



North State Connectivity: Regional Framework

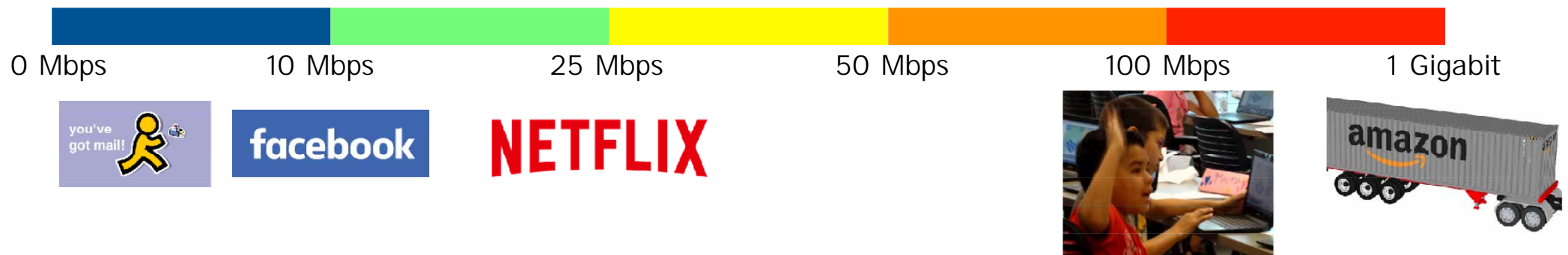
2 October 2019



Steve Blum
President



Broadband speed standards

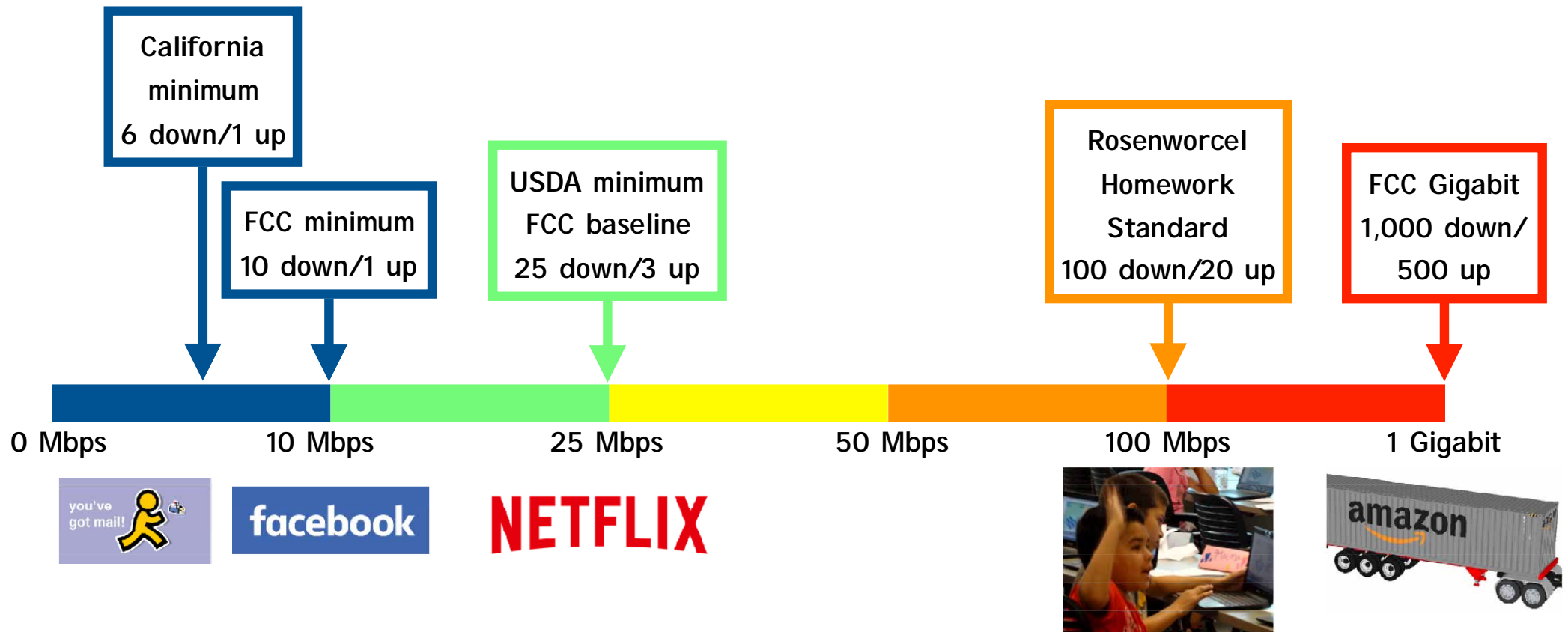


facebook


















NETFLIX



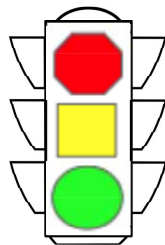
Broadband speed standards



Broadband speed standards

	6 down/ 1 up CA legislature min	25 down/ 3 up FCC/USDA baseline	100 down/20up FCC "above baseline"	250 down/20 up CA avg max	1000 down/ 500 up FCC "Gigabit"
MBEP consumer					
MBEP business					
MBEP combined					
North county					
South county					
Monterey					
San Benito					
Santa Cruz					

**Rural and urban minimum
needs the same**



- Consumers comfortable with 100/20, can get by with 25/3.
- Businesses need better, but can get by with 100/20

Minimum speed: 100 Mbps down/20 Mbps up

100 Mbps broadband results in 0.2% to 0.3% lower unemployment, with biggest impact in rural communities – University of Tennessee/ Oklahoma State University study

Regional
Standard
100 down/20 up



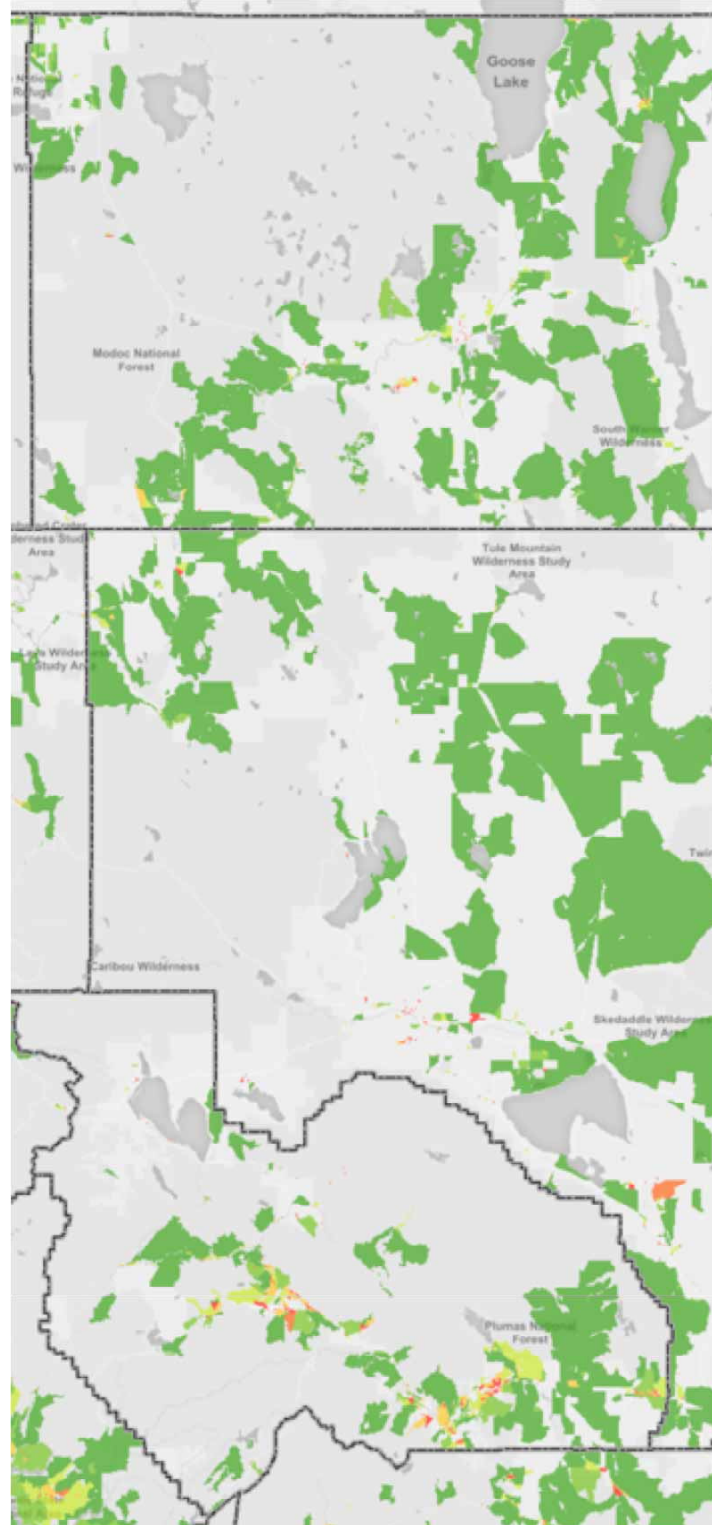
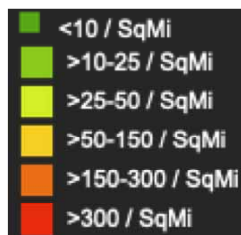
Minimum speed: 100 Mbps down/20 Mbps up

Broadband Gap heat map

Census
blocks
without:

California
minimum
6 down/1 up

by population

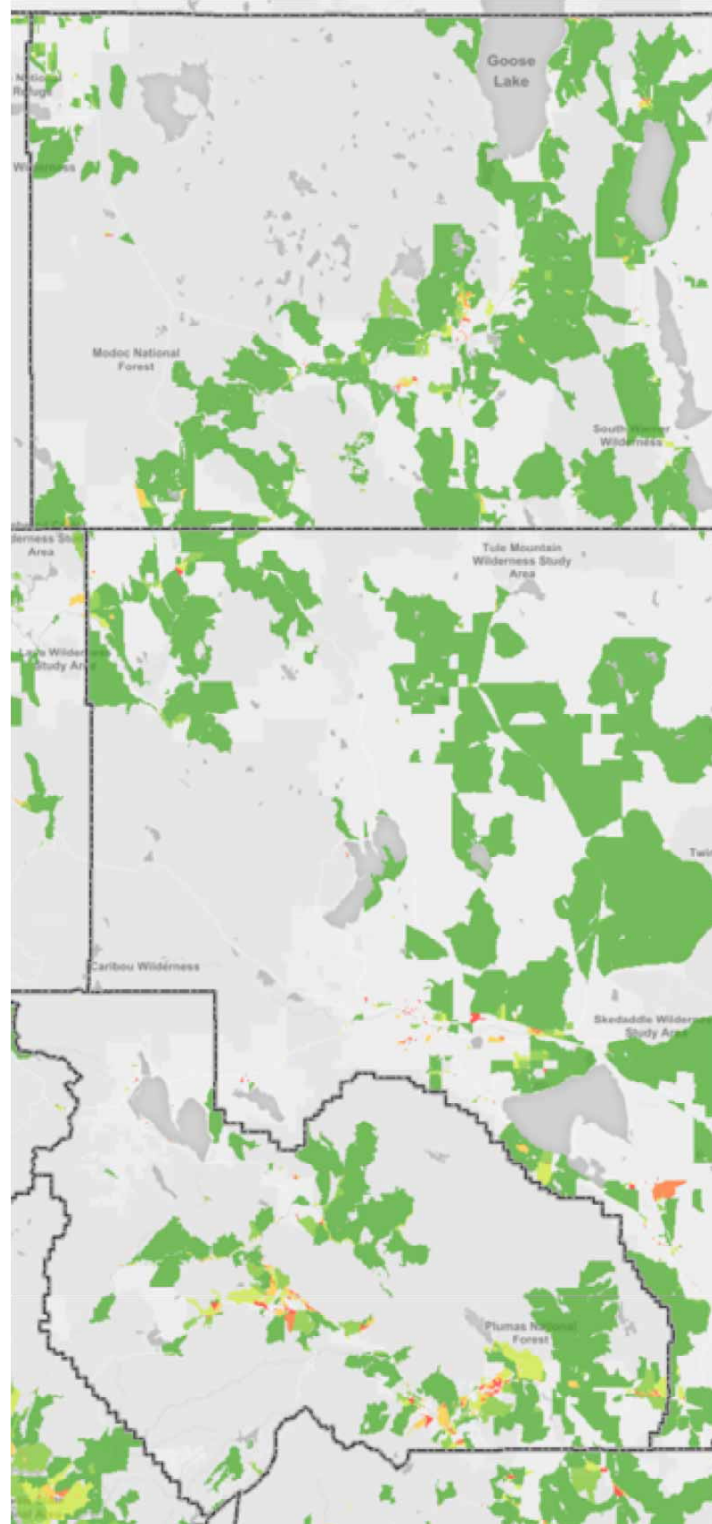
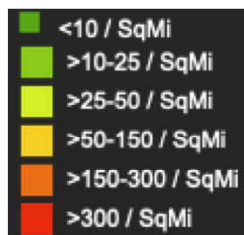


Broadband Gap heat map

Census
blocks
without:

FCC minimum
10 down/1 up

by population

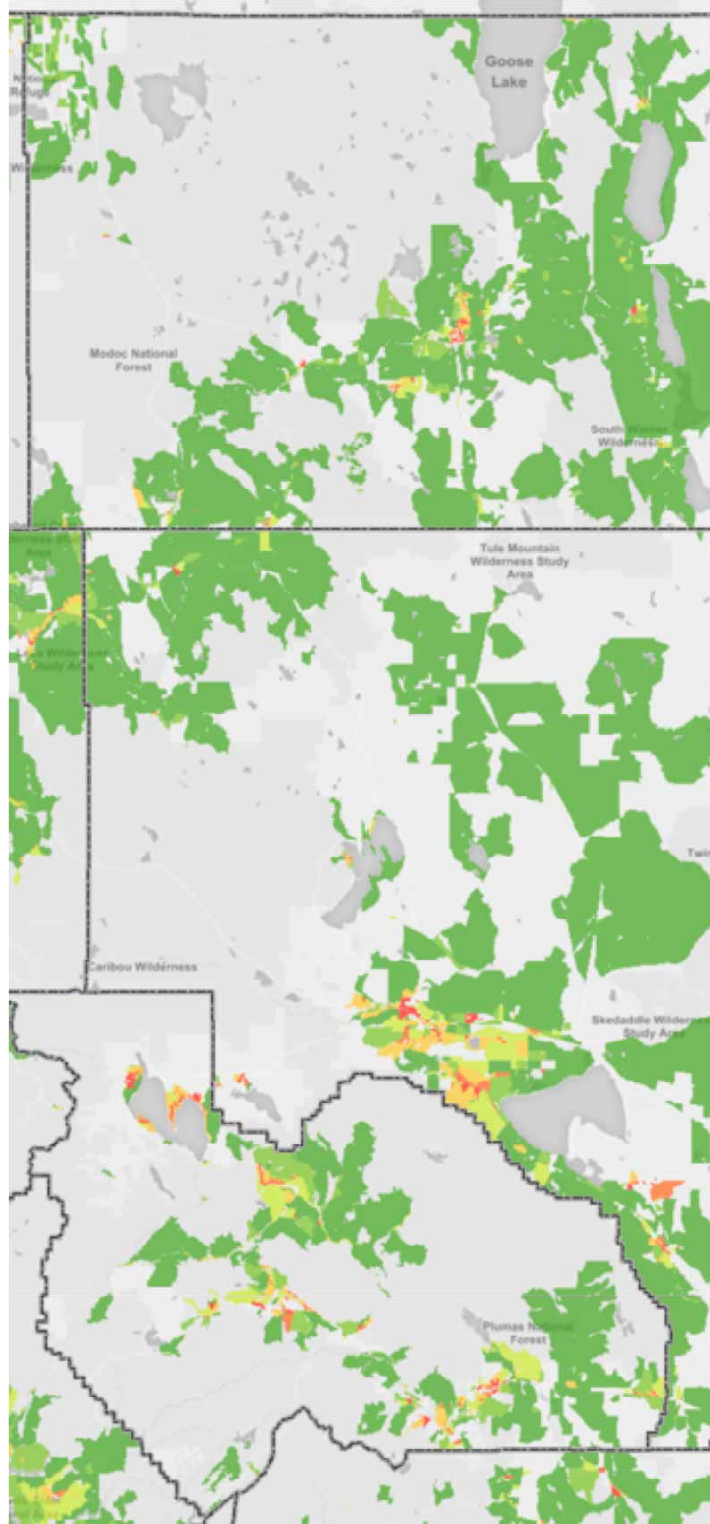
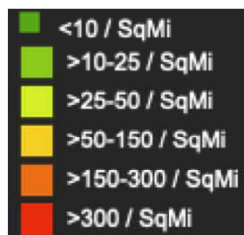


Broadband Gap heat map

Census
blocks
without:

USDA minimum
FCC baseline
25 down/3 up

by population

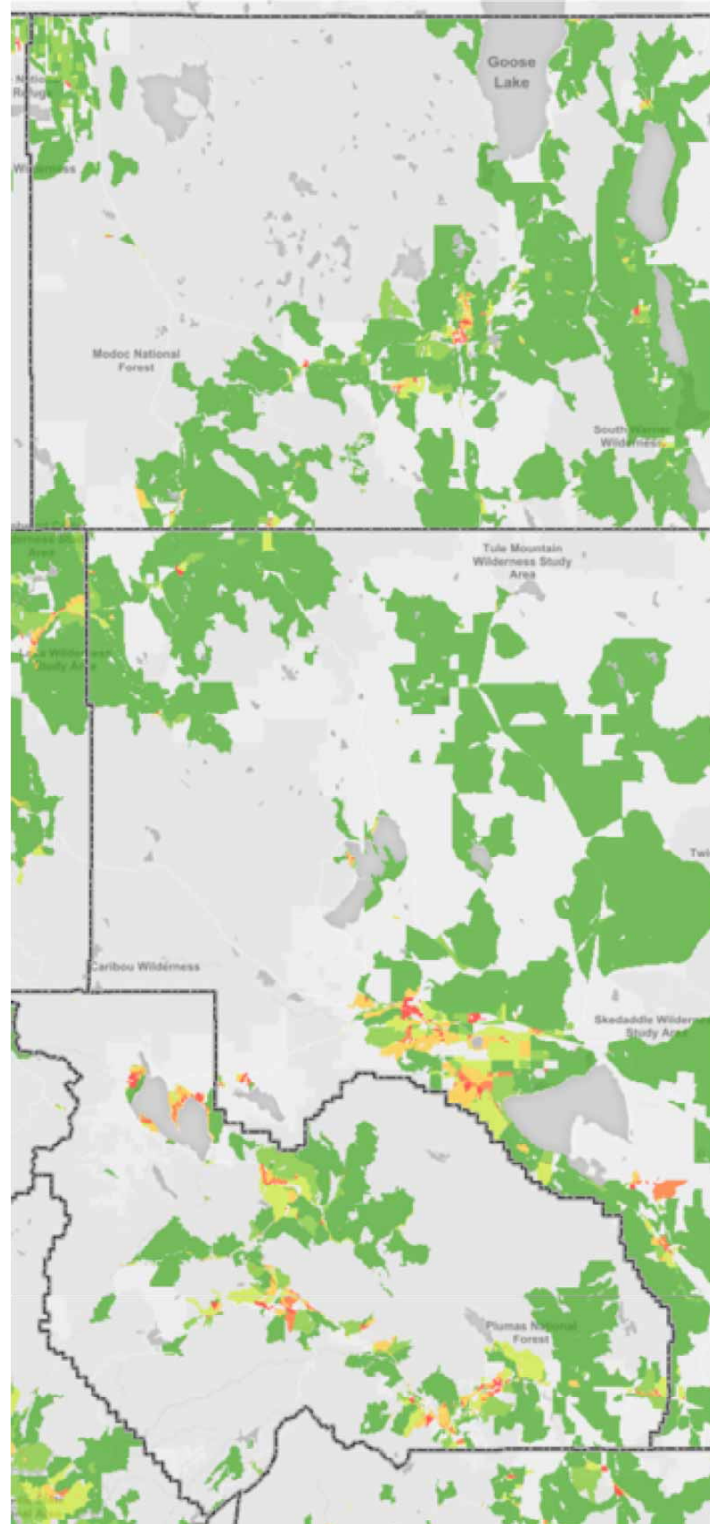
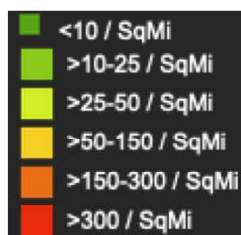


Broadband Gap heat map

Census
blocks
without:

Regional
Standard
100 down/
20 up

by population

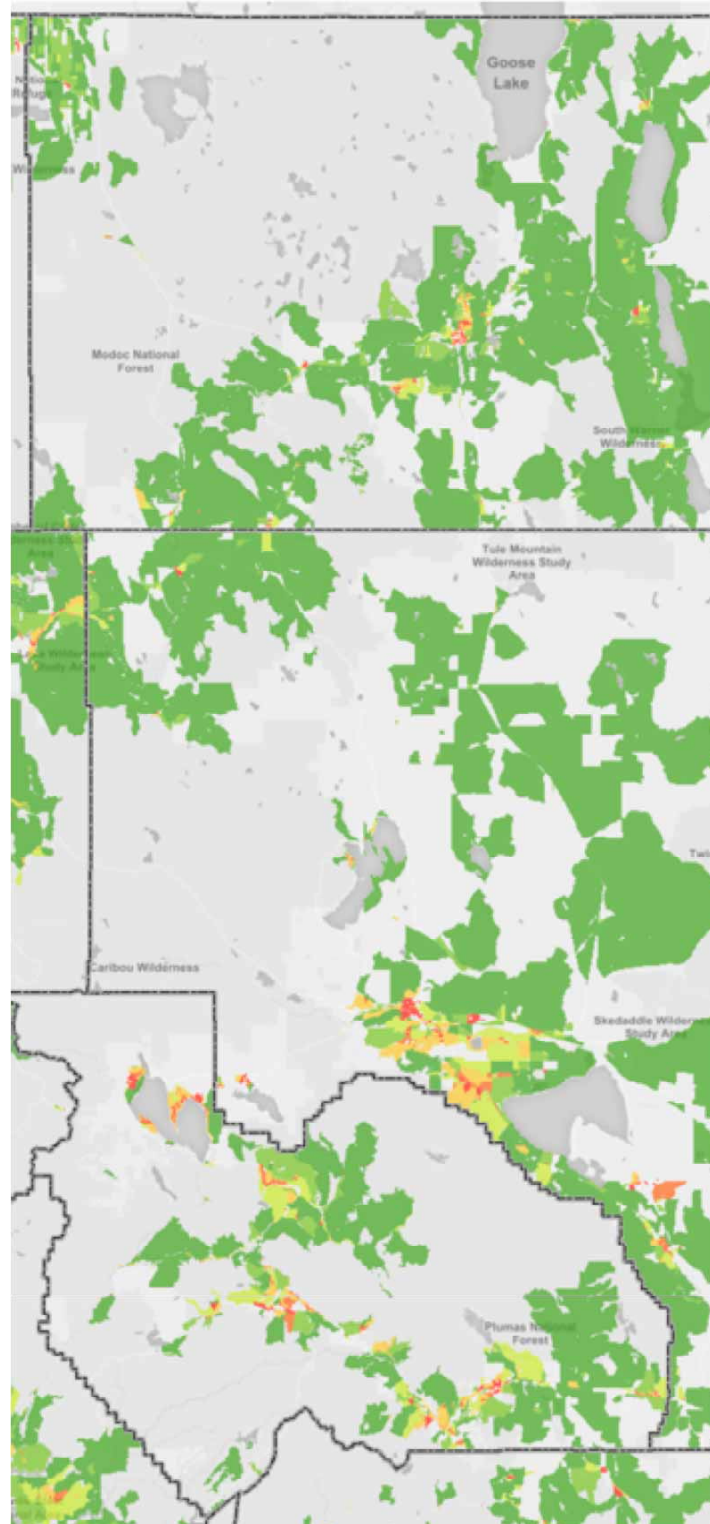
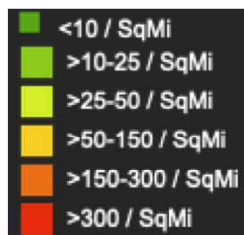


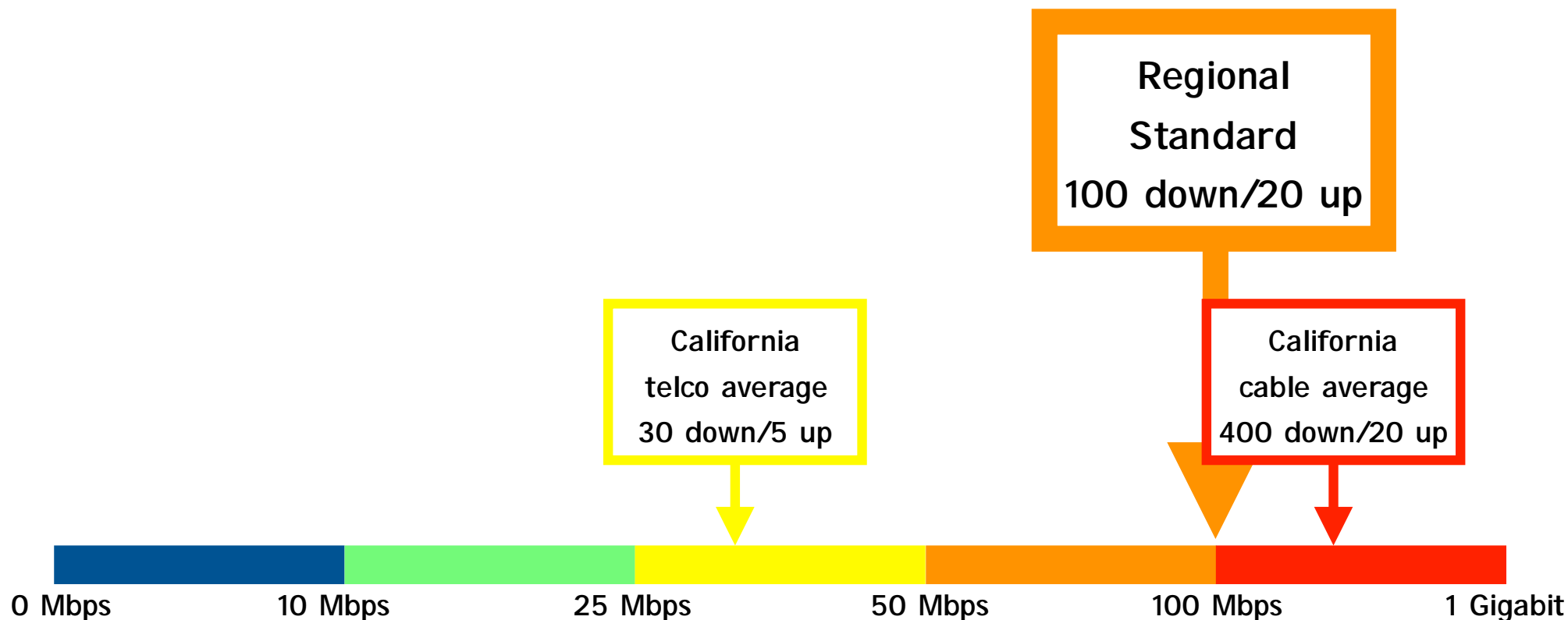
Broadband Gap heat map

Census
blocks
without:

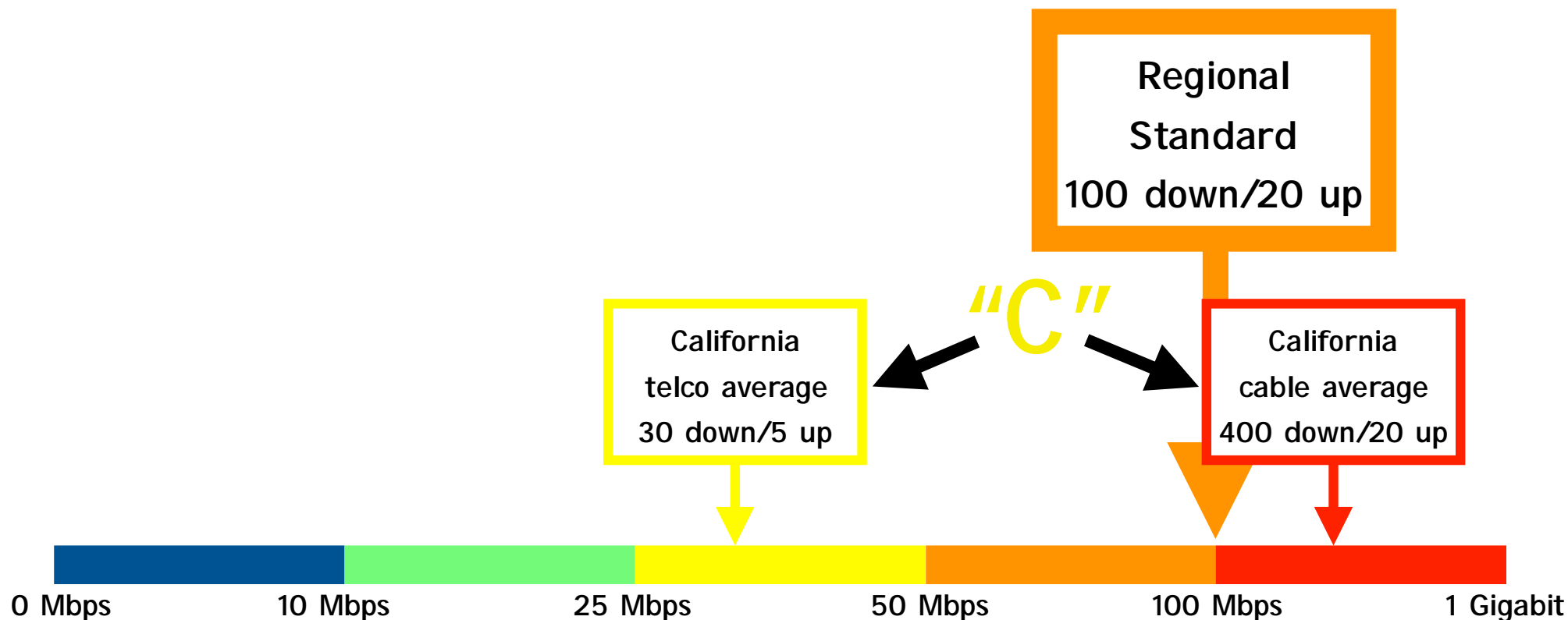
FCC Gigabit
1,000 down/
500 up

by population

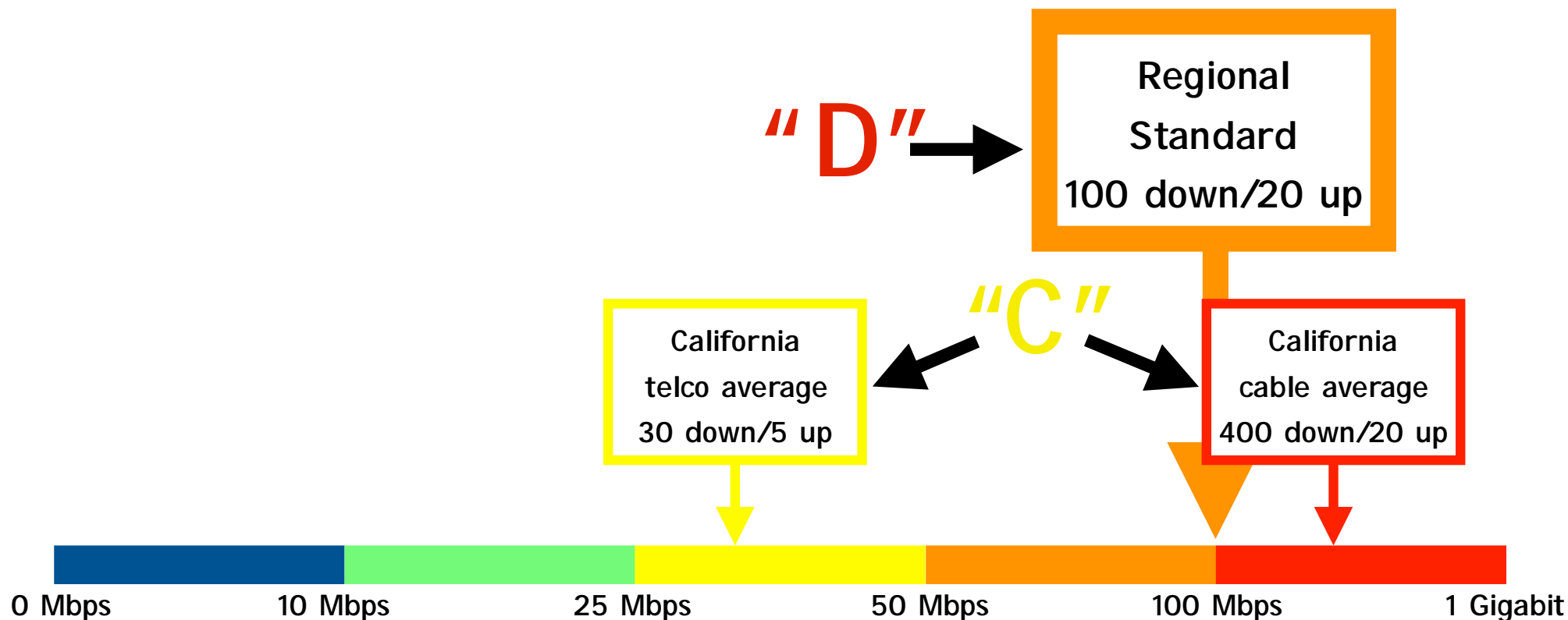




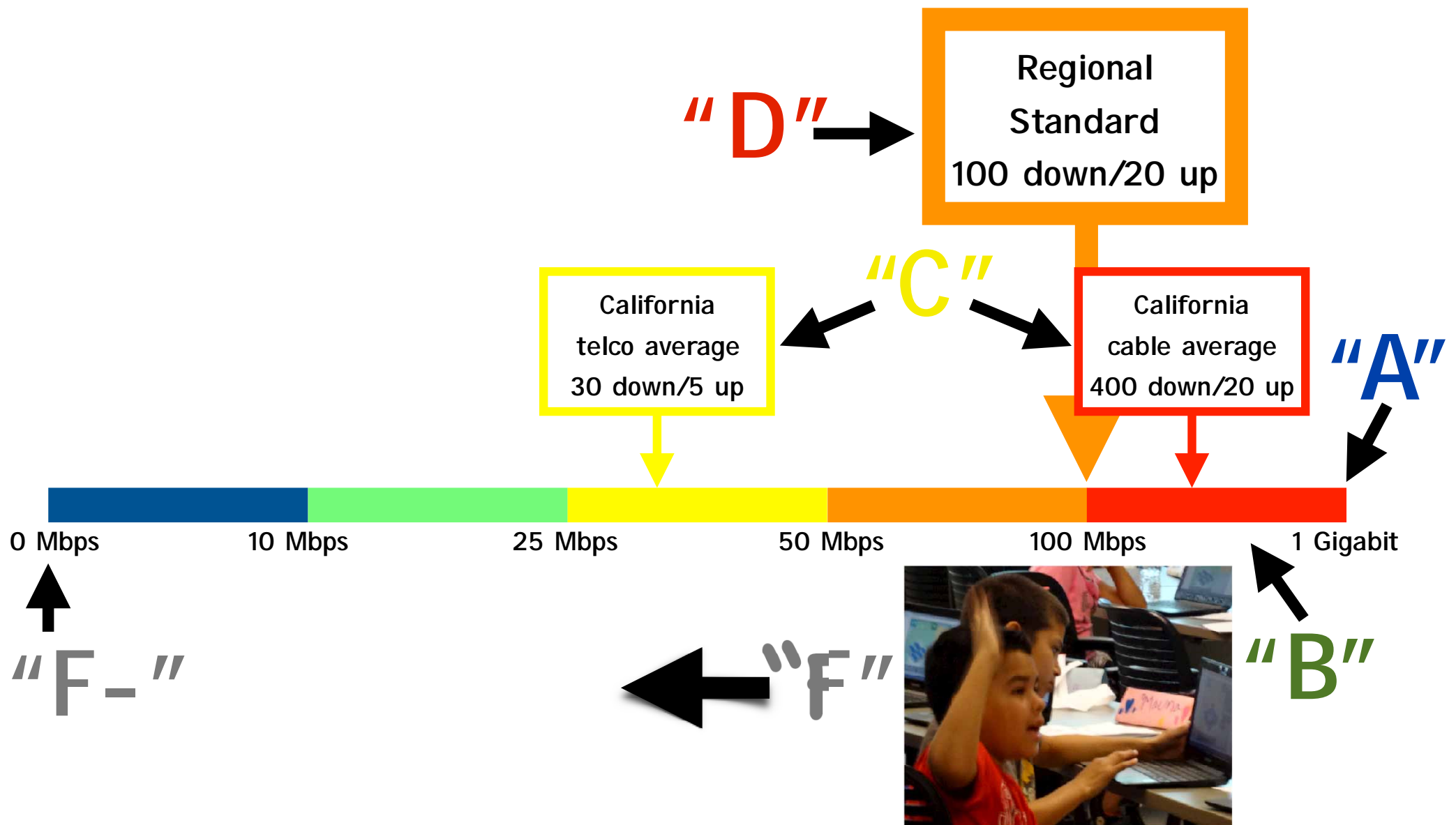
Average Californian has access to 2 providers



Average infrastructure = average grade = "C"



Infrastructure at minimum = barely passing = "D"



No infrastructure at regional standard = "F"

Wireline Infrastructure Report Card

A

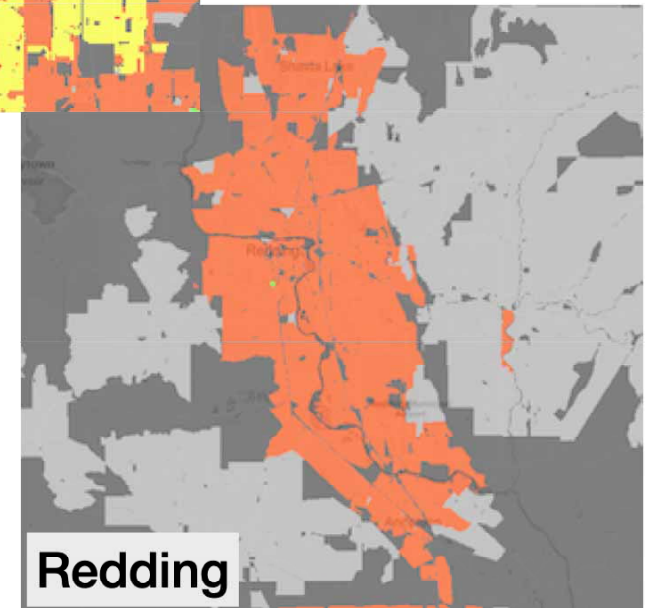
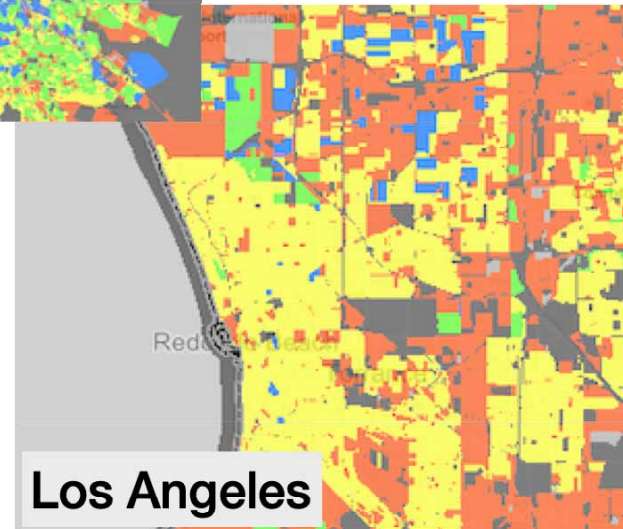
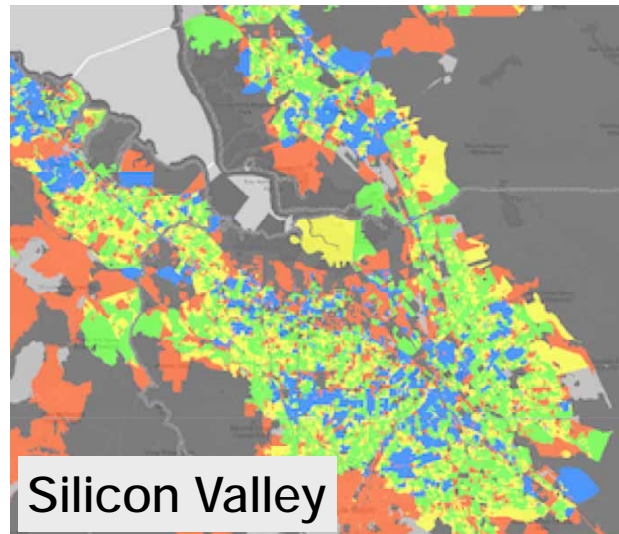
B

C

D

F

Wireline Service Grades	
<i>(Updated: 6/5/19)</i>	
■	A - At least two Primary ISP's, one Tech 50 at minimum of 1000/500 and one (any Tech) at minimum 400/20.
■	B - At least two Primary ISP's, one at minimum of 900/35 and on at minimum of 100/20.
■	C - At least two Primary ISP's, one at minimum of 400/20 and on at minimum of 30/5.
■	D - At least one Primary ISP's at minimum of 100/20.
■	F - At least one Primary ISP's at speeds below 100/20.
■	F- - NO Primary Provider



Wireline Infrastructure Report Card

A

B

C

D

F

Wireline Service Grades	
(Updated: 6/5/19)	
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■	F- - NO Primary Provider



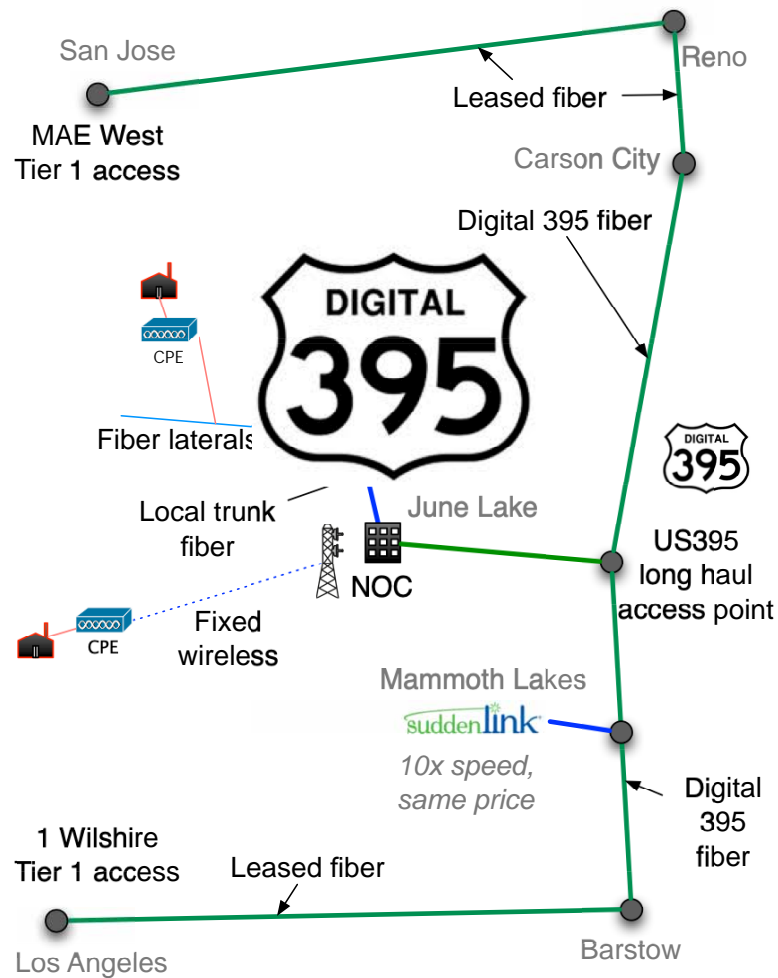
**Northeast California Counties
Primary Wireline Broadband Infrastructure Grades**

	Grade	GPA
Lassen County	F	0.0
Modoc County	F	0.0
Plumas County	F	0.0
City of Alturas	F	0.0
City of Portola	F	0.0
City of Susanville	F	0.0
Blairsden CDP	F +	0.3
California Pines CDP	F	0.1
Plumas Eureka CDP	F	0.1
Quincy CDP	F	0.1



*What can you do
about it?*

Fiber is the foundation of fast, reliable, affordable broadband



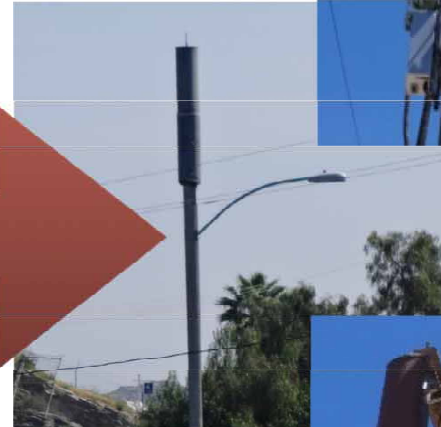
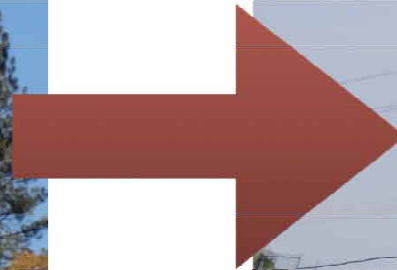
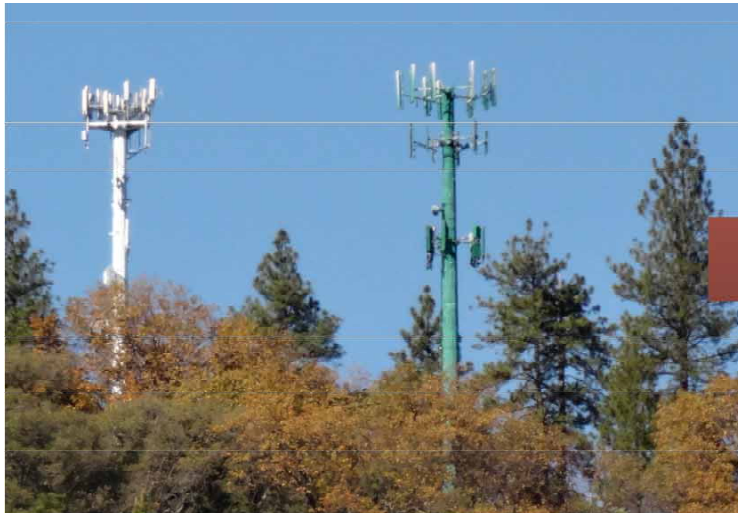
Mammoth Lakes

suddenlink

10x speed,
same price

Fiber boosts copper, wireless too

5G is “infill” technology in rural areas, per AT&T

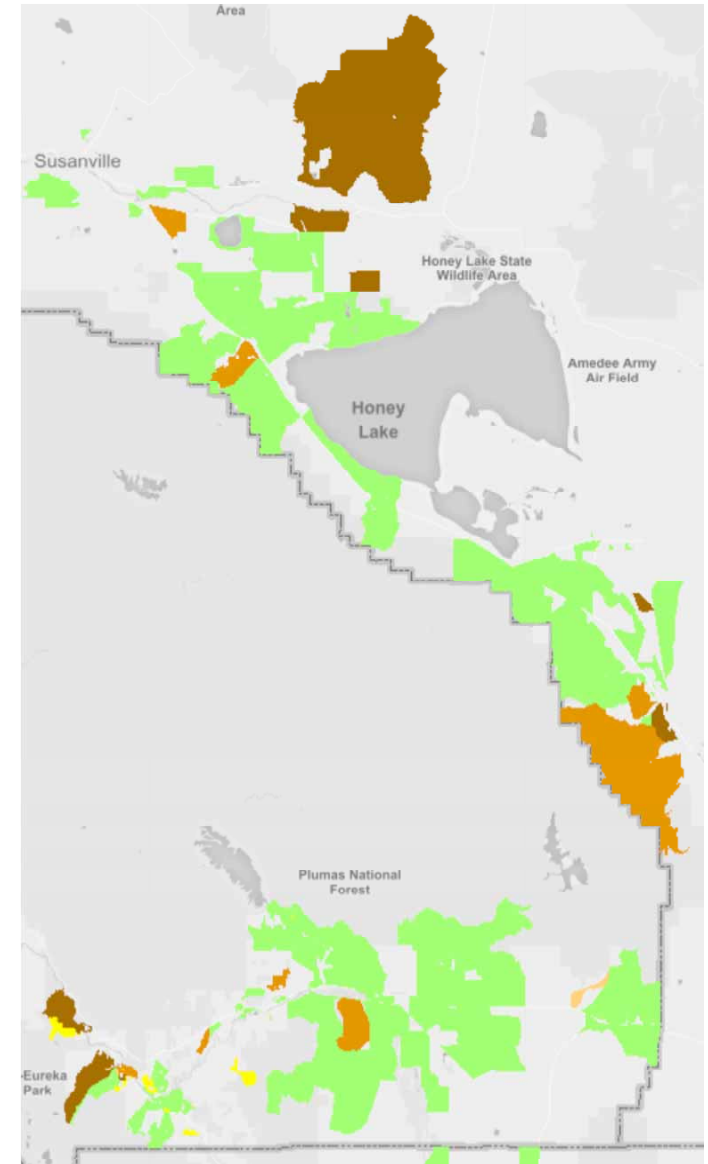


- Mobile data use growing from 7 GB to 48 GB per month by 2023.
- 5G will serve dense urban markets & corridors first.
- 5G is about two things: technology and densification.

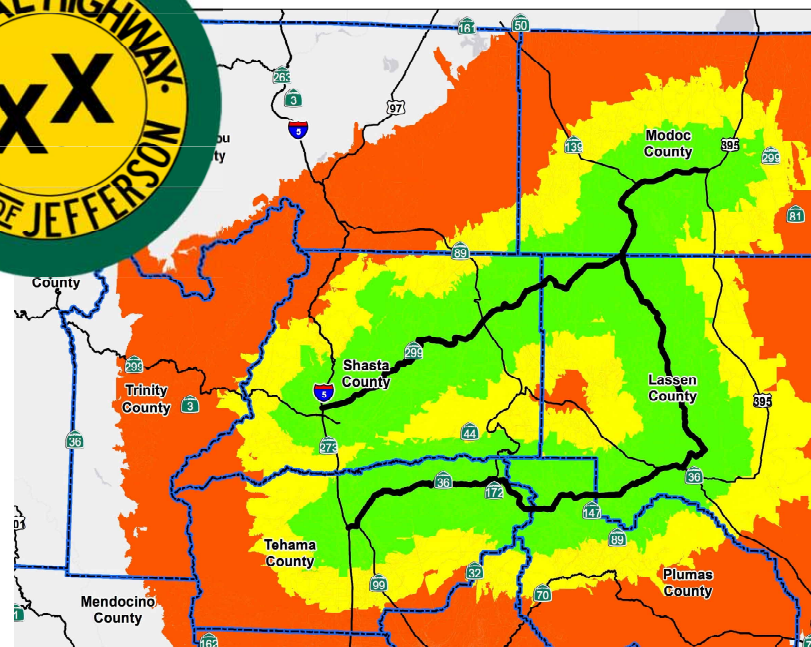
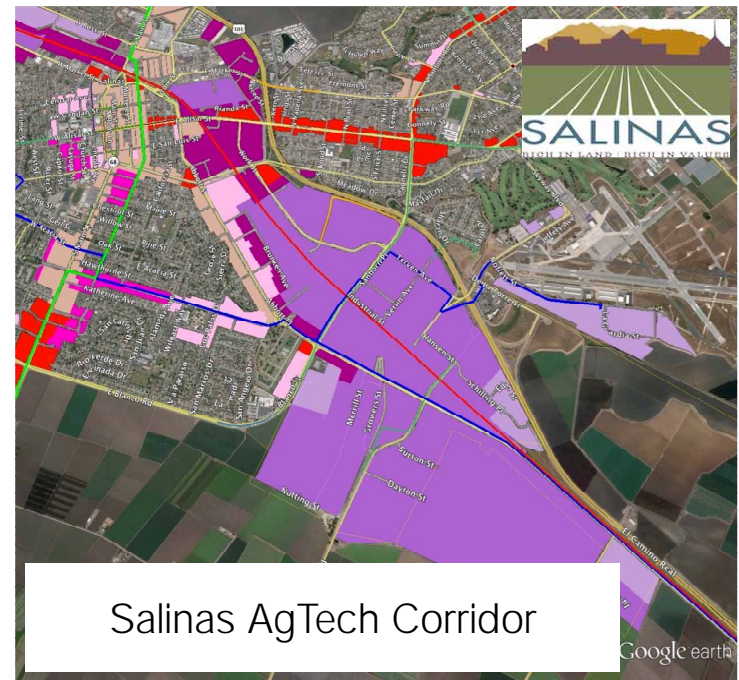
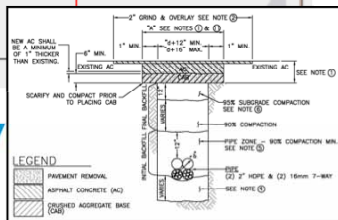
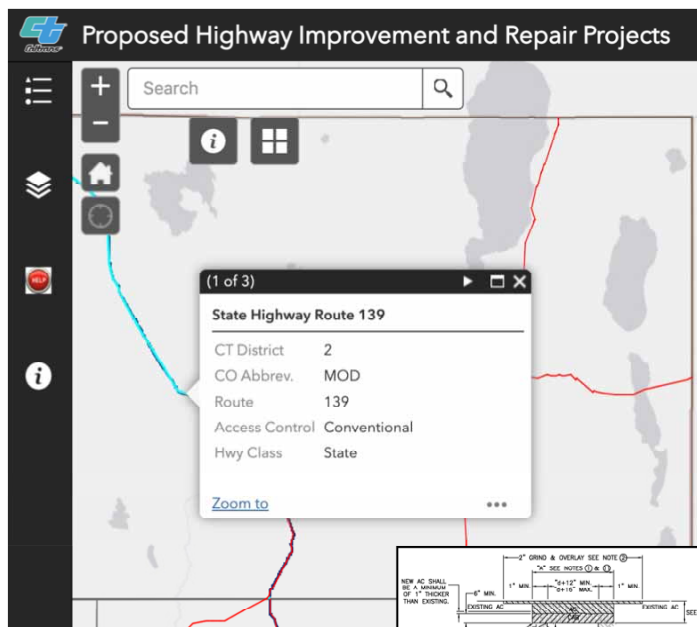
Fixed wireless is expensive, slow, unreliable compared to wireline infrastructure

CPUC order, 31 May 2016:

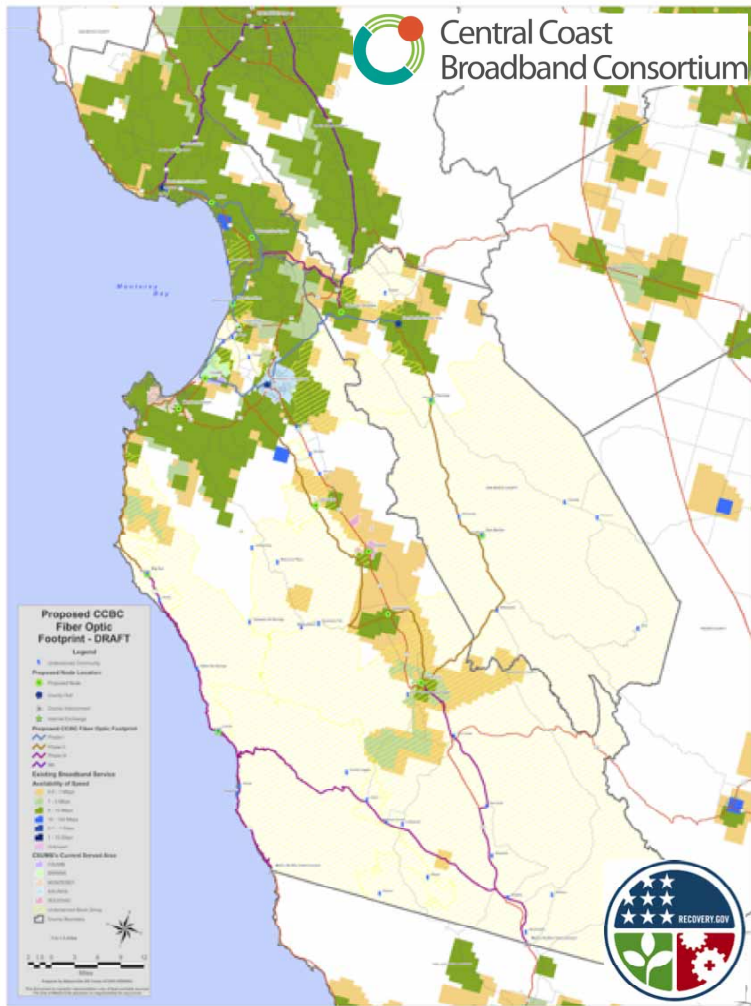
- Fiber-to-the-premises network...is not subject to terrain variability, and [can] serve every household in the project area.
- Fiber-to-the-premise systems have significant speed advantages over fixed wireless systems.
- A fiber network has a significant advantage in terms of capacity over fixed wireless in any given area. Fixed wireless may be able to burst high speeds to a customer, but the more other customers are being served by the same antenna at the same time, the more wireless spectrum is required, and spectrum is in limited supply.
- [FTTP] network offers a better value over the fixed wireless offerings in the project area in terms of price per megabit (Mb), especially for low-income customers.



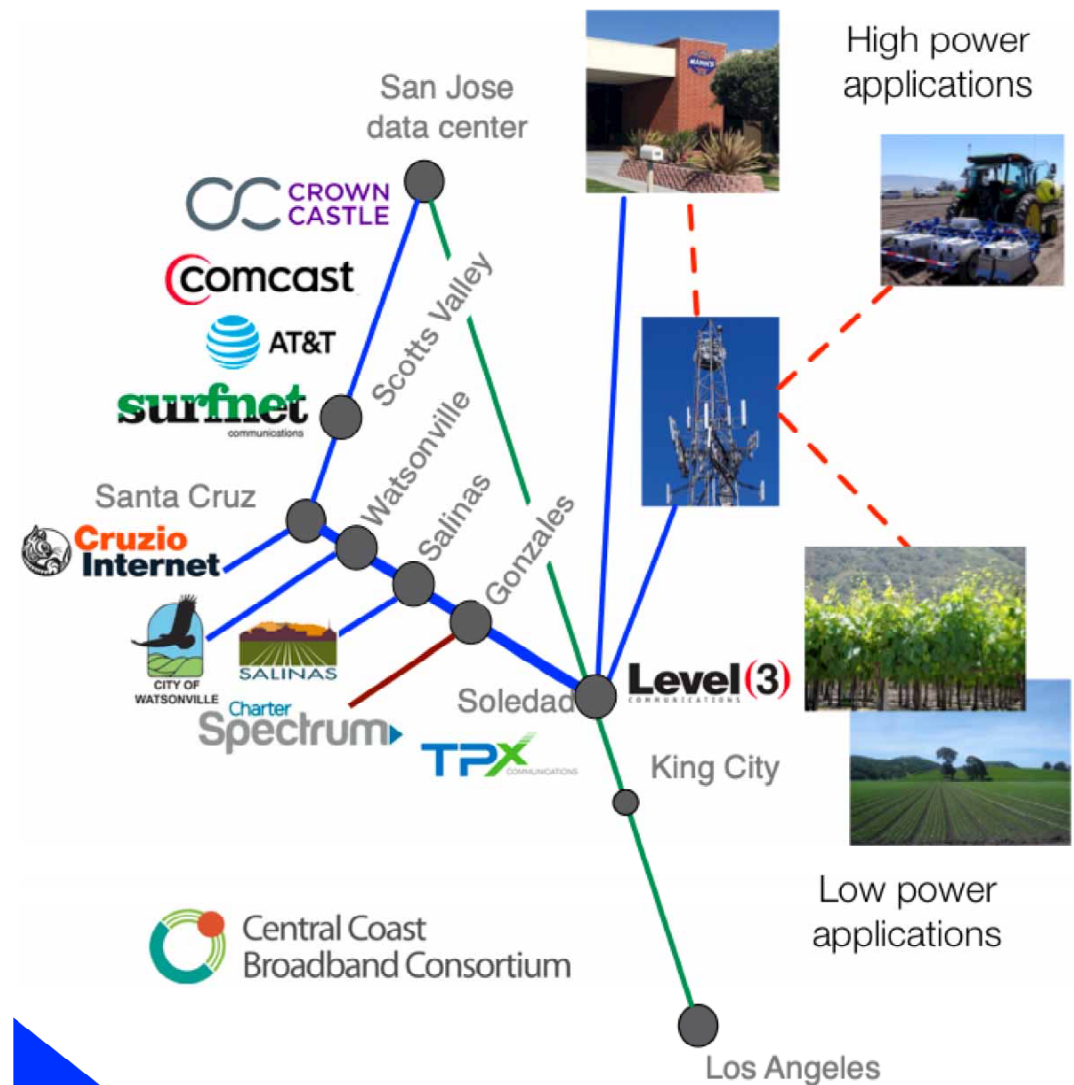
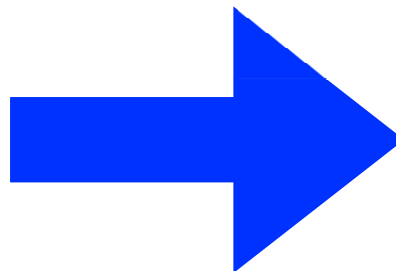
Plan for broadband



Build a base of plans, funding, partners

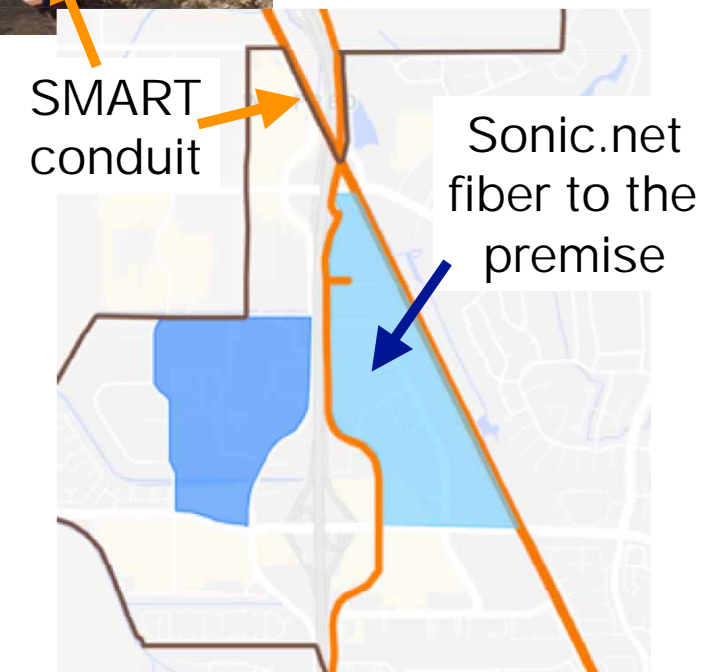
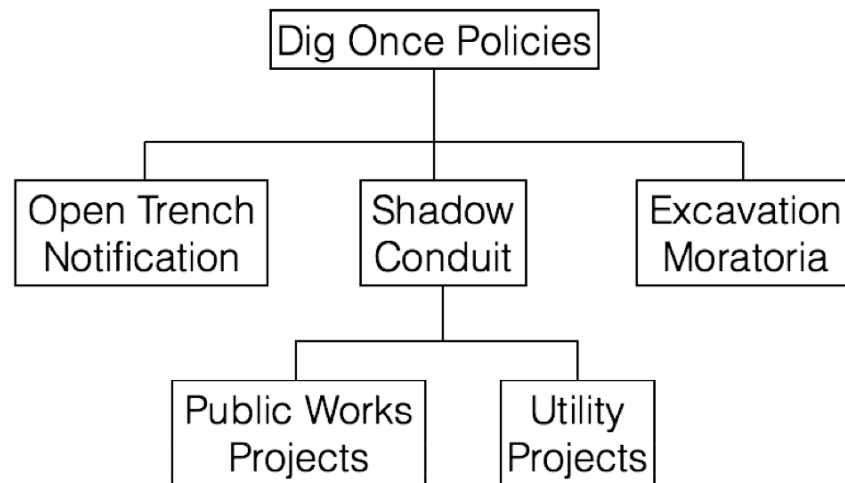


2009



2019

Top level policies for wireline & wireless



Dig Once

- Watsonville, SMART

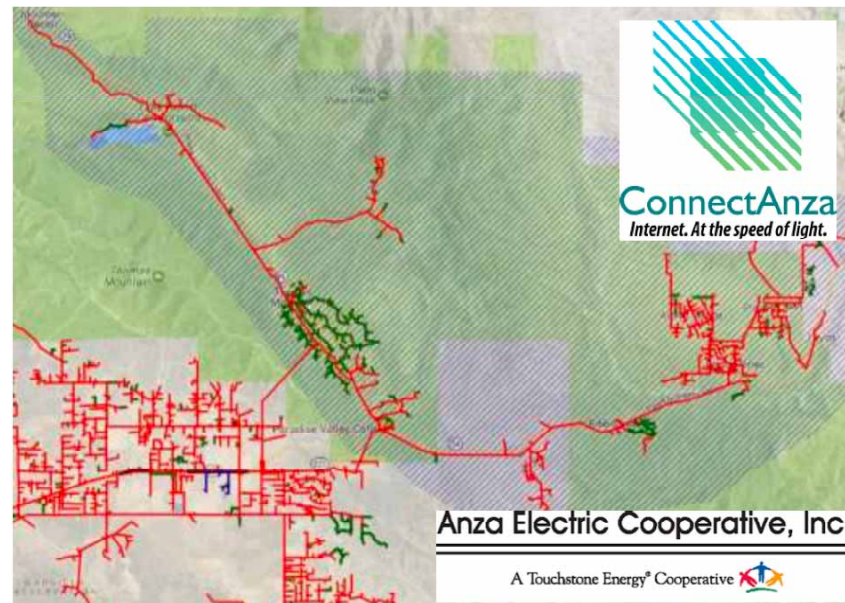
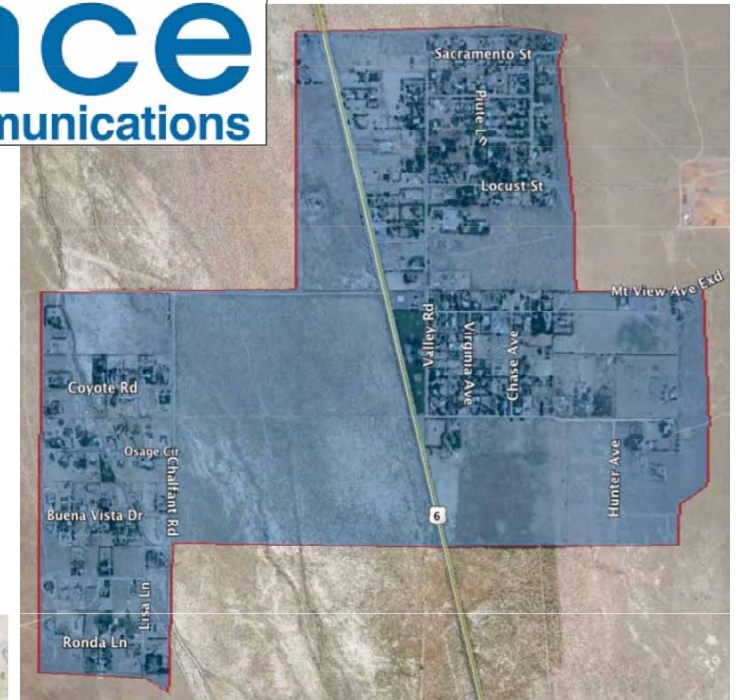
Streamlining & coordination

- Master permits and leases

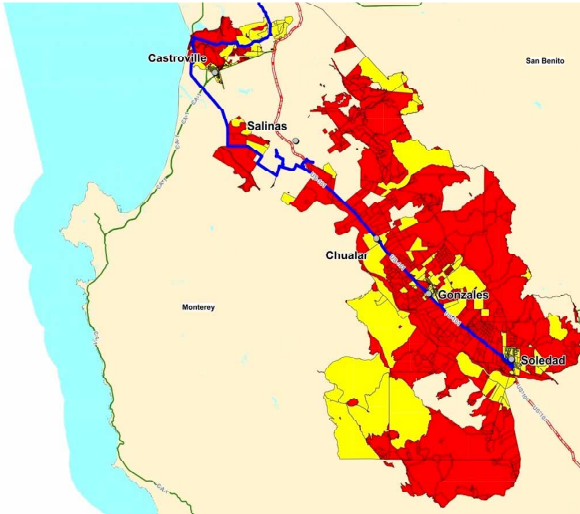
Advocacy

- Charter, Frontier transactions
- Alturas, Gonzales

Find projects, partners, funding



Funding broadband infrastructure requires patience, creativity



California Advanced Services Fund
highly restricted.

But, Boron, Lee Vining, Bridgeport...



Public safety programs narrowly
tailored.

But Weimar, Cressman...



EDA, transportation, public
housing funds complex.

***But, LA, San Leandro,
SMART...***



Industry is largely deregulated.

But, Alturas, Gonzales...



School, library programs
create disincentives for
rational planning.

But, Weaverville, Soledad...



FCC, USDA rural programs
designed for midwest, favor
incumbents.

***But, Anza, Plumas-Sierra,
Surprise Valley...***



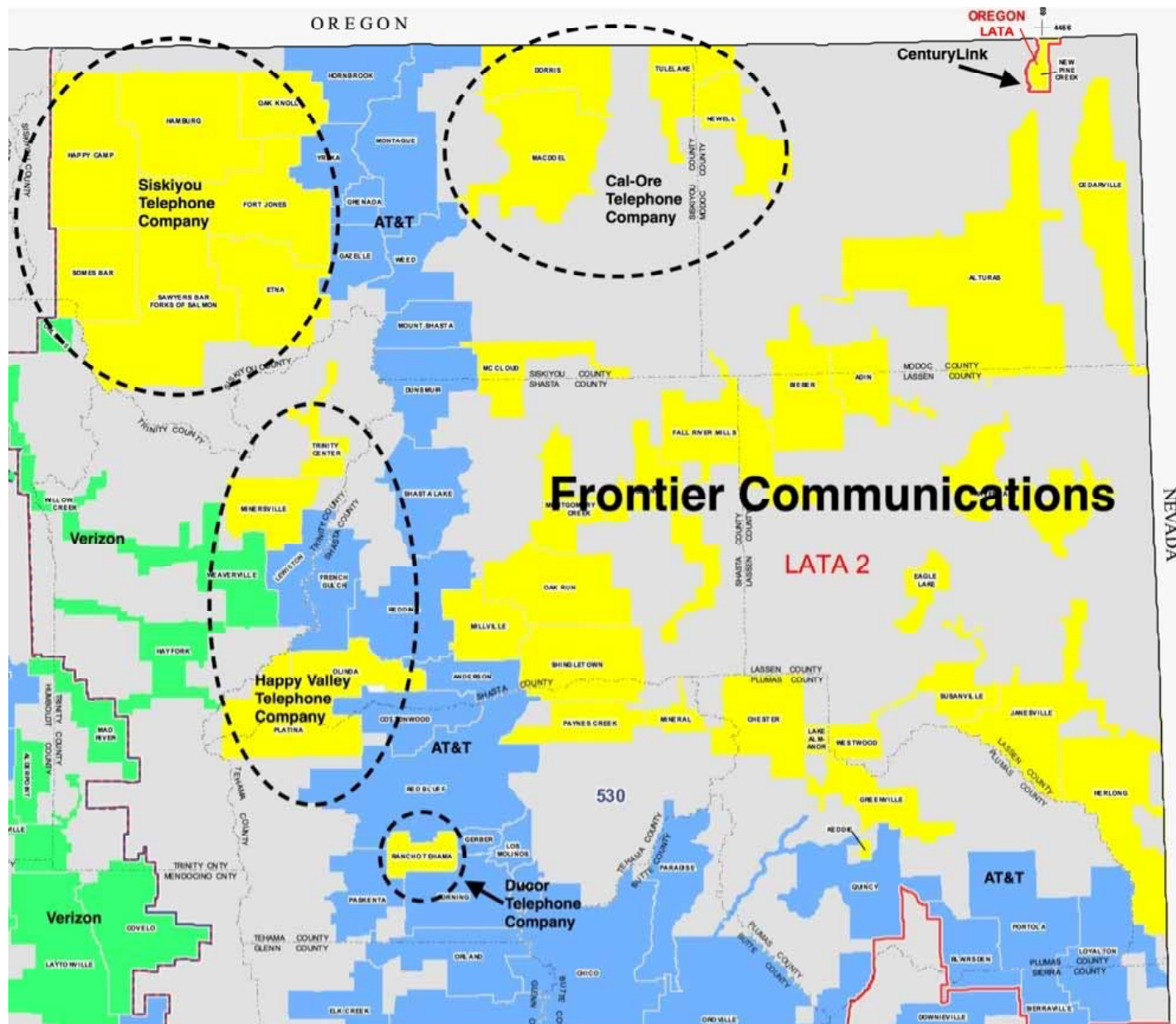
Questions?



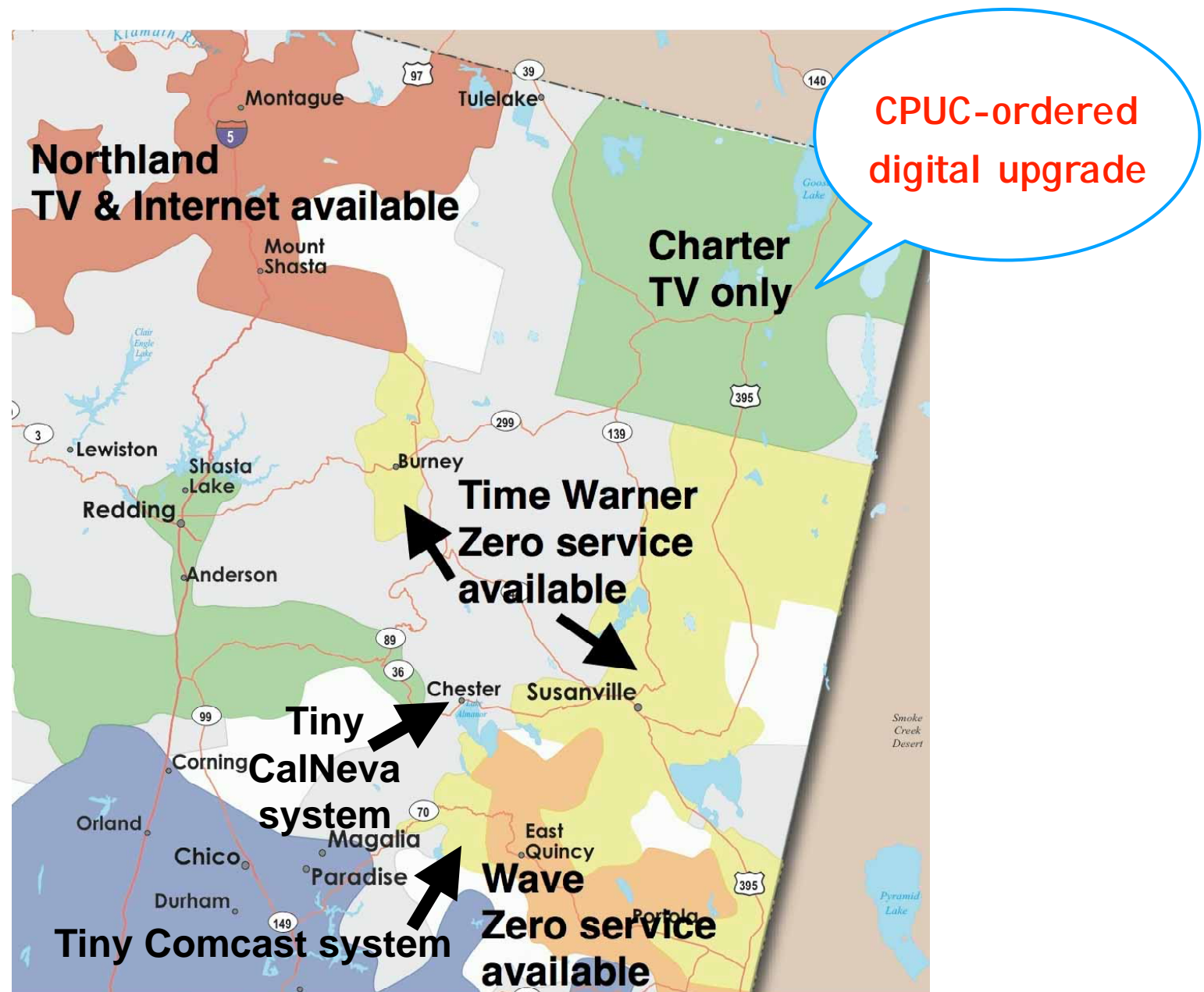


Back up slides





Frontier dominant carrier east, west of I-5, AT&T has I-5 corridor, rural telephone companies play significant roles



Big cable operators staked claims, but didn't work them

Frontier eligible for most of the \$20 million, six year CAF-2 subsidies

Must upgrade all funded census blocks to 10 Mbps download/1 Mbps upload speeds by end of 2020

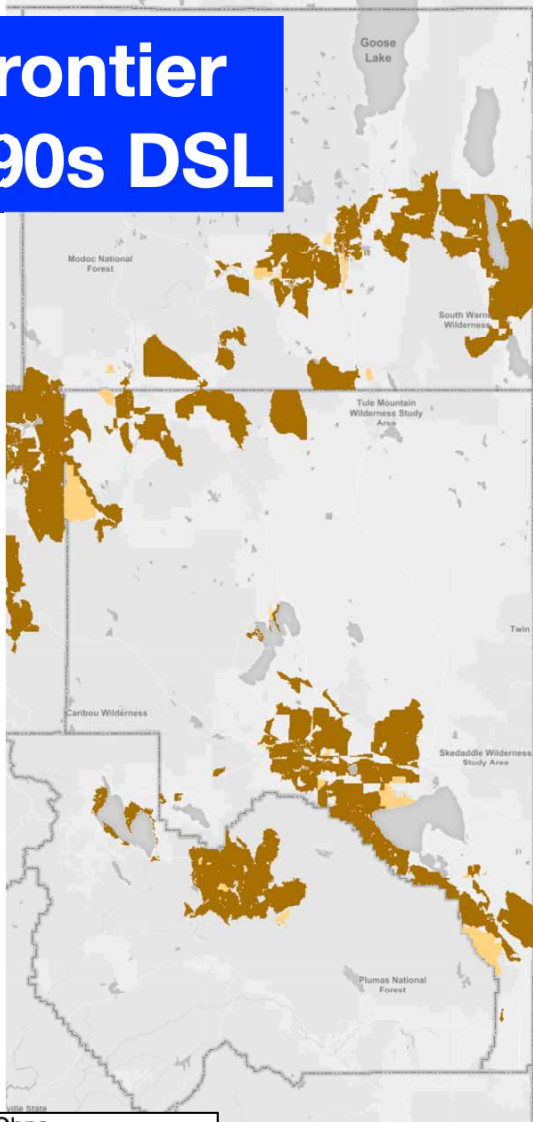
CAF-2 Six Year Subsidies

	AT&T	Frontier	Century Link
Lassen		\$3,582,833	
Modoc		\$7,372,722	\$313,547
Plumas	\$775,063	\$1,083,101	
Shasta	\$38,568	\$4,783,184	
Siskiyou	\$740,968	\$40,739	
Tehama	\$22,390	\$1,326,829	
Total	\$1,576,988	\$18,189,408	\$313,547

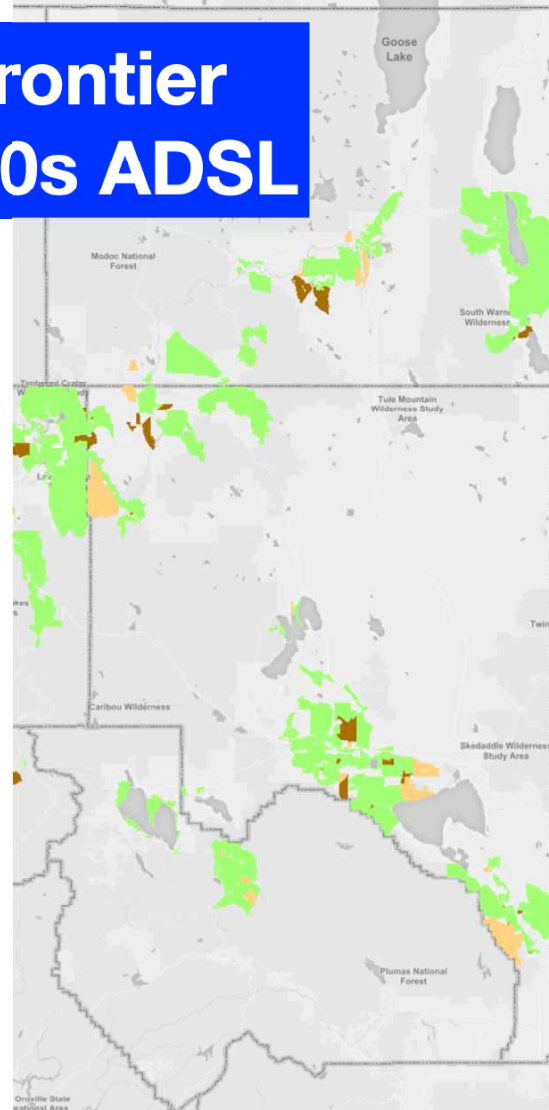
Subsidised "Locations"

	AT&T	Frontier	Century Link
Lassen		1,469	
Modoc		1,905	41
Plumas	307	435	
Shasta	20	1,615	
Siskiyou	244	7	
Tehama	5	377	
Total	576	5,808	41

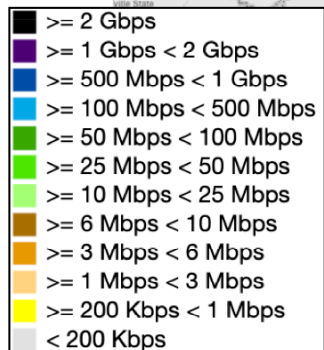
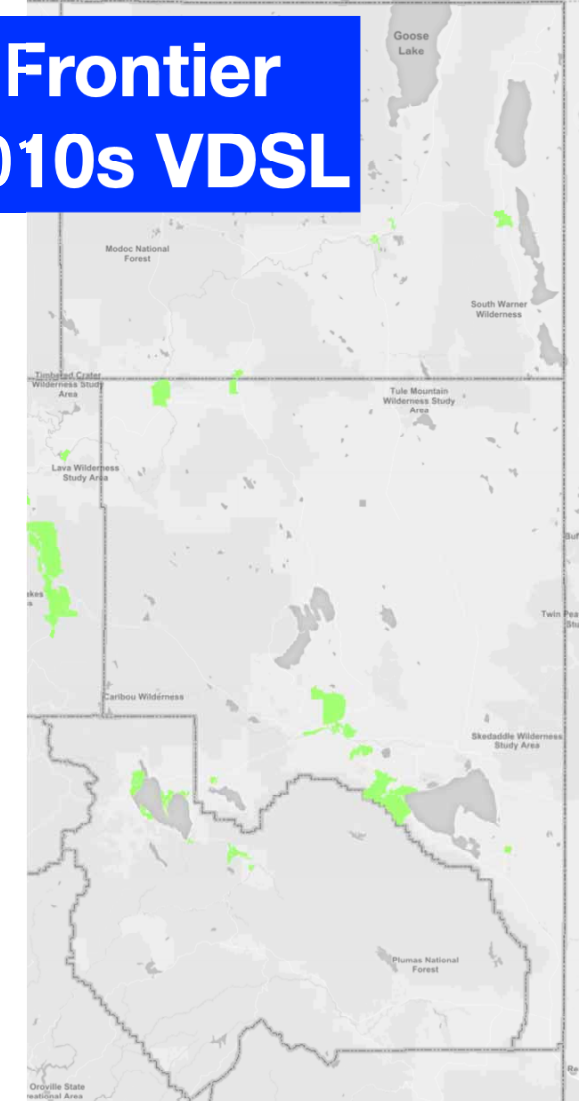
Frontier 1990s DSL



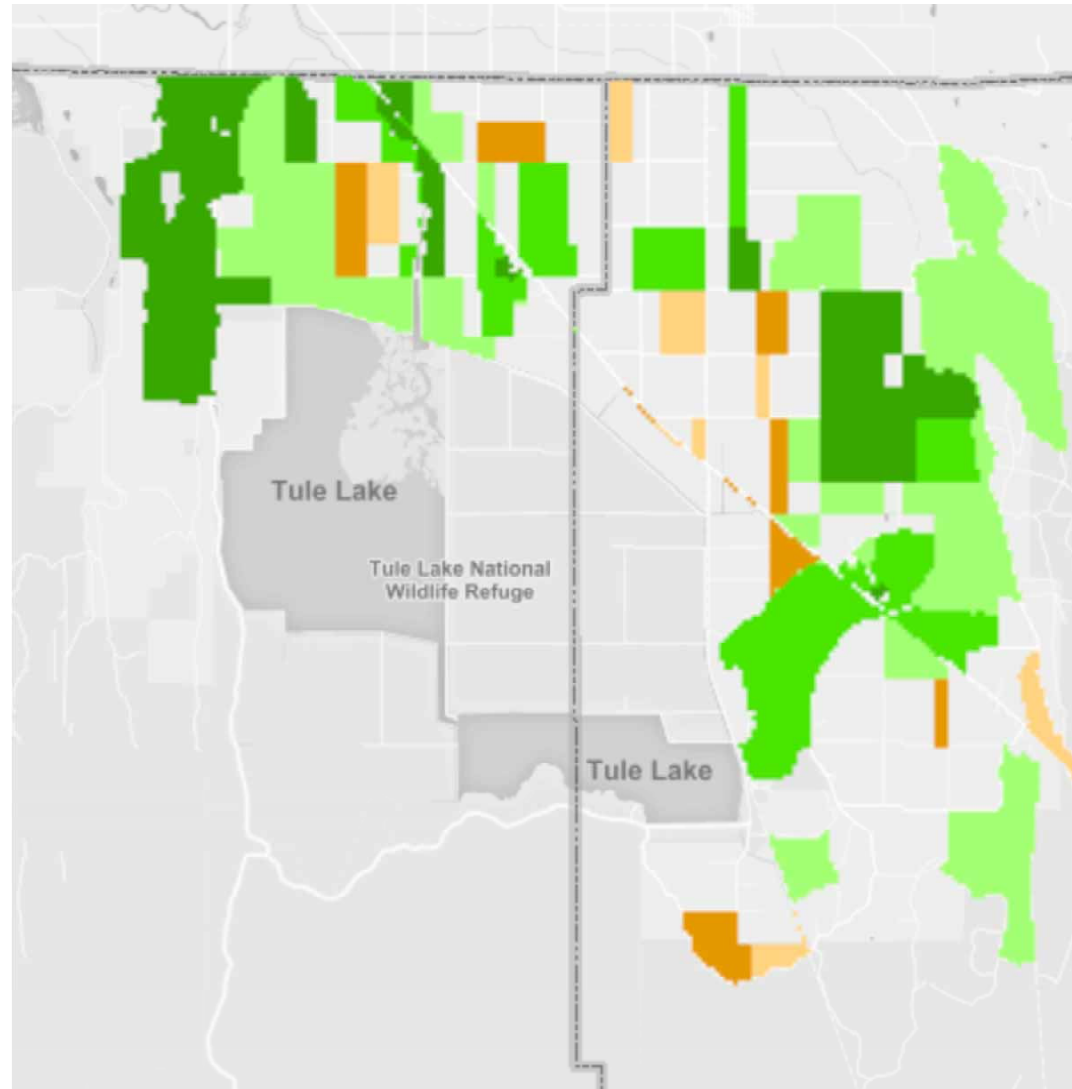
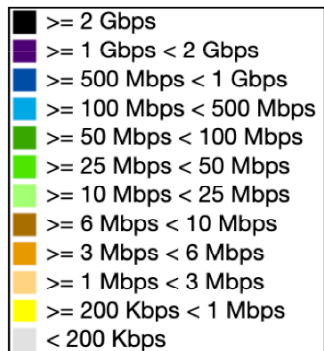
Frontier 2000s ADSL



Frontier 2010s VDSL



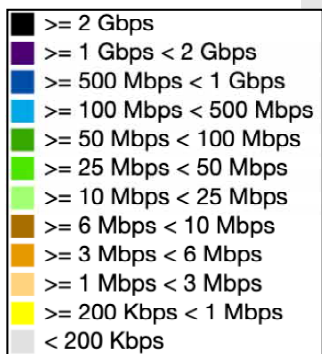
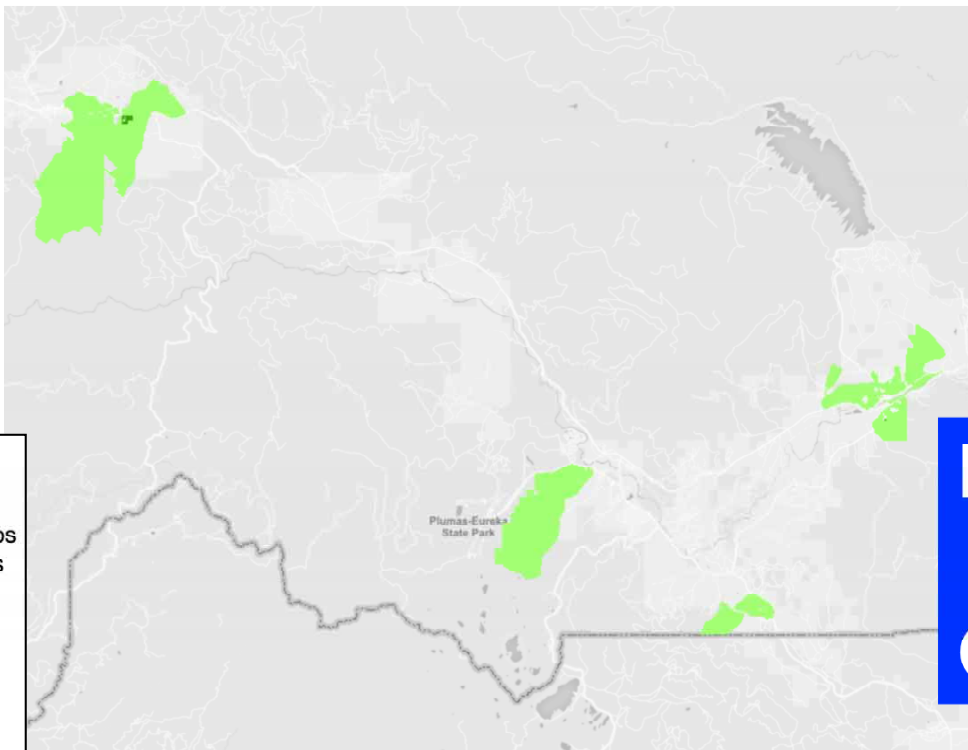
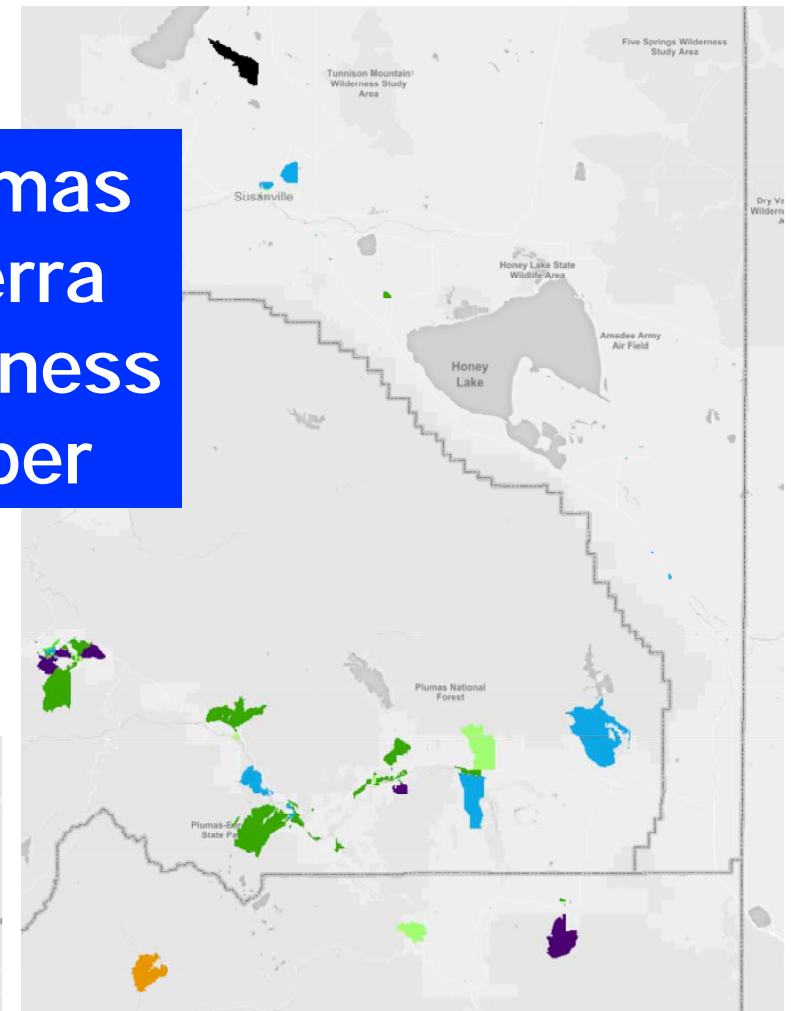
Cal-Ore 2010s VDSL



Plumas Sierra Consumer Fiber

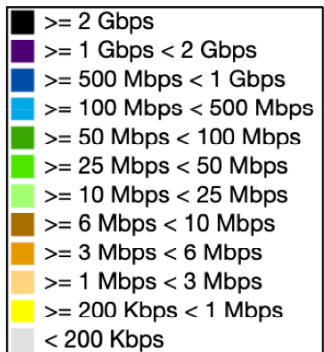
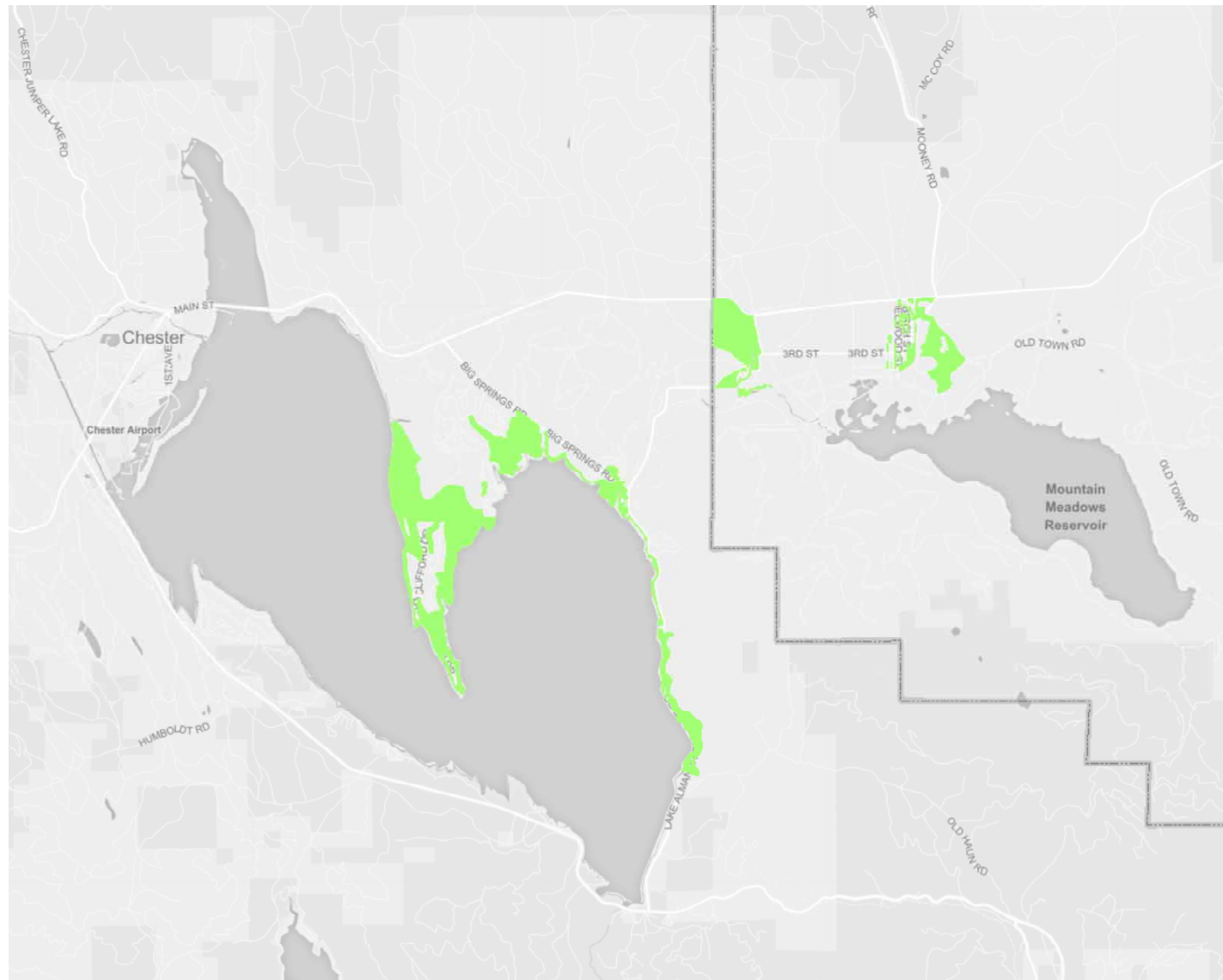


Plumas Sierra Business Fiber

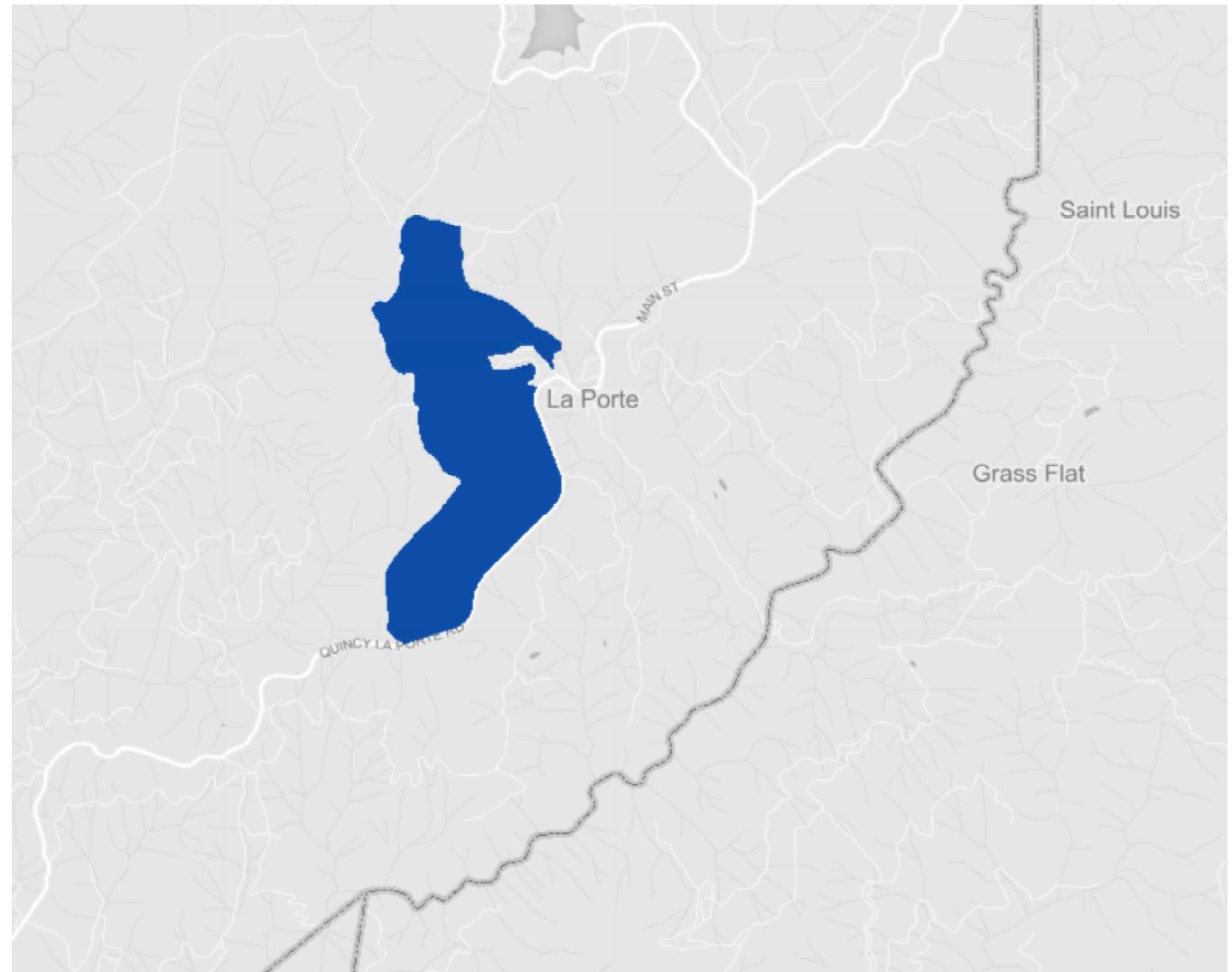
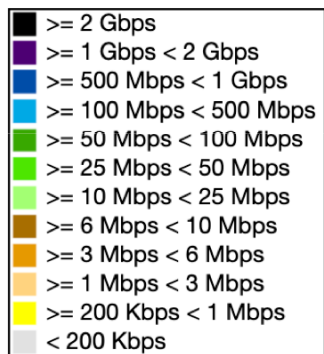


Plumas Sierra Copper

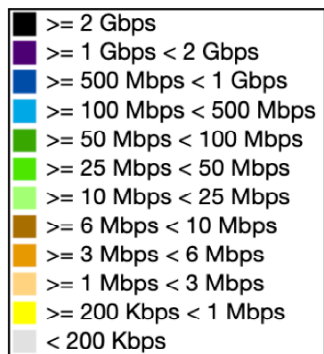
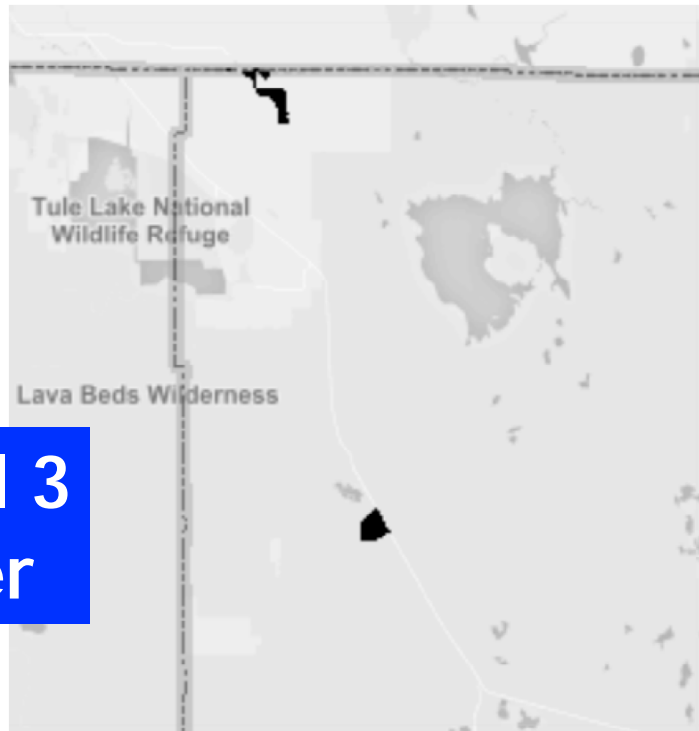
CalNeva 1990s Cable modem



Comcast 2010s Cable modem



Level 3 Fiber





	Distance (miles)	Cost - low range	Cost - high range
Core Network	320	\$48,000,000	\$80,000,000
Community extensions	164	\$24,600,000	\$41,000,000
Total	484	\$72,600,000	\$121,000,000

	Current Availability	Digital Highway Loop - Total	Digital Highway Loop - Unserved	New Availability	Gain
Lassen	56%	10,047	3,264	81%	26%
Modoc	36%	3,422	1,957	74%	38%
Plumas	31%	4,739	1,512	40%	10%
Shasta	90%	7,762	2,888	94%	4%
Tehama	72%	2,658	1,701	79%	6%
Total	75%	28,628	11,322	83%	6%

As of 31 December 2015

A

Superior infrastructure. At least two competing providers. At least one advertizing fiber-based service at a minimum of 1 Gbps download/500 Mbps upload speeds, and another offering service at a minimum of 400 Mbps download/20 Mbps upload speeds.

B

Above average infrastructure. At least two competing providers. At least one advertizing fiber-to-the-premise service at a minimum of 900 Mbps download/35 Mbps upload speeds, and another offering service at a minimum of 100 Mbps download/20 Mbps upload speeds.

C

Average infrastructure. At least two competing providers. At least one advertizing fiber to the premise service at a minimum of 400 Mbps download/20 Mbps upload speeds, and another offering service at a minimum of 30 Mbps download/5 Mbps upload speeds.

D

Barely passing. At least one provider that meets the Central Coast Broadband Consortium/ Monterey Bay Economic Partnership minimum standard.

F

Fail. At least one provider offers service, but no service is available that meets the Central Coast Broadband Consortium/Monterey Bay Economic Partnership minimum standard.

F -

Unserved. No broadband service available

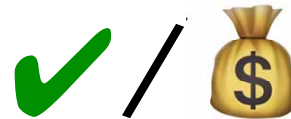
Urban

Rural

Low speed
residential service



High speed
residential service



Commercial grade
service



Local fiber



Connections to
Tier 1 hubs



Mobile service



*Rural broadband planning is regional,
urban is city by city*

Urban

Low speed
residential service



High speed
residential service



Commercial grade
service



Local fiber



Connections to
Tier 1 hubs



Mobile serv



*Sweet spot
for muni,
EDA, PPP
projects*

Rural



*Sweet spot
for CASF,
federal rural
programs*

*Rural broadband planning is regional,
urban is city by city*