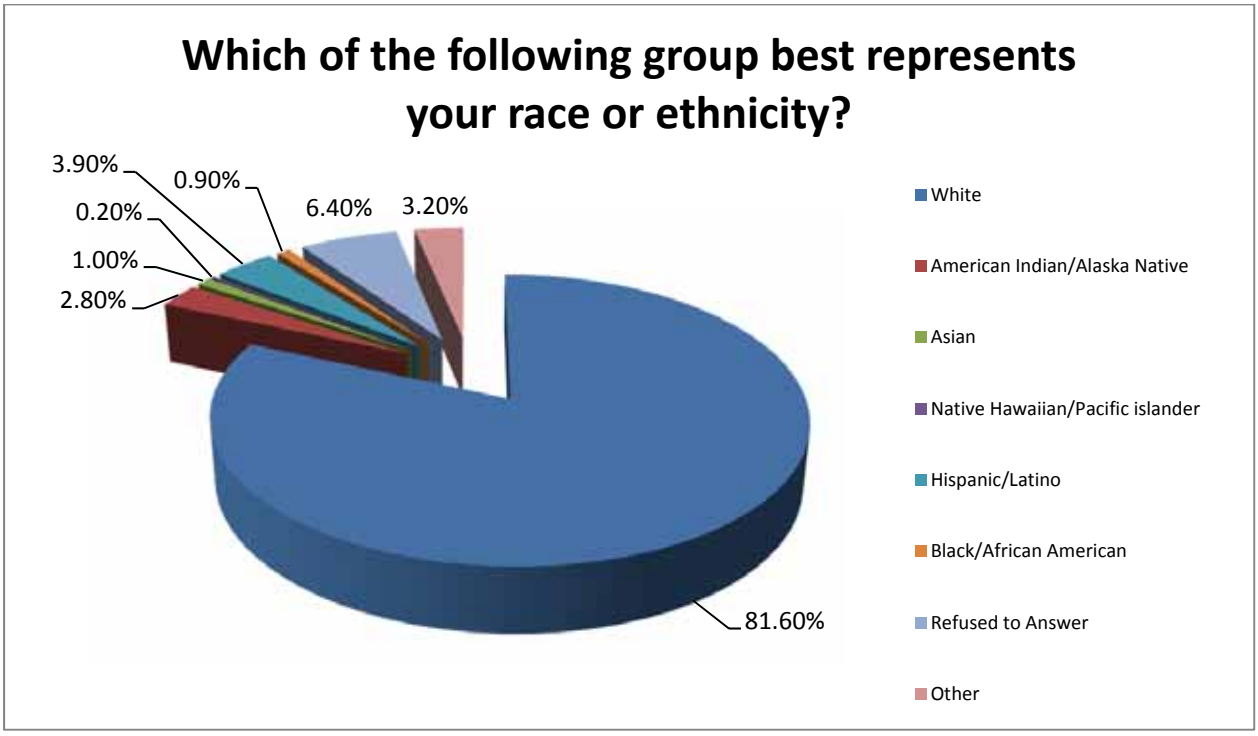
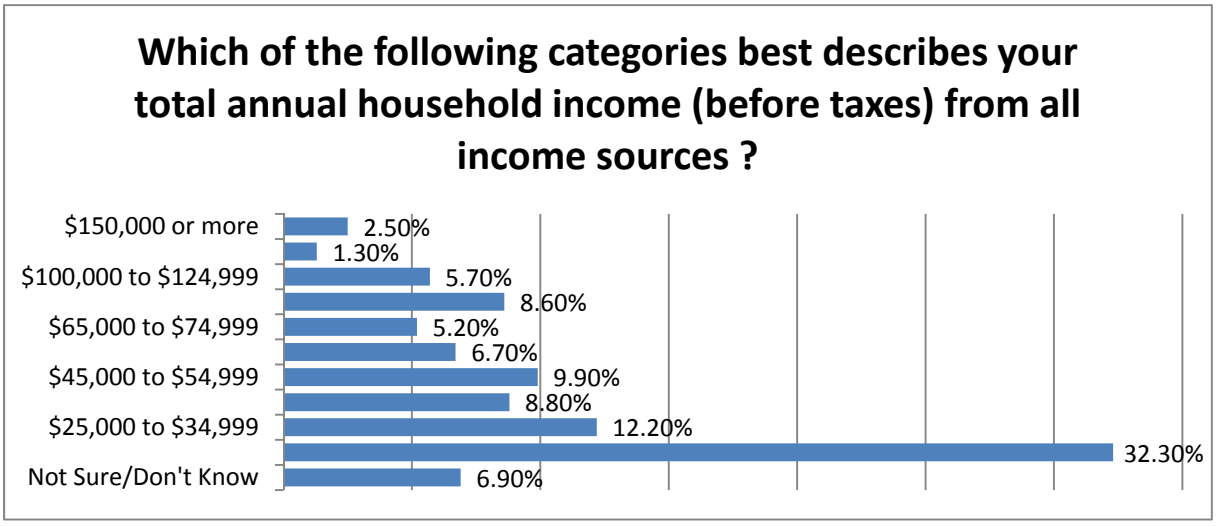


Table 18. Which of the following categories best describes your total annual household income (before taxes) from all income sources (Q37)?

Total annual income	Number	Percent	Cumulative Percent
Less than $25,000	432	32.3	32.2
$25,000 to $34,999	164	12.2	44.4
$35,000 to $44,999	118	8.8	53.2
$45,000 to $54,999	133	9.9	63.1
$55,000 to $64,999	90	6.7	69.8
$65,000 to $74,999	70	5.2	75.0
$75,000 to $99,999	116	8.6	83.6
$100,000 to $124,999	76	5.7	89.3
$125,000 to $149,999	18	1.3	90.6
$150,000 or more	34	2.5	93.1
Not Sure/Don't Know	92	6.9	**100.0**
Total	**1343**	**100.00**	

Figure 7. Which of the following categories best describes your total annual household income (before taxes) from all income sources (Q37)?



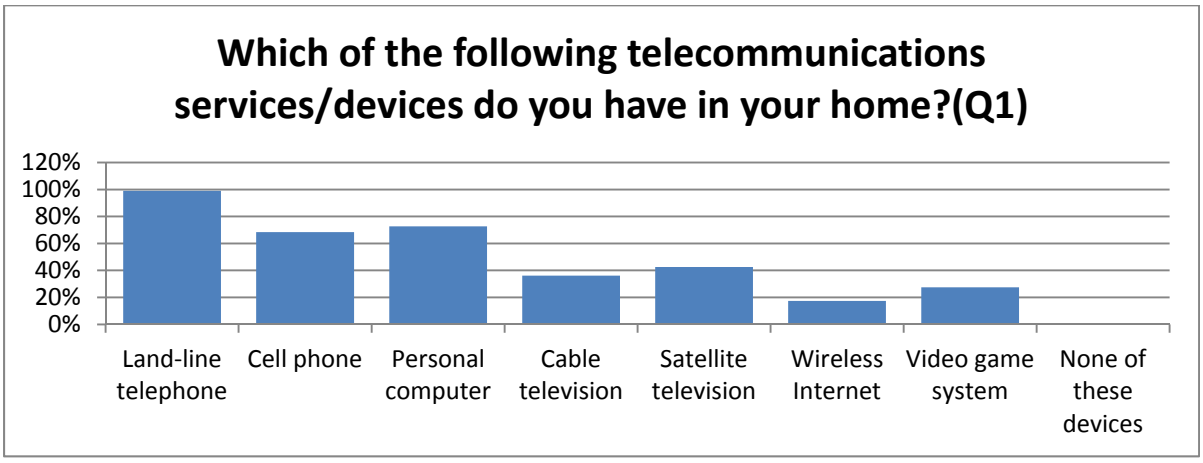
Types of Telecommunication Devices in Homes

Household telephone survey respondents provided information on the types of telecommunications services/devices they had in their homes. Respondents could select multiple devices, so responses total more than 100%. Nearly all the respondents (99.0%) have a land-line telephone in their home, and most (72.7%) said they have personal computers in their homes (Table 17 and Figure 8).

Table 19. Which of the following telecommunications services/devices do you have in your home (Q1)?

Telecommunication device	Number	Percent
Land-line telephone	1818	99.0
Cell phone	1256	68.4
Personal computer	1335	72.7
Cable television	665	36.2
Satellite television	781	42.5
Wireless Internet	319	17.4
Video game system	505	27.5
None of these devices	2	0.1

Figure 8. Types of telecommunications services/devices in households in the study area (Q1).



Internet Access at Home

More than two-thirds (69.4%) said that Internet access at home is at least somewhat important, and 24.8% said that access at home is important or very important. Nearly half of all the respondents (44.6%) think Internet access at home is extremely important (Table 18 and Figure 9). More than two-thirds (69.3%) in the seven county study area had some type of Internet access when the survey was conducted (Table 19). Of those without Internet access, the four top reasons for not having access at home were:

1. Respondents did not need Internet access at home
2. Respondents did not use a computer
3. Respondents said that Internet access is too expensive
4. Respondents can access the Internet at other places

A complete list of reasons for not having access is presented in Table 20 and Figure 10.

Table 20. In your opinion, how important is Internet access at your home (Q2)?

Importance Rating	Number	Percent	Cumulative Percent
Extremely important	816	44.6	44.6
Important	252	13.8	58.4
Somewhat important	201	11.0	69.4
Not important	542	29.6	99.0
Not Sure/Don't Know	18	1.0	100.0
Total	**1829**	**100.0**	

Figure 9. Perceived importance of Internet service at home (Q2).

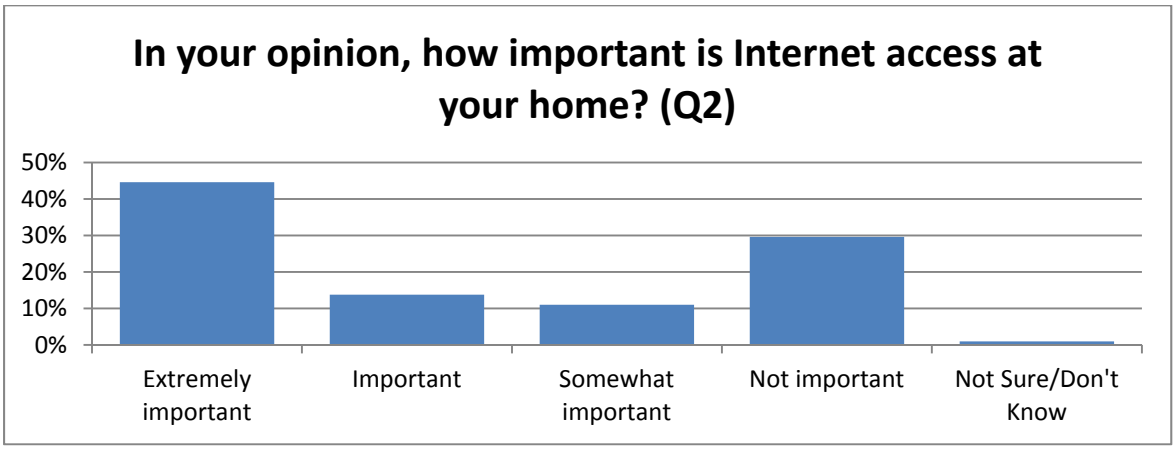


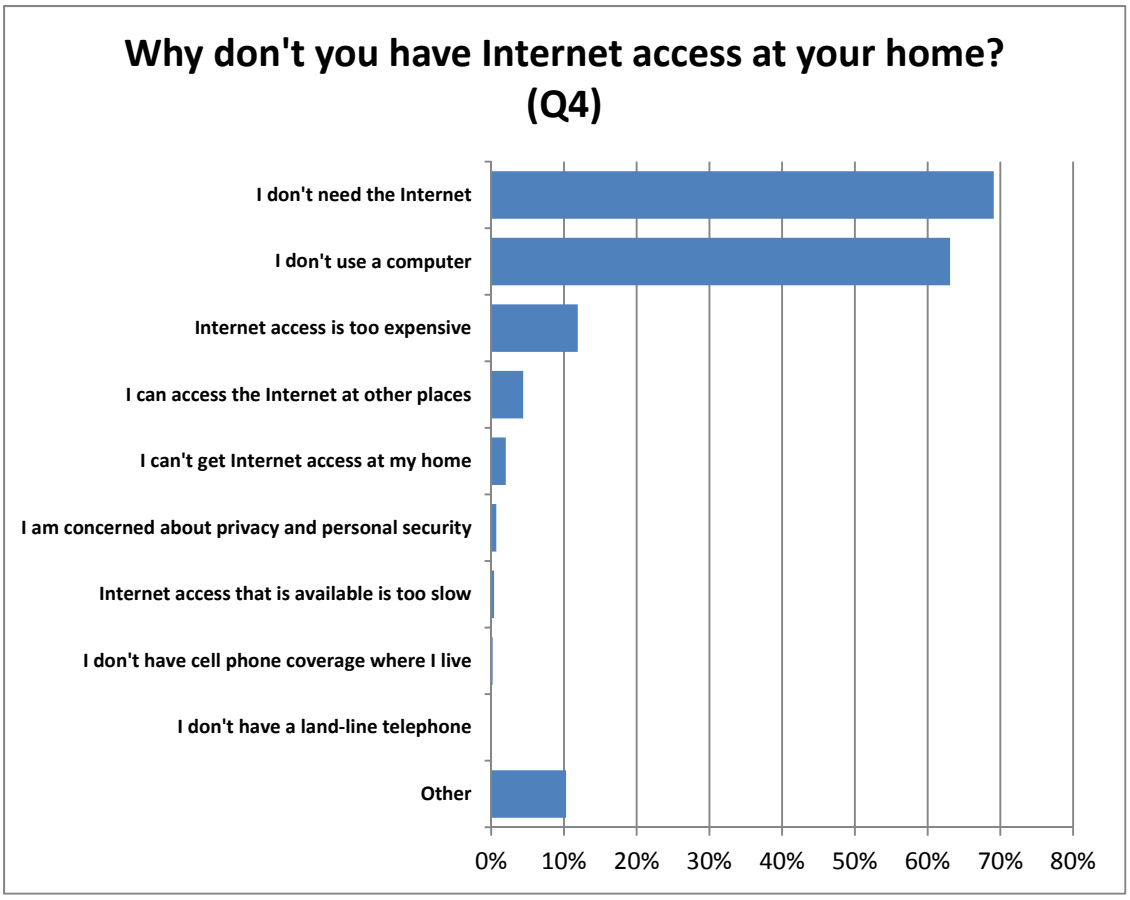
Table 21. Do you have Internet access at your home (Q3)?

Internet access?	Number	Percent
Yes	1273	69.3
No	563	30.7
Total	**1836**	**100.0**

Table 22. Why don't you have Internet access at your home (Q4)?

Reasons	Number	Percent of those without access	Percent of all respondents
I don't need the Internet	389	69.1	21.2
I don't use a computer	355	63.1	19.3
Internet access is too expensive	67	11.9	3.6
I can access the Internet at other places	25	4.4	1.4
I can't get Internet access at my home	11	2.0	0.6
I am concerned about privacy and personal security	4	0.7	0.2
Internet access that is available is too slow	2	0.4	0.1
I don’t have cell phone coverage where I live	1	0.2	0.1
I don't have a land-line telephone	0	0.0	0.0
Other	58	10.3	3.2

Figure 10. Reasons that residents do not have Internet service at home (Q4).



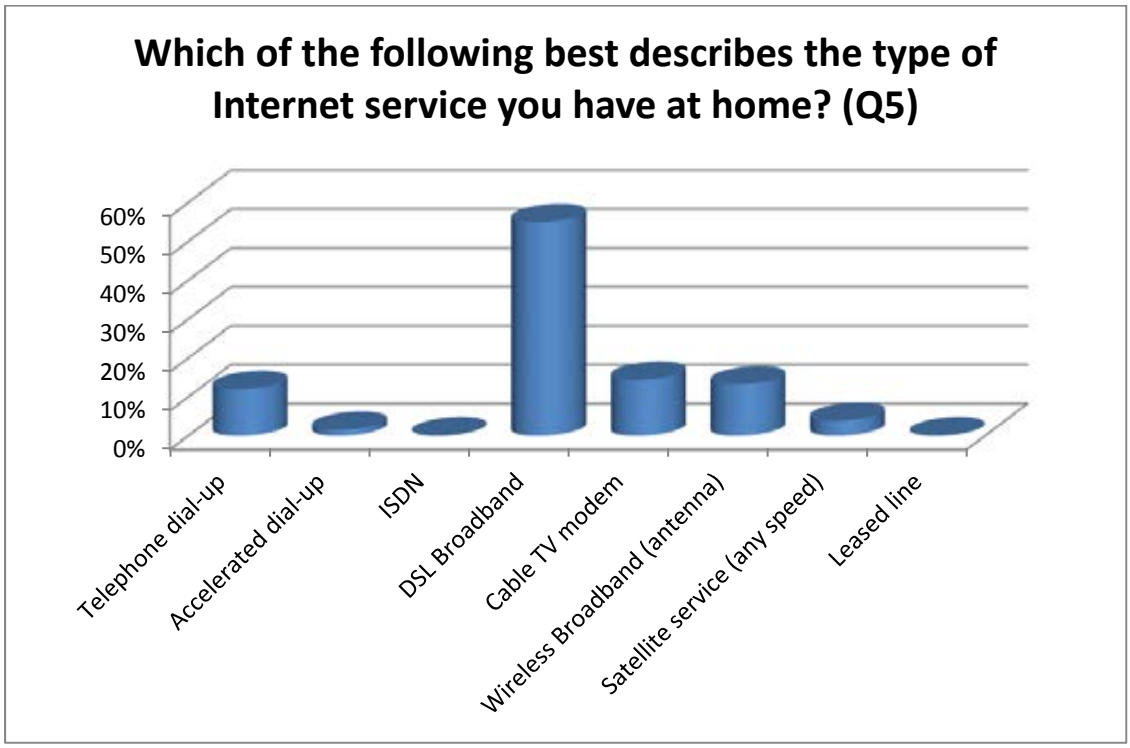
Of the households with some type of Internet access, only 13.6% said they have dial-up service, and 86.4% said they have some type of broadband (Table 21 and Figure 11).

Table 23. Which of the following best describes the type of Internet service you have at home (Q5)?

Type of Internet service	Number	Percent
Telephone dial-up	149	12.0
Accelerated dial-up	18	1.5
ISDN	1	0.1
DSL Broadband	682	55.0
Cable TV modem	178	14.4

Wireless Broadband (antenna)	164	13.2
Satellite service (any speed)	47	3.8
Leased line	1	0.1
Total	**788**	**100.00**

Figure 11. Which of the following best describes the type of Internet service you have at home (Q5)?

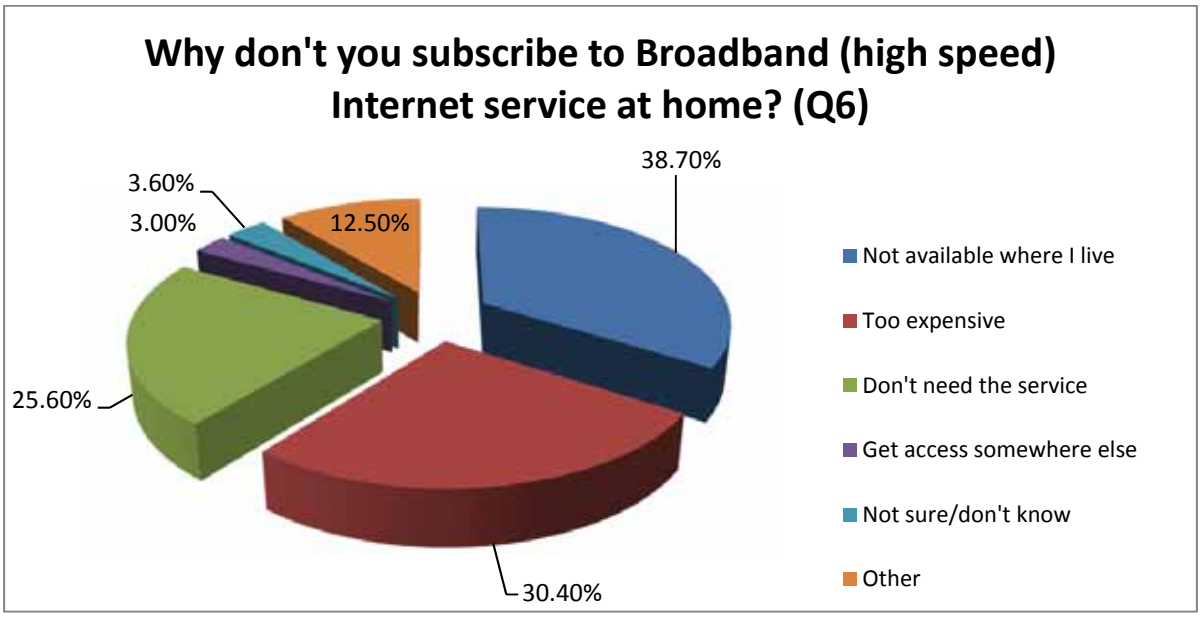


Household survey respondents without broadband were asked why they did not subscribe to this type of service. As shown in Table 22 and Figure 12, more than one-third (38.7%) said broadband service is not available where they live, and 30.4% said that it is too expensive. Another 25.6% said they do not need the service.

Table 24. Why don't you subscribe to Broadband (high speed) Internet service at home (Q6)?

Reasons for not having broadband	Number	Percent of those Percent without broadband	Percent of all respondents
Not available where I live	65	38.7	3.5
Too expensive	51	30.4	2.8
I don't need broadband high speed Internet service	43	25.6	2.3
Can get access somewhere else	5	3.0	0.3
Not sure/don't know	6	3.6	0.3
Other	21	12.5	1.1

Figure 12. Why don't you subscribe to Broadband (high speed) Internet service at home (Q6)?



Cost and Satisfaction with Internet Service

Of the household respondents with Internet service, 60.3% said they pay $39.99 or less per month, and less than half (42.1%) pay $29.99 or less per month (Table 23 and Figure 13). Most (81.9%) of all the respondents with Internet service said they are satisfied or very satisfied with their existing Internet service provider (ISP) (Table 24 and Figure 14).

Table 25. How much do you currently pay per month for Internet access at your home (Q8)?

Amount of money	Number	Percent
$0.00	205	19.1
$0.01 - $9.99	0	0.0
$10.00 - $19.99	77	7.2
$20.00 - $29.99	169	15.8
$30.00 - $39.99	195	18.2
$40.00 - $49.99	107	10.0
$50.00 - $59.99	107	10.0
$60.00 - $69.99	53	4.9
$70.00 or more	159	14.8
Total	**1072**	**100.0**

Mean (average) amount paid is $34.26.

Figure 13. How much do you currently pay per month for Internet access at your home (Q8)?

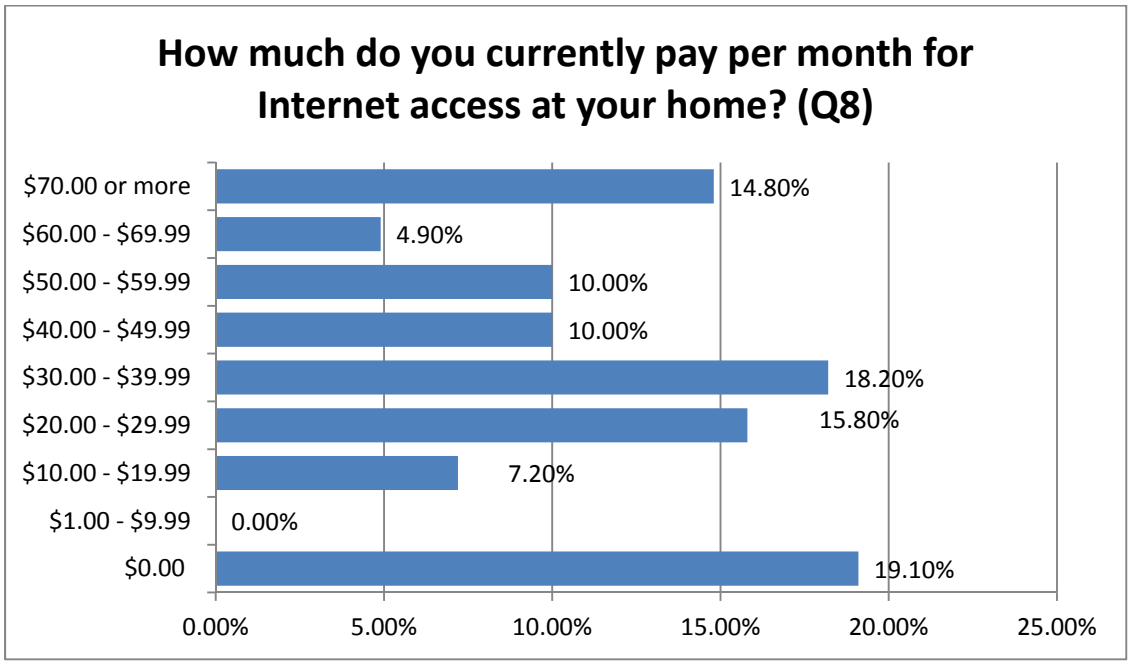
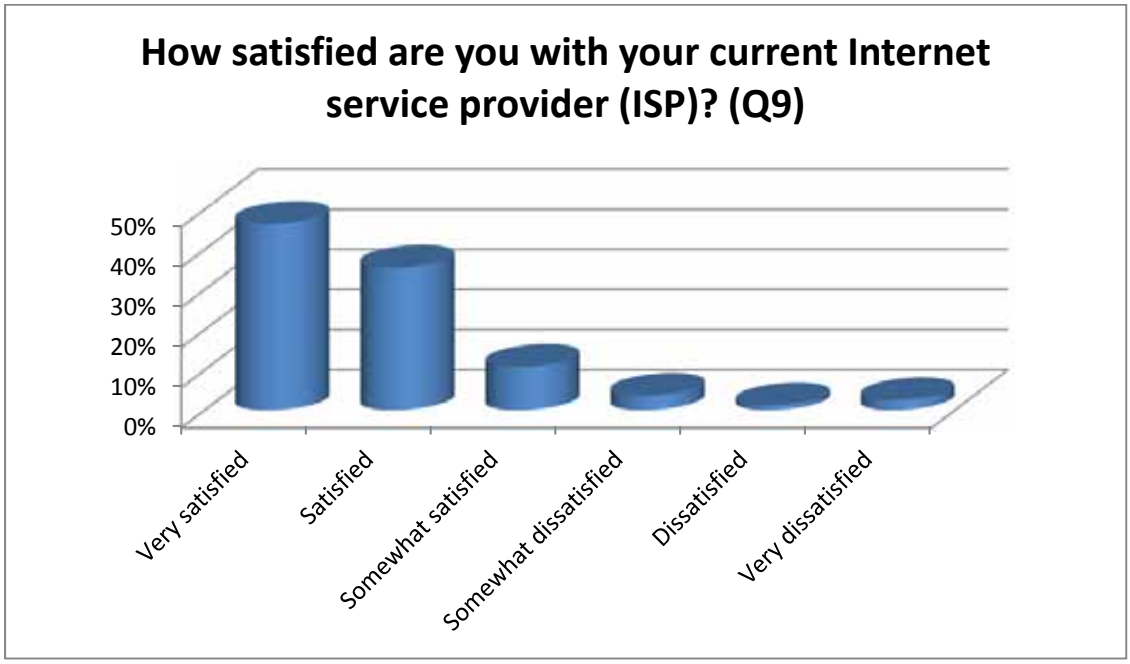


Table 26. How satisfied are you with your current Internet service provider (ISP) (Q9)?

Level of satisfaction	Number	Percent	Cumulative Percent
Very satisfied	491	46.4	46.4
Satisfied	376	35.5	81.9
Somewhat satisfied	114	10.8	92.6
Somewhat dissatisfied	38	3.6	96.2
Dissatisfied	13	1.2	97.5
Very dissatisfied	27	2.5	100.0
Total	**1059**	**100.0**	

Figure 14. How satisfied are you with your current Internet service provider (ISP) (Q9)?



Household respondents with Internet access were asked if they would like to pay more per month for a faster Internet connection at their home. As shown in Table 25 and Figure 15, only 11.3% said they would pay more per month for a faster connection. The respondents that did not have Internet access in Question 3 and those with broadband service who said they would be willing to pay more for a faster connection in Question 10 were asked how much they would be willing to pay. Respondents were randomly assigned higher bid amounts between $50.00 and $80.00 (Question 11a). Those who said they would not pay the higher bid amount were randomly assigned a lower bid amount between $20.00 and $40.00 (Question 11b). As shown in Table 26 and Figure 16, more than half (66.5%) said they would pay at least $40.00 per month for broadband service.

Table 27. Would you be willing to pay more per month for a faster Internet connection at your home (Q10)?

Willing to pay more?	Number	Percent
Yes	133	11.3
No	1040	88.7
Total	**1173**	**100.0**

Figure 15. Percentage of residential customers who said they were willing to pay more for a faster Internet connection (Q10).

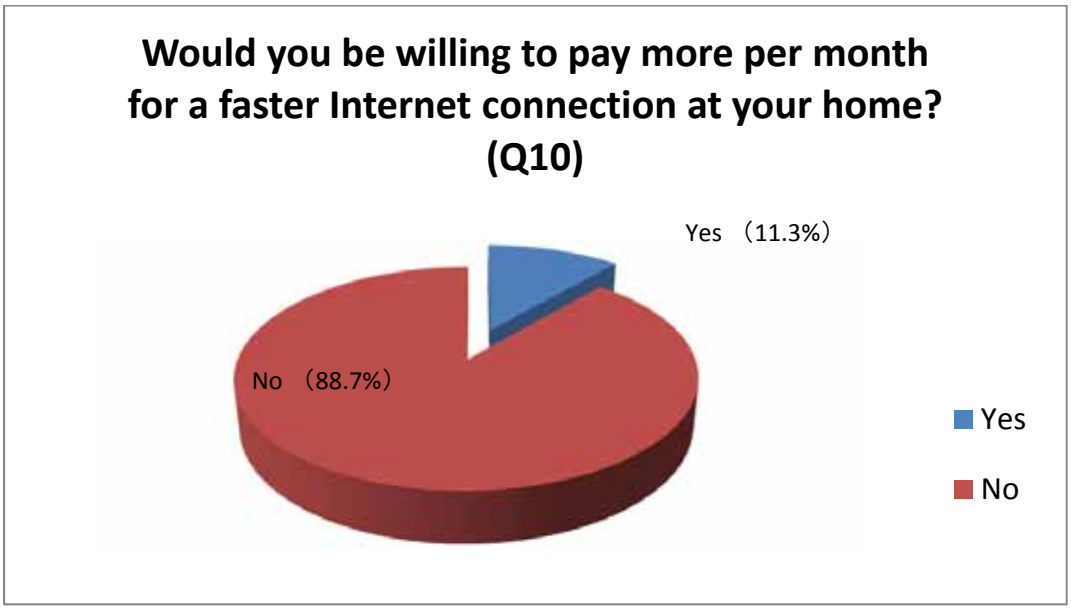
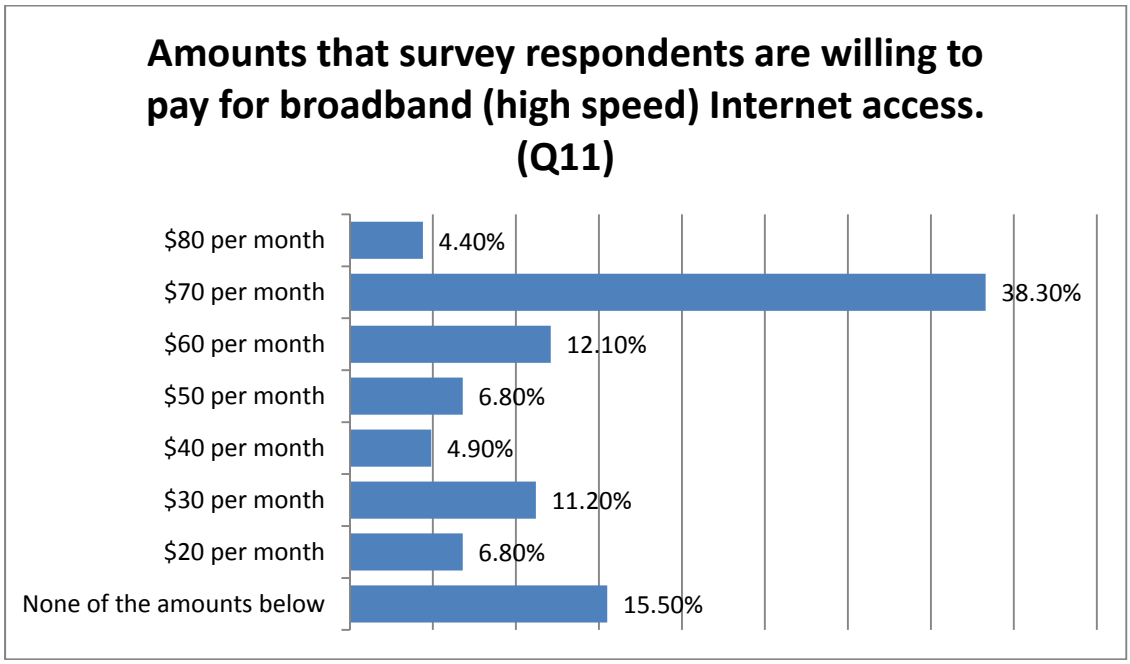


Table 28. Amounts that survey respondents are willing to pay for broadband (high speed) Internet access (Q11).

Amounts	Number	Percent	Cumulative Percent
None of the amounts below	32	15.5	15.5
$20 per month	14	6.8	22.3
$30 per month	23	11.2	33.5
$40 per month	10	4.9	38.4
$50 per month	14	6.8	45.2
$60 per month	25	12.1	57.3
$70 per month	79	38.3	95.5
$80 per month	9	4.4	100.0%
Total	**206**	**100.0**	

Figure 16. Amounts that survey respondents are willing to pay for broadband (high speed) Internet access (Q11).

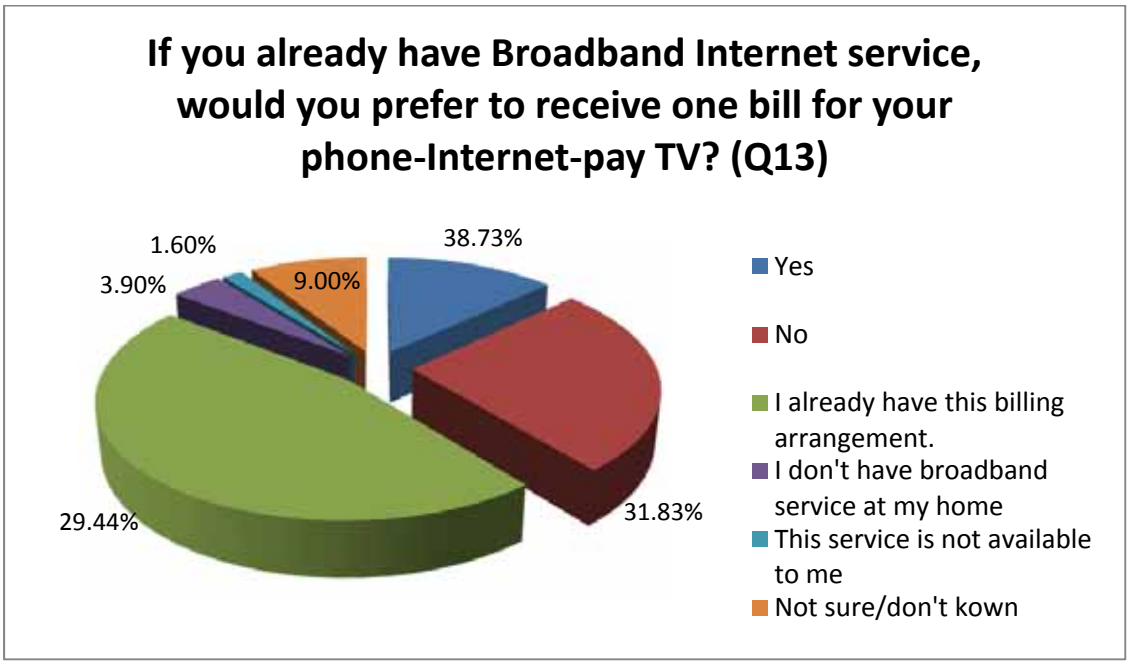


Household respondents (residential customers) with broadband service were asked if they would prefer to receive one bill for their phone-Internet-pay TV. As shown in Table 27 and Figure 17, only 13.0% said "yes", and near half (46.6%) said they already had this billing arrangement at the time of the survey.

Table 29. If you already have broadband Internet service, would you prefer to receive one bill for your phone-Internet-pay TV (Q13)?

Prefer one bill?	Number	Percent
Yes	157	13.0
No	313	25.9
I already have this billing arrangement	563	46.6
I don't have broadband service at my home	47	3.9
This service is not available to me	19	1.6
Not sure/don't know	109	9.0
Total	**377**	**100.00**

Figure 17. If you already have broadband Internet service, would you prefer to receive one bill for your phone-Internet-pay TV (Q13)?



Internet Access Outside the Home

Close to half (44.2%) of the homes in the seven county study area had access to the Internet at locations outside of their homes when the survey was conducted (Table 28 and Figure 18). As shown in Table 29 and Figure 19, places of employment, wireless hotspots, other people's homes, and libraries were the four most frequently cited locations for Internet access outside the home.

Table 30. Do you have access to the Internet at locations outside of your home (Q14)?

Internet access outside the home?	Number	Percent
Yes	800	44.2
No	1012	55.8
Total	**1812**	**100.0**

Figure 18. Do you have access to the Internet at locations outside of your home (Q14)?

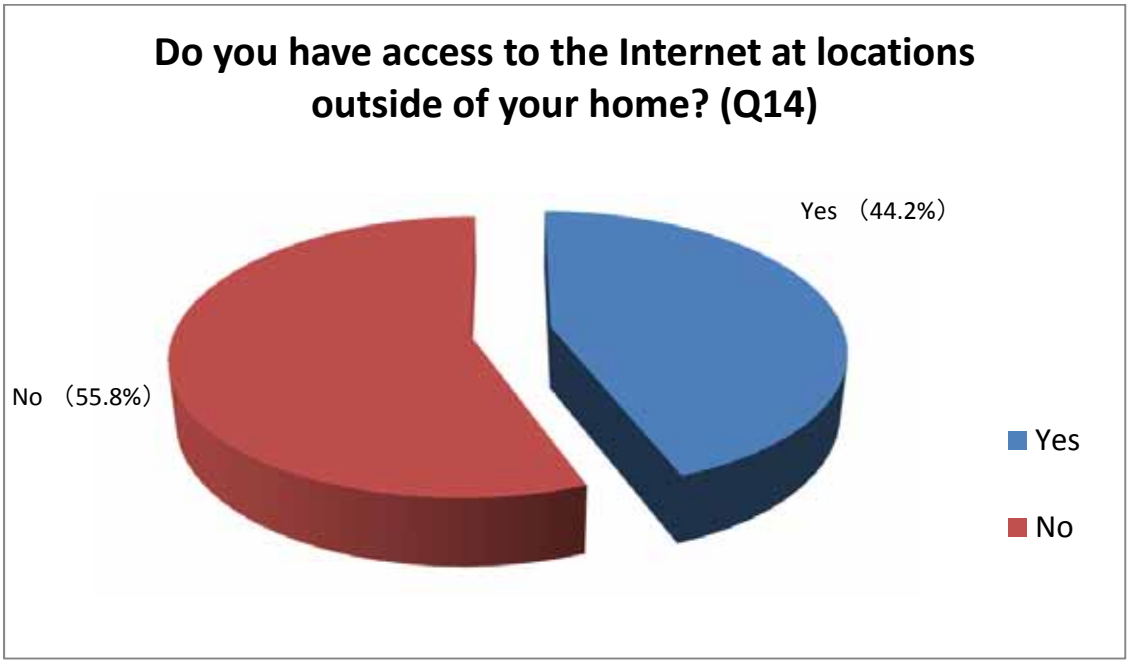
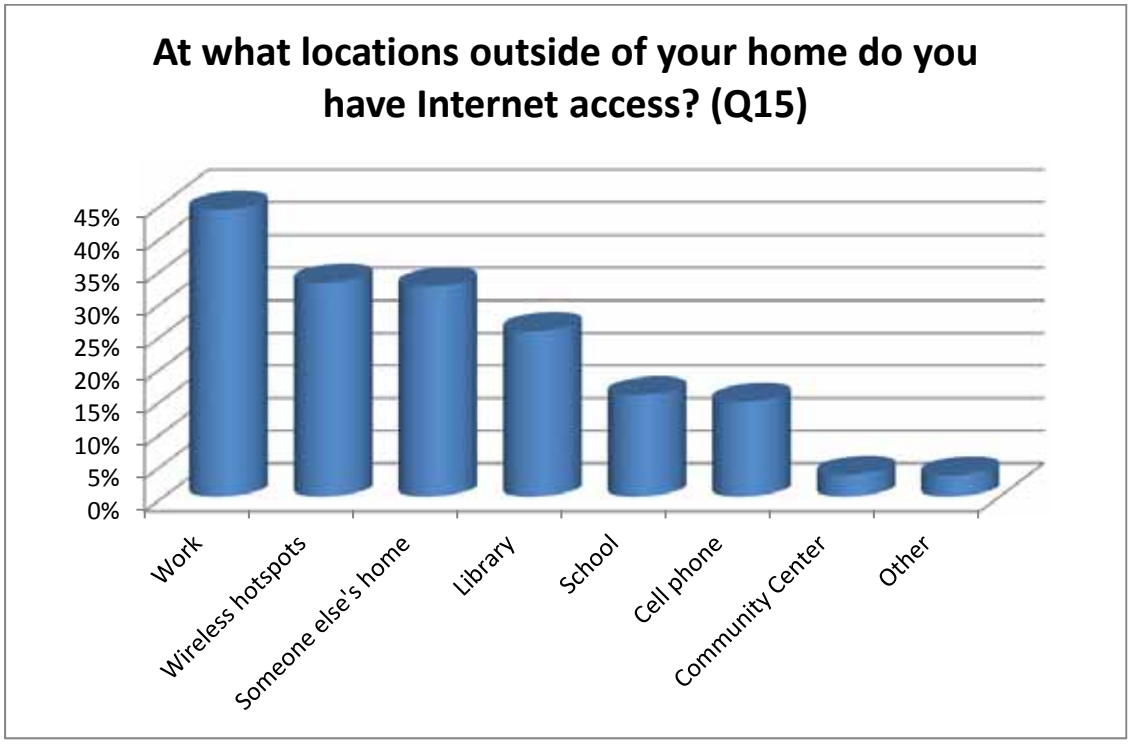


Table 29. At what locations outside your home do you have Internet access (Q15)?

Access location	Number	Percent with outside access	Percent of all respondents
Work	352	44.0	19.2
Wireless hotspots	263	32.9	14.3
Someone else's home	258	32.3	14.1
Library	204	25.5	11.1
School	125	15.6	6.8
Cell phone	117	14.6	6.4
Community Center	27	3.4	1.5
Other	26	3.3	1.4

Figure 19. At what locations outside your home do you have Internet access (Q15)?



Uses of the Internet at Home

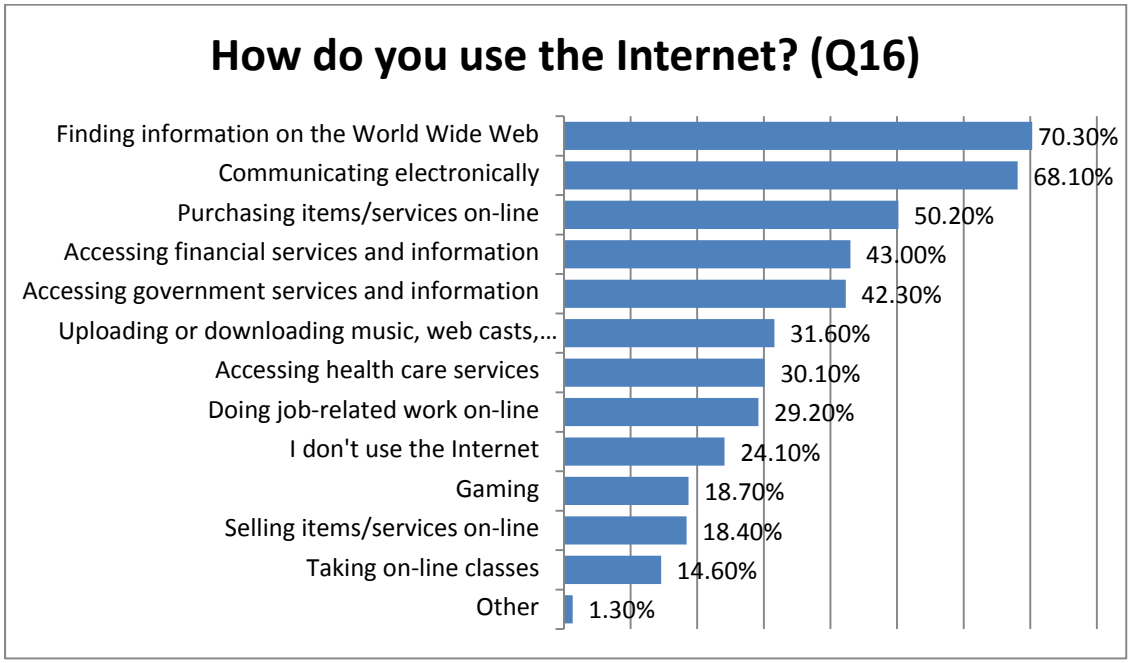
Household survey respondents were asked how they use the Internet. Each respondent was permitted to select as many uses as applied to them. As shown in Table 30 and Figure 20, finding information on the World Wide Web (70.3%), communicating electronically (68.1%), purchasing items and/or services on-line (50.2%), accessing financial services and information (43.0%), and accessing government services and information (42.3%) were the most frequently cited uses.

Table 30. How do you use the Internet (Q16)?

Internet uses	Number	Percent
Finding information on the World Wide Web	1291	70.3
Communicating electronically	1251	68.1
Purchasing items/services on-line	922	50.2
Accessing financial services and		

information	790	43.0
Accessing government services and information	777	42.3
Uploading or downloading music, web casts, pod casts, or video	581	31.6
Accessing health care services	553	30.1
Doing job-related work on-line	537	29.2
I don't use the Internet	442	24.1
Gaming	344	18.7
Selling items/services on-line	337	18.4
Taking on-line classes	268	14.6
Other	23	1.3

Figure 20. How do you use the Internet (Q16)?



Employment Status

Household survey respondents were asked if they were employed full-time, part-time, or currently not working. As shown in Table 31 and Figure 21, just over one quarter (25.4%) said they were employed full-time and 9.2% said they were employed part-time at the time of the survey. The most frequent types of employment were education, health care, government, and home-based businesses (Table 32).

Table 31. Are you currently employed full-time or part-time (Q21)?

Employment status	Number	Percent
Employed full-time	453	25.4
Employed part-time	164	9.2
Unemployment	201	11.3
Retired	806	45.3
Disabled	105	5.9
Other	52	2.9
Total	**1781**	**100.0**

Figure 21. Are you currently employed full-time or part-time (Q21)?

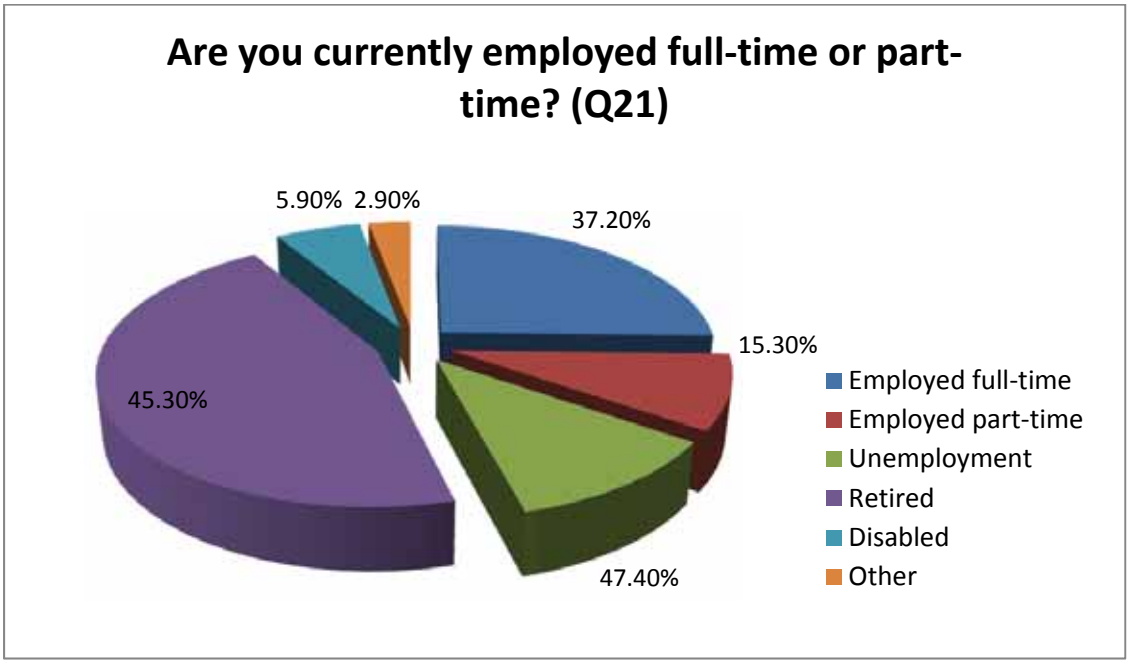


Table 32. In what type of setting are you currently employed (Q22)?

Type of employment setting	Number	Percent
Education	84	5.4
Health Care	78	5.0
Government	55	3.5
Home-based business	46	3.0
Retail	43	2.8
Construction	39	2.5
Finance, insurance, real estate	32	2.1
Human/Social Services	27	1.7
Transportation and Warehousing	14	0.9
Agriculture	13	0.8
Food Service	13	0.8
Professional/Scientific	13	0.8
Information Technology	13	0.8
Manufacturing	12	0.8
Tourism/Hospitality	11	0.7
Legal	9	0.6
Utilities	6	0.4
Forest products	5	0.3
Arts and culture	5	0.3
Other	1039	66.7
Total	**1558**	**100.0%**

Business Telephone Survey

Types of Businesses Surveyed

The types of businesses surveyed for the Northeast California Connect Broadband Survey ranged from home-based small businesses to government and manufacturing (Table 33 and Figure 22). The largest percentage of businesses in the region was retail. Over three-fourths (85.1%) of northeast businesses are located within one mile of a city of town (Table 34).

Table 33. Which of the following best describes the type of business that you own or manage (Q18)?

Type of business	Number	Percent
Retail	128	16.2
Construction	63	8.0
Finance, insurance, real estate	62	7.9
Home-based business	53	6.7
Health Care	45	5.7
Agriculture	36	4.6
Food Service	26	3.3
Manufacturing	22	2.8
Human/Social Services	22	2.8
Tourism/Hospitality	21	2.7
Education	20	2.5
Government	17	2.2
Transportation and Warehousing	15	1.9
Professional/Scientific	15	1.9
Legal	11	1.4
Information Technology	8	1.0

Wholesale	6	0.8
Media communications/media publishing	6	0.8
Arts and Culture	5	0.6
Utilities	2	0.3
Forest Products	2	0.3
Other	203	25.8
Total	**788**	**100.00**

Figure 22. Which of the following best describes the type of business that you own or manage (Q18)?

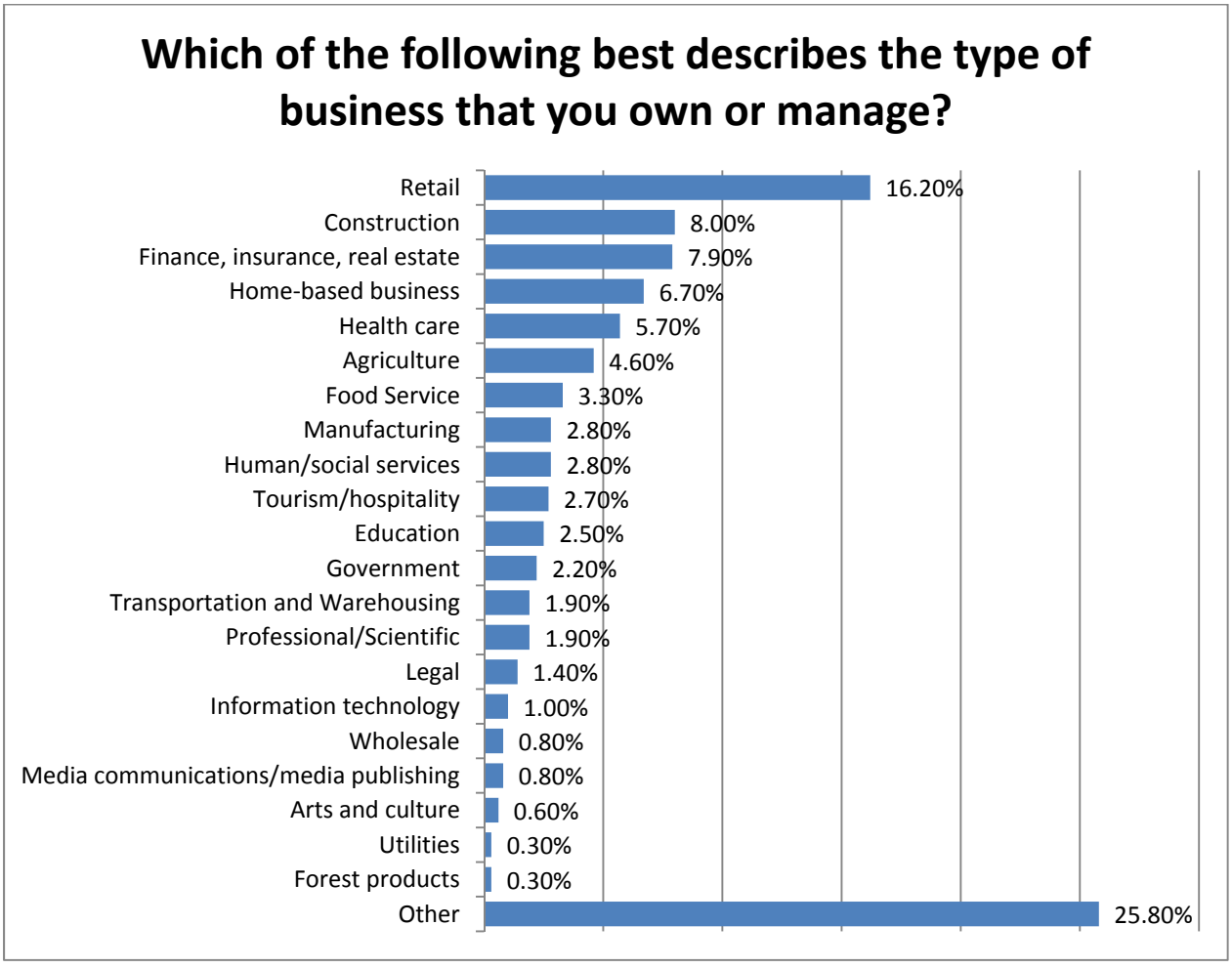


Table 34. If your business is located outside that city or town, about how many miles is that city or town from your business (Q20rec)?

Distance to town	Number	Percent
Within one mile	681	85.1
Outside of one mile	119	14.9
Total	**800**	**100.0**

Demographic Characteristics of Business Survey Respondents

Almost a quarter (22.5%) of business respondents hold a four-year undergraduate college degree and 10.8% have a graduate or professional degree (Table 35 and Figure 23). Most respondents (83.8%) are White (Table 36 and Figure 24), and 40% reported annual household incomes of $75,000 or more (Table 37 and Figure 25). A total of 47.8% of the business survey respondents were male and 52.2% were female (Table 38 and Figure 26).

Table 35. Highest levels of education completed by business survey respondents (Q24).

Education levels	Number	Percent
Did not complete high school	15	1.9
High school graduate or G.E.D.	147	18.4
Some college but no degree	323	40.4
Four-year undergraduate college degree (B.S., B.A., or equivalent)	180	22.5
Graduate or professional degree	86	10.8
Refused to Answer	49	6.1
Total	**800**	**100.0**

Table 23. Highest levels of education completed by business survey respondents (Q24).

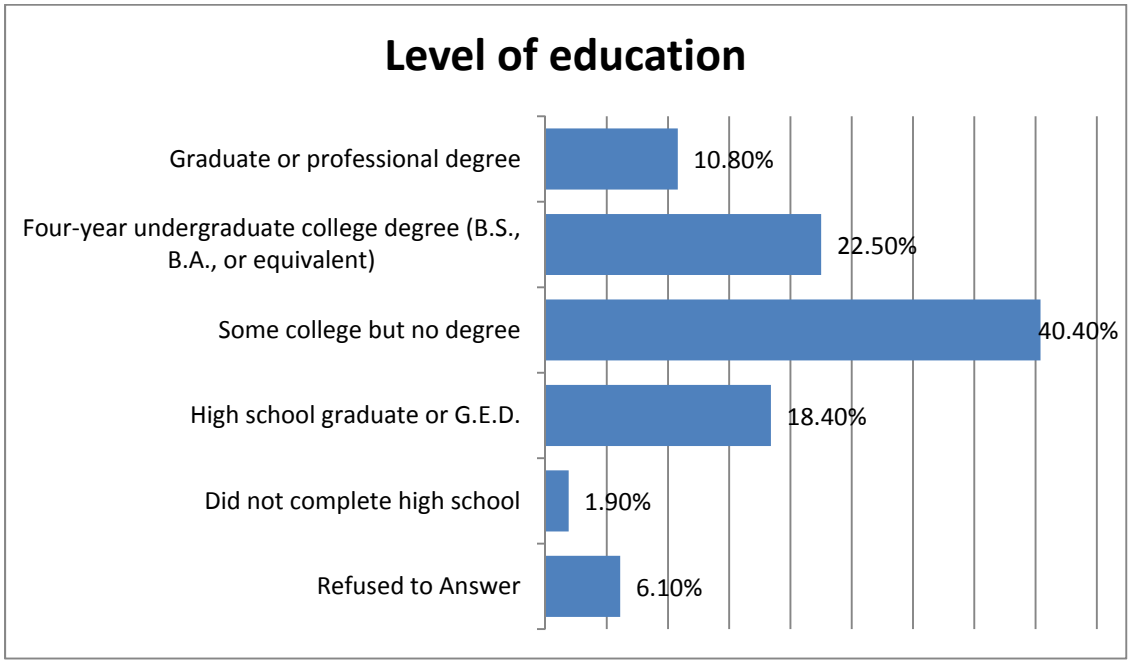


Table 36. Race or ethnicity of business survey respondents (Q25).

Race or ethnicity	Number	Percent
White	670	83.8
American Indian/Alaska Native	16	2.0
Asian	14	1.8
Native Hawaiian/Pacific islander	2	0.3
Hispanic/Latino	21	2.6
Black/African American	3	0.4
Other	29	3.6
Refuse to answer	70	8.8

Figure 24. Race or ethnicity of business survey respondents (Q25).

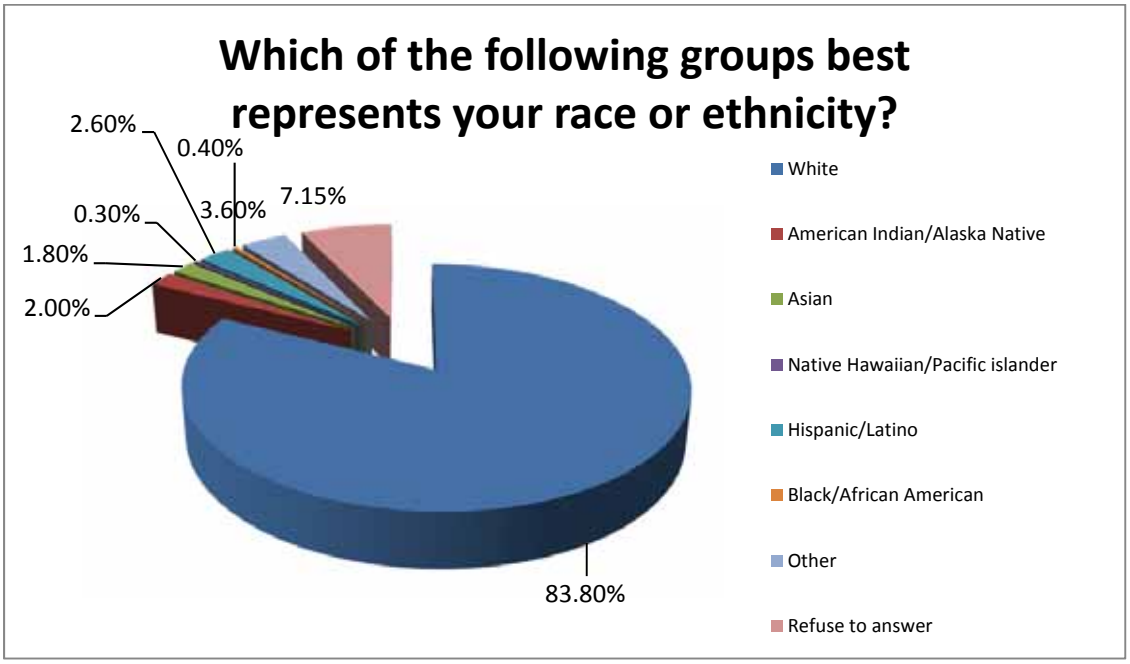


Table 37. Annual household income distribution of business survey respondents (Q26).

Household incomes	Number	Percent	Valid Percent	Cumulative Percent
Less than $25,000	55	6.9	9.9	9.9
$25,000 to $34,999	44	5.5	7.9	17.8
$35,000 to $44,999	52	6.5	9.4	27.2
$45,000 to $54,999	65	8.1	11.7	38.8
$55,000 to $64,999	59	7.4	10.6	49.5
$65,000 to $74,999	59	7.4	10.6	60.1
$75,000 to $99,999	89	11.1	16.0	76.1
$100,000 to $124,999	62	7.8	11.2	87.2
$125,000 to $149,999	22	2.8	4.0	91.2

$150,000 or more	49	6.1	8.8	100.0
Total	556	69.5	100.0	
Refused to Answer	244	30.5		
Total	**800**	**100.0**		

Figure 25. Annual household income distribution of business survey respondents (Q26).

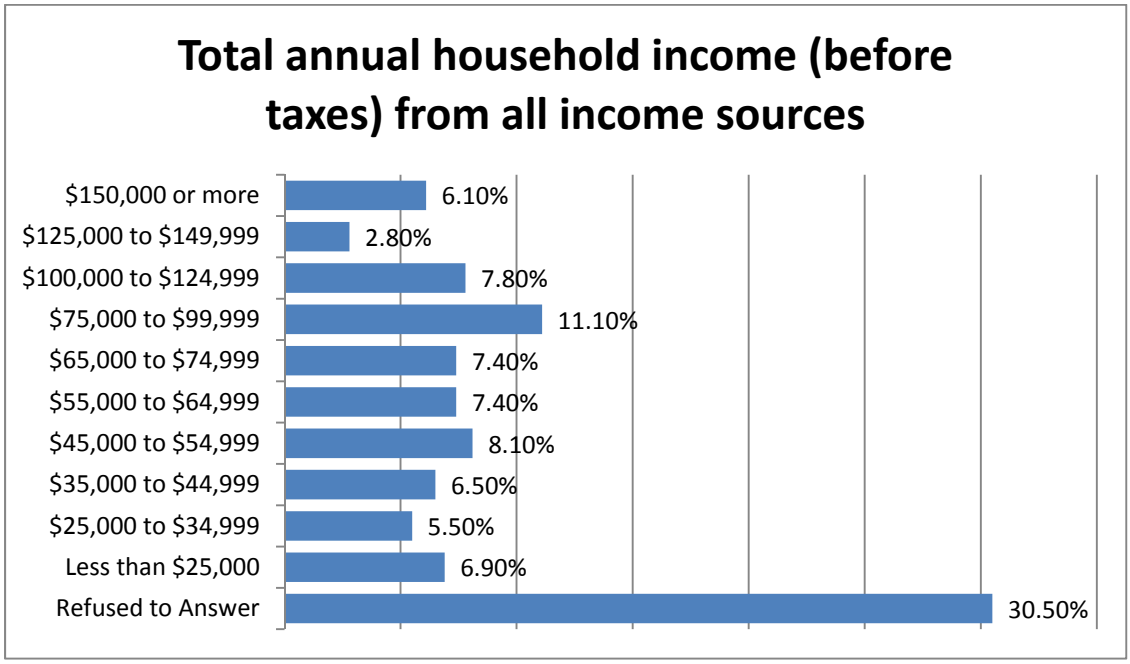
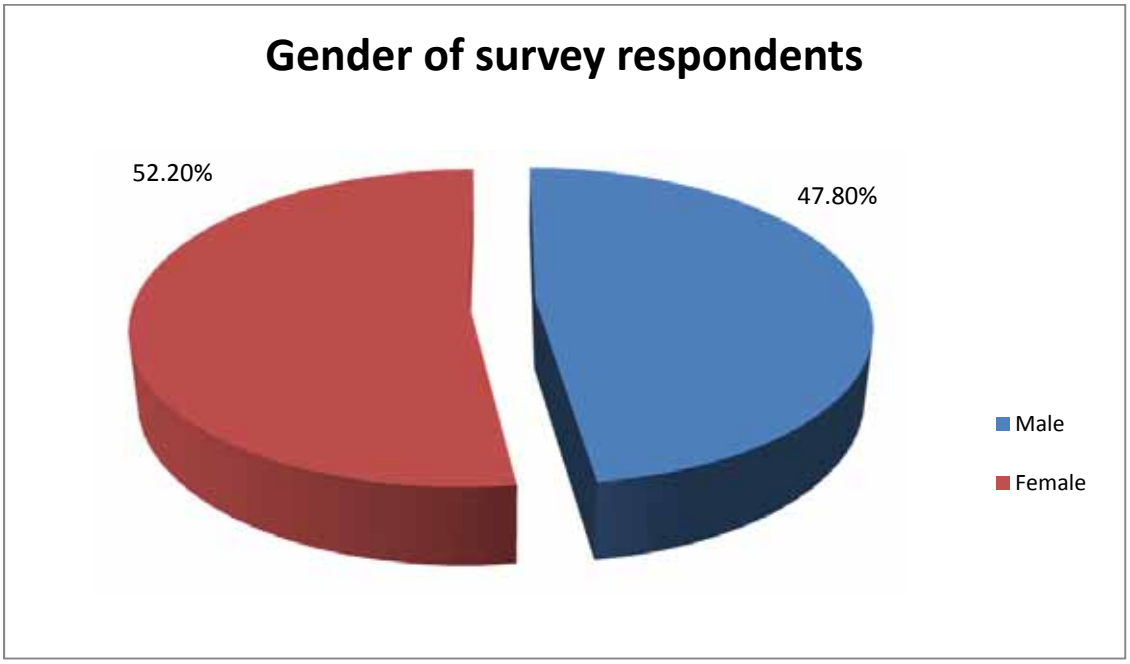


Table 38. Gender of business survey respondents (Q28).

Gender	Number	Percent
Male	382	47.8
Female	418	52.2
Total	**800**	**100.0**

Table 26. Gender of business survey respondents (Q28).



Telecommunications Devices in Businesses

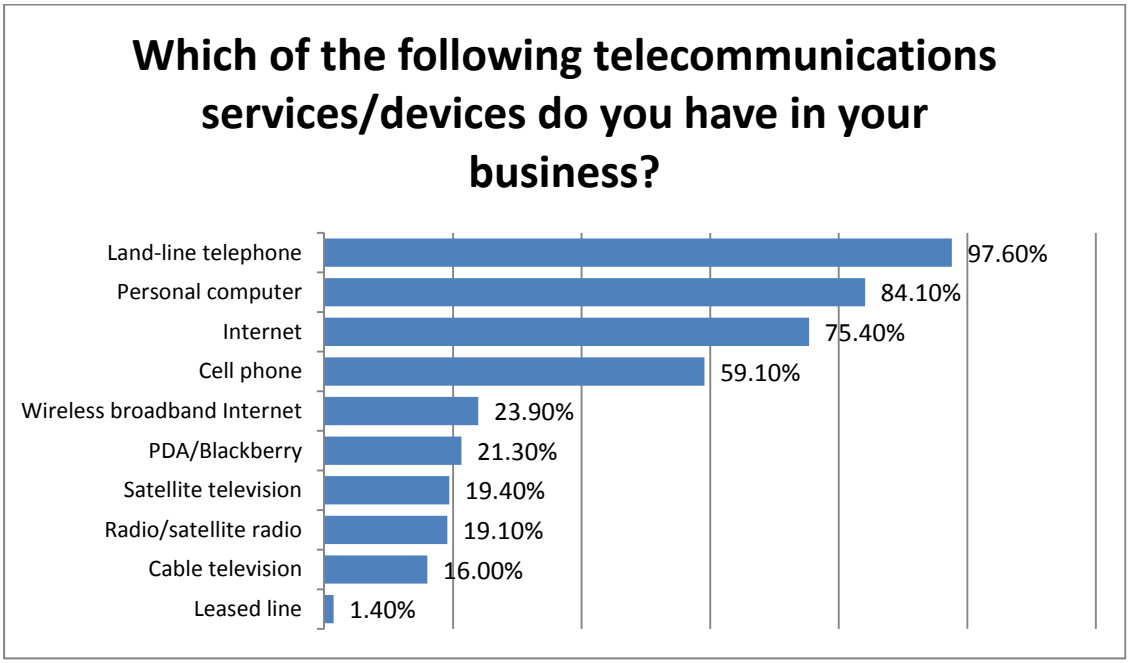
Almost all of the businesses (97.6%) reported having land-line telephones, 84.1% said they had personal computers, and more than half (59.1%) reported having cell phones. In addition, 35.4% said they had either satellite or cable television at their businesses. Three-fourths (75.4%) reported having Internet access at the time of the survey (Table 39 and Figure 27).

Table 39. Which of the following telecommunications services/devices do you have in your business (Q1)?

Telecommunications devices	Number	Percentage of all respondents
Land-line telephone	781	97.6
Personal computer	673	84.1
Internet	603	75.4
Cell phone	473	59.1
Wireless broadband	191	23.9

Internet		
PDA/Blackberry	170	21.3
Satellite television	155	19.4
Radio/satellite radio	153	19.1
Cable television	128	16.0
Leased line	11	1.4

Figure 27. Which of the following telecommunications services/devices do you have in your business (Q1)?



Business Internet Access

Nearly two-thirds of respondents (63.8%) said that Internet access at their businesses is extremely important, and another 18.2% said access is important or somewhat important (Table 40 and Figure 28). As shown in Table 41, most (83.2%) of businesses in the study area have some type of Internet access. Most of those who do not have access gave the following reasons:

1. I don't need the Internet
2. I don't use a computer
3. I can access the Internet at other places

4. I can't get Internet access at my business
5. Internet access that is available is too slow

A complete list of reasons is presented in Table 42 and Figure 29. Of the 126 respondents who do not have Internet access at workplace, 14 respondents (11.1%) indicated that they would like to connect their businesses to Internet if service is made available to their locations (Table 43).

Those businesses with Internet service at the time of the survey were asked about their type of service. A total of 61.3% of those with Internet service reported having DSL broadband and 6.5% had dial-up service. Other broadband access services included several technologies: wireless WiFi broadband (11.5%); cable TV modem (8.7%); satellite service (5.1%); T-1 line (4.8%); DS-3 (fiber optic) (0.9%); wireless cell phone broadband (0.8%); and, gigabit Ethernet (0.2%) (Table 44 and Figure 30). When these businesses were asked about the download speed of their Internet service, 66% said they were unsure about their download speed (Table 45 and Figure 31).

Table 40. In your opinion, how important is Internet access at your business (Q2)?

Importance rating	Number	Percent
Extremely important	509	63.8
Important	99	12.4
Somewhat important	46	5.8
Not important	143	17.9
Not Sure/Don't Know	1	0.1
Total	**798**	**100.0**

Figure 28. In your opinion, how important is Internet access at your business (Q2)?

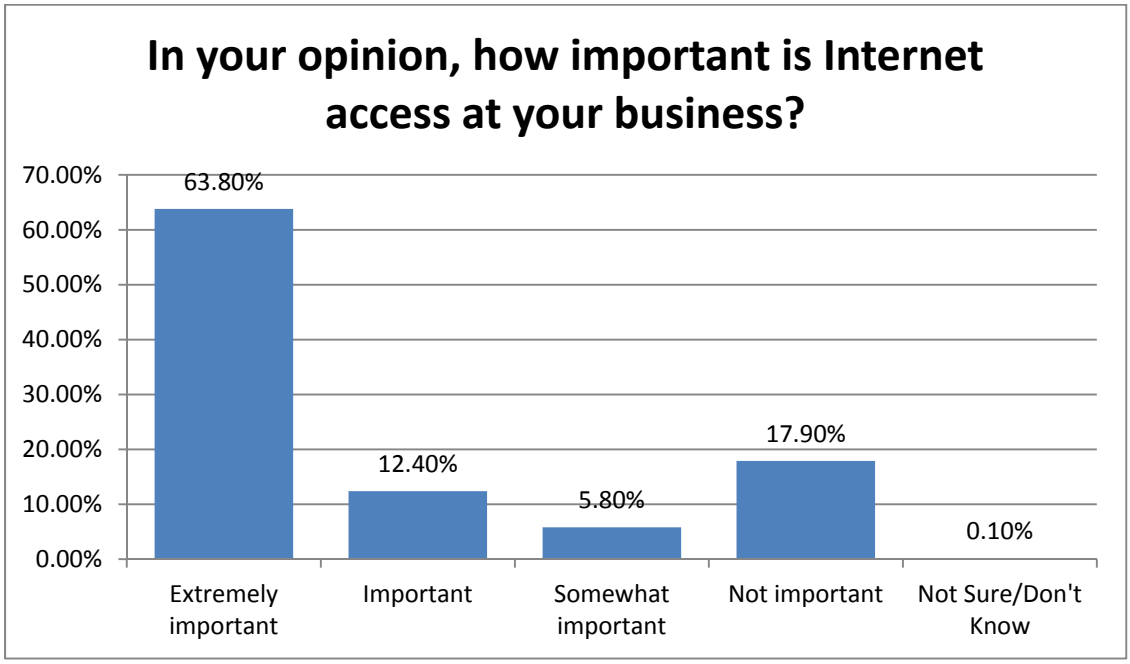


Table 41. Do you have Internet access at your business (Q3)?

Internet access	Number	Percent
Yes	664	83.2
No	134	16.8
Total	**798**	**100.0**

Table 42. Why don't you have Internet access at your business (Q4)?

Reasons for not having Internet access	Number	Percentage of all respondents	Percentage of those without access
I don't need the Internet	92	11.5	68.7
I don't use a computer	54	6.8	40.3
I can access the Internet at other places	11	1.4	8.2
I can't get Internet access	7	0.9	5.2

at my business			
Internet access is too expensive	6	0.8	4.5
Internet access that is available is too slow	4	0.5	3.0
I'm concerned about privacy and personal security	2	0.3	1.5
I don't have a land-line telephone	0	0.0	0.0
Other	12	1.5	9.0

Figure 29. Why don't you have Internet access at your business (q4)?

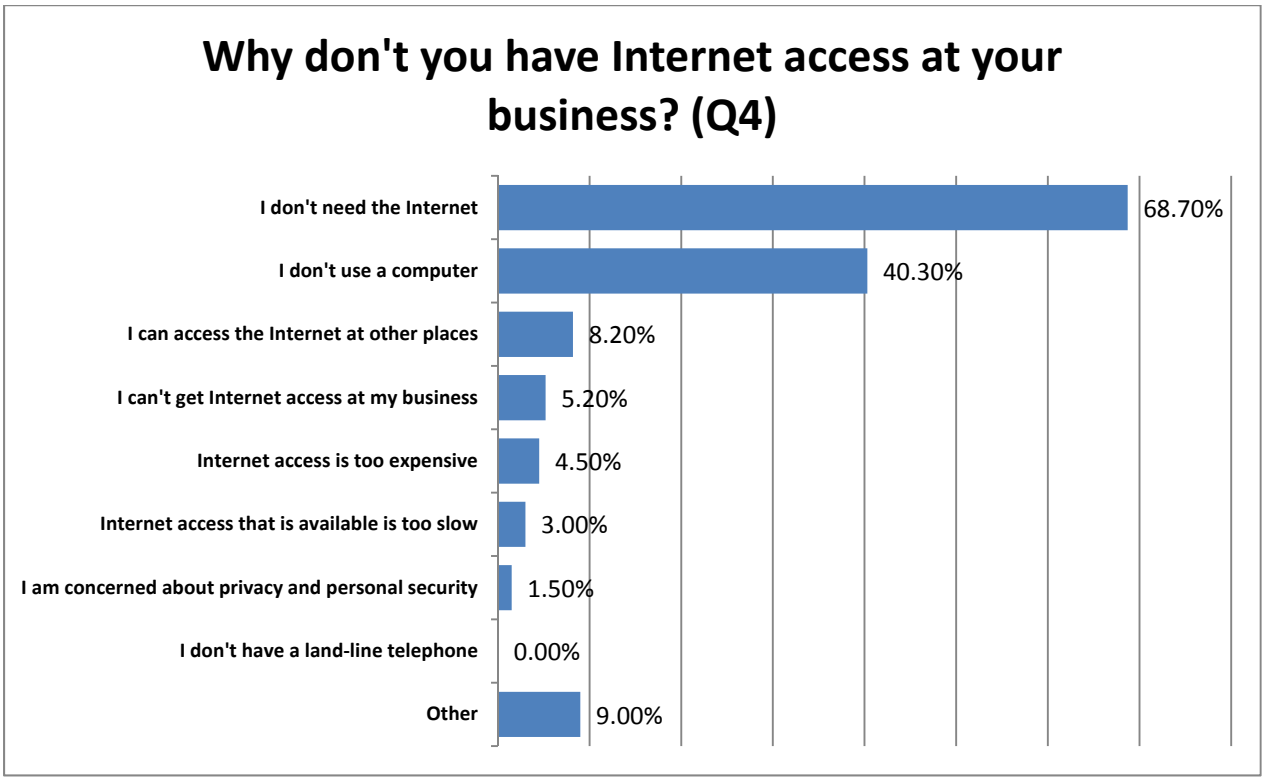


Table 43. Would you like to connect your business to Internet if service is made available to your location (Q4a)?

Want Internet connection?	Number	Percent of all respondents	Percent of respondents without Internet service
Yes	14	11.1	11.1
No	107	84.9	96.0
Depends on the cost	5	4.0	100.0
Total	**126**	**100.0**	

Table 44. Which of the following best describes the type of Internet service you have at your business (Q5)?

Type of service	Number	Percent of all respondents	Percent of respondents with service
DSL Broadband	393	49.1	61.3
Wireless WiFi Broadband (antenna)	74	9.3	11.5
Cable TV modem	56	7.0	8.7
Telephone dial-up	36	4.5	5.6
Satellite service (any speed)	33	4.1	5.1
T-1	31	3.9	4.8
DS-3 (fiberoptic)	6	0.8	0.9
Wireless Cell phone Broadband			

	5	0.6	0.8
Accelerated dial-up	4	0.5	0.6
ISDN	2	0.3	0.3
Gigabit Ethernet	1	0.1	0.2
Total	**641**	**80.1**	**100.0**

Figure 30. Which of the following best describes the type of Internet service you have at your business (Q5)?

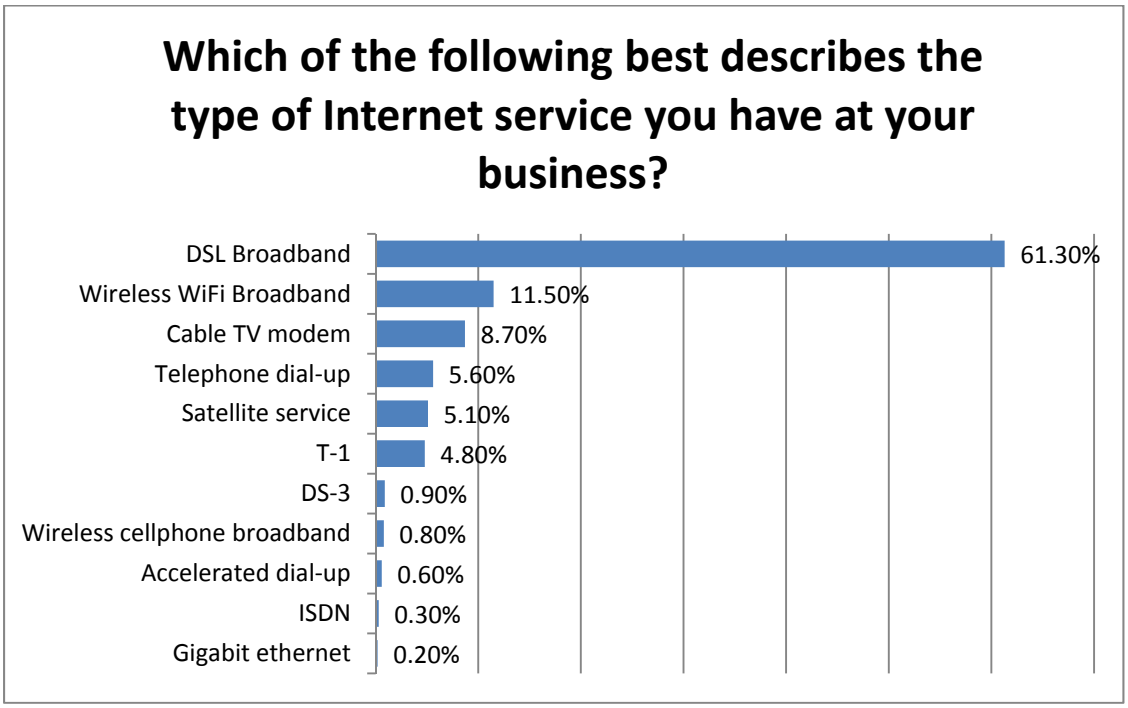
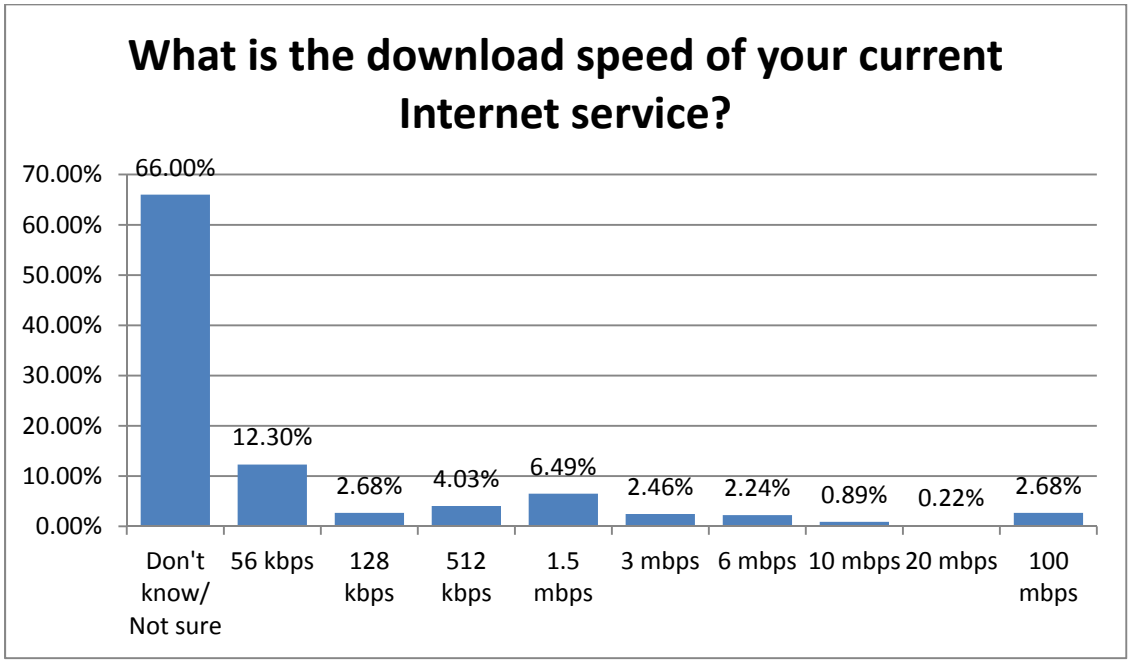


Table 45. What is the download speed of your current Internet service (Q6)?

Download speed	Number	Percent	Cumulative Percent
56 kbps	55	12.30%	12.30%
128 kbps	12	2.68%	14.99%
512 kbps	18	4.03%	19.02%

1.5 mbps	29	6.49%	25.50%
3 mbps	11	2.46%	27.96%
6 mbps	10	2.24%	30.20%
10 mbps	4	0.89%	31.10%
20 mbps	1	0.22%	31.32%
100 mbps	12	2.68%	34.00%
Don't know/ Not sure	295	66.00%	100.00%
Total	**447**	**100.00%**	

Figure 31. What is the download speed of your current Internet service (Q6)?



Cost and Satisfaction with Internet Service

Those businesses with Internet access were asked how much they pay per month. As shown in Table 46 and Figure 32, more than one-fourth (26.2%) pay less than $20.00, just over half (52.1%) pay less than $40.00 per month, and about three-fourths (74.7%) pay less than $60.00 per month. When these businesses were asked about their level of satisfaction with their current Internet service provider (ISP), 89.7% said they were at least somewhat satisfied and 78.4% said they were satisfied or very satisfied. The

remaining 10.3% expressed some level of dissatisfaction with their ISP (Table 47 and Figure 33).

Business customers were asked questions regarding their satisfaction with speed and reliability of their current Internet service. As shown in Table 48, more than three-fourths (78.1%) of businesses with Internet service said they were satisfied or very satisfied with their current access speed. More than three-fourths (84.6%) said they were satisfied or very satisfied with the reliability of their current service and 8.6% said they were somewhat to very dissatisfied (Table 49).

When businesses were asked if they need a redundant broadband connection from a different Internet service provider with an independent backbone, 5.6% said “yes” (Table 50). Approximately half (48.1%) of businesses said that a service level agreement from their ISP was at least somewhat important for them to make a long-term commitment for service, and 33.7% said that such an agreement was important or very important to them (Table 51).

Table 46. How much do you currently pay per month for Internet access at your business (Q8)?

Monthly payment	Number	Percentage
$20.00 or less	146	26.2
$20.00—$29.99	56	10.1
$30.00—$39.99	88	15.8
$40.00—$49.99	69	12.4
$50.00—$59.99	57	10.2
$60.00—$69.99	37	6.6
$70.00—$99.99	48	8.6
$100.00 or more	56	10.1
Total	**557**	**100.0**

Figure 32. How much do you currently pay per month for Internet access at your business (Q8)?

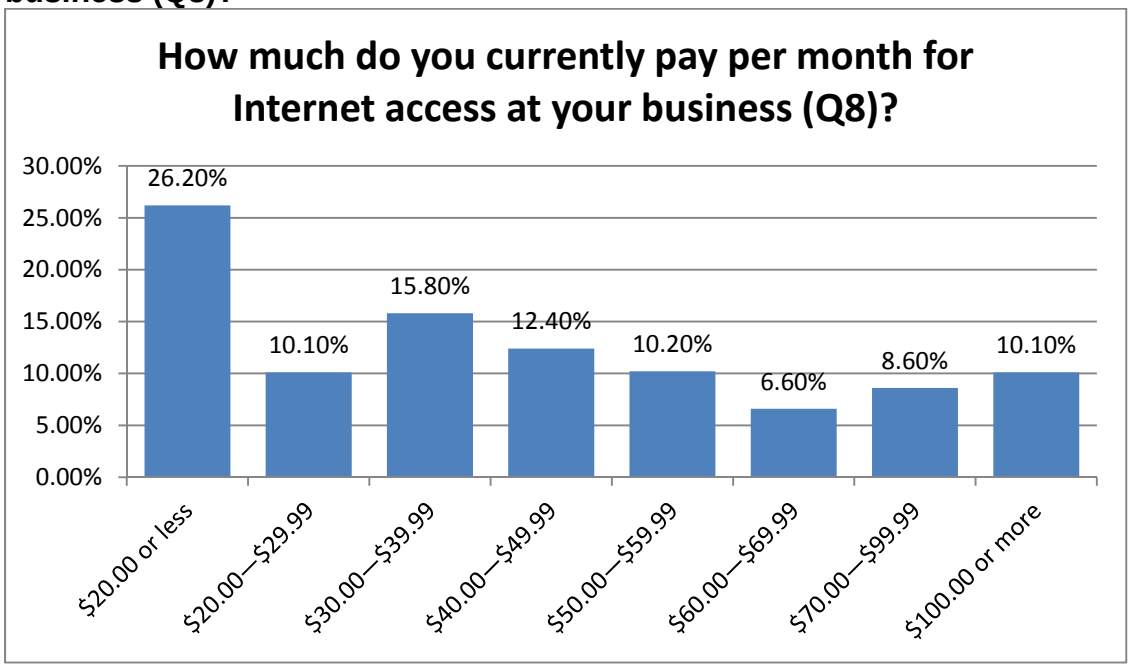


Table 47. How satisfied are you with your current Internet service provider (ISP)(Q9)?

Levels of satisfaction	Number	Percent	Cumulative Percent
Very satisfied	241	36.3	36.3
Satisfied	279	42.1	78.4
Somewhat satisfied	75	11.3	89.7
Somewhat dissatisfied	25	3.8	93.5
Dissatisfied	18	2.7	96.2
Very dissatisfied	25	3.8	100.0
Total	**663**	**100.0**	

Figure 33. How satisfied are you with your current Internet service provider (ISP)(Q9)?

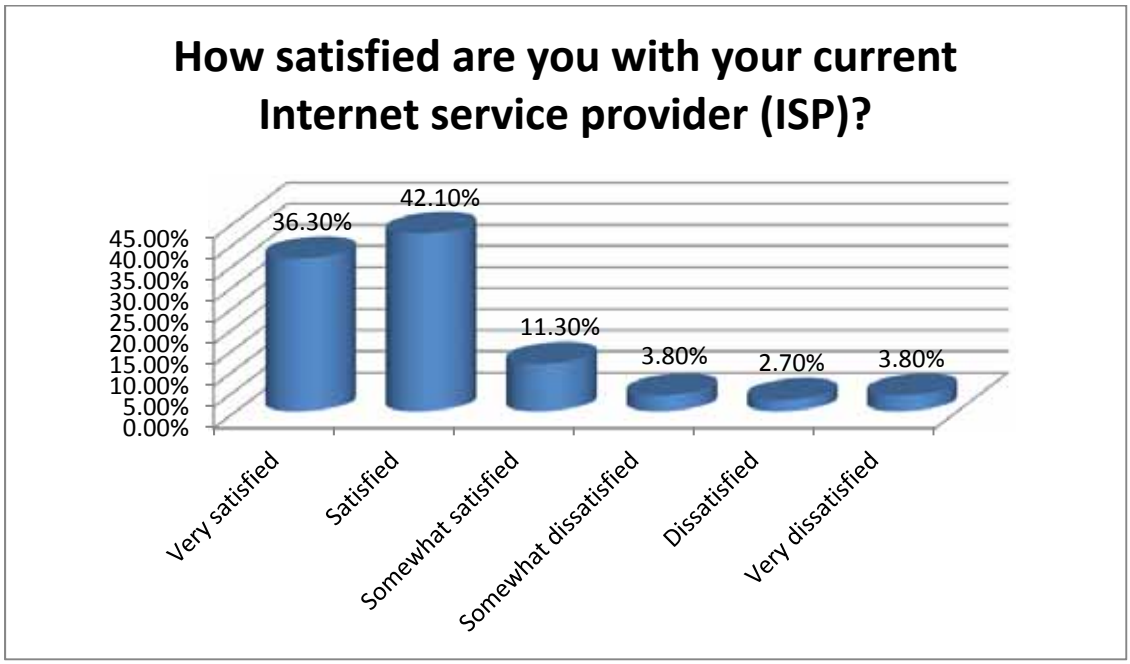


Table 48. How satisfied are you with the speed of your current Internet access (Q9a)?

Levels of satisfaction	Number	Percent	Cumulative Percent
Very satisfied	217	32.9	32.9
Satisfied	298	45.2	78.1
Somewhat satisfied	58	8.8	86.9
Somewhat dissatisfied	19	2.9	89.8
Dissatisfied	22	3.3	93.2
Very dissatisfied	45	6.8	100.0
Total	**659**	**100.0**	

Table 49. How satisfied are you with the reliability of your current Internet access (Q9b)?

Levels of satisfaction	Number	Percent	Cumulative Percent
Very satisfied	267	40.3	40.3
Satisfied	293	44.3	84.6
Somewhat satisfied	45	6.8	91.4
Somewhat dissatisfied	18	2.7	94.1
Dissatisfied	14	2.1	96.2
Very dissatisfied	25	3.8	100.0
Total	**662**	**100.0%**	

Table 50. Does your business need a redundant broadband connection from a different Internet service provider with an independent backbone (Q9d)?

Need redundancy	Number	Percent
Yes	37	5.6
No	596	90.0
Not Sure/Don't Know	29	4.4
Total	**662**	**100.0**

Table 51. How important is a service level agreement from your Internet service provider for you to make a long-term commitment for service (Q9e)?

Importance rating	Number	Percent	Cumulative Percent
Extremely important	82	13.7	13.7
Important	119	19.9	33.7
Somewhat important	86	14.4	48.1
Not important	310	51.9	100.0
Total	**597**	**100.0**	

Business survey respondents were asked if they would be willing to pay more per month for a faster Internet connection. As shown in Table 52 and Figure 34, 17.3% said "yes". Randomized bid amounts for faster service were presented to each of these business respondents, and then they were asked if they would be willing to pay the amount. If the respondent answered "no" to a higher amount, they were asked if they would be willing to pay a lower amount that was randomly selected. As shown in Table 53 and Figure 35, about two-thirds (64.4%) said they would not pay either of the two amounts they were presented. The remaining 11.5% said they would be willing to pay at most $75.00 per month. A few (4.9%) of these business respondents were willing to pay at most $400.00 per month, and 6.9% would pay more than $400 per month.

Table 52. Would you be willing to pay more per month for a faster Internet connection at your business(Q10)?

Willing to pay more?	Number	Percent
Yes	104	17.3
No	498	82.7
Total	**602**	**100.0**

Figure 34. Would you be willing to pay more per month for a faster Internet connection at your business(Q10)?

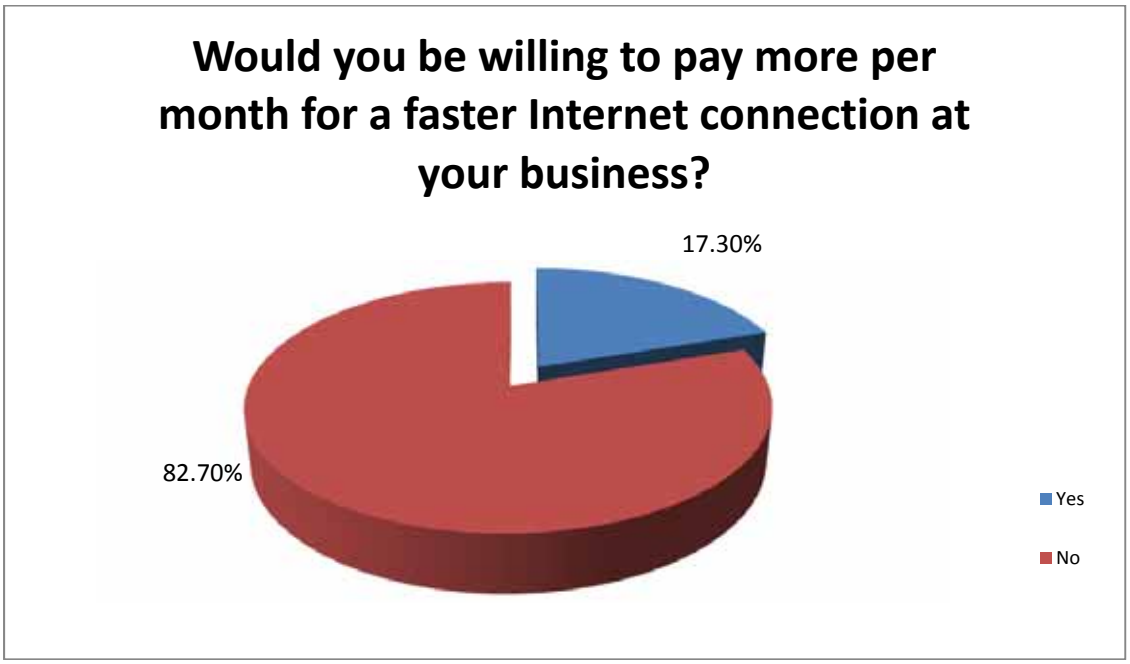
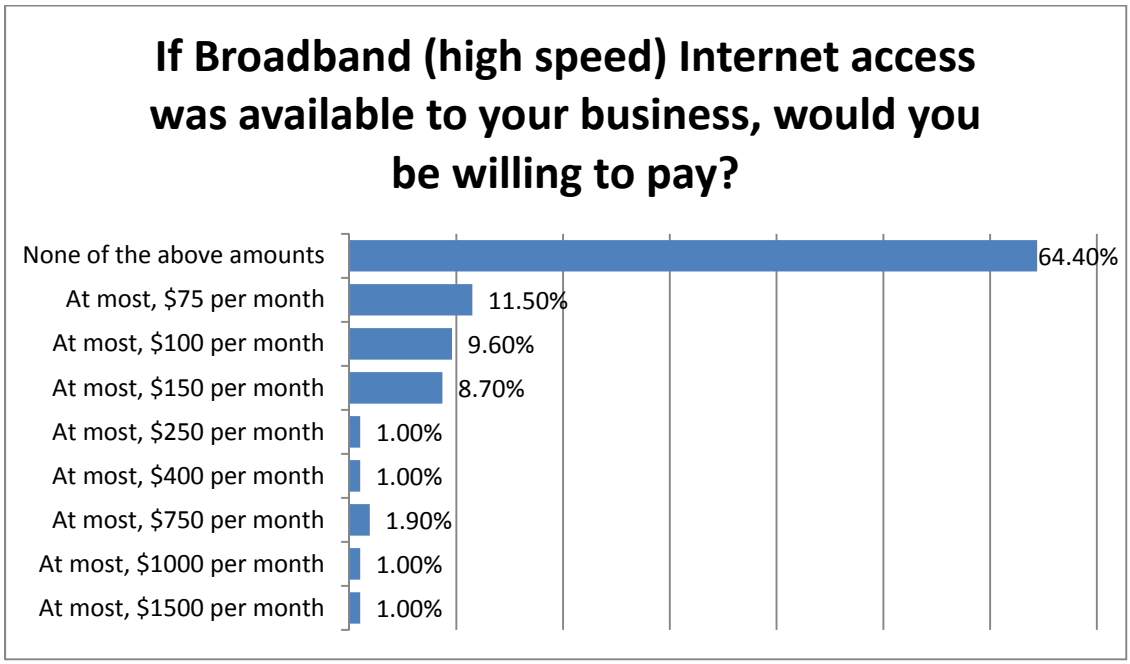


Table 53. If Broadband (high speed) Internet access was available to your business, would you be willing to pay (Q11)?

Amount	Number	Percent	Cumulative Percent
At most, $1500 per month	1	1.0	1.0
At most, $1000 per month	1	1.0	2.0
At most, $750 per month	2	1.9	3.9
At most, $400 per month	1	1.0	4.9
At most, $250 per month	1	1.0	5.9
At most, $150 per month	9	8.7	14.6
At most, $100 per month	10	9.6	24.2
At most, $75 per month	12	11.5	35.7
None of the above amounts	67	64.4	100.00%
Total	**104**	**100.00**	

Figure 35. If Broadband (high speed) Internet access was available to your business, would you be willing to pay (Q11)?



Interest in Training

Business survey respondents were asked if they were interested in training on potential workplace uses or applications of the Internet/Web. As shown in Table 54, 8.2% expressed an interest in training.

Table 54. Are you interested in training on potential workplace uses or applications of the Internet/Web (Q13)?

Interested in training	Number	Percent
Yes	65	8.2
No	712	89.7
Not sure/Don't know	17	2.1
Total	**794**	**100.0**

Billing Arrangements

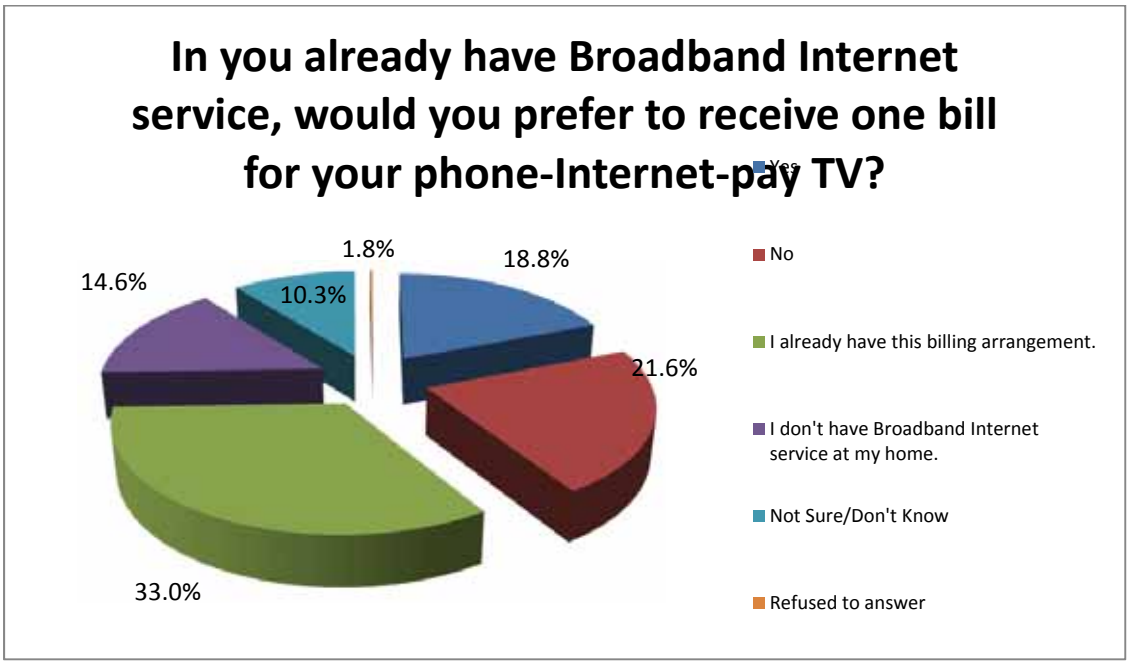
Business customers who had Internet service were asked if they would prefer to receive one bill for their telephone, Internet and pay television. As shown in Table 55 and Figure 36, about one-third (33.0%) said they already had this arrangement, 14.6% did not have

broadband Internet service at their business, and 10.3% said they were not sure. A total of 18.8% of the business respondents said they would prefer one bill for these services.

Table 55. In you already have Broadband Internet service, would you prefer to receive one bill for your phone-Internet-pay TV (Q14)?

Prefer to receive one bill for service?	Number	Percent
Yes	150	18.8
No	173	21.6
I already have this billing arrangement.	264	33.0
I don't have Broadband Internet service at my business.	117	14.6
Not Sure/Don't Know	82	10.3
Refused to Answer	14	1.8
Total	**800**	**100.0**

Figure 36. In you already have Broadband Internet service, would you prefer to receive one bill for your phone-Internet-pay TV (Q14)?



Internet Access Outside the Business

Business survey respondents were asked if they had access to the Internet outside of their business. As shown in Table 56 and Figure 37, about three-fourths (73.4%) said "yes". Of those with access, almost three-fourths (83.7%) said they had access at their homes, and almost one-fourth (24.0%) use wireless hotspots (Table 57 and Figure 38).

Table 56. Do you have access to the Internet at locations outside of your business (Q15)?

Outside access?	Number	Percent
Yes	575	73.4
No	207	26.4
Not Sure/Don't Know	1	0.1
Total	**783**	**100.0**

Figure 37. Do you have access to the Internet at locations outside of your business (Q15)?

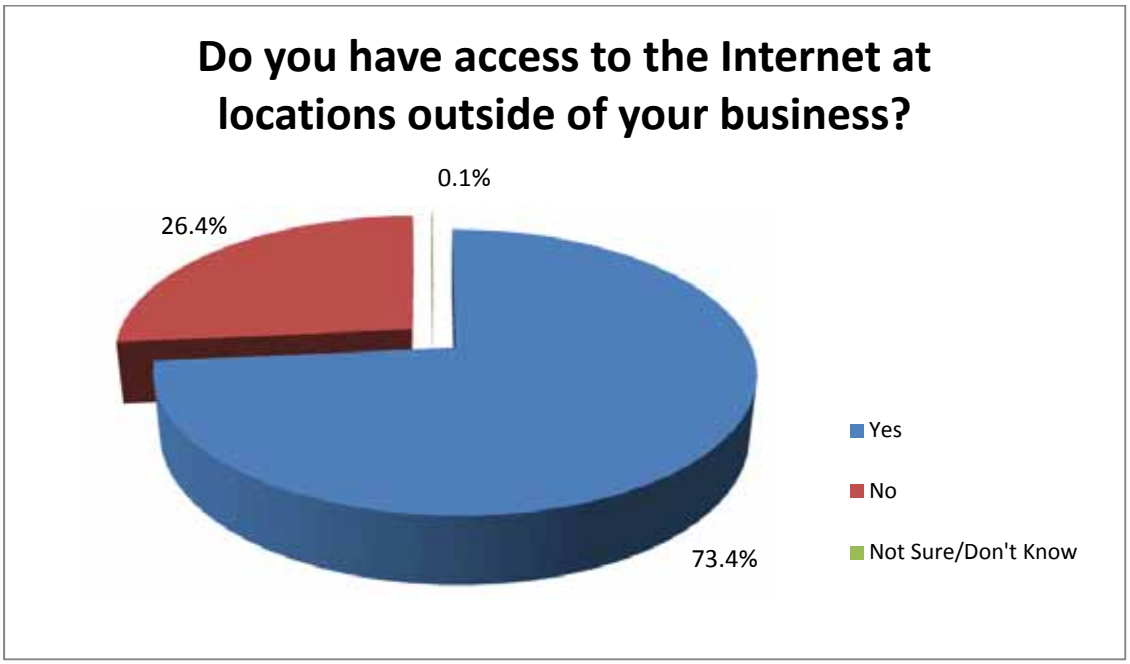
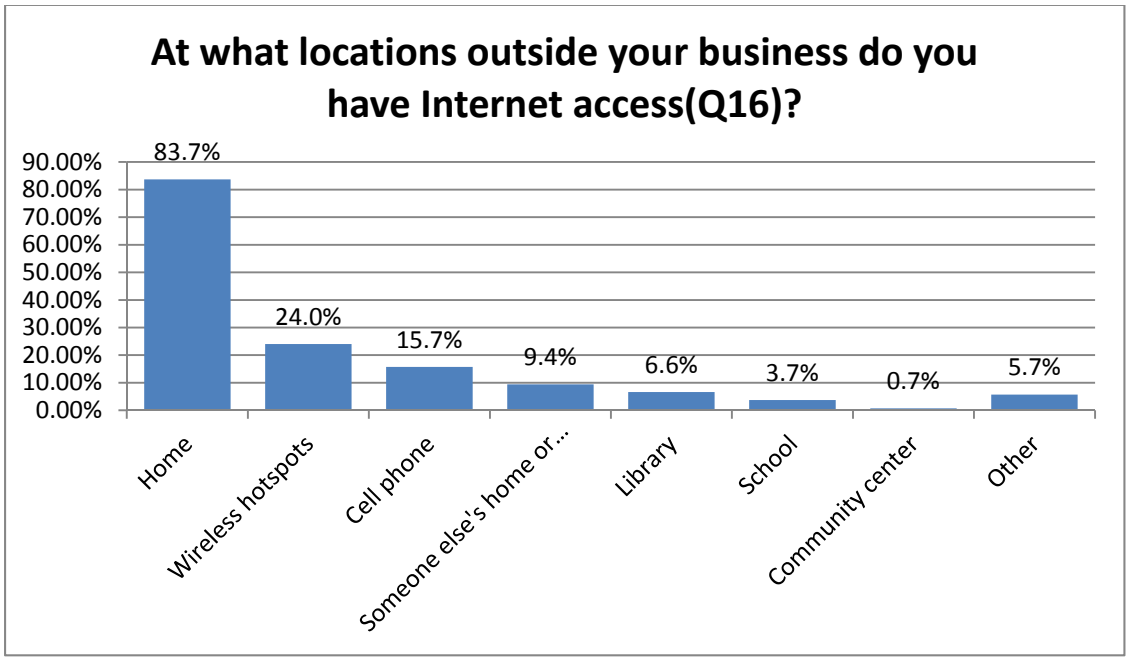


Table 57. At what locations outside your business do you have Internet access (Q16)?

Outside access locations	Number	Percentage of all the respondents	Percentage of people who answered this question
Home	481	60.1	83.7
Wireless hotspots	138	17.3	24.0
Cell phone	90	11.3	15.7
Someone else's home or business	54	6.8	9.4
Library	38	4.8	6.6
School	21	2.6	3.7

Community center	4	0.5	0.7
Other	33	4.1	5.7

Figure 38. At what locations outside your business do you have Internet access (Q16)?



Business Uses of the Internet

When business survey respondents were asked about their uses of the Internet, 81.3% said they look up information on the World Wide Web, 77.5% communicate electronically, about two-thirds (67.8%) purchase items and/or service on-line, and almost two-thirds (63.6%) access government services and information. Just over half access financial services and information and 48.1% have a company web site (Table 58 and Figure 39).

Table 58. For which of the following do you use the Internet (Q17)?

Uses of the Internet	Number	Percent
Looking up information on the World Wide Web	650	81.3
Communicating electronically	620	77.5

Purchasing items/services on-line	542	67.8
Accessing government services and information	509	63.6
Accessing financial services and information	428	53.5
Company web site	385	48.1
Selling items/services on-line	260	32.5
Uploading or downloading music, web casts, pod casts, or video	249	31.1
Taking on-line classes	219	27.4
I don't use Internet for my business	116	14.5
Accessing health care services	54	6.8
Providing on-line classes	44	5.5
Other	8	1.0
Not sure/ Don't know	5	0.6
Refused to answer	12	1.5

Figure 39. For which of the following do you use the Internet (Q17)?

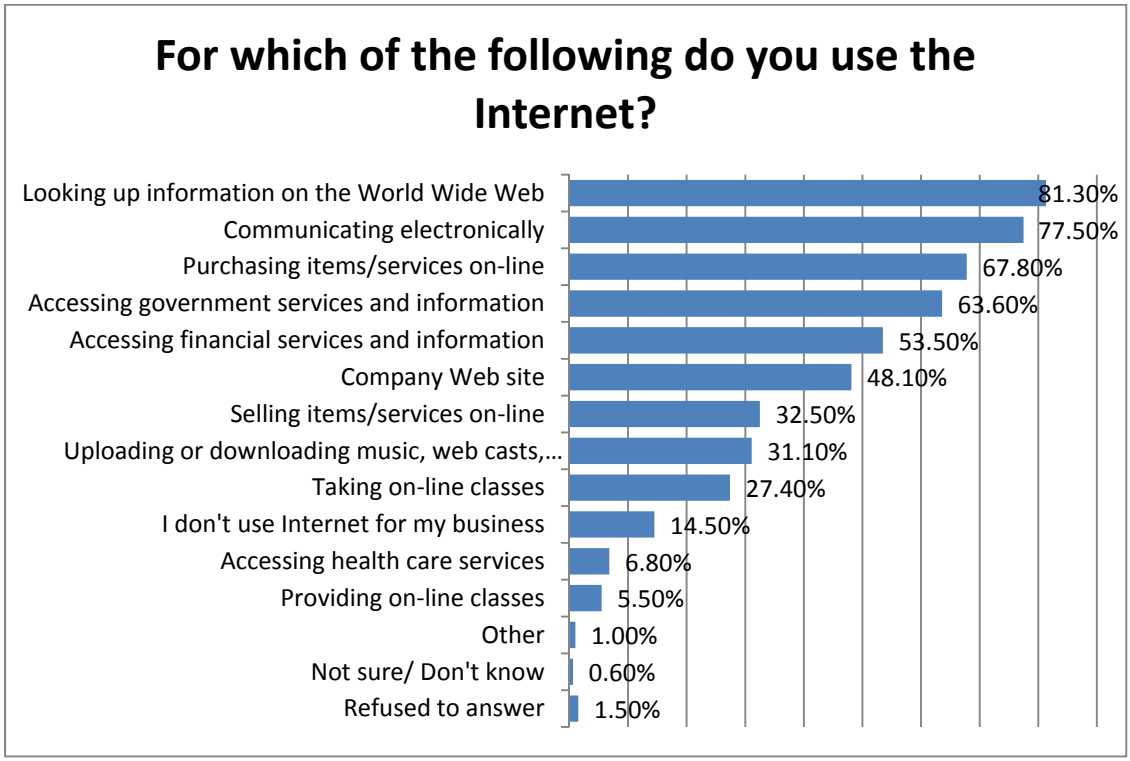


Table 59. How much do you currently pay per month for Internet access at your home (Q8)?

Amount	Number	Percent	Cumulative Percent
0.00	71	8.9%	8.9%
1.00	1	.1%	9.1%
3.00	1	.1%	9.2%
3.95	1	.1%	9.3%
4.95	1	.1%	9.4%
4.99	1	.1%	9.6%
5.00	4	.5%	10.1%

Amount	Number	Percent	Cumulative Percent
5.95	1	.1%	10.2%
6.95	1	.1%	10.3%
8.00	2	.3%	10.6%
8.95	1	.1%	10.7%
9.00	7	.9%	11.6%
9.50	2	.3%	11.8%
9.95	15	1.9%	13.7%
9.99	4	.5%	14.2%
10.00	61	7.7%	21.9%
10.50	1	.1%	22.0%
10.95	2	.3%	22.3%
11.00	4	.5%	22.8%
12.00	10	1.3%	24.0%
12.25	1	.1%	24.2%
12.95	1	.1%	24.3%
13.00	1	.1%	24.4%
13.50	1	.1%	24.5%
14.00	6	.8%	25.3%
14.95	6	.8%	26.0%
15.00	29	3.6%	29.7%
15.95	2	.3%	29.9%

Amount	Number	Percent	Cumulative Percent
15.99	1	.1%	30.1%
16.00	7	.9%	30.9%
16.99	1	.1%	31.1%
17.00	4	.5%	31.6%
17.95	1	.1%	31.7%
18.00	5	.6%	32.3%
19.00	9	1.1%	33.5%
19.50	1	.1%	33.6%
19.75	1	.1%	33.7%
19.95	7	.9%	34.6%
19.99	8	1.0%	35.6%
20.00	63	7.9%	43.5%
21.00	2	.3%	43.8%
21.95	9	1.1%	44.9%
22.00	3	.4%	45.3%
23.00	6	.8%	46.0%
24.00	4	.5%	46.5%
24.25	1	.1%	46.7%
24.95	3	.4%	47.0%
25.00	54	6.8%	53.8%
25.90	1	.1%	54.0%

Amount	Number	Percent	Cumulative Percent
26.00	5	.6%	54.6%
27.00	1	.1%	54.7%
28.00	3	.4%	55.1%
29.00	10	1.3%	56.4%
29.95	4	.5%	56.9%
29.99	4	.5%	57.4%
30.00	57	7.2%	64.5%
31.00	1	.1%	64.7%
32.00	2	.3%	64.9%
33.00	3	.4%	65.3%
34.00	3	.4%	65.7%
35.00	19	2.4%	68.1%
36.00	2	.3%	68.3%
38.00	1	.1%	68.4%
39.00	7	.9%	69.3%
39.95	8	1.0%	70.3%
39.99	2	.3%	70.6%
40.00	42	5.3%	75.8%
41.00	2	.3%	76.1%
42.00	1	.1%	76.2%
43.99	1	.1%	76.4%

Amount	Number	Percent	Cumulative Percent
44.00	1	.1%	76.5%
45.00	6	.8%	77.2%
45.96	1	.1%	77.4%
46.00	2	.3%	77.6%
47.99	1	.1%	77.7%
48.00	1	.1%	77.9%
49.00	3	.4%	78.2%
49.95	3	.4%	78.6%
49.99	6	.8%	79.4%
50.00	39	4.9%	84.3%
53.00	1	.1%	84.4%
54.95	1	.1%	84.5%
55.00	2	.3%	84.8%
58.00	1	.1%	84.9%
59.00	5	.6%	85.5%
59.95	1	.1%	85.7%
59.99	2	.3%	85.9%
60.00	34	4.3%	90.2%
62.00	1	.1%	90.3%
65.00	4	.5%	90.8%
69.00	7	.9%	91.7%

Amount	Number	Percent	Cumulative Percent
69.95	1	.1%	91.8%
69.99	3	.4%	92.2%
70.00	18	2.3%	94.5%
72.00	1	.1%	94.6%
75.00	5	.6%	95.2%
79.00	3	.4%	95.6%
79.95	1	.1%	95.7%
80.00	13	1.6%	97.4%
85.00	1	.1%	97.5%
92.00	1	.1%	97.6%
92.20	1	.1%	97.7%
93.00	1	.1%	97.9%
100.00	7	.9%	98.7%
114.00	1	.1%	98.9%
120.00	4	.5%	99.4%
130.00	1	.1%	99.5%
140.00	1	.1%	99.6%
150.00	1	.1%	99.7%
175.00	1	.1%	99.9%
500.00	1	.1%	100.0%
Total	795	100.0%	

Table 60. On average, about how many hours per day do you spend on the Internet at home (Q33a)?

Number of hours on the Internet at home	Number	Percent	Cumulative Percent
.0	190	19.45%	19.45%
.1	14	1.43%	20.88%
.2	20	2.05%	22.93%
.3	1	0.10%	23.03%
.4	2	0.20%	23.23%
.5	119	12.18%	35.41%
.7	6	0.61%	36.03%
1.0	264	27.02%	63.05%
1.5	30	3.07%	66.12%
1.7	1	0.10%	66.22%
2.0	168	17.20%	83.42%
2.5	13	1.33%	84.75%
3.0	63	6.45%	91.20%
3.5	9	0.92%	92.12%
4.0	35	3.58%	95.70%
4.5	1	0.10%	95.80%
5.0	13	1.33%	97.13%
5.5	1	0.10%	97.24%
6.0	7	0.72%	97.95%
6.5	1	0.10%	98.06%

7.0	7	0.72%	98.77%
8.0	6	0.61%	99.39%
9.0	2	0.20%	99.59%
10.0	3	0.31%	99.90%
12.0	1	0.10%	100.0%
Total	**977**	**100.0%**	

Mean number of hours spent on the Internet at home per-day is 1.45.

Table 61. On average, about how many hours per day do you spend on the Internet at work (Q33b)?

Number of hours on the Internet at work	Number	Percent	Cumulative Percent
.1	12	3.14%	3.14%
.2	10	2.62%	5.76%
.5	37	9.69%	15.45%
.7	2	0.52%	15.97%
1.0	99	25.92%	41.89%
1.5	13	3.40%	45.29%
2.0	60	15.71%	61.00%
2.5	3	0.79%	61.79%
3.0	25	6.54%	68.33%
3.5	4	1.05%	69.38%
4.0	22	5.76%	75.14%
4.5	1	0.26%	75.40%
5.0	11	2.88%	78.28%

6.0	26	6.81%	85.09%
7.0	4	1.05%	86.14%
8.0	40	10.47%	96.61%
9.0	2	0.52%	97.13%
9.5	1	0.26%	97.39%
10.0	7	1.83%	99.22%
11.0	1	0.26%	99.48%
14.0	1	0.26%	99.74%
15.0	1	0.26%	100.00%
Total	**382**	**100.0%**	

Table 62. How much do you currently pay per month for Internet access at your business (Q8)?

Amount	Number	Percent	Valid Percent	Cumulative Percent
0.00	61	12.4	13.7	13.7
6.00	1	.2	.2	13.9
8.95	1	.2	.2	14.1
9.50	1	.2	.2	14.3
9.95	3	.6	.7	15.0
9.99	1	.2	.2	15.2
10.00	4	.8	.9	16.1
12.00	4	.8	.9	17.0
13.00	1	.2	.2	17.3
13.90	1	.2	.2	17.5

Amount	Number	Percent	Valid Percent	Cumulative Percent
13.99	1	.2	.2	17.7
14.00	2	.4	.4	18.2
14.99	2	.4	.4	18.6
15.00	2	.4	.4	19.1
15.95	1	.2	.2	19.3
16.00	3	.6	.7	20.0
16.90	1	.2	.2	20.2
17.95	1	.2	.2	20.4
18.00	1	.2	.2	20.6
18.50	1	.2	.2	20.9
19.00	5	1.0	1.1	22.0
19.95	5	1.0	1.1	23.1
19.99	1	.2	.2	23.3
20.00	14	2.9	3.1	26.5
20.95	2	.4	.4	26.9
21.00	4	.8	.9	27.8
21.95	1	.2	.2	28.0
21.99	1	.2	.2	28.3
22.00	3	.6	.7	28.9
23.00	4	.8	.9	29.8
24.00	2	.4	.4	30.3
24.95	2	.4	.4	30.7

Amount	Number	Percent	Valid Percent	Cumulative Percent
24.99	2	.4	.4	31.2
25.00	14	2.9	3.1	34.3
25.90	1	.2	.2	34.5
29.00	7	1.4	1.6	36.1
29.95	3	.6	.7	36.8
29.99	2	.4	.4	37.2
30.00	30	6.1	6.7	43.9
31.95	1	.2	.2	44.2
33.00	1	.2	.2	44.4
34.95	1	.2	.2	44.6
35.00	12	2.4	2.7	47.3
35.99	1	.2	.2	47.5
36.00	1	.2	.2	47.8
36.75	1	.2	.2	48.0
38.00	1	.2	.2	48.2
39.00	11	2.2	2.5	50.7
39.95	4	.8	.9	51.6
39.99	1	.2	.2	51.8
40.00	28	5.7	6.3	58.1
42.00	2	.4	.4	58.5
44.00	1	.2	.2	58.7
45.00	12	2.4	2.7	61.4

Amount	Number	Percent	Valid Percent	Cumulative Percent
48.00	2	.4	.4	61.9
49.00	4	.8	.9	62.8
49.95	1	.2	.2	63.0
49.99	3	.6	.7	63.7
50.00	39	8.0	8.7	72.4
53.00	1	.2	.2	72.6
53.85	1	.2	.2	72.9
54.99	1	.2	.2	73.1
55.00	1	.2	.2	73.3
57.99	1	.2	.2	73.5
59.00	4	.8	.9	74.4
59.95	1	.2	.2	74.7
59.99	3	.6	.7	75.3
60.00	25	5.1	5.6	80.9
62.00	1	.2	.2	81.2
65.00	4	.8	.9	82.1
69.00	3	.6	.7	82.7
69.99	2	.4	.4	83.2
70.00	10	2.0	2.2	85.4
71.00	1	.2	.2	85.7
72.00	1	.2	.2	85.9
75.00	1	.2	.2	86.1

Amount	Number	Percent	Valid Percent	Cumulative Percent
78.00	1	.2	.2	86.3
79.00	5	1.0	1.1	87.4
80.00	8	1.6	1.8	89.2
84.00	1	.2	.2	89.5
85.00	2	.4	.4	89.9
90.00	2	.4	.4	90.4
95.00	1	.2	.2	90.6
99.00	3	.6	.7	91.3
100.00	8	1.6	1.8	93.0
115.00	1	.2	.2	93.3
119.00	1	.2	.2	93.5
150.00	1	.2	.2	93.7
185.00	1	.2	.2	93.9
200.00	4	.8	.9	94.8
215.00	1	.2	.2	95.1
220.00	2	.4	.4	95.5
250.00	3	.6	.7	96.2
280.00	1	.2	.2	96.4
300.00	3	.6	.7	97.1
350.00	1	.2	.2	97.3
351.00	1	.2	.2	97.5
400.00	1	.2	.2	97.8

Amount	Number	Percent	Valid Percent	Cumulative Percent
500.00	3	.6	.7	98.4
608.00	1	.2	.2	98.7
619.75	1	.2	.2	98.9
660.00	3	.6	.7	99.6
700.00	2	.4	.4	100.0
Subtotal	446	91.0	100.0	
Did not answer	44	9.0		
TOTAL	**490**	**100.0**		

Appendix F

F: Detailed Survey Questions

Northeast Broadband High-Speed Internet

Household Survey 2009

Data Codebook

The following survey is designed to help identify your high-speed Internet needs and uses. The survey should take you about 10 to 12 minutes to complete. All your answers and information will be kept strictly confidential and will be combined with answers provided by other people who complete the survey with the results reported as averages. Your participation in the survey is completely voluntary. You may stop answering questions at any time, and you may skip any question that you do not want to answer.

In which of the following counties is your home located?

1= Butte
2= Lassen
3= Modoc
4= Plumas
5= Shasta
6= Siskiyou
7= Tehama
8= Don't know/not sure (go to Stop)
9= None of the above (go to Stop)
10= Refused to answer (go to Stop)

1. I'd like to begin by asking which of the following telecommunications services/devices do you have in your home? (Please check all that apply.)

1= Land-line telephone
2= Cell phone
3= Personal computer
4= Cable television
5= Satellite television
6= Wireless Internet
7= Video game system
8= None

9= Not sure/don’t know
10= Refused to answer

2. In your opinion, how important is Internet access at your home?

1= Extremely important
2= Important
3= Somewhat important
4= Not important
5= Not Sure/Don't Know
6= Refused to Answer

2a. Do you have one or more children under age 18 living in your household?

1= Yes
2= No
3= Refused to answer

3. Do you have Internet access at your home?

1= Yes
2= No
3= Not Sure/Don't Know
4= Refused to Answer

4. (No Internet access at home) Why don't you have Internet access at your home? (Check all that apply.)

1= I don't use a computer
2= I don't need the Internet
3= Internet access is too expensive
4= Internet access that is available is too slow
5= I can't get Internet access at my home
6= I can access the Internet at other places
7= I am concerned about privacy and personal security
8= I don't have a land-line telephone
9= I don’t have cell phone coverage where I live
10= Not Sure/Don't Know

11= Refused to Answer

12= Other:_____

5. Which of the following best describes the type of Internet service you have at home? (Check only one.)

1= Telephone dial-up
2= Accelerated dial-up
3= ISDN
4= DSL Broadband (go to Q5a)
5= Cable TV modem (go to Q5a)
6= Wireless Broadband (antenna) (go to Q5a)
7= Satellite service (any speed) (go to Q5a)
8= Leased line
9= Not Sure/Don't Know
10= Refused to Answer

5a. Which of the following contributed to your decision to subscribe to broadband?

Please check all that apply.

1= I realized broadband was worth the extra money.
2= I learned that broadband became available in my area.
3= The cost of broadband became affordable.
4= I got a computer in my home.
5= I needed to conduct business on-line.
6= I heard about the benefits of broadband.
7= A friend or family member convinced me to subscribe to broadband.
8= Other (Please explain _____)
9= Don’t know/unsure
10= Refused to answer

5b. Do you subscribe to any other types of Internet service?

1= Yes (go to Q5c)
2= No
3= Not Sure/Don't Know
4= Refused to Answer

5c. To what other types of Internet services do you currently subscribe?

1= Telephone dial-up
2= Accelerated dial-up
3= ISDN dial-up

4= DSL Broadband
5= Cable TV modem
6= Wireless Broadband (antenna)
7= Satellite service (any speed)
8= Leased line
9= Not Sure/Don't Know
10= Refused to Answer

6. What is the reason or reasons don't you subscribe to Broadband (high speed) Internet service at home? (Check all that apply.)

1= I don't need broadband high speed Internet service
2= Broadband (high speed) Internet service is too expensive
3= Broadband (high speed) Internet service is not available where I live
4= I can get broadband (high speed) Internet service somewhere else
5= Not Sure/Don't Know
6= Refused to Answer
7= Other:_____

7. What is the name of the company that provides your Internet access at your home?

_____

7a. What is the download speed of your current Internet service?

1= Please enter the speed. _____
2= Not Sure/Don’t Know
3= Refused to Answer

7b. What is the upload speed of your current Internet service?

1= Please enter the speed. _____
2= Not Sure/Don’t Know
3= Refused to Answer

7c. Do you have a need for disability access services for the Internet?

1= Yes (go to Q7d)
2= No (skip to Q8)
3= Not Sure/Don't Know (skip to Q8)
4= Refused to Answer (skip to Q8)

7d. What type or types of accessibility features do you need for the Internet? Please check all that apply.

1= Visual
2= Hearing
3= Mobility
4= Other (Please describe _____)
5= Don’t know/unsure
6= Refused to answer

8. How much do you currently pay per month for Internet access at your home? (Enter the amount in this format 29.95) _____

8a. Do you pay for bundled services – local phone service, long distance, cable or satellite TV, and/or Internet access?

1= Yes (go to Q8b)
2= No
3= Not Sure/Don’t Know
4= Refused to Answer

8b. Which services are included in your service package/bundle? Please check all that apply.

1= Local phone service
2= Long distance phone service
3= Cable or satellite television
4= Internet access
5= Not Sure/Don’t Know
6= Refused to Answer

9. How satisfied are you with your current Internet service provider (ISP)? Would you say that you are very satisfied, satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

1= Very satisfied
2= Satisfied
3= Somewhat satisfied
4= Somewhat dissatisfied
5= Dissatisfied
6= Very dissatisfied
7= Not Sure/Don't Know

8= Refused to Answer

10. Would you be willing to pay more per month for a faster Internet connection at your home?

1= Yes
2= No
3= Not Sure/Don't Know
4= Refused to Answer

11a. If Broadband (high speed) Internet access was available to your home, would you be willing to pay: (read first amount only; if respondent says "no", check "no")

1= No
2= $50 per month
3= $80 per month
4= $60 per month
5= $70 per month

11b. Would you be willing to pay: (read first amount only; if respondent says "no", check "no")

1= $20 per month
2= $30 per month
3= No
4= $40 per month

12. What is the physical address of the residential location or locations where you would like to receive Broadband (high speed) Internet service? _____

13. If you already have Broadband Internet service, would you prefer to receive one bill for your phone-Internet-pay TV?

1= Yes
2= No
3= Not Sure/Don't Know
4= I already have this billing arrangement.
5= I don't have Broadband Internet service at my home.
6= This billing service is not available to me.
7= Refused to Answer

14. Do you have access to the Internet at locations outside of your home?

1= Yes
2= No
3= Not Sure/Don't Know
4= Refused to Answer

15. At what locations outside your home do you have Internet access? (check all that apply)

1= Work
2= Library
3= School
4= Someone else's home
5= Wireless hotspots
6= Cell phone
7= Community Center
8= Not Sure/Don't Know
9= Refused to Answer
10= Other _____

16. For which of the following do you use the Internet? (Check all that apply.)

1= I do not use the Internet
2= Communication electronically
3= Looking up information on the World Wide Web
4= Purchasing items/services on-line
5= Selling items/services on-line
6= Doing job-related work on-line
7= Accessing government services and information
8= Accessing health care services
9= Accessing financial services and information
10= Uploading or downloading music, webcasts, podcasts, or video
11= Taking on-line classes
12= Gaming
13= Refused to Answer
14= Other _____

These last few questions are for classification purposes only. All of your responses will be kept STRICTLY CONFIDENTIAL and will be combined with responses of other people to be reported as averages.

17. What is your home zip code _____

18. What is the name of the town or city nearest your home? _____

19. If you live outside that city or town, about how many miles is that city or town from your home? _____

20. Are you currently employed full-time or part-time?

1= Employed full-time
2= Employed part-time
3= Unemployed
4= Retired
5= Disabled
6= Other _____
7= Refused to Answer

21. In what type of setting are you currently employed?

1= Home-based business
2= Health Care
3= Forest Products
4= Human/Social Services
5= Information Technology
6= Manufacturing
7= Tourism/Hospitality
8= Agriculture
9= Arts and Culture
10= Fisheries
11= Food Service
12= Construction
13= Wholesale
14= Transportation and Warehousing
15= Retail
16= Finance, Insurance, Real Estate
17= Education
18= Government
19= Professional/Scientific
20= Legal

21= Utilities
22= Not Sure/Don't Know
23= Refused to Answer
24= Other _____

22a. On average, about how many hours per day to you spend on the Internet at home?
_____

22b. About how many hours per day do you spend on the Internet at work?
_____

23. In what year were you born? _____

24. Which of the following best describes your highest level of education? (Please check only one.)

1= Did not complete high school
2= High school graduate or G.E.D.
3= Some college but no degree
4= Four-year undergraduate college degree (B.A., B.S., or equivalent)
5= Graduate or professional degree
6= Refused to Answer

25. Which of the following groups best represents your race or ethnicity? (Check only one.)

1= White
2= American Indian/Alaska Native
3= Asian
4= Native Hawaiian/Pacific Islander
5= Hispanic/Latino
6= Black/African-American
7= Refused to Answer
8= Other _____

26. The last question asks about your total annual household income. That is the combined income for all persons living in your household from all sources before

taxes. Please stop me when I read the category that best describes your annual household income. (Please check only one.)

1= Less than $25,000
2= $25,000 - $34,999
3= $35,000 - $44,999
4= $45,000 - $54,999
5= $55,000 - $64,999
6= $65,000 - $74,999
7= $75,000 - $99,999
8= $100,000 - $124,999
9= $125,000 - $149,999
10= $150,000 or more
11= Not Sure/Don't Know
12= Refused to Answer

This concludes the survey. Thank you for your participation!

INTERVIEWER - Code gender of the respondent.

1= Male
2= Female

CASE ID _____

Northeast Broadband High-Speed Internet

Business Survey 2009

Data Codebook

Hello. This is _____ calling from California State University, Chico.
Can you hear me ok? We are conducting a short survey regarding high speed Internet service as part of a research project for the State of California. Information from the survey will be used to encourage more companies to offer high speed Internet service in your area. All of your answers will be kept strictly confidential and will be combined with answers provided by other people to be reported as averages.

Intro1. Are you the person with the authority to make decisions regarding Internet access at your workplace?

1. Yes (go to cnty)
2. No (go to Intro2)

Intro2. Who makes decisions concerning telecommunication services for your business?

Intro3. May I speak with _____(fill name from intro2)?

1. Yes
2. Person not available (go to callback)
3. Answering machine, receptionist or voice mail(go to message)
4. Refused

In which of the following counties is your business located?

1. Butte
2. Lassen
3. Modoc
4. Plumas
5. Shasta
6. Siskiyou
7. Tehama
8. None of the above
9. Don't know
10. Refused to answer

1. Which of the following telecommunications services/devices do you have in your business? (*Please check all that apply.)*

1. Land-line telephone
2. Cell phone
3. Personal computer
4. Cable television
5. Satellite television
6. Radio/satellite radio
7. PDA/Blackberry
8. Internet
9. Wireless broadband Internet
10. Leased line
11. Not Sure/Don't Know
12. Refused to Answer

2. In your opinion, how important is Internet access at your business?

1. Extremely important
2. Important
3. Somewhat important
4. Not important
5. Not Sure/Don't Know
6. Refused to Answer

3. Do you have Internet access at your business?

1. Yes (Skip to Question 5)
2. No (Go to Question 4)
3. Not Sure/Don't Know (Skip to Question 5)
4. Refused to Answer (Skip to Question 13)

4. (No Internet access at the business) Why don't you have Internet access at your business? (Please check all that apply.)

1. I don't use a computer
2. I don't need the Internet
3. Internet access is too expensive
4. Internet access that is available is too slow
5. I can't get Internet access at my business
6. I can access the Internet at other places
7. I am concerned about privacy and personal security
8. I don't have a land-line telephone
9. Other
10. Not Sure/Don't Know
11. Refused to Answer

4a. Would you like to connect business to internet if service is made available to your location

1. Yes (Skip to Question 12)
2. No (Skip to Question 13)
3. Depends on the cost (Skip to Question 13)
4. Not Sure (Skip to Question 13)
5. Refused to Answer (Skip to Question 13)

5. Which of the following best describes the type of Internet service you have at your business (that is your primary Internet service)?

1. Telephone dial-up
2. Accelerated dial-up
3. ISDN
4. DSL Broadband
5. Cable TV modem
6. Wireless WiFi Broadband (antenna)
7. Wireless Cellphone Broadband
8. Satellite service (any speed)
9. DS-3 (fiberoptic)
10. T-1
11. Gigabit Ethernet
12. Other (Please describe)
13. Not Sure/Don't Know
14. Refused to Answer

5a. Do you or others in your business have a need for disability access services for the internet?

1. Yes
2. No
3. Not sure/Don't know
4. Refused to Answer

5b. Please describe the type or types of disability access services that you or others in your business need.

6. What is the download speed of your current primary Internet service?

6a. Do you have any other type or types of Internet access or service at your business?

1. Yes
2. No
3. Not Sure/Don't know
4. Refused to Answer

6b. What other type or types of Internet access or service do you have? (Check all that apply)

1. Telephone dial-up
2. Accelerated dial-up
3. ISDN
4. DSL Broadband
5. Cable TV modem
6. Wireless WiFi Broadband (antenna)
7. Wireless Cellphone Broadband
8. Satellite service(any speed)
9. DS-3(fiberoptic)
10. T-1
11. Gigabit Ethernet
12. Other (Describe)
13. Not Sure/Don't know
14. Refused to Answer

7. What is the name of the company that provides your business with your primary Internet access?

8. How much do you currently pay per month for Internet access at your business? (*Enter the amount in this format 129.95*)

_____**Please enter the amount.**

8a. Do you pay for bundled services-local phone service, long distance, cable or satellite TV, and/or Internet access?

1. Yes
2. No
3. This billing option is not available
4. Not sure/ Don't know
5. Refused to Answer

8b. Which services are included in your service package/bundle? Please check all that apply.

1. Local phone service
2. Long distance phone service
3. Wireless/cell phone service
4. Internet access
5. Cable or satellite television
6. Other
7. Not sure/Don't know
8. Refused to Answer

9. Overall, how satisfied are you with your current primary Internet service provider (ISP)?

1. Very satisfied
2. Satisfied
3. Somewhat Satisfied
4. Somewhat dissatisfied
5. Dissatisfied
6. Very dissatisfied
7. Not Sure/Don't Know
8. Refused to Answer

9a. How satisfied are you with the reliability of your current primary Internet access?

1. Very satisfied
2. Satisfied
3. Somewhat Satisfied
4. Somewhat dissatisfied
5. Dissatisfied
6. Very dissatisfied
7. Not Sure/Don't Know
8. Refused to Answer

9b. How satisfied are you with the download speed of your current primary Internet access?

1. Very satisfied
2. Satisfied
3. Somewhat Satisfied
4. Somewhat dissatisfied
5. Dissatisfied
6. Very dissatisfied
7. Not Sure/Don't Know
8. Refused to Answer

9c. What Internet download speed would you like to have at your business?

9d. Does your business need a redundant broadband connection from a different Internet service provider with an independent backbone or backup system?

1. Yes
2. No
3. Not sure/ Don't know
4. Refused to Answer

9d1. Would you be willing to pay for a second Internet connection for back up your primary Internet connection?

1. Yes
2. No
3. Don't know/unsure
4. Refused to answer

9d2. Why would you be unwilling to pay for a backup Internet connection?

1. It costs too much.
2. It is not available.
3. I can be without service for a short time (day or less).
4. Other _____

9e. How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you making a long-term commitment for service?

1. Extremely important
2. Important
3. Somewhat important
4. Not important
5. Not sure/Don't know
6. Refused to answer

9f. Have you switched Internet service providers at your business during the past 12 months?

1. Yes
2. No
3. Don't know/unsure
4. Refused to answer

9g. What was your reason or reasons for changing Internet service providers? (Check all that apply.)

1. Cost
2. Access speed
3. Reliability of service
4. Other _____

10. Would you be willing to pay more per month for a faster Internet connection at your business?

1. Yes (Go to Question 11)
2. No (Skip to Question 13)
3. Not Sure/Don't Know (Skip to Question 13)
4. Refused to Answer (Skip to Question 13)

11a. If higher speed Broadband Internet access was available to your business, would you be willing to pay:(read first amount only; if respondent says "no", check "no")

1. No
2. At most, $750 per month
3. At most, $1,000 per month
4. At most, $1500 per month
5. At most, $2,000 per month
6. At most, $2,500 per month
7. More than $2,500 per month
8. No

11b. Would you be willing to pay: (read first amount only; if respondents say "no", check "no").

1. At most, $75 per month
2. At most $100 per month
3. At most, $150 per month
4. At most, $250 per month
5. At most, $400 per month
6. At most, $500 per month
7. No

12. What is the address of the business location or locations where you would like to receive Broadband (high speed) Internet service?

13. Are you interested in training on potential workplace uses or applications of the Internet/Web?

1. Yes (*Go to Question 13a*)
2. No (*Skip to Question 14*)
3. Not Sure/Don't Know (*Skip to Question 14*)
4. Refused to Answer (Skip to Question 14)

13a. Please describe the type of training that you would be interested in receiving.

14. If you already have Broadband Internet service, would you prefer to receive one bill for your phone and Internet?

1. Yes
2. No
3. Not Sure/Don't Know
4. I already have this billing arrangement.
5. I don't have Broadband Internet service at my business.
6. Refused to answer

15. Do you have access to the Internet at locations outside of your business?

1. Yes (Go to Question 16)
2. No (Skip to Question 17)
3. Not Sure/Don't Know (Skip to Question 17)
4. Refused to Answer (Skip to Question 17)

16. At what locations outside your business do you have Internet access?

1. Home
2. Library
3. School
4. Someone else's home or business
5. Wireless hotspots
6. Cell phone
7. Community Center
8. Other (please explain)
9. Not Sure/Don't Know
10. Refused to Answer

17. For which of the following do you use the Internet at your business? (Check all that apply.)

1. Communicating electronically
2. Looking up information on the World Wide Web
3. Purchasing items/services on-line
4. Selling items/services on-line
5. Company Web site
6. Accessing government services and information
7. Accessing health care services
8. Accessing financial services and information
9. Uploading or downloading music, webcasts, podcasts, or video
10. Taking on-line classes
11. Providing on-line classes
12. Other (please explain)
13. I don't use the Internet for my business
14. Not Sure/Don't Know
15. Refused to Answer

18. Which of the following best describes the type of business that you own or manage?

1. Home-based business
2. Health Care
3. Forest Products
4. Human/Social Services
5. Information Technology
6. Manufacturing
7. Tourism/Hospitality
8. Agriculture
9. Arts and Culture
10. Fisheries
11. Food Service
12. Construction
13. Wholesale
14. Transportation and Warehousing
15. Retail
16. Finance, insurance, real estate
17. Education
18. Government
19. Professional/Scientific
20. Legal
21. Utilities
22. Media communications/media publishing
23. Other (Please describe)
24. Not Sure/Don't Know
25. Refused to Answer

19. What is the Postal Service ZIP code for your business?

19a. What is the name of the town or city nearest your business?

20. If your business is located outside that city or town, about how many miles is that city or town from your business?

21. On average, about how many hours per day do you spend on the Internet at home?

22. On average, about how many hours per day do you spend per day on the Internet at work?

These last few questions are for classification purposes only. All of your responses will be kept STRICTLY CONFIDENTIAL and will be combined with responses of other people to be reported as averages.

23. In what year were you born?

24. Which of the following best describes your highest level of education?

1. Did not complete high school
2. High school graduate or G.E.D.
3. Some college but no degree
4. Four-year undergraduate college degree (B.S., B.A., or equivalent)
5. Graduate or professional degree
6. Refused to Answer

25. Which of the following groups best represents your race or ethnicity? (*You may check more than one group*.)

1. White
2. American Indian/Alaska Native
3. Asian
4. Native Hawaiian/Pacific Islander
5. Hispanic/Latino
6. Black/African American
7. Other (please describe)
8. Refused to Answer

26. Which of the following categories best describes your total annual household income (before taxes) from all income sources? (Please check only one.)

1. Less than $ 25,000
2. $ 25,000 - $ 34,999
3. $ 35,000 - $ 44,999
4. $ 45,000 - $ 54,999
5. $ 55,000 - $ 64,999
6. $ 65,000 - $ 74,999
7. $ 75,000 - $ 99,999
8. $100,000 - $ 124,999
9. $125,000 - $ 149,999
10. $150,000 or more
11. Refused to answer

27. What concerns or comments regarding high speed Internet service do you have that were not addressed in the survey?

This concludes the survey. Thank you for your participation! If you would like us to call you about your remaining concerns or comments, please provide your name and phone number below.

Sex. Interviewer –code gender

1. Male

2. Female

Appendix G

G: County Crosstabulations

Household Survey Results by County

Which of the following telecommunications services/devices do you have at your home?(Cellphone) * In which of the following counties is your home located?

Crosstab

			In which of the following counties is your home located?		
			Butte	Lassen	Modoc
Which of the following telecommunications services/devices do you have at your home?(Cellphone)	UnChecked	Count	254	13	14
		% within In which of the following counties is your home located?	33.1%	26.5%	46.7%
	Checked	Count	514	36	16
		% within In which of the following counties is your home located?	66.9%	73.5%	53.3%
Total		Count	768	49	30
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?		
			Plumas	Shasta	Siskiyou
Which of the following telecommunications services/devices do you have at your home?(Cellphone)	UnChecked	Count	20	158	60
		% within In which of the following counties is your home located?	30.8%	26.6%	38.2%
	Checked	Count	45	436	97
		% within In which of the following counties is your home located?	69.2%	73.4%	61.8%
Total		Count	65	594	157
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Cellphone)	UnChecked	Count	61	580
		% within In which of the following counties is your home located?	35.3%	31.6%
	Checked	Count	112	1256

	% within In which of the following counties is your home located?	64.7%	68.4%
Total	Count	173	1836
	% within In which of the following counties is your home located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.652[a]	6	.016
Likelihood Ratio	15.560	6	.016
Linear-by-Linear Association	.273	1	.601
N of Valid Cases	1836		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.48.

A significantly larger percentage of household respondents in Modoc and Siskiyou County said they did not have cell phones than did respondents in the other five counties.

Which of the following telecommunications services/devices do you have at your home? (Cable television) * In which of the following counties is your home located?

Crosstab

			In which of the following counties is your home located?		
			Butte	Lassen	Modoc
Which of the following telecommunications services/devices do you have at your home?(Cable television)	UnChecked	Count	406	42	23
		% within In which of the following counties is your home located?	52.9%	85.7%	76.7%
	Checked	Count	362	7	7
		% within In which of the following counties is your home located?	47.1%	14.3%	23.3%
Total		Count	768	49	30
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?		
			Plumas	Shasta	Siskiyou
Which of the following	UnChecked	Count	49	406	117

telecommunications services/devices do you have at your home?(Cable television)		% within In which of the following counties is your home located?	75.4%	68.4%	74.5%
	Checked	Count	16	188	40
		% within In which of the following counties is your home located?	24.6%	31.6%	25.5%
Total		Count	65	594	157
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Cable television)	UnChecked	Count	128	1171
		% within In which of the following counties is your home located?	74.0%	63.8%
	Checked	Count	45	665
		% within In which of the following counties is your home located?	26.0%	36.2%
Total		Count	173	1836

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Cable television)	UnChecked	Count	128	1171
		% within In which of the following counties is your home located?	74.0%	63.8%
	Checked	Count	45	665
		% within In which of the following counties is your home located?	26.0%	36.2%
Total		Count	173	1836
		% within In which of the following counties is your home located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	76.778[a]	6	.000
Likelihood Ratio	78.400	6	.000
Linear-by-Linear Association	53.390	1	.000
N of Valid Cases	1836		

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	76.778[a]	6	.000
Likelihood Ratio	78.400	6	.000
Linear-by-Linear Association	53.390	1	.000
N of Valid Cases	1836		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.87.

A significantly larger percentage of household survey respondents in Butte County said they have cable television than respondents in the other six counties.

Which of the following telecommunications services/devices do you have at your home?(Satellite television) * In which of the following counties is your home located?

Crosstab

			In which of the following counties is your home located?		
			Butte	Lassen	Modoc
Which of the following telecommunications services/devices do you have at your home?(Satellite television)	UnChecked	Count	522	21	13
		% within In which of the following counties is your home located?	68.0%	42.9%	43.3%
	Checked	Count	246	28	17
		% within In which of the following counties is your home located?	32.0%	57.1%	56.7%
Total		Count	768	49	30
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?		
			Plumas	Shasta	Siskiyou
Which of the following	UnChecked	Count	26	302	81

telecommunications services/devices do you have at your home?(Satellite television)		% within In which of the following counties is your home located?	40.0%	50.8%	51.6%
	Checked	Count	39	292	76
		% within In which of the following counties is your home located?	60.0%	49.2%	48.4%
Total		Count	65	594	157
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Satellite television)	UnChecked	Count	90	1055
		% within In which of the following counties is your home located?	52.0%	57.5%
	Checked	Count	83	781
		% within In which of the following counties is your home located?	48.0%	42.5%
Total		Count	173	1836

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Satellite television)	UnChecked	Count	90	1055
		% within In which of the following counties is your home located?	52.0%	57.5%
	Checked	Count	83	781
		% within In which of the following counties is your home located?	48.0%	42.5%
Total		Count	173	1836
		% within In which of the following counties is your home located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	64.477[a]	6	.000
Likelihood Ratio	65.164	6	.000
Linear-by-Linear Association	41.817	1	.000
N of Valid Cases	1836		

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	64.477[a]	6	.000
Likelihood Ratio	65.164	6	.000
Linear-by-Linear Association	41.817	1	.000
N of Valid Cases	1836		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.76.

A significantly smaller percentage of household respondents in Butte County have satellite television than the respondents in the other six northeastern counties.

Which of the following telecommunications services/devices do you have at your home?(Video game system) * In which of the following counties is your home located?

Crosstab

			In which of the following counties is your home located?		
			Butte	Lassen	Modoc
Which of the following telecommunications services/devices do you have at your home?(Video game system)	UnChecked	Count	558	35	27
		% within In which of the following counties is your home located?	72.7%	71.4%	90.0%
	Checked	Count	210	14	3
		% within In which of the following counties is your home located?	27.3%	28.6%	10.0%
Total		Count	768	49	30
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?		
			Plumas	Shasta	Siskiyou
Which of the following	UnChecked	Count	52	415	127

telecommunications services/devices do you have at your home?(Video game system)		% within In which of the following counties is your home located?	80.0%	69.9%	80.9%
	Checked	Count	13	179	30
		% within In which of the following counties is your home located?	20.0%	30.1%	19.1%
Total		Count	65	594	157
		% within In which of the following counties is your home located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Video game system)	UnChecked	Count	117	1331
		% within In which of the following counties is your home located?	67.6%	72.5%
	Checked	Count	56	505
		% within In which of the following counties is your home located?	32.4%	27.5%
Total		Count	173	1836

Crosstab

			In which of the following counties is your home located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have at your home?(Video game system)	UnChecked	Count	117	1331
		% within In which of the following counties is your home located?	67.6%	72.5%
	Checked	Count	56	505
		% within In which of the following counties is your home located?	32.4%	27.5%
Total		Count	173	1836
		% within In which of the following counties is your home located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.149[a]	6	.013
Likelihood Ratio	17.597	6	.007
Linear-by-Linear Association	.269	1	.604
N of Valid Cases	1836		

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.149[a]	6	.013
Likelihood Ratio	17.597	6	.007
Linear-by-Linear Association	.269	1	.604
N of Valid Cases	1836		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.25.

Crosstabs - Business Survey Results by County

Have you switched Internet service providers at your business during the past 12 months? * In which of the following counties is your business located?

Crosstab

			In which of the following counties is your business located?	
			Butte	Lassen
Have you switched Internet service providers at your business during the past 12 months?	Yes	Count	32	0
		% within In which of the following counties is your business located?	12.8%	.0%
	No	Count	217	24
		% within In which of the following counties is your business located?	86.8%	100.0%
	Don't know/unsure	Count	1	0
		% within In which of the following counties is your business located?	.4%	.0%
	Refused to answer	Count	0	0
		% within In which of the following counties is your business located?	.0%	.0%
Total		Count	250	24

Crosstab

			In which of the following counties is your business located?	
			Butte	Lassen
Have you switched Internet service providers at your business during the past 12 months?	Yes	Count	32	0
		% within In which of the following counties is your business located?	12.8%	.0%
	No	Count	217	24
		% within In which of the following counties is your business located?	86.8%	100.0%
	Don't know/unsure	Count	1	0
		% within In which of the following counties is your business located?	.4%	.0%
	Refused to answer	Count	0	0
		% within In which of the following counties is your business located?	.0%	.0%
Total		Count	250	24
		% within In which of the following counties is your business located?	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Modoc	Plumas
Have you switched Internet service providers at your business during the past 12 months?	Yes	Count	1	3
		% within In which of the following counties is your business located?	5.6%	7.3%
	No	Count	17	38
		% within In which of the following counties is your business located?	94.4%	92.7%
	Don't know/unsure	Count	0	0
		% within In which of the following counties is your business located?	.0%	.0%
	Refused to answer	Count	0	0
		% within In which of the following counties is your business located?	.0%	.0%
Total		Count	18	41
		% within In which of the following counties is your business located?	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Shasta	Siskiyou
Have you switched Internet service providers at your business during the past 12 months?	Yes	Count	24	6
		% within In which of the following counties is your business located?	11.8%	8.5%
	No	Count	178	64
		% within In which of the following counties is your business located?	87.7%	90.1%
	Don't know/unsure	Count	1	1
		% within In which of the following counties is your business located?	.5%	1.4%
	Refused to answer	Count	0	0
		% within In which of the following counties is your business located?	.0%	.0%
Total		Count	203	71
		% within In which of the following counties is your business located?	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
Have you switched Internet service providers at your business during the past 12 months?	Yes	Count	5	71
		% within In which of the following counties is your business located?	8.8%	10.7%
	No	Count	48	586
		% within In which of the following counties is your business located?	84.2%	88.3%
	Don't know/unsure	Count	3	6
		% within In which of the following counties is your business located?	5.3%	.9%
	Refused to answer	Count	1	1
		% within In which of the following counties is your business located?	1.8%	.2%
Total		Count	57	664
		% within In which of the following counties is your business located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.674[a]	18	.031
Likelihood Ratio	22.201	18	.223
Linear-by-Linear Association	2.898	1	.089
N of Valid Cases	664		

a. 17 cells (60.7%) have expected count less than 5. The minimum expected count is .03.

Note that a significantly larger percentage of business survey respondents in Butte and Shasta County switched their ISP during the 12 months prior to the survey than did respondents in the other five northeast counties.

Which of the following telecommunications services/devices do you have in your business? (Satellite television) * In which of the following counties is your business located?

Crosstab

			In which of the following counties is your business located?		
			Butte	Lassen	Modoc
Which of the following telecommunications services/devices do you have in your business?(Satellite television)	UnChecked	Count	257	22	15
		% within In which of the following counties is your business located?	87.4%	73.3%	75.0%
	Checked	Count	37	8	5
		% within In which of the following counties is your business located?	12.6%	26.7%	25.0%
Total		Count	294	30	20
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?		
			Plumas	Shasta	Siskiyou
Which of the following telecommunications services/devices do you have in your business?(Satellite television)	UnChecked	Count	31	204	62
		% within In which of the following counties is your business located?	66.0%	81.9%	70.5%
	Checked	Count	16	45	26
		% within In which of the following counties is your business located?	34.0%	18.1%	29.5%
Total		Count	47	249	88
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have in your business?(Satellite television)	UnChecked	Count	54	645
		% within In which of the following counties is your business located?	75.0%	80.6%
	Checked	Count	18	155
		% within In which of the following counties is your business located?	25.0%	19.4%
Total		Count	72	800
		% within In which of the following counties is your business located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.132[a]	6	.000
Likelihood Ratio	23.399	6	.001
Linear-by-Linear Association	10.790	1	.001
N of Valid Cases	800		

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
Which of the following telecommunications services/devices do you have in your business?(Satellite television)	UnChecked	Count	54	645
		% within In which of the following counties is your business located?	75.0%	80.6%
	Checked	Count	18	155
		% within In which of the following counties is your business located?	25.0%	19.4%
Total		Count	72	800

a. 1 cells (7.1%) have expected count less than 5. The minimum expected count is 3.88.

Significantly larger percentages of business respondents in Lassen, Modoc, Plumas, Siskiyou and Tehama County reported having satellite television than respondents in Butte and Shasta County.

How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you? * In which of the following counties is your business located?

Crosstab

			In which of the following counties is your business located?	
			Butte	Lassen
How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you	Extremely important	Count	36	3
		% within In which of the following counties is your business located?	16.0%	13.6%
	Important	Count	37	1
		% within In which of the following counties is your business located?	16.4%	4.5%
	Somewhat important	Count	41	2
		% within In which of the following counties is your business located?	18.2%	9.1%
	Not important	Count	111	16
		% within In which of the following counties is your business located?	49.3%	72.7%
Total		Count	225	22

Crosstab

			In which of the following counties is your business located?	
			Butte	Lassen
How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you	Extremely important	Count	36	3
		% within In which of the following counties is your business located?	16.0%	13.6%
	Important	Count	37	1
		% within In which of the following counties is your business located?	16.4%	4.5%
	Somewhat important	Count	41	2
		% within In which of the following counties is your business located?	18.2%	9.1%
	Not important	Count	111	16
		% within In which of the following counties is your business located?	49.3%	72.7%
Total		Count	225	22
		% within In which of the following counties is your business located?	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Modoc	Plumas
How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you	Extremely important	Count	2	6
		% within In which of the following counties is your business located?	11.8%	17.1%
	Important	Count	7	12
		% within In which of the following counties is your business located?	41.2%	34.3%
	Somewhat important	Count	1	8
		% within In which of the following counties is your business located?	5.9%	22.9%
	Not important	Count	7	9
		% within In which of the following counties is your business located?	41.2%	25.7%
Total		Count	17	35
		% within In which of the following counties is your business located?	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Shasta	Siskiyou
How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you	Extremely important	Count	18	12
		% within In which of the following counties is your business located?	9.7%	19.7%
	Important	Count	33	15
		% within In which of the following counties is your business located?	17.7%	24.6%
	Somewhat important	Count	20	8
		% within In which of the following counties is your business located?	10.8%	13.1%
	Not important	Count	115	26
		% within In which of the following counties is your business located?	61.8%	42.6%
Total		Count	186	61
		% within In which of the following counties is your business located?	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
How important is a Service Level Agreement from your Internet Service Provider for you to make a long-term commitment for service? Would you say that a Service Level Agreement is extremely important, important, somewhat important, or nor important to you	Extremely important	Count	5	82
		% within In which of the following counties is your business located?	9.8%	13.7%
	Important	Count	14	119
		% within In which of the following counties is your business located?	27.5%	19.9%
	Somewhat important	Count	6	86
		% within In which of the following counties is your business located?	11.8%	14.4%
	Not important	Count	26	310
		% within In which of the following counties is your business located?	51.0%	51.9%
Total		Count	51	597
		% within In which of the following counties is your business located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38.575[a]	18	.003
Likelihood Ratio	39.011	18	.003
Linear-by-Linear Association	.093	1	.761
N of Valid Cases	597		

a. 7 cells (25.0%) have expected count less than 5. The minimum expected count is 2.34.

Significantly larger percentages of business respondents in Butte, Plumas, and Siskiyou County rated Internet access extremely important than respondents in the other four northeast counties.

At what locations outside your business do you have Internet access?(Home) * In which of the following counties is your business located?

Crosstab

			In which of the following counties is your business located?		
			Butte	Lassen	Modoc
At what locations outside your business do you have Internet access?(Home)	UnChecked	Count	32	0	2
		% within In which of the following counties is your business located?	14.7%	.0%	12.5%
	Checked	Count	185	19	14
		% within In which of the following counties is your business located?	85.3%	100.0%	87.5%
Total		Count	217	19	16
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?		
			Plumas	Shasta	Siskiyou
At what locations outside your business do you have Internet access?(Home)	UnChecked	Count	11	31	6
		% within In which of the following counties is your business located?	29.7%	17.2%	10.3%
	Checked	Count	26	149	52
		% within In which of the following counties is your business located?	70.3%	82.8%	89.7%
Total		Count	37	180	58
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
At what locations outside	UnChecked	Count	12	94

your business do you have Internet access?(Home)		% within In which of the following counties is your business located?	25.0%	16.3%
	Checked	Count	36	481
		% within In which of the following counties is your business located?	75.0%	83.7%
Total		Count	48	575
		% within In which of the following counties is your business located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.395[a]	6	.037
Likelihood Ratio	15.629	6	.016
Linear-by-Linear Association	1.561	1	.212
N of Valid Cases	575		

a. 2 cells (14.3%) have expected count less than 5. The minimum expected count is 2.62.

Significantly smaller percentages of business respondents in Plumas and Tehama County reported having Internet access at their homes than did respondents in the other five northeast counties.

At what locations outside your business do you have Internet access?(Library) * In which of the following counties is your business located?

Crosstab

			In which of the following counties is your business located?		
			Butte	Lassen	Modoc
At what locations outside your business do you have Internet access?(Library)	UnChecked	Count	213	19	12
		% within In which of the following counties is your business located?	98.2%	100.0%	75.0%
	Checked	Count	4	0	4
		% within In which of the following counties is your business located?	1.8%	.0%	25.0%
Total		Count	217	19	16
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?		
			Plumas	Shasta	Siskiyou
At what locations outside	UnChecked	Count	32	164	52

your business do you have Internet access?(Library)		% within In which of the following counties is your business located?	86.5%	91.1%	89.7%
	Checked	Count	5	16	6
		% within In which of the following counties is your business located?	13.5%	8.9%	10.3%
Total		Count	37	180	58
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
At what locations outside your business do you have Internet access?(Library)	UnChecked	Count	45	537
		% within In which of the following counties is your business located?	93.8%	93.4%
	Checked	Count	3	38
		% within In which of the following counties is your business located?	6.3%	6.6%
Total		Count	48	575

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
At what locations outside your business do you have Internet access?(Library)	UnChecked	Count	45	537
		% within In which of the following counties is your business located?	93.8%	93.4%
	Checked	Count	3	38
		% within In which of the following counties is your business located?	6.3%	6.6%
Total		Count	48	575
		% within In which of the following counties is your business located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.793[a]	6	.001
Likelihood Ratio	23.721	6	.001

Linear-by-Linear Association	8.671	1	.003
N of Valid Cases	575		

a. 5 cells (35.7%) have expected count less than 5. The minimum expected count is 1.06.

Larger percentages of business respondents in Modoc, Plumas, and Siskiyou County report accessing the Internet at a library than did respondents in the other four northeast counties.

Which of the following groups best represents your race or ethnicity?(American Indian/Alaska Native) * In which of the following counties is your business located?

Crosstab

			In which of the following counties is your business located?		
			Butte	Lassen	Modoc
Which of the following groups best represents your race or ethnicity?(American Indian/Alaska Native)	UnChecked	Count	287	30	17
		% within In which of the following counties is your business located?	97.6%	100.0%	85.0%
	Checked	Count	7	0	3
		% within In which of the following counties is your business located?	2.4%	.0%	15.0%
Total		Count	294	30	20
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?		
			Plumas	Shasta	Siskiyou
Which of the following	UnChecked	Count	47	245	86

groups best represents your race or ethnicity?(American Indian/Alaska Native)		% within In which of the following counties is your business located?	100.0%	98.4%	97.7%
	Checked	Count	0	4	2
		% within In which of the following counties is your business located?	.0%	1.6%	2.3%
Total		Count	47	249	88
		% within In which of the following counties is your business located?	100.0%	100.0%	100.0%

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
Which of the following groups best represents your race or ethnicity?(American Indian/Alaska Native)	UnChecked	Count	72	784
		% within In which of the following counties is your business located?	100.0%	98.0%
	Checked	Count	0	16
		% within In which of the following counties is your business located?	.0%	2.0%
Total		Count	72	800

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
Which of the following groups best represents your race or ethnicity?(American Indian/Alaska Native)	UnChecked	Count	72	784
		% within In which of the following counties is your business located?	100.0%	98.0%
	Checked	Count	0	16
		% within In which of the following counties is your business located?	.0%	2.0%
Total		Count	72	800
		% within In which of the following counties is your business located?	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.734[a]	6	.002
Likelihood Ratio	13.719	6	.033
Linear-by-Linear Association	1.197	1	.274
N of Valid Cases	800		

Crosstab

			In which of the following counties is your business located?	
			Tehama	Total
Which of the following groups best represents your race or ethnicity?(American Indian/Alaska Native)	UnChecked	Count	72	784
		% within In which of the following counties is your business located?	100.0%	98.0%
	Checked	Count	0	16
		% within In which of the following counties is your business located?	.0%	2.0%
Total		Count	72	800

a. 6 cells (42.9%) have expected count less than 5. The minimum expected count is .40.

A significantly larger percentage of business survey respondents in Modoc County reported American Indian/Native American as their ethnicity than did respondents from the other six northeast counties.

Significantly smaller percentages of household respondents in Modoc, Plumas and Siskiyou County said they have video game systems than respondents in the other four northeast counties.

Appendix H

H: Governor's List of Recommended ARRA Applications

(document begins on following page)

GOVERNOR ARNOLD SCHWARZENEGGER

October 14, 2009

Mr. Larry Strickling
Administrator
National Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Ave., N.W.
Washington, DC 20230

Dear Mr. Strickling,

More than 12 percent of Californians are unemployed, while many others are underemployed and finding it necessary to supplement their current incomes. Now more than ever, a fast, reliable Internet connection is essential across the state, as jobs are often posted, filled and performed online. It is clear that the expansion of broadband infrastructure across California could be a key to our economic recovery.

A recent study by the Public Policy Institute of California showed that even among those who could have access to broadband in California, some minorities and those with limited English cannot afford the service or have not recognized the potential. California has an opportunity to improve the lives of our urban and rural, low-income residents through increased broadband availability and affordability. Telecommunications providers in our state have done well in wiring urban areas, but need assistance to expand broadband to the unserved areas of California.

While it is vital to spurring economic development and creating jobs, adding broadband availability beyond the urban cores is also an extremely expensive proposition. This is one area where American Recovery and Reinvestment Act (ARRA) funding can have a direct and profound impact. Broadband providers, nonprofit organizations, community organizations, municipalities and county governments have all joined together to develop ARRA projects and programs that will address needs in unserved and underserved areas.

We recognized several years ago that increased broadband availability was to be key to California's economic future. In 2006, I formed a Broadband Taskforce to bring together business leaders, academics, engineers and public policy experts to develop goals and action plans for broadband expansion. My Broadband Task Force has prepared the attached information – outlines of California's broadband goals, the steps we took to determine them and the best tools to identify the served and unserved areas of the state – and I can confidently support the enclosed projects as consistent with our goals for broadband expansion and education.

STATE CAPITOL • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841

These are the projects – and the ARRA investments – that will best allow us to meet our broadband goals, bring jobs to the vast unserved areas of our state and improve the quality of life for all Californians.

Sincerely,

Arnold Schwarzenegger

/la

Attachment

California Broadband ARRA Project Recommendations

October 14, 2009

Attachments

1. Appendix 1- Allocation of Grant Funds to California
2. Appendix 2- California Recommended Applications
    - Appendix 2a- Infrastructure
    - Appendix 2b- Sustainable Broadband Adoption
    - Appendix 2c- Public Computer Centers
3. Appendix 3- Multistate Applications Headquartered in California
4. Appendix 4- California Broadband Taskforce Goals and Priorities
5. Appendix 5- Identification of Unserved and Underserved Areas

Appendix 1- Allocation of Grant Funds to California

California is pleased to recommend a list of outstanding projects in each category (Infrastructure, Sustainable Broadband Adoption and Public Computer Centers) that are critical in driving forward California's economic growth and prosperity. These projects fill in the unserved and underserved areas of the state's broadband infrastructure. They provide broadband speeds that are far superior to the FCC definition of broadband and which are necessary for today's Internet user. They continue our ongoing work on nation-leading projects such as telehealth networks, digital literacy programs, and public computer centers focused on underserved populations shown to be slow broadband adopters by our state specific surveys. They bring needed public computer centers and broadband adoption programs to rural and remote areas of California, including tribal lands; urban disadvantaged; and people with disabilities. In short, these recommended projects can begin immediately. They will best allow California to achieve our ambitious but achievable broadband goals and objectives established in 2006.

The recommended applications are presented in alphabetical order in Appendix 2. We arrived at this recommended list after the applications were thoroughly reviewed by a team of telecommunications professionals and broadband experts. Many previously served on the California Broadband Task Force.

California prioritized review of applications for projects principally in California. We did not provide feedback on the multistate applications although there may be several worthy projects in that category, because it was difficult for us to assess the State specific impact of those projects. However, of the multistate applications, the list in Appendix 3 consists of companies that appear to be headquartered or have offices in California. Grants to those companies will have beneficial impacts on our State.

While those projects listed in Appendix 2 represent those most clearly aligned to our broadband goals, silence on an application should not be construed in any adverse manner as to that application.

We hope that NTIA will utilize this information in its deliberations in making its final awards.

If you have questions about California's broadband priorities, please contact Teri Takai, State Chief Information Officer at (916) 319-9223 or teri.takai@cio.ca.gov, Joe Camicia, Chief of Staff to CIO, (916) 549-7299 or joe.camicia@cio.ca.gov, or Rachelle Chong, Commissioner, CPUC, at (415) 703-3700 or crc@cpuc.ca.gov

Appendix 2- California Recommended Applications

2a. Infrastructure

(In Alphabetical Order)

Applicant	Project Title
Audeamus	Westside Broadband Project for Rural Central California-San Joaquin, Tranquility, and West Fresno
Broadband Associates International	NorCal Broadband Access Consortium - California Northeastern Middle Mile Span
Broadband Associates International	Highway 299 Middle Mile Fiber Optic Project
Broadband Associates International	Highway 299 Last Mile Broadband Project
California Broadband Cooperative, Inc	Digital 395 Middle Mile Project
California Valley Broadband, LLC	CVB Project 1
City of Grover Beach	Grover Beach Municipal Network
City of Shafter	Shafter Broadband Network
Clear Network Communications, Inc.	Sierra Internet Enhancement for Rural Regional Area
ConnectTo Communications, Inc.	The El Dorado County Rural Utilities Service Broadband Infrastructure to RUS (BIP) and NTIA (BTOP)
Etheric Networks Incorporated	California Central Valley Advanced Wireless Services Backbone Ring
Fresno County Superintendent of Schools	Broadband Access Project: Connecting Rural & Underserved Central California Communities

Appendix 2- California Recommended Applications

2a. Infrastructure

Hoopa Valley Tribe	Hoopa Broadband Project
Imperial County Office of Education	BorderNet Project
IP Networks Inc.	Northern California Counties Broadband Middle Mile
Level 3 EON, LLC	Expanding broadband access across California
Nevada County Economic Resource Council	Nevada County Connected
Personal Network Computing, Inc. dba Valley Internet	NorCal Broadband Access Consortium - Valley Internet for Lake, Glenn, Colusa, Napa, Solano counties
Plumas-Sierra Telecommunications	NorCal Broadband Access Consortium - Plumas Sierra Telecommunications Lassen Project
Race Communications, Inc	Kern County - 5 Service Areas
Regents of the University of California	California Telehealth Network Expansion and Enhancement Initiative - NTIA/BTOP Infrastructure
Rural Broadband Now! LLC	AccessMendo
Siskiyou County Economic Development	Siskiyou Broadband Middle Mile
Siskiyou County Economic Development Council	Siskiyou Broadband Last Mile Project

Appendix 2- California Recommended Applications

2a. Infrastructure

SK Works, LLC.	Cuyama Rural Broadband Project
Southern California Tribal Chairmen Association	SCTCA/TDVNet-BIP
Surfnet Communications Inc.	Central Coast Wireless Broadband Project
University Corporation at Monterey Bay	Broadband Grid for California's Central Coast
WaveDivision Holdings, LLC	Colfax, CA Last Mile Project
Youth Policy Institute	Los Angeles Wireless Broadband Initiative

2b. Sustainable Broadband Adoption

(In Alphabetical Order)

Applicant	Project Title
Boat People SOS, Inc.	Neighborhood Empowerment and Support through Teamwork - Information and Training Centers
Butte-Glenn Community College District	ALLIANCE Project
California Emerging Technology Fund	CREATE - Computer Refurbishing and Employment Applications Training and Education
California Emerging Technology Fund	Broadband Awareness and Adoption
City of Santa Monica	Santa Monica City Net and City Wi-Fi
Computers for Youth Foundation, Inc.	CFY/LAUSD Family Broadband Engagement Program
Lake Tahoe Community College	Lake Tahoe Public Intranet (LTPI)
North Orange County Community College District	Narrowing the Digital Divide Through Education and Access
Oakland, City of	Get Connected Oakland
Open Neighborhoods	Open Los Angeles Community Adoption
PAXIO Inc.	EmeryConnect
Regents of the University of California	California Telehealth Network Expansion and Enhancement Initiative-NTIA/BTOP Broadband Adoption
San Diego County Office of Education	CloudConnect
Studio 4 Networks Inc	Studybeat.com Broadband Adoption Campaign

2b. Sustainable Broadband Adoption

TCU Community Partnership Inc.	Sustainable Broadband Adoption Community Connectivity
Youth Policy Institute	LA Family Technology Project

2c. Public Computer Centers

(In Alphabetical Order)

Applicant	Project Title
Berkeley, City of (Inc.)	Public Access Computer Centers
Boat People SOS, Inc.	Neighborhood Empowerment and Support through Teamwork - Community Technology Center Orange County
Califa Group	21st Century Learning Centers
California Emerging Technology Fund	Digital Literacy for All: A California Emerging Technology Fund Public Computer Centers Proposal
California State University, Fresno Foundation	Central California Computer Learning Center (CCCLC)
City of Farmersville	Farmersville Computer Center
City of Los Angeles	Los Angeles' Computer Access Network ("L.A.-CAN")
City of Rancho Cucamonga	RC Family Resource Center Community Connections Computer Center
Educating Young Minds	Access / No Excuse
Hope Through Housing Foundation	Community Learning Zones (CLZs)
Housing Authority of the County of San Bernardino	Transforming Neighborhood Network Centers for Job Creation and Broadband Access
Kings Canyon Unified School District	Central Valley Connections
Los Angeles Unified School District	LAUSD Online Parent Community Centers

Appendix 2- California Recommended Applications

2c. Public Computer Centers

Los Angeles Urban League	Los Angeles Urban League Community Technology & Media Center
Mission Economic Development Agency	Latino Microenterprise Tech Net
Siskiyou County Economic Development Council	Siskiyou Broadband Public Computer Center
TCU Community Partnership Inc.	Energy and Technologies, Resource and Training Center (ETRTC)
Youth Policy Institute	YPI Public Computer Centers

Appendix 3 - Multistate Applications Headquartered in California

Grants of These Applications Will Benefit California

Acorn Technologies
America 2.0 Inc.
Common Sense Media
Cricket Communications Inc.
CWLab International Ltd.
Ikanos Communications, Ltd.
Logiclink, Inc.
Mission Economic Development Agency
National Medical Wireless Broadband Alliance, LLC
Operation HOPE, Inc.
Peer Plus One Communications, Inc.
Rural Communities United
Satellite Broadband ARRA Application LLC
Schatnet Internet LLC
Social Communications Company
Tactus Technology
Webpass Inc.
Wi2Wi, Inc.
WiViu Technology Inc.
Wi-Zee, LLC
ZeroDivide

Appendix 4 - California Broadband Task Force- Goals and Priorities

As background, on November 28, 2006, Governor Arnold Schwarzenegger signed Executive Order S-23-06 (web link: http://gov.ca.gov/index.php?/executive-order/4585/) to commission a California Broadband Task Force (Task Force) "to remove barriers to broadband access, identify opportunities for increased broadband adoption, and enable the creation and deployment of new advanced communication technologies."

The Task Force produced its final report on December 15, 2007 (web link: http://www.calink.ca.gov/taskforcereport/). The Task Force adopted three broadband goals:

- California must ensure ubiquitous and affordable broadband infrastructure, made available through a variety of technologies to all Californians.
- California must drive the creation and use of applications that produce the greatest economic, educational, and social benefits for California's economy and communities.
- California must construct next-generation broadband infrastructure, positioning California as the global economic leader in a knowledge-based economy.

Through analysis of the Task Force's broadband mapping project and independent research, the Task Force determined:

- 1.4 million mostly rural Californians lack broadband access at any speed.
- Barely more than half of Californians have adopted broadband at home.
- Only half of Californians have access to broadband at speeds greater than 10 megabits per second (Mbps) (including both upstream and downstream speeds).
- Broadband infrastructure is deployed unevenly throughout the state, from state-of–the-art to nonexistent.

Thus, the Task Force recommended seven key actions to help our state achieve fast, reliable, and affordable broadband service:

1. Build out high speed broadband infrastructure to all Californians
Advancing new incentives for deployment and improving existing programs will create a world-class broadband infrastructure in California.

2. Develop model permitting standards and encourage collaboration among providers
Developing a public-private partnership between local governments and broadband providers to endorse permitting standards will improve the speed with which broadband is deployed.

3. Increase the use and adoption of broadband and computer technology
Expanding the opportunities for Californians to access, use, and learn broadband, at home and in the community will provide the foundation for a digitally literate society that is able to fully benefit from broadband technology.

Appendix 4 - California Broadband Task Force- Goals and Priorities

4. Engage and reward broadband innovation and research
Promoting innovative uses of broadband technology and encouraging wider e-government use will result in quality-of-life improvements, while increasing demand for a robust broadband infrastructure.

5. Create a statewide e-health network
Implementing a sustainable statewide e-health network will improve quality of care across the state and simultaneously increase demand for broadband services.

6. Leverage educational opportunities to increase broadband use
Ensuring high-capacity broadband connections coupled with a robust technology support system, relevant curriculum, literacy standards, and off-campus educational partnerships will provide California's students with the skills they need to compete in a 21st century economy.

7. Continue state-level and statewide leadership
Continuing the California Broadband Initiative and supporting the creation of Community Broadband Leadership Councils will strengthen the statewide leadership necessary to drive broadband access and adoption across California.

Appendix 5- Identification of Unserved and Underserved Areas

As to the identification of unserved and underserved areas within California's borders, please refer to California's updated broadband maps (as of August 10, 2009) which can be found at the following weblink:

http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/Broadband+Availability+Maps.htm

In 2006-2007, the Task Force undertook a broadband mapping exercise at the street address level that is described in the Task Force Report. California requested voluntary information from our broadband providers and mapped the information to produce the broadband availability maps, which include broadband speed information. You will see the original maps (wireline and wireless) as appendices to the Task Force Report. Since that time, the California Public Utilities Commission (CPUC) has updated the Task Force broadband maps with recent information from our state video franchise holders who offer broadband, and as to grants of the CPUC's California Advanced Service Fund program (a state funded broadband grant program; see web link http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/announcingcasf.htm for more information).

When assessing a broadband infrastructure application, NTIA will be assisted by referencing the California broadband maps when making its determination of whether the area is unserved, underserved or served. To the best of California's knowledge, the updated broadband maps kept by the CPUC are the most current and accurate available.