

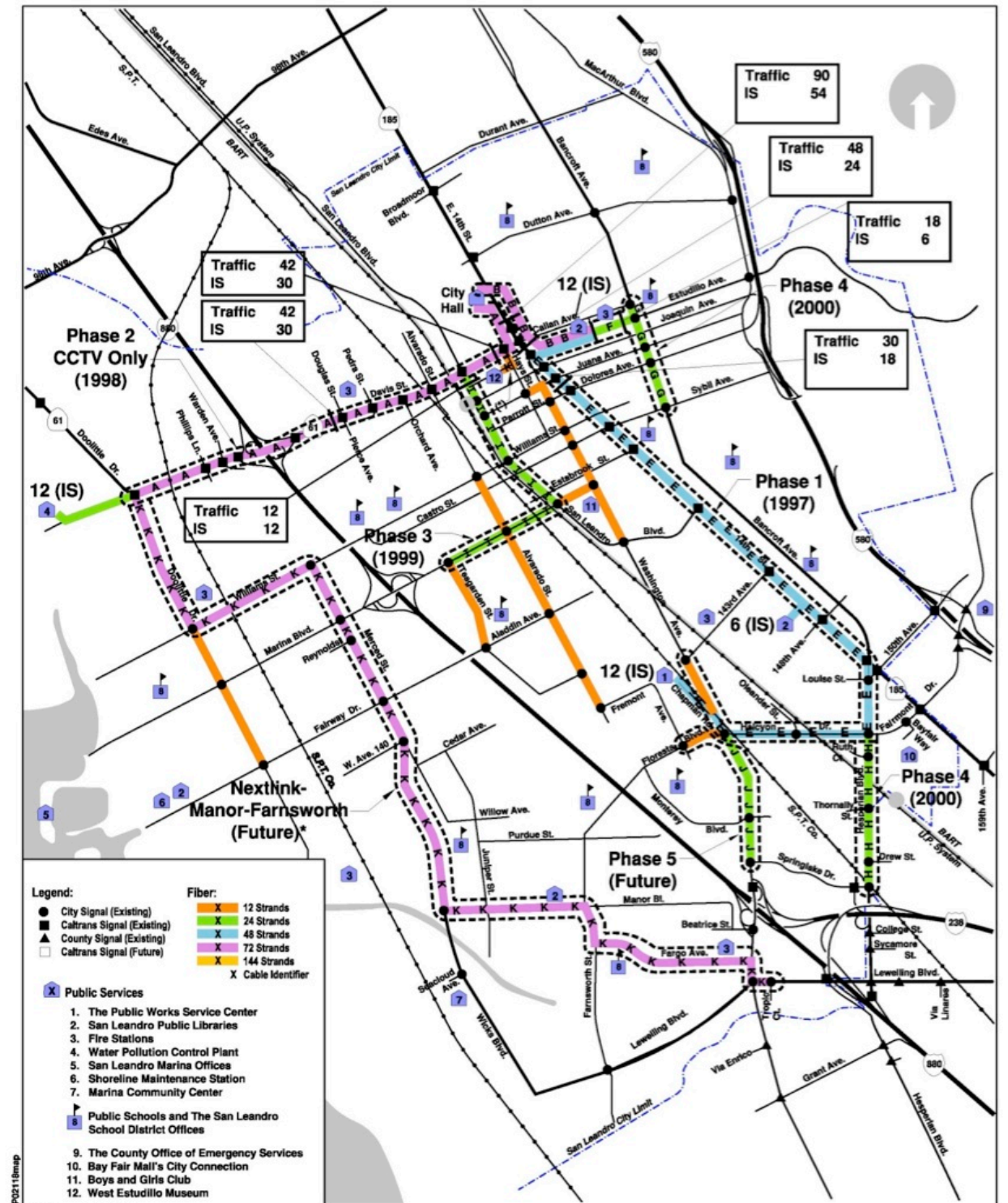
Five broadband trends shaping communities

19 September 2013



Communities turn conduit into gold

- Lit San Leandro is an 11 mile fiber system through commercial & industrial areas, built with city conduit, \$2 million in private capital.
- Palo Alto netting more than \$2 million a year with dark fiber on city poles and conduit.
- Dig once, open trench and shadow conduit polices gaining popularity.

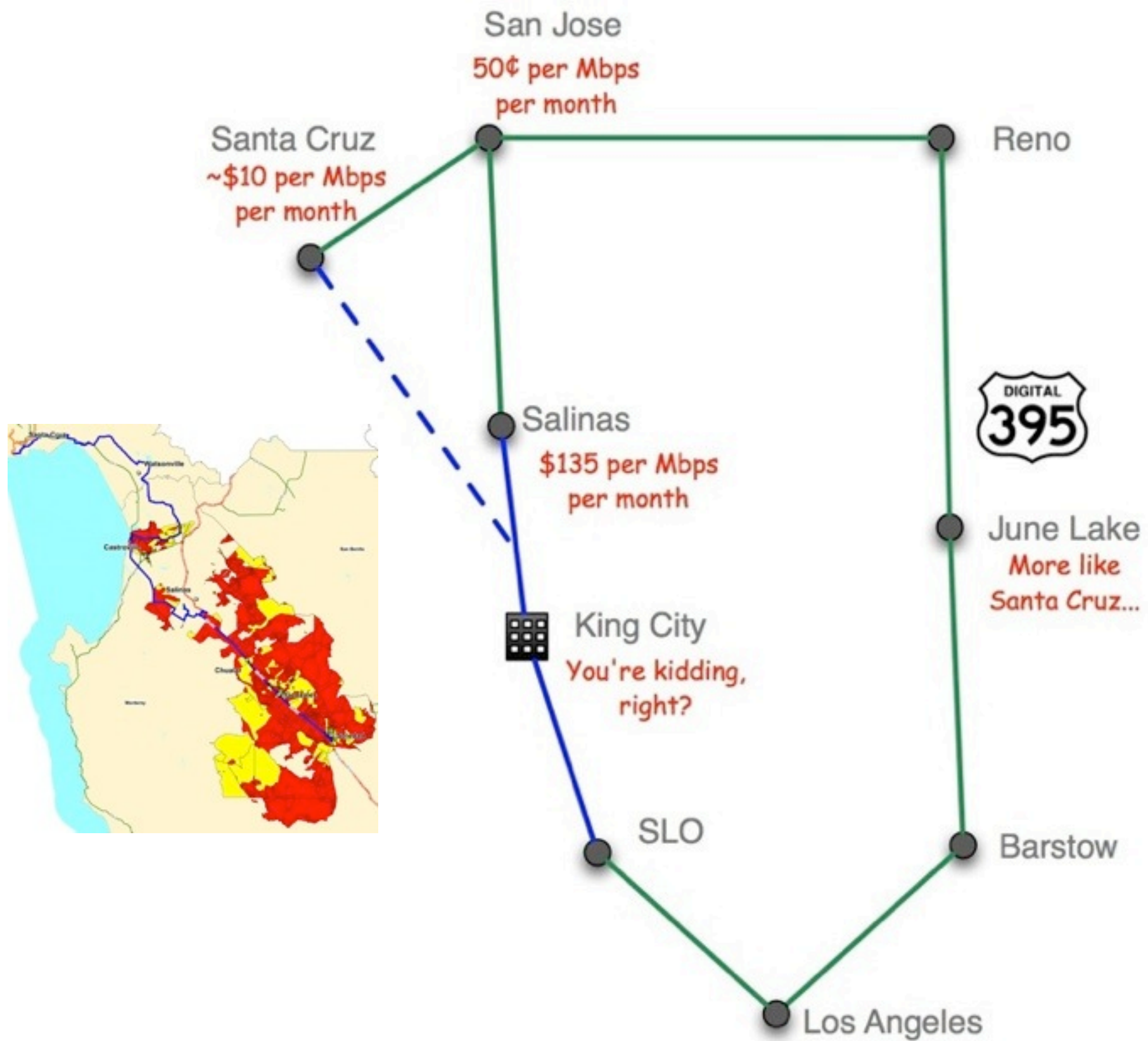


City of San Leandro
Advanced Traffic Signal System
Fiber Count Diagram

Google Fiber scares telcos into launching fiber projects in Austin, Omaha

- Serving homes in Kansas City with expansion into suburbs.
- Kansas Internet speeds up 86%.
- Bought a municipal FTTH system in Provo, Utah, with expansion along I-15 corridor possible.
- Plans to build FTTH in Austin.
- But not in California.

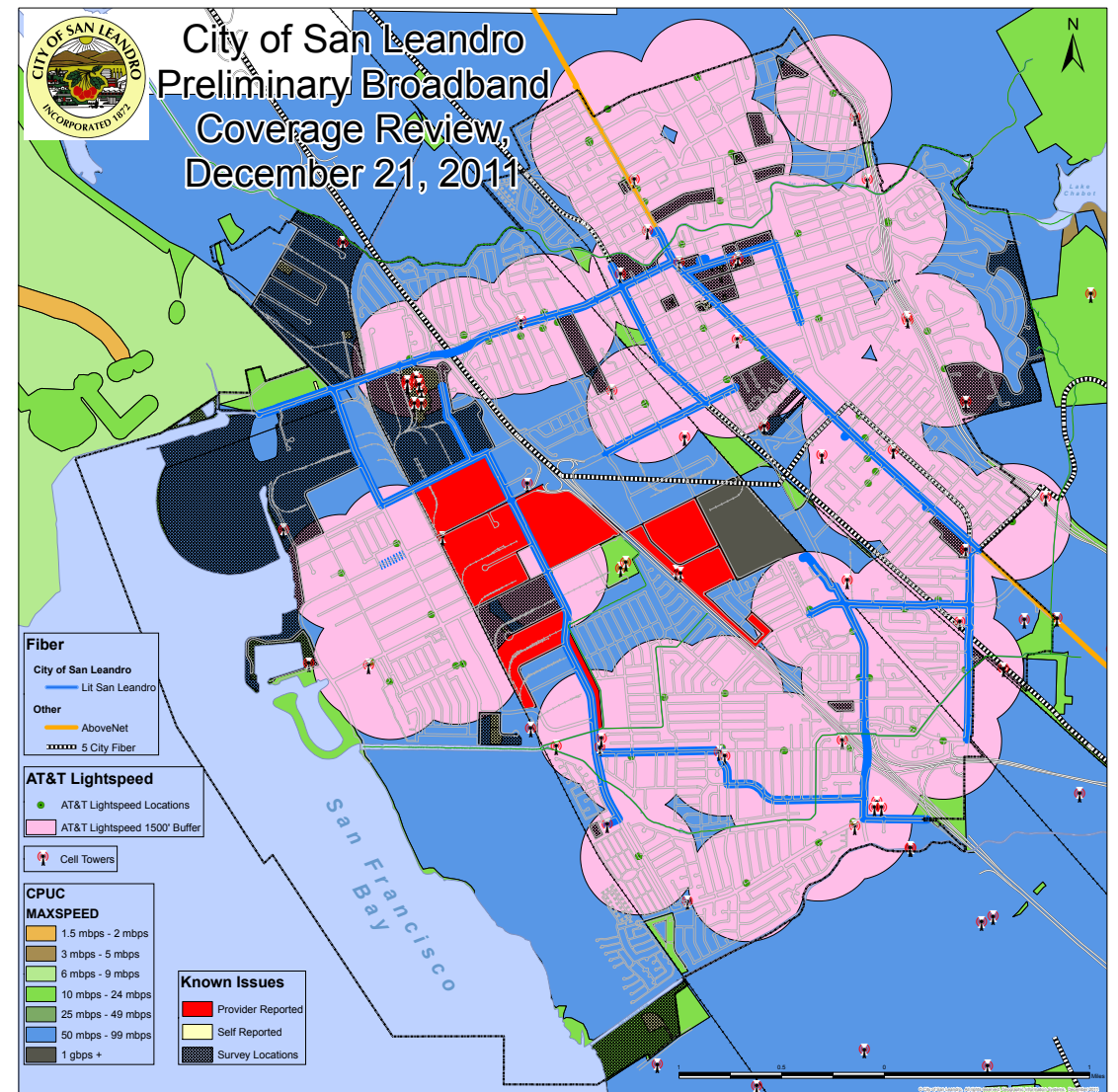




Independent middle mile projects connect remote communities

Aspen Springs, Chalfant, Crowley Lake, Sunny Slopes in Mono County; Monterey Dunes projects on table

- Although public works departments require applicants to detail where they are excavating when building out communications infrastructure, the maps submitted by applicants are not supplied in digital formats.
- As a result, visibility into the physical plant that makes up the internet in this region is limited, which has negative impacts for communities hoping to foster economic development and plan for long range contingencies.
- This can be remedied through changing application requirements and making electronic records mandatory.



Log permit applications
and track infrastructure

Location of current publicly
and privately owned conduit,
fiber routes largely unknown

- The City of San Francisco also requires a high level of planning and coordination between providers to minimize impact on traffic flow and streets within the City.
- Placed behind a password-protected firewall, the City's Five Year excavation planning tool leverages the municipal GIS to increase coordination between providers.
- Developing such a tool locally will help preserve existing capital improvement project investments and reduce overlap in future applications.



Coordination of street openings
between public & private partners

Santa Cruz County considering
adopting San Francisco's
policy

- A key component for developing broadband resources is developing a set of accepted standards for placement of this resource in relation to existing municipal services.
- A working group at the County of Santa Cruz Public Works / Wastewater is undertaking this Scope of Work now.
- Santa Cruz County giving sole control over telecoms projects to public works department, eliminating planning department from process.
- Allow the installation of equipment within public right of ways, subject only to "time, place and manner" of access, through the County's encroachment permit process.
- Work on this standards and practice area is key to securing buy in from civil engineers.
- Engagement of public works people is vital.



Develop standards and practices
for placement & access to fiber

Public works departments
starting to take ownership of
fiber & conduit projects

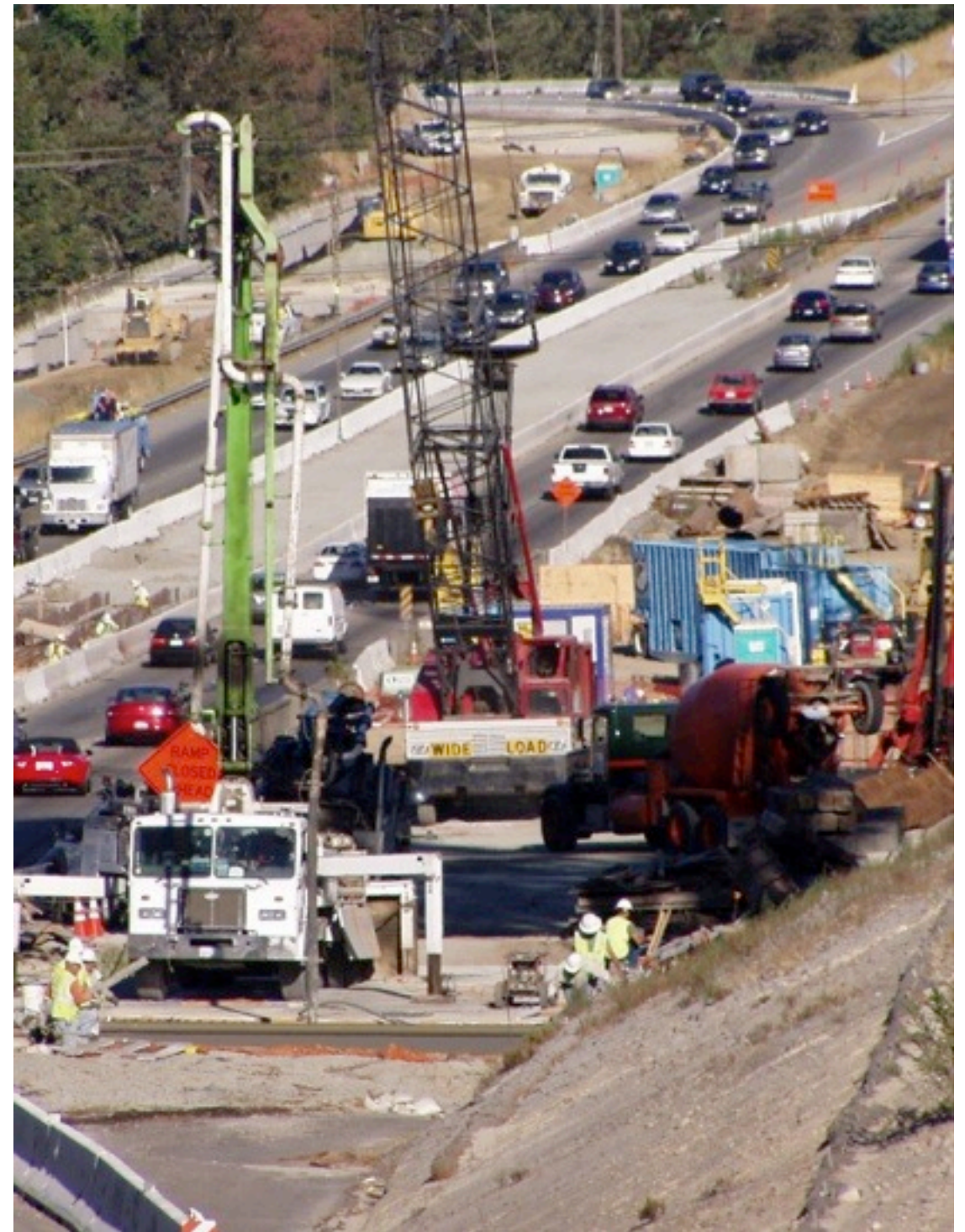
- This kind of ordinance requires that a telecommunications provider will, in the process for applying for access to the public right of way, allow the jurisdiction in question to catalogue the planned run in their internal databases, then notice all other known telecommunications and cable providers in order to coordinate in the placement of conduit beneath an existing street limiting impact on streets and traffic.
- In some communities, this policy is augmented so that the municipality deploys additional “shadow” conduit as part of planned CIP projects, planning for the eventual deployment of additional telecommunications resources as demand increases in future years for utility, cable, communications or internet service.



Dig once

Communication and access to mapping data key

- The cost of bare, simple conduit placed into an open trench is fairly low (estimated by the US Department of Transportation's Federal Highway Administration at 75-80 cents per foot for 2" HDPE pipe)
- The Federal Highway Administration estimates it is ten times more expensive to dig up and then repair an existing road to lay fiber, than to dig a channel for it when the road is being fixed or built.
- Rule of thumb: cutting into a street reduces its remaining service life by 10%, maybe more in snow country.

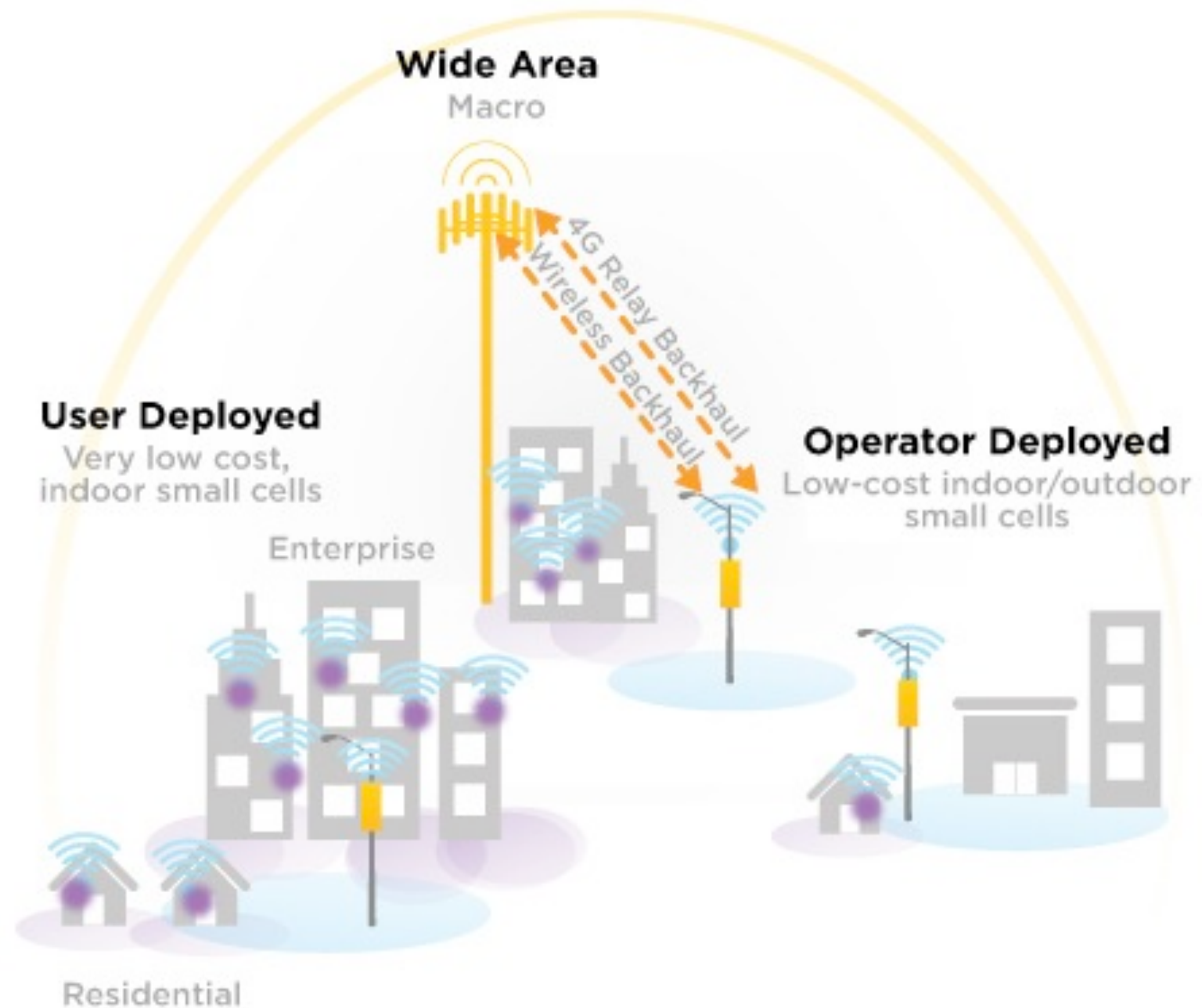


Cost implications

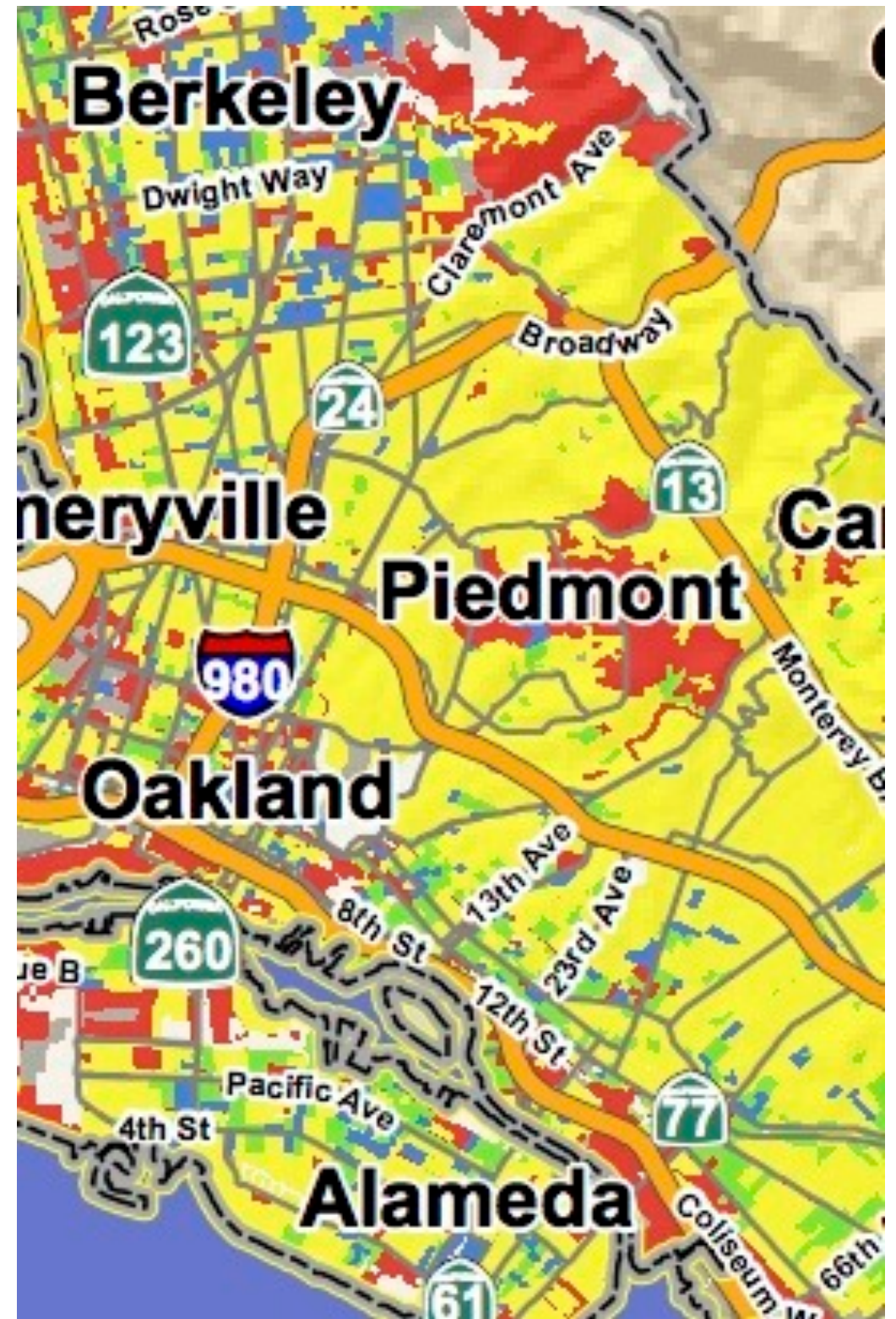
It's inexpensive, not free

The Internet of Things will optimize our world

- 5G mobile data networks will extend coverage, capacity 1000x.
- Wireless networks will be intertwined with people, homes and communities.
- 50 billion mobile devices by 2020 - Ericsson.
- Sensors, cameras, automation will run the world around us: Smart Cities.



- Local agencies have some leeway in managing tower and antenna sites, but not much power to say “no”
- FCC “shot clock” gives local government three to five months to approve applications.
- FCC rules require local government to approve modifications, within certain limits.
- Local agencies cannot regulate wireless facilities on the basis of tin foil hat fears.
- Clear, written policies are the best foundation for exercising what local control is possible, e.g. environmental, safety and aesthetic issues.



FCC squeezing local role in wireless planning & approval

Best way to increase wireless capacity is to build more fiber



NextSpace



All the comforts of work, where ever you live

- Telecommuting is a targeted strategy for communities, cities trying to keep people in town during the day.
- Coworking is a booming commercial real estate play that took off in 2008 in Santa Cruz.
- Companies attracting urban employees to suburban campuses with free, connected transit.



- Encourage telecommuting.
- Keep increasing the amount of public services on line.
- Digital literacy and workforce development.
- Systems interoperability, open data programs.
- City of Santa Cruz's OpenCounter platform going national with Knight Foundation funding.



552,600
SMALL BUSINESSES
ARE CREATED EACH YEAR

IN 2009, SMALL BUSINESS ACCOUNTED FOR:



99.7%
OF U.S. EMPLOYER
FIRMS



49.2%
OF PRIVATE-SECTOR
EMPLOYMENT



64%
OF NET NEW PRIVATE-
SECTOR JOBS



42.9%
OF PRIVATE-SECTOR
PAYROLL

 **OpenCounter**

Local policies and programs
encourage growth of broadband
economy

Attitudes and expectations
count



Conduit is forever

Questions?



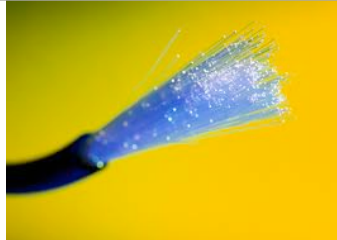

Back-up slides



- Boring: \$30.00
- Fiber optic cable: \$1.80
- Conduit \$2.75
- Right of way \$1.00
- Environmental \$1.50
- Tax (on goods) 10%
- Management 10%
- Furnish & commissioning 5%
- Engineering 5%
- Documentation 5%

Costs

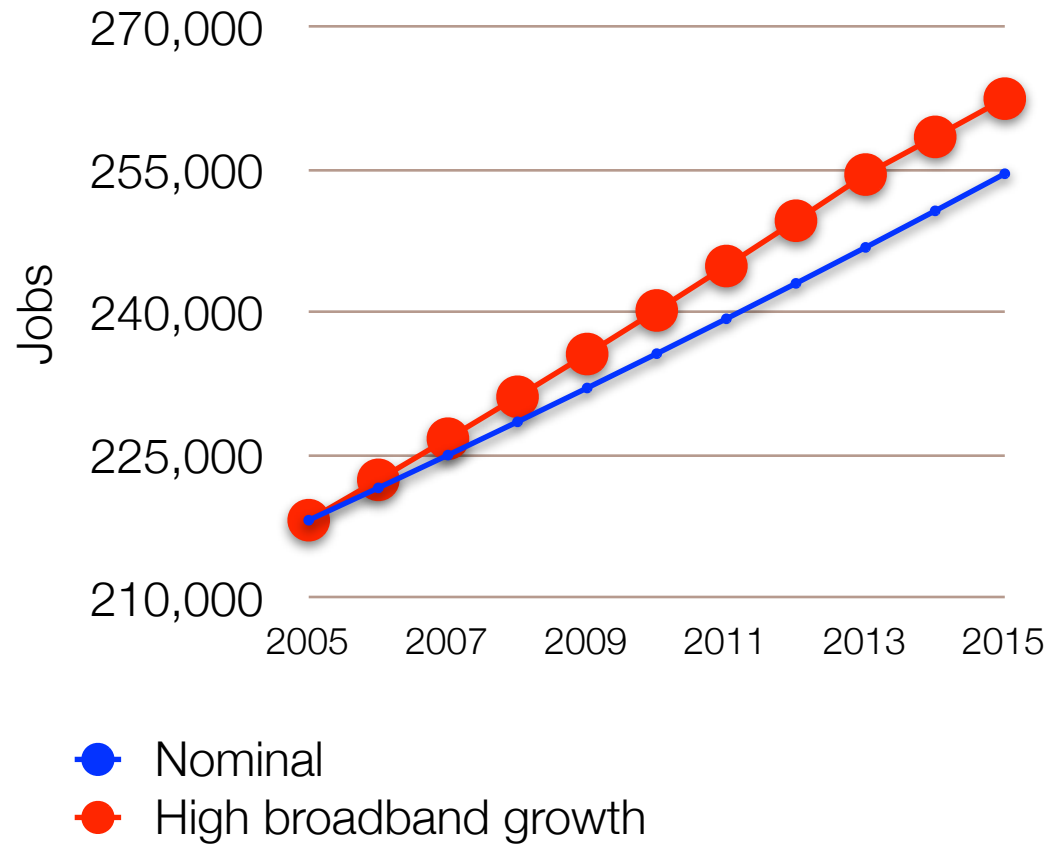
Based on San Francisco,
Oakland, San Leandro & Palo
Alto figures

Layer		Revenue	Margin	Competition	Water Analogy
Internet		\$1K/ mo and up	Low <10-20%	High	Water
Ethernet/ electronics		Not common	Medium	Make vs. buy	Pump
Fiber optic cable		Local loop \$1-5K/mo	Medium	Few to none	Pipe
Conduit		20¢-\$2/ft/year	High 100%+	None	Trench/ Right of way

Broadband value chain

The higher up the chain, the greater the competition and the lower the margins

Broadband's Effect on San Joaquin County Employment



Source: Sacramento Regional Research Institute

Almost 50K job-years created by improved broadband access

Top U.S. Cities Average Measured Connection Speed

Rank	City	2Q11 Ave. Mbps
1	San Jose, CA	13.7
2	Fredericksburg, VA	8.5
3	Monterey Park, CA	8.2
4	Fremont, CA	8.2
5	Staten Island, NY	7.6
6	Columbia, MD	7.5
7	Jersey City, NJ	7.5
8	Riverside, CA	7.5
9	Oakland, CA	7.5
10	Fairfield, CA	7.3

Source: Akamai

Broadband attracts
business, drives growth

Bandwidth is a basic
requirement for business
location decisions



- Broadband requirements for new development, renovations
- Prioritizing broadband as a planning criterion
- Commercial/industrial vs. residential
- Anticipating and accommodating future needs



- Broadband conduit in CIP, public works, transportation projects
- Open trench policies
- Right of way and encroachment policies
- Conduit, pole, site leasing
- GIS integration



- Telecommuting
- Public services and digital inclusion
- Digital literacy and workforce development
- Systems interoperability, open data programs



- Wireless site, towers and antenna policies
- Environmental and aesthetic issues

Core policies, practices identified and evaluated

Goal is to make broadband a routine policy consideration and planning element

- Municipal fiber projects in San Leandro, Palo Alto, Benicia, Salinas, Oakland.
 - Municipal wireless projects in Los Angeles, Oakland, Folsom, Lompoc.
 - Broadband policy development in Watsonville, Alameda, Morgan Hill
 - Community broadband system planning and implementation at The Villages in San Jose, Rancho Murieta near Sacramento, Corona.
 - Private ISP planning & funding in Monterey, Santa Cruz, San Benito, Nevada Counties.
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Planning, management and business development
consulting for community broadband

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