

**CALIFORNIA ADVANCED SERVICES FUND**



California Public Utilities Commission  
 Ryan Dulin, Director  
 Communications Division  
 April 2, 2015

**Informal Broadband Strategy**

- Infrastructure
- Adoption
- Cost/Affordability
- Service Quality/Capacity/Speeds

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**CASF Goals Overview**

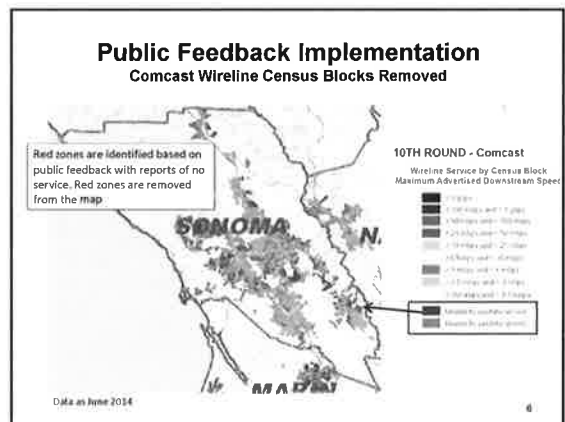
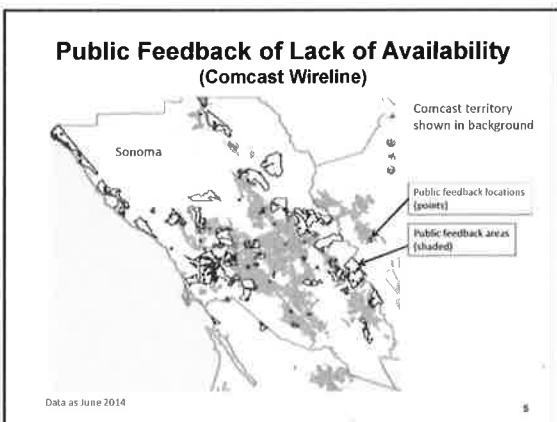
- Fund infrastructure projects that will provide broadband access to no less than 98% of California households by December 31, 2015
  - Identify unserved and underserved areas of the State
- Fund \$25 Million in public housing broadband projects by December 31, 2016

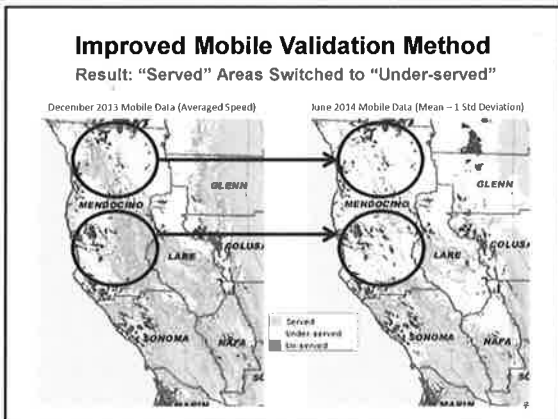
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**CASF Broadband Deployment Initiatives**

- Enhance the accuracy of broadband availability data
- Continue oversight of existing consortia and solicit applications for new consortia and/or projects using remaining funds in the CASF Consortia Grant Account.
- Implement SB 740 (Non-Telcos) and AB 1299 (Public Housing)
- Provide a second "right of first refusal" opportunity to existing providers that plan to expand their service availability.
- Engage federal, state, and local agencies to address broadband deployment issues

4





### AB1299 Implementation Activities

DATES	ACTIVITY
November 17, 2014	Proposed Public Housing Account Decision Issued: <ul style="list-style-type: none"> <li>Clarifies eligibility and application requirements</li> <li>Identifies activities to be funded - CASF funding up 100% of the eligible cost for infrastructure and 85% for adoption projects</li> <li>Delegates to CD staff approval of applications requesting grants of less than \$75K for infrastructure projects and \$50K for adoption projects that also meet certain criteria as specified in the PD. Projects that do not meet the criteria will be approved through Commission resolutions</li> <li>Sets quarterly deadline for application submissions with first deadline of January 15, 2015</li> </ul>
December 18, 2014	Commission meeting and proposed Public Housing program decision
December 19, 2014	Per Proposed Decision, application window for Public Housing grant applications opens and continuing through 2016 or until funds are fully encumbered.
December 2014 - January 2015	Staff to conduct outreach (via webinar or in-person workshops) to prospective applicants regarding rules and application process.
January 2015 and thereafter	Commission starts approving Public Housing grant awards.

### SB 740 Implementation Activities


DATES	ACTIVITY
November 1, 2014	Existing provider to declare commitment to upgrade broadband service
December 1, 2014	CPUC begins accepting applications for CASF Infrastructure Grant/Loan on a rolling basis going forward
May 1, 2015	Last date for an existing provider to submit completion report for areas it committed to upgrade broadband service or submit a request for extension
May 2, 2015	Date when local government agencies may begin to apply for CASF Infrastructure Grant in unserved areas

### CASF Funding Status (as of November 2014)

CASF Accounts	Remaining Funds (*approx)	Awarded Funds	Description
Infrastructure Grant Account	\$150 million *	\$99.27 million	47 Projects
Regional Consortia Account	\$240 thousand *	\$9.26 million	16 Consortia Groups
Revolving Loan Account	\$9.873 million	\$126,854	3 Projects
Broadband Public Housing Account	\$20 million (Deployment) \$5 million (Adoption)	\$0	Applications proposed to begin Jan. 2015

- ### Challenges
- One size fits all (rural vs. urban)
  - Costs relative to revenues dissuade some providers from CASF participation
  - Regulatory requirements and conflicting priorities:
    - CEQA compliance review requires two stage funding and add unknown costs and delay to projects. Permitting with federal agencies can be costly and problematic
    - Rights-of-way access for non-telecommunications providers is not guaranteed
    - No real coordination across multiple infrastructure projects (e.g. dig once policies)
    - Lack of Interconnection/shared infrastructure
  - Limited resources
    - Consortia funding ended
    - CASF funds are insufficient to close the Digital Divide

- ### Where do we go from here?
- Implementation of Informal Broadband Strategy
    - Infrastructure
    - Adoption
    - Cost/Affordability
    - Service Quality/Capacity/Speeds
  - Defining Priorities
  - FUNDING
  - Defining Broadband Governance
  - Broadband Beyond the Household


  
 City of Arts & Innovation

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## Seizing our Destiny

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**Riverside's journey to the most intelligent community in the world!**

  
 City of Arts & Innovation


## The Tribe




City Council Hires City Manager and expert on Economic Development from the County of Riverside




City Manager brings in new Management Team



Mayor is Chairman of SmartRiverside and appoints CIO as Executive Director



City Manager brings in first Chief Innovation Officer from Dell Inc, who was former County of Riverside CIO

  
 City of Arts & Innovation


## SmartRiverside




Non-Profit Corporation Serving the Community

Mayor – Chairman  
CIO – Executive Director


30 members –  
Higher Education  
K-12  
Private Sector Technology  
Companies  
CEO Forum




From PC into the Community

  
 City of Arts & Innovation


## Broadband




AT&T wins RFP to deploy tri-band WiFi



City has Utility run fiber to every City facility and serve WiFi




City expedites permits for AT&T U-verse & creates internet competition




**SMARTRIVERSIDE**

Access devices attached to street lights



Over 1600 access points installed providing FREE WiFi



  
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## Mobile



### City & Public Safety Mobile Applications






  
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## In Car Video



Capture  
Transfer  
Store  
Manage










Capture Video and Audio in the field  
Transfer Video back to enterprise storage over wireless





**Video Security**



City of RIVERSIDE  
City of Arts & Innovation



Traffic Management  
Graffiti and gang intervention  
Parks and Facility Security  
Analytics

**Traffic Management**

City of RIVERSIDE  
City of Arts & Innovation






Upgrade existing controllers to 802.11 b/g  
Control/monitor traffic signals from central facility  
Installing cameras at 354 Intersections to monitor traffic

**Digital Inclusion**

City of RIVERSIDE  
City of Arts & Innovation

Highland Elementary  
Grant Elementary

Step 1

SMART RIVERSIDE

Salvation Army  
Seniors over 55

Dial "311"

Step 2



Provide PC

Step 3

Norte Vista High School  
Lincoln High School

**Digital Inclusion**

City of RIVERSIDE  
City of Arts & Innovation

At the 8th hour, SmartRiverside delivers 1 system per household



Celebrating 6,000 families served

Refurbish PCs w/Microsoft Office

Collect E-waste and exchange for working systems and funds to self sustain program




Gang Intervention Program hires youth and SmartRiverside trains them in A+ certification

City of RIVERSIDE  
City of Arts & Innovation

**Innovation**

City of RIVERSIDE  
City of Arts & Innovation

**Innovation Economy Corporation** commercializes innovations with global impact potential. With a philosophy of "Doing Good and Doing Well", the mission is to acquire innovative research, technology, products/services and transform them into high-growth businesses with the potential to enhance the lives of people across the globe.




## Innovation







**CE-CERT** is the Center for Environmental Research & Technology (CE-CERT) as a model for partnerships among industry, government, and academia. CE-CERT's goals were to become a recognized leader in environmental education, a collaborator with industry and government to improve the technical basis for regulations and policy, a creative source of new technology, and a contributor to a better understanding of the environment.



## Innovation





**Winston Chung Global Energy Center**  
As part of the Bourns College of Engineering and the Center for Environmental Engineering and Technology, the Winston Center complements existing energy research in the Southern California Research Initiative for Solar Energy (SC-RISE) and solar thermal research.




## Innovation







**Foreign Trade Zone**  
The Office of Foreign Trade focuses its efforts on exports, foreign direct investment, diplomatic relations and global business attraction. The office serves the International trade community with the ability to provide assistance with exporting, foreign finance, logistics, shipping, federal and international trade regulations, treaties and other areas directly linked to trade and investments. The Office of Foreign Trade has been asked to testify in support of Trade and export bills in the Senate and Assembly of the State Legislature on a regular basis. Bills sponsored by our Office of Foreign Trade helped California become eligible for federal funds for business exports, formally established California's support for EB 5.



## Innovation




UCR provide the research and intellectual Capital




IEC commercializes the best  
INNOVATION ECONOMY CORPORATION  
TECH COAST ANGELS  
Investment in start ups is strong

Entrepreneurs get free consulting advice from industry experts  
Bourns provide incubation space for start-ups

CEOs from High Tech Companies collaborate with all Tech companies



## Knowledge Workforce




**RIVERSIDE**  
Bachelor BS BA - 3171  
Master MAM MDA - PhD - 581


**La Sierra**  
Bachelor BS BA - 332  
Master MAM MDA - PhD - 119

**CDU** California State University  
Bachelor BS BA - 414  
Master MAM MDA - PhD - 274

**KAPLAN COLLEGE**  
Riverside Campus



**CalWorks GAIN - Greater Avenues for Independence**



**Project BRIDGE** (Building Resources for the Intervention and Deterrence of Gang Engagement)






## City of Arts & Innovation







- First all electronic high school in CA
- Digital Dashboard for parent to monitor attendance, home work and GPA
- Starting kids in Kindergarten with Apple iPad Touches

 City of Arts & Innovation	<h2>Advocacy</h2> 
	<ul style="list-style-type: none"><li>• Weekly E-mails</li><li>• Quarterly Mailings</li><li>• Freeway Billboards</li><li>• City Manager Blog</li><li>• Facebook/Twitter daily updates</li><li>• Top 10 Web Site in the US</li></ul>

 City of Arts & Innovation	<h2>Advocacy</h2> 
	<ul style="list-style-type: none"><li>• Champions Council</li><li>• Vision and strategy for our future</li><li>• Priorities of events and projects for focus</li></ul>

 City of Arts & Innovation
 <b>Intelligent Community of the Year 2012</b>



# Inland Empire Regional Broadband Consortium

General Assembly Meeting  
November 19, 2013

**California Emerging Technology Fund**

Local Government Rountable

April 2 - 3, 2015

The Mission Inn  
Riverside, California

**CPUC CASF 16 Statewide Consortia**

**Inland Empire Regional Broadband Consortium**

Riverside County  
and  
San Bernardino County

**Inland Empire Regional Broadband Consortium**

**INLAND EMPIRE BROADBAND INFRASTRUCTURE AND ACCESS PLAN**

- Closing the Digital Divide
- The Inland Empire as a "Smart Region"
- Rural and Remote Areas
- Local Government Broadband Solutions
- Programs for Underserved and Disadvantaged Residents
- Education
- **Healthcare and Telemedicine**
- Broadband and Economic Development
- Priority List of Action Items

**Inland Empire Regional Broadband Consortium**

**GoSection8.com**

- Social Security
- DMV
- Bank Office
- Housing Authorities
- Accounts
- Banking
- News

**The Inland Empire can be a "Smart Region"**

**What makes a Region Smart?**

- Affordable High Speed Broadband
- Gigabyte Internet Speeds
- Wireless Hot Spots
- Fiber to the Home
- Telecommuting
- Technology Companies
- Start-up Incubators
- Venture Capitalists
- Entrepreneurs
- High School and College Graduates
- Online Education
- Research Universities
- Telemedicine
- 24 Hour Government
- Connected Citizens
- Social Networking and Meet-ups
- Culture Experiences and Art
- Tourism
- Smart Grid
- Sustainability
- Quality of Life

**"Smart Region"**

- UC-Riverside Medical School
- Loma Linda University & Medical Center
- Ivy
- Kelly Space and Technology
- Cal State University San Bernardino
- Others???

Riverside, CA  
— Awarded 2012 Most Intelligent Community in the West

**What the GIG?**

Chattanooga, TN

[www.thegigcity.com](http://www.thegigcity.com)

**GIG CITY**


**GIG TANK**

**GIG PRIZES**




**Inland Empire  
Regional Broadband Consortium**

- **Lea Deesing**
  - Chair, IERB Executive Committee
  - Chief Innovation Officer, City of Riverside
  - Executive Director, Smart Riverside




**SMARTRIVERSIDE**

## What is SmartRiverside?



## MULTI-FACETED

- Digital Inclusion
  - 7000+ Computers given away to low income families
- At-risk Youth Mentoring
- STEM Speaker Outreach
- New Coding Program
  - Kids
  - At Risk Youth
  - Veterans
  - Girls
- Fiscal Agent for smart initiatives
  - IERB
  - Hackathon

**SMARTRIVERSIDE**

## Digital Inclusion

- Helps narrow the digital divide
- Available to low income families
  - Free Technology Training
  - Free PCs (over 7000 so far)
  - Free Microsoft Office
  - Free PC Support
  - Free Computer Labs
- Funded by grants, golf tournament, donations



"Raise your hand if you have never used a computer before."



**SMARTRIVERSIDE**

## At-Risk Youth Mentoring

- SmartRiverside mentors at-risk youth
  - Project BRIDGE
  - Youth Opportunity Centers
  - Workforce Development on the job training
  - Role Models
- Jesse's story




**SMARTRIVERSIDE**

**NEW**

## Science, Technology, Engineering, and Math Outreach

- STEM Outreach
  - 700+ students in region in January
  - Annual speaker at the 8<sup>th</sup> Grade Girls Math and Science Conference American Association of University Women (AAUW)
  - Nontraditional Employment for Woman (NEW) day at RCC
  - Internship Program



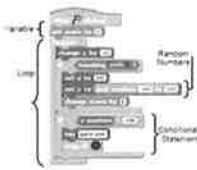

**SMARTRIVERSIDE**





**NEW Coding Program for Kids**

- Coding programs for 4 – 8, partner with school districts
  - Google CS First
- Robotics Coding for 9 – 12
  - Raspberry Pi Kits
  - Internships for College Level City Internships







SMARTRIVERSIDE

Google CS First Site Photo


**Fiscal Agent**

- Fiscal Agent for Inland Empire Regional Broadband Consortium (IERB)
- Sponsor & Fiscal Agent for RivCodes
- Computer programming competition

Inland Empire Regional Broadband Consortium

- LOCAL GOVERNMENT SOLUTIONS**
- Fiber: Implementation Process and Requirements**
  - Ordinances
  - Planning Process—CFQA
  - Engineering Estimates—Budget in Project
  - Capital Improvement and Major Infrastructure
  - GIS Mapping
- Urgency for Action**
- Funding**




**Bill Bayne, P.E.**  
Municipal Utilities & Public Works Commissioner  
City of Redlands  
and  
Cal OES Safety Assessment Engineer

Inland Empire Regional Broadband Consortium

**CLOUD COMPUTING**



- BROADBAND AND ECONOMIC DEVELOPMENT**
- 11 Case Studies in the Inland Empire
- New business paradigm: Cloud = Need for speed
- Small business—Broadband availability, speed, and cost matter
- Business-level Internet costs—its higher than you think
- Business chases high speed internet—its not so easy to get it
- What about businesses that can't move?
- Economic Growth depends on business-level Broadband speeds
  - Priorities:**
    - Areas planned for economic growth need to have business level internet service.
    - Educate lending agents about business internet needs—speed, quality, and cost matter.



**Michael Mack, CEO**  
NETREVA

Inland Empire Regional Broadband Consortium

- ARE YOU GETTING ENOUGH FIBER IN YOUR DIET?**
- Broadband Economic Development Divide**
  - What is it? Who is involved?
- Commercial/Industrial Locational Analyses**
  - Challenges in a digital world
- Municipal and regional government shortsightedness**
- Call for unification of open source geographic information**
- What do we do?**
- Policy Directives at the local, regional and state level.**

**Emil Marzullo, CEO**  
P3 Global Solutions

Inland Empire Regional Broadband Consortium

- [www.cetfund.org](http://www.cetfund.org) — California Emerging Technology Fund (CETF)
- [www.iebroadband.com](http://www.iebroadband.com) — Inland Empire Regional Broadband Consortium
- [www.cpuc.ca.gov](http://www.cpuc.ca.gov) — California Advanced Services Fund (CASF)

**IERB Consortium Contact:**

Martha van Rooijen, MVR Consulting  
Consortium Manager  
martha@iebroadband.com or (951) 845-4391



# Inland Empire Regional Broadband Consortium

General Assembly Meeting  
November 19, 2013

**Inland Empire  
Regional Broadband Consortium**

Priority Communities  
Riverside County

- Anza, Mountain Center and Pinyon Pines
- Mecca and Thermal
- Ripley
- Aguanga

- Riverside County Priority Community
- Anza, Mountain Center, and Pinyon Pines
- Aguanga
  - Population: 5,800
  - Housing Units: 3,058
  - Unserved and Underserved
  - Camp Ronald McDonald
  - Idyllwild Arts Academy
  - Cahuilla Band of Indians
  - Santa Rosa Band of Cahuilla Indians
  - Anza Electric Cooperative
  - Multiple Anchors in Community that need Broadband

- Riverside County Priority Community
- Mecca and Thermal
  - Population: 11,442
  - Housing Units: 2,791
  - Unserved and Underserved
  - Thermal Airport
  - Farm Worker Community
  - Multiple Anchors in Community that need Broadband

**Inland Empire  
Regional Broadband Consortium**

Priority Communities  
San Bernardino County

- Red Mountain, Searles Valley, and Trona
- Phelan and Pinon Hills
- Morongo Basin

- San Bernardino County Priority Community
- Phelan and Pinon Hills
  - Population: 21,000
  - Housing Units: 8,144
  - Unserved and Underserved
  - Phelan-Pinon Hills Community Service District
  - Verizon will not expand services
  - New High-Desert Transportation Corridor: Victorville to Palmdale



- San Bernardino County Priority Community
- Morongo Basin
  - Population: 59,356
  - Housing Units: 29,238
  - Unserved and Underserved
  - Joshua Tree National Park
  - Marine Corps Air Ground Combat Center
  - III-Desert Medical Center
  - Morongo Unified School District
  - Sheriff, Police and Fire Stations



# Inland Empire Regional Broadband Consortium

General Assembly Meeting  
November 19, 2013

- San Bernardino County Priority Community
- Red Mountain, Searles Valley, Trona
  - Population: 1,864
  - Housing Units: 1,068
  - Unserved and Underserved
  - Take Advantage of "Digital 395"
  - Red Mountain is literally on Digital 395 Path
  - Trona Unified School District
  - Community Anchors—Sheriff Fire Stations
  - Star Trek V: The Final Frontier was filmed in Trona






- Healthcare and Telemedicine
  - Doctors Visit's Online
  - Medical Kiosks
  - California Telehealth Network








- Education
  - Online Education—connectivity is needed at home and school. Other ideas?
    - 10/31/2014, Coachella Valley Unified School District: WiFi on all School Buses next year
      - Students can go online to use their district-issued iPads to and from school.
      - School Buses will be parked overnight in some low-income neighborhoods and trailer parks
      - Funded with School Bond—Internet Infrastructure, iPads, Bus-mounted Routers...
    - Snowline School District "Virtual School" 3<sup>rd</sup> grade to High School
    - Redlands e-Academy K-12
    - CETV School2Home
  - School District Technology Plans -- E-Rate
  - San Bernardino Community College Digital Consortium
    - Documenting Technologies and Digital Media Sector Resources
    - Help align workforce with the needs of employers in our region






- Local Government Broadband Solutions
  - Loma Linda Connected Community Program
    - Fiber to the Home (FTTH) and everywhere
    - City Ordinance
    - Municipal owned-operated
    - Economic Growth
  - City of Beaumont FTTH (New Housing Developments)
    - HOA's contract with ISP: Greenfield Communications
    - Fiber runs to closet—All homes have Fiber
    - High Speed Internet always on, paid for in HOA Fees
  - City of Ontario Fiber Plan
    - Fiber Optic Master Plan Beyond

SMART RIVERSIDE



## What is SmartRiverside?

#VeridoCa.gov

## MULTI-FACETED

- Digital Inclusion
  - 7000+ Computers given away to low income families
- At-risk Youth Mentoring
- STEM Speaker Outreach
- New Coding Program
  - Kids
  - At Risk Youth
  - Veterans
  - Girls
- Fiscal Agent for various similar initiatives
  - IERB
  - Hackathon

SMART RIVERSIDE

## Digital Inclusion

- Helps narrow the digital divide
- Available to low income families
  - Free Technology Training
  - Free PCs (over 7000 so far)
  - Free Microsoft Office
  - Free PC Support
  - Free Computer Labs
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SMART RIVERSIDE

## At-Risk Youth Mentoring

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  - Project BRIDGE
  - Youth Opportunity Centers
  - Workforce Development on the job training
  - Role Models
- Jesse's story






SMART RIVERSIDE

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## Science, Technology, Engineering, and Math Outreach

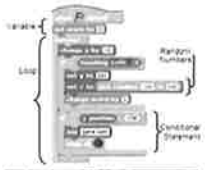

- STEM Outreach
  - 700+ students in region in January
  - Annual speaker at the 8<sup>th</sup> Grade Girls Math and Science Conference American Association of University Women (AAUW)
  - Nontraditional Employment for Woman (NEW) day at RCC
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SMART RIVERSIDE

## Coding Program for Kids

- Coding programs for 4 – 8, partner with school districts
  - Google CS First Robotics Coding for 9 – 12
  - Raspberry Pi Kits
- Internships for College Level
  - City Internships

Google CS First Box Photo



SMART RIVERSIDE

## Fiscal Agent

- Fiscal Agent for Inland Empire Regional Broadband Consortium (IERB)
- Sponsor & Fiscal Agent for RivCodes
  - Computer programming competition





RiversideCo.gov



### Loma Linda's Ordinance

- Data Cabinet in Master Bedroom
- 2 Cat 6 in each living space
- Fiber into Data Cabinet and Community MDF.
- Fiber throughout the development.
- Build a community MDF
- Deed the infrastructure over to the City once completed.
- Cost to the Builder ~ \$3,500 per unit







### Developer Reaction

- **Guarded at first**
  - Concerned about cost
  - Concerned infrastructure would not be utilized
- **Today**
  - See infrastructure as a value added product.
  - Up sell smart home components.
  - Easy to recover the cost of infrastructure on sale price

### Underground Construction



- Four self healing metropolitan fiber rings.
- Each ring covers a quadrant of the city.
- Automatic failover.
- Single mode fiber.

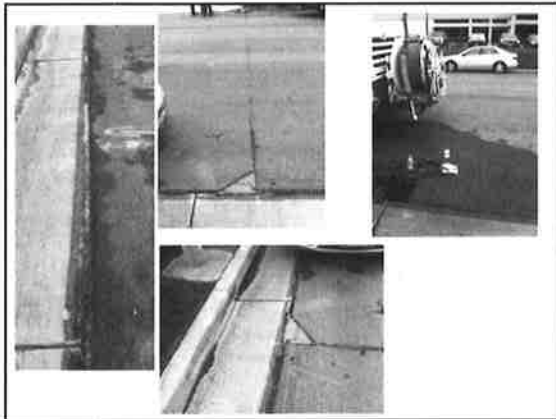
### Micro Fiber Construction



### Micro Trench

- Fast
- Little Restoration
- No Traffic Control



Cut through depth of asphalt into base



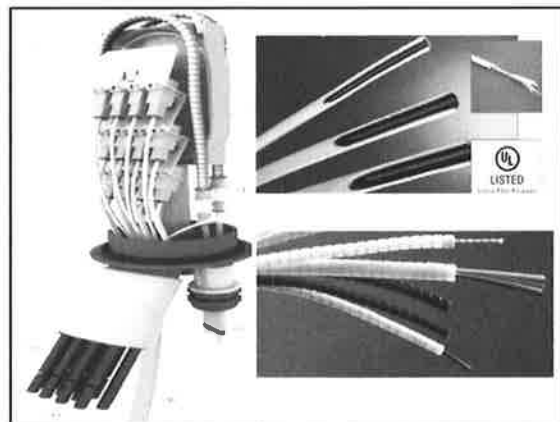
Pass under curb and gutter



Micro Duct to pull box and duct splice



24 strand cable inside Micro Duct



### What we learned

- Construction method it fast, requires little restoration and is scalable
- Materials are easy to use and require little training or specialized knowledge
- Some traditional conduit construction is still necessary
- Residents are responsive to the program
- Over 50% of residents signed up

### \$3200 per House Connected

\$2500 Construction



\$200 Distribution



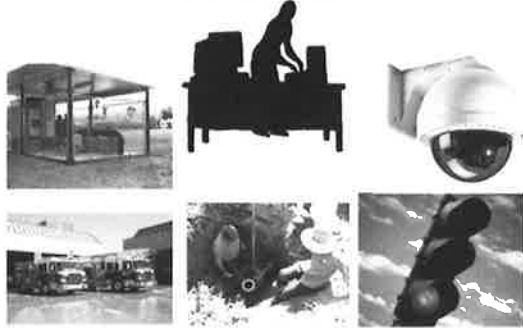
\$500 Electronics



### Why do we need it?



### City Services



### Provides for economic growth



### Inland Empire

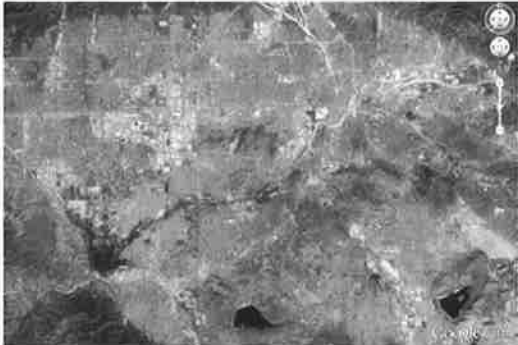




### Inland Empire

- Population: 4.2 Million  
Phoenix Metro Area: 4.3 Million  
Seattle/Tacoma Metro: 3.6 Million  
Oklahoma City Metro: 1.2 Million
- 13<sup>th</sup> Largest Metro Area in US
- No Television station
- 20% are college grads
- Median Household Income: \$59,900

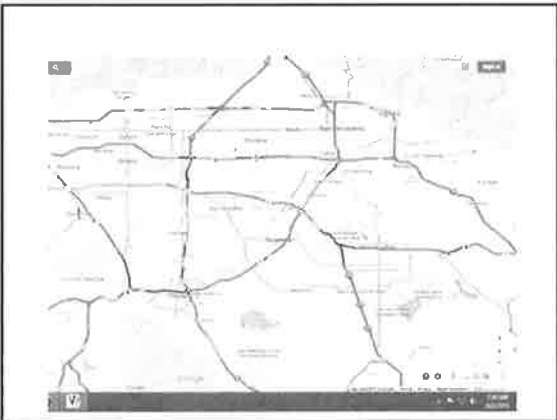
### Inland Empire



### Inland Empire



### Inland Empire



### Today's 21 year olds

Watched 20,000 hours of TV  
 Played 10,000 hours of video games  
 Talked on the phone for 10,000 hours  
 Sent 250,000 emails or text messages  
 50 % have Created content on the web  
 70% of 4 year olds have used a computer

### What Where When Why How

**Internet searches per month 6.4 billion searches per month**

Google	2,733,000,000
Yahoo	1,792,000,000
MSN	845,000,000
AOL	486,000,000
Ask	378,000,000
Others	166,000,000
<b>Total</b>	<b>6,400,000,000</b>

**Who answered these questions before the internet?**

### Shared Knowledge

At the end of 2013 there were more than 750,000 **Wikipedia** articles in English

**Less than 1/3** of Wikipedia's content is in english

Wikipedia is now the **8th most popular website** in the world.

Despite this, Wikipedia has only has **10 fulltime positions**

### The amount of technical and scientific information doubles every 2 years

½ of what a student starting a 4 year degree learned in the 1<sup>st</sup> year is outdated by the 3<sup>rd</sup> year

**By 2020 it will double every 72 hours**

The US Department of Education estimates today's high school student will have 10-14 jobs....

### By age 38

1 of 4 workers works for a company where they have been employed less than 1 year

**Less than 1 in 2 have worked for the same company for 5 years**

- We are preparing students for jobs ... that don't yet exist
- Using technologies ... that haven't been invented
- In order to solve problems ... that have not been discovered

## Designing and Installing Fiber Optics to Maximize Your "Smart Community"



### What is Fiber Optic cable?

Fiber Optic cable is made of super-thin filaments of glass that can carry beams of light. Because a fiber-optic cable is light-based, data can be sent through it at the speed of light (almost unlimited capacity). Using a laser transmitter that encodes frequency signals into pulses of light, ones and zeros are sent through the cable. The receiving end of the transmission translates the light signals back into data which can be read by a computer. Because fiber optics are based entirely on beams of light, they are less susceptible to noise and interference than other data-transfer mediums such as copper wires or telephone lines.



## Designing and Installing Fiber for the "Smart Community"

### Installing Fiber will:

1. Improve services offered in your community by providing fast Internet service, more communication options, reliability, and better customer service
2. Differentiate and future-proof your communities through technology

### Design Factors to Consider:

1. "Passive" (not requiring power) designs are the most reliable and will future proof the outside plant.
2. Installing Active (requires power) components reduces the amount of fiber required in the outside plant but adds components that will require maintenance and possibly require upgrading when more bandwidth is needed.

## How Greenfield Provides Communication Services

### Greenfield Offers High Speed Internet, Digital Telephone and Video Packages:

1. Internet speeds starting at 20 Mbps up to 1 Gbps
2. Phone packages starting at \$9 per month
3. Greenfield is a certified dealer for both DirecTV and Dish Network. We can deliver either over fiber if the fiber is in private streets or easements.
4. Greenfield has a California State Video Franchise allowing us to deliver traditional cable TV packages over fiber in public streets.

### Marketing and Pricing:

1. Having the best fiber optic infrastructure and services is not enough. A sound marketing strategy is critical to getting the word out about the value being delivered and to encourage (spread the word) for people to live in your new "Smart Community"
2. Greenfield typically includes an Internet package as a bulk offering whether to master planned communities, apartments or condominiums. This allows further price discounts.

## Premium, Concierge Customer Service

Greenfield delivers all fiber optic communication services with the highest level of customer (concierge) service. Concierge service means...

- After hour service calls (nights, weekends)
- No four or six hour service windows, if we say 4 PM we're there at 4 PM.
- 24/7 call center
- Dedicated and knowledgeable field reps for each project
- Attend community functions and events
- Become an integral part of the community
  - Local Tech committees
  - Tie security cameras to the fiber network
  - Community websites

## Our Team in Action

Setting a Cabinet for an Ethernet Access Circuit (right)

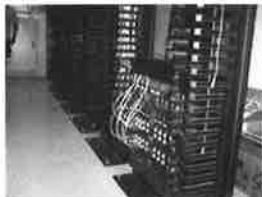
Installing a below-grade Optical NOC (below)



### Optical Equipment

Optical Transmit Equipment and Fiber Management (right)

Optical Lasers (below)



### Optical Equipment

EDFA and CWDM (right)

Video Headend (below)



### Optical Equipment

Fiber Management (right)

In-Home Structured Wiring Panel (below)



### Outside Plant

Fiber Splice Closure with Slack (right)

Fiber Optic Splicing Trailer (lower right:)



### Back-Up Systems

Mobile Optical Headend (right)

Battery Back Up (below)



### Maintenance and Emergency Response

Maintenance and Emergency Response Crew(right)

Repairing a fiber cut in a 288 count fiber (below)



**Photo Gallery of Communities we Serve**

Fairway Canyons in Beaumont (right)



Ivy in China (below)



**Photo Gallery of Communities we Serve**

Rancho Murietta (right)



Township 9 in Sacramento (below)



**Photo Gallery of Communities we Serve**

College Park in Chino (right)



Lincoln Crossing in Lincoln (below)




**Projects we Serve in California**

Amerige Heights in Fullerton  
 Lincoln Crossing in Lincoln  
 Fairway Canyon in Beaumont  
 College Park in Chino  
 Township 9 in Sacramento  
 Northwest Landpark in Sacramento  
 Ivy in Chino  
 Pacifica in San Juan Capistrano  
 Riverbend in Orange  
 Vero in Carson  
 Sage Park in Gardena  
 City of Rancho Murieta  
 Cannery Place in Sacramento

**Home Builders we have worked with**

KB Homes  
 Lennar  
 Greystone  
 Pulte  
 New Home Company  
 Standard Pacific  
 DR Horton  
 Harmony  
 JD Pierce  
 John Lang  
 MBK  
 Olsen Urban Housing  
 Pacer  
 Pardee  
 Pinnacle  
 Ryan Homes  
 Ryland  
 Stratham  
 Woodside



## A TECHNOLOGY VISION FOR THE CITY OF LOS ANGELES

**Eric Garcetti**  
Mayor

**CityLinkLA**

**THE GOAL:** Getting fiber to every facility in Los Angeles along with a WiFi network in developed areas to enable visitors and students to get access to broadband anytime and any place. A portion of this network must be free to serve our low income and those without a PC or broadband access.

www.citylinkla.org @CITYLINKLA

"Having Los Angeles as a Gigabit Community will enhance our position in the global economy by encouraging high-tech companies to move to or stay in this great city."  
**Mayor Eric Garcetti**

"Los Angeles needs to be part of Next Century Cities to encourage other communities around the United States that broadband success is a local issue and we need to work with each other to determine how we can deliver services to our citizens."  
**Councilman Bob Blumenfeld**  
Council District 3  
Chair: Innovation, Technology & General Services Committee

### WHAT IS CITYLINKLA


- A 1 Gigabit connection for City residences at ~\$70/month with 5Mbps for free
- WiFi in developed areas of the City for free
- Business class broadband options everywhere at competitive prices

**CityLinkLA**  
REDESIGNED BY

### What the RFI told LA . . .

From 37 responses:

- Permitting Process Needs Improvement (must be expedited)
- Access to Right of Way
- Access to LADWP Fiber & Poles
- Access to Street Lights
- Access to City Facilities
- Single Point of Contact



**City split into 4 Zones**

### DEPARTMENTAL COMMITMENT - DIPG


LACBN Digital Infrastructure Permitting Group  
Position Summary and Salaries

Department	No.	Class Code	Description	2010	2012	2014
Building and Safety	1	4601 SR STRUCTURAL ENGINEER	Single Point of Contact II	\$103,488	\$118,278	\$133,278
Building and Safety	1	4626 PRINCIPAL INSPECTOR		\$94,240	\$107,712	\$121,712
Building and Safety	1	4602 STRUCTURAL ENGINEER ASSOCIATE II		\$73,816	\$83,712	\$94,272
Bureau of Contract Admin.	1	2228 SA CONSTRUCTION SUPERVISOR		\$103,312	\$118,464	\$133,824
Bureau of Engineering	1	5034 CIVIL ENGINEER I/II		\$100,260	\$114,912	\$129,816
Bureau of Engineering	1	5035 CIVIL ENGINEER I/II		\$98,416	\$112,728	\$127,272
Bureau of Street Lighting	1	2282 ST LIGHT ENGINEER		\$82,872	\$94,656	\$106,896
Bureau of Street Services	1	2232 ST ENGINEER PUP		\$100,248	\$114,912	\$129,816
Bureau of Street Services	1	2236 ST ENGINEERING ASSOCIATE II		\$75,176	\$85,008	\$95,008
City Attorney	1	2012 COUNSEL ATTORNEY II		\$115,944	\$131,784	\$147,784
Department of Finance	1	2263 SENIOR REAL ESTATE OFFICER		\$85,296	\$97,344	\$109,824
Planning	1	2242 PL CITY PLANNER		\$105,816	\$120,216	\$134,856
Transportation and Parks	1	2001 COMMUNICATIONS ENGINEER ASSOCIATE II		\$79,500	\$90,720	\$102,000
Transportation	1	2128 TR ENGINEER I/II		\$108,864	\$123,312	\$137,832
Water and Power	1	3024 SENIOR STATION LAYOUT MAN (S/L)		\$99,888	\$113,936	\$128,336

Total: 15 | \$1,644,888 | \$1,894,848

### WHAT WE ASKING FROM CITY DEPARTMENTS


- Collaborative teamwork and resources
- Improved permitting
- Access to Rights of Way, data, city infrastructure and facilities



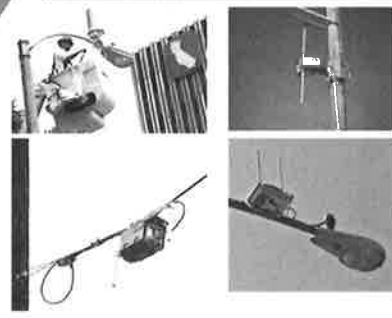
### DEPARTMENTAL COMMITMENT - DATA.LACITY.ORG



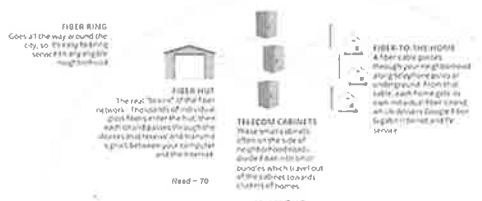
### What Does A Network Look Like?



### What Does A Network Look Like?



### What Does A Network Look Like?



**FIBER RING**  
Goes all the way around the city, so it's like having service in any neighborhood.


**FIBER HUB**  
The red "box" of the fiber network. Thousands of individual glass fibers enter the hub, where each is amplified through the fibers and then sent to your computer and the internet.

**TELECOM CABINETS**  
These small cabinets sit on the side of neighborhood roads, divided into separate bays which are used out of the boxes towards clusters of homes.

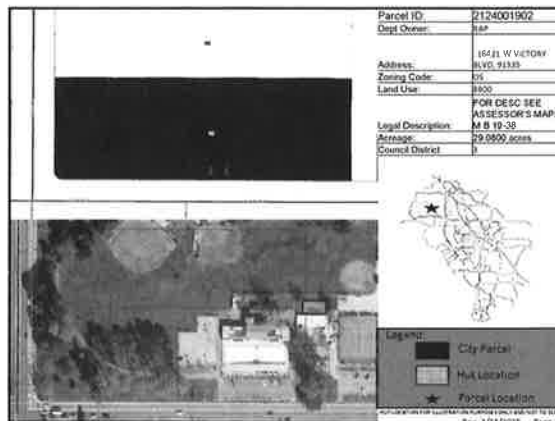
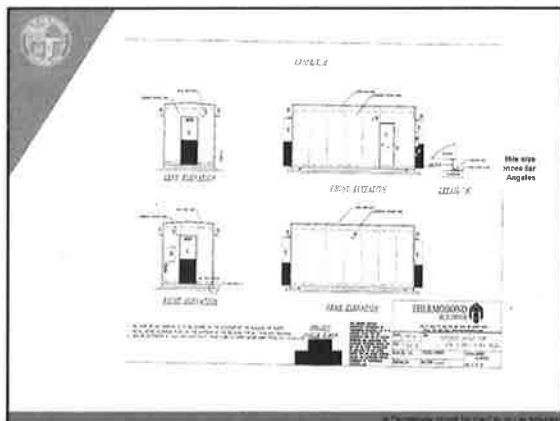
Need - 70  
Need - 1500

### What Network Facilities Look Like?

One per 20,000 residences



GOAL: Identify whether these could be placed at corporate yards, parks, parking lots without planning issues



### What Do Above Ground Facilities Look Like?

One per 200 residences

GOAL: Identify whether these could be placed at police/fire stations/libraries externally without planning issues

### 186 Proposed Sites

- Street Lighting
- LADWP
- Ports
- Street Services
- Animal Services
- HACLA
- LAFD
- LAPD
- DOT
- Sanitation
- Recreation & Parks

### WHAT BENEFITS TO LOS ANGELES

- Requesting free broadband to the 188 BTOP Training facilities (many Recreation Centers)
- Lower cost, higher speed internet services
- WiFi across LA

### Goal: Streamline Following Processes


- **Regulatory Permits/Policies**
  - Access to City Right of Way (streets, PUE)
  - street lights, underground facilities, etc.
  - work hours, night time work, etc
- **Land Use Approvals**
  - City assets outside of ROW (land, buildings)
  - Private Property
- **Digital Infrastructure Permitting Group and Single Point of Contact**



**Expediting Leasing - Types**

- Access to LADWP fiber and poles (fiber)
- Access to Bureau of Street Lighting streetlights (wireless)
- Access to City facilities (fiber/wireless)


**Could LADWP be the fiber backbone?**



**TIMELINE FOR CITYLINKLA**

- RFP Release – April 2015
- RFP Responses due – September 2015
- Contract Award – Q1 2016

[www.citylinkla.org](http://www.citylinkla.org)




"Digital Inclusion & eWaste Recycling Pilot"

Launched in February 2015

**Background**

- Implement an 18 month pilot leveraging 10,000+ City PC's
- Provide approx. 3,500+ free refurbished computers to low-income families and communities where people have limited computer access.
- Provide job training for disadvantaged and hard to employ for refurbishing and recycling.
- Expand program in the future through partnerships with private sector & community for PC donations for ongoing sustainability.

**OurCycle LA Team**

- **Leadership:** Mayor Garcetti, Council President Wesson, ITGS Chair Blumenfeld
- **Supporting Depts:** ITA, GSD, Sanitation and City Attorney
- **External Partners:** Non profits & social enterprises
- **Funding Partners:** CETF, RedF & Citibank

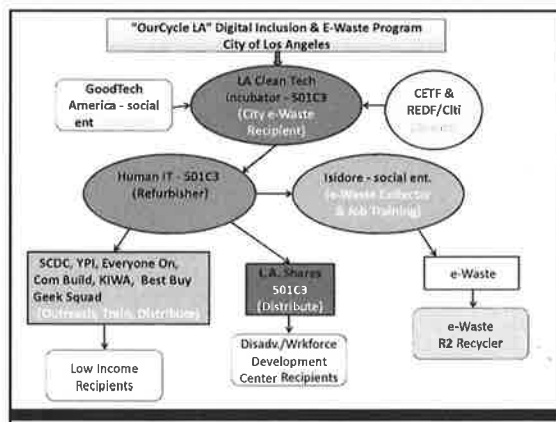
### Goals

- Increase digital and internet access for low-income communities;
- Establish a framework for a burgeoning e-waste management sector in LA;
- Provide job training and career paths for the disadvantaged and hard to employ;
- Minimize LA's e-waste footprint; and
- Implement a self-sustaining business model.

### 10,000 Sq. Ft. Space


### 10,000+ Computers & Growing...

### Public Private Partnership



### Pilot Computer Distribution

- **Baldwin Village and Koreatown Adoptions.**
- **Non Profits in the City serving the low income community with existing public access or workforce computer centers.**



### Grant Funding

- **Digital Literacy** - \$150,000 in grant funding from the California Emerging Technology Fund (CETF), for digital literacy start up and operational costs for the Pilot Program for the period September 1, 2014 to January 31, 2016.
- **Job Training** - \$100,000 in grant funding from REDF & Citibank (\$50k ea) for job training and employment opportunities for disadvantaged and hard to employ.
- **Program Expansion** - The Mayor's Fund has selected the OurCycle LA Pilot as one of its priority programs.

### Outcome Metrics - 2015

- Refurbish 2,500+ computers
- Facilitate 1,500+ new broadband Internet subscriptions at home
- Provide digital & financial literacy training to 2,500+ individuals
- Train 75 youth/adult volunteers assisting with computer refurbishing-related work
- Distribute 1,250+ refurbished computers to individuals/families
- Distribute 1,250+ refurbished computers to non-profit organizations

### Timeline

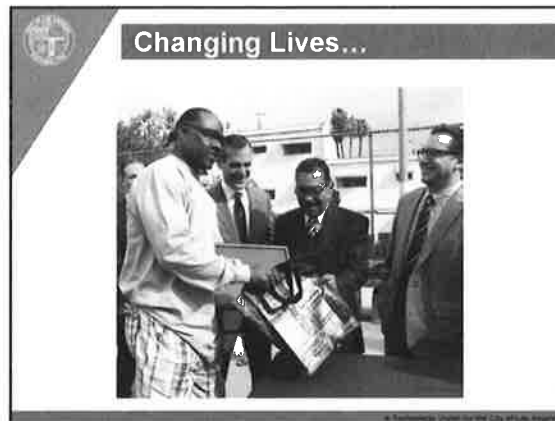
Feb 2014	May 2014	May 2014	June 2014 - ongoing	July - Aug	Aug to Nov 2014	Nov 2014 - ongoing	Feb 2015	2015 to early 2016
	ITCS Comte approval of digital inclusion program	City Council approval of digital inclusion program	OurCycle partners with 1,000+ computers	OurCycle partners with 1,000+ computers	OurCycle partners with 1,000+ computers	OurCycle partners with 1,000+ computers	Press event to announce program and distribute first batch of approx 500 computers to low income families and non-profits	

### February 27, 2015 Launch Event



### CETF Funding Partner






  
**PRAXIS**  
 ASSOCIATES  


---

**The Digital 395 Experience**  
**CETF – Local Government Roundtable**  
 Michael Ort  
**April 2, 2015**





### A Transformative Infrastructure




Los Angeles Aqueduct - 1913


US 395 – 1910 to 1940



Digital 395- 2013

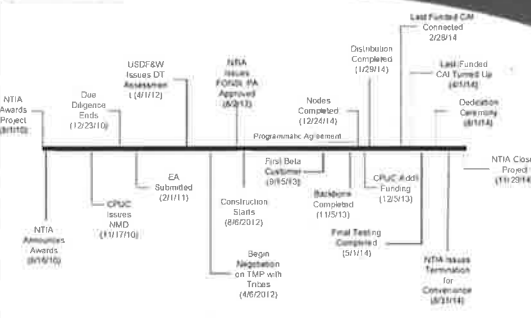


### Digital 395 Project




- Spans Eastern Sierra: Reno to Barstow
- \$109M Fiber Optic Middle Mile Project
- Funding: NTIA / CASF
- 432 Strand Underground Cable
- 11 Node Sites for Local Distribution
- 275 Anchors and 49 Points of Interconnection
- Presently: 150Gbps (2 Strands) – 8.1Tb

### Challenges: Time



Key milestones include: NTIA Awards Project (8/15/10), EA Submitted (2/1/11), Construction Starts (8/22/12), First Beta Customer (9/15/13), Backbone Completed (11/15/13), Final Testing Completed (5/1/14), and NTIA Closes Project (11/29/14).

### Challenges: Environmental




Typical Archeological Evaluation Site

- Federal / Consultancy / Agency Control
  - > Incompatible Agency Environmental Guidelines = PA
  - > 485 Cultural Sites (Avoidance Approach)
  - > 83 Sensitive / Critical Species (No "Takes")
  - > \$25.3MM of Environmental-Related Costs
- Resource-constrained agencies "tap in"
- Acquired ROW and Environmental Staff
  - > Separated Study from Mitigation Measures
  - > Hired Consulting firm
  - > Developed close, personal relationship with Agencies
  - > Renegotiate mitigation as events unfolded, saving \$6M - \$8M
  - > Escalated issues to Senior Levels
    - > Governor's office/agency heads
    - > Senator Bover's office
    - > Secretary of the Navy

### Proposed Digital 299 Project

Digital 299 – Complete Route



Legend:
 

- Nodes — Digital 299 Path
- Towns — Outfall Pipe
- Whiskeytown National Recreation Area
- Bureau of Land Management
- Six Rivers NF
- Shasta-Trinity NF


### Digital 299: Applying Lessons

- Stakeholder Alignment
- Funding
- Permits
- Timing
- Broadband Adoption
- Applications Development




For Discussion Purposes Only

### A New Conversation . . . Sustainability



For Discussion Purposes Only

### Challenge: Make a Difference



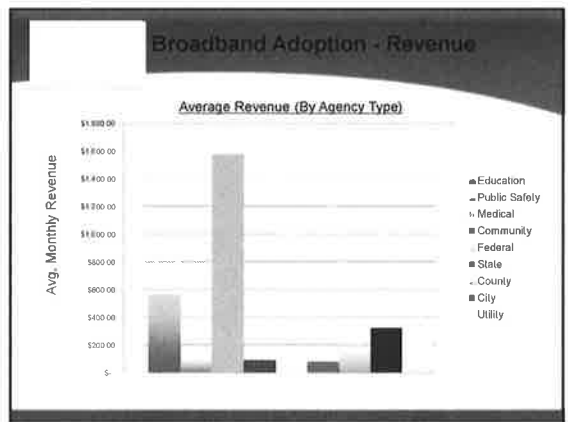
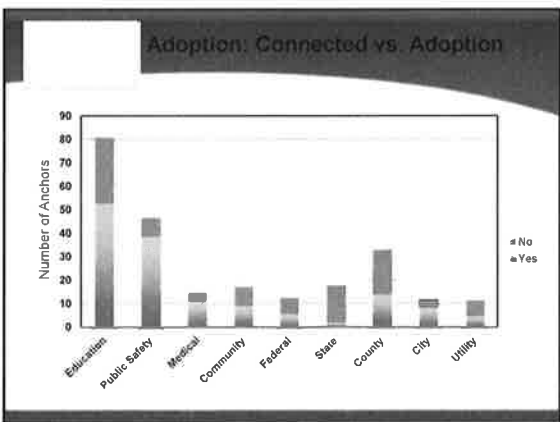
- Market Strategy: Be Disruptive
  - Wholesale Model (GEM Anchors & Last Mile)
  - Flood the region with broadband to stimulate application use and development
  - Establish metro or better pricing and product offering
  - Many points of interconnection, shareable assets
- Last Mile Channel Strategy
  - Adopt model of "Cooperation, not Competition"
  - Symbiotic relationship – Mutual Benefit
  - Last Mile Providers will stimulate demand
  - Encouraged expansion of Last Mile solutions
- Results
  - Immediate: Bandwidth Restrictions Lifted
  - 10x increase in bandwidth, no additional costs

For Discussion Purposes Only

### Typical Digital Educational Solution

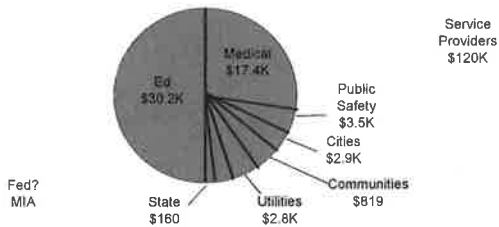
ILEC Solution	Digital 395 Solution	
<ul style="list-style-type: none"> <li>• 3 Mb (2 Bonded T-1s)</li> <li>• \$3,000 Per Site</li> <li>• Net Local Cost: \$300</li> <li>• \$ 1500 / Mb (\$150 local)</li> </ul>	<ul style="list-style-type: none"> <li>• 100 Mbps Ethernet</li> <li>• \$400 Per Site</li> <li>• Net Local Cost: \$40</li> <li>• \$ 4 per Mb (40¢ local)</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Gig Ethernet</li> <li>• \$2,000.00 Per Site</li> <li>• Net Local Cost: \$200</li> <li>• \$ 2 per Mb (20¢ local)</li> </ul>

For Discussion Purposes Only



## Challenge: Sustainability

Monthly Revenue Contribution



Education	Public Safety	Medical	Communities	Federal	State	County	City	Utility	Service Providers
\$ 32,147,211	\$ 3,324,777	\$ 17,400,000	\$ 819.99	\$	\$ 160.00	\$ 7,020.00	\$ 2,940.00	\$ 1,845.00	\$ 120,000.00

## Who is Praxis?

### Praxis Associates

- > A Network Development Corporation
- > Public and Private Networks / Publicly or Privately Funded
- > Full-Service capability (Propose, Design, OSP, Nodes, Commissioning)
- > Companion Service Provider Company: Inyo Networks

### Praxis Eco-System



## CETF Local Government Roundtable and CENIC

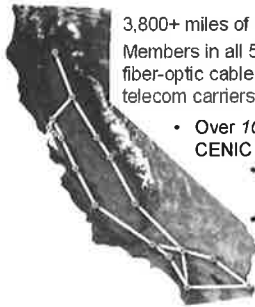
April 2, 2015  
 Louis Fox, President & CEO

### CENIC: California's Research & Education Network

- CENIC is a 501(c)3 created to serve California's K-20 research & education institutions with cost-effective, high-bandwidth networking
- Five Charter Associates: California Community Colleges, California K-12 System, California State University System, Private Universities, and the University of California System



### CENIC: California's Research & Education Network



3,800+ miles of optical fiber  
 Members in all 58 counties connect via fiber-optic cable or leased circuits from telecom carriers

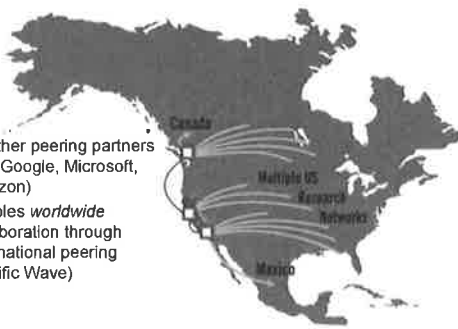
- Over 10,000 sites connect to CENIC
- 20,000,000 Californians use CENIC
- Governed by members on the segmental level

### CENIC: California's Research & Education Network



- Three networks operate simultaneously as independent layers on a single infrastructure
- CalREN-Digital California (DC): daily use for e-mail, web browsing, videoconferencing, etc.
- CalREN-High-Performance Research (HPR): high-performance research for big-science "power users"
- CalREN-eXperimental Development (XD): bleeding-edge research on network itself

### CalREN and the US



- 88 other peering partners (inc. Google, Microsoft, Amazon)
- Enables worldwide collaboration through international peering (Pacific Wave)

### CalREN and the World





**CENIC Makes CA Research & Education  
Part of a Worldwide Community**



\* Image taken from the Global Lambda Integrated Facility (GLIF) • [www.glif.io](http://www.glif.io)

**2015 CENIC Initiatives**

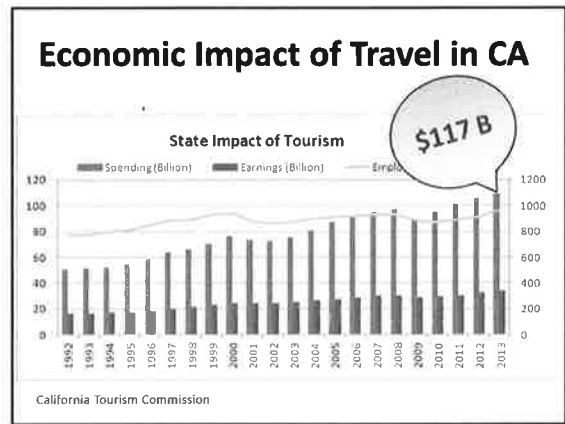
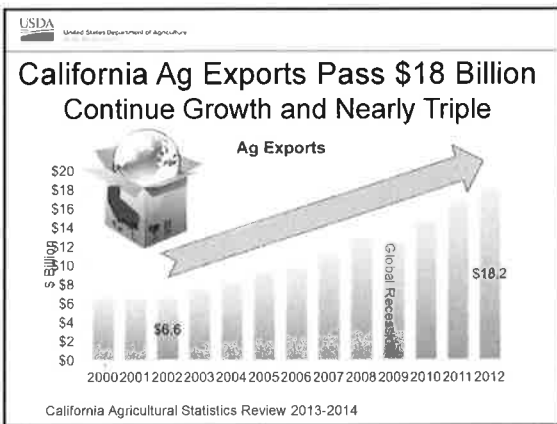
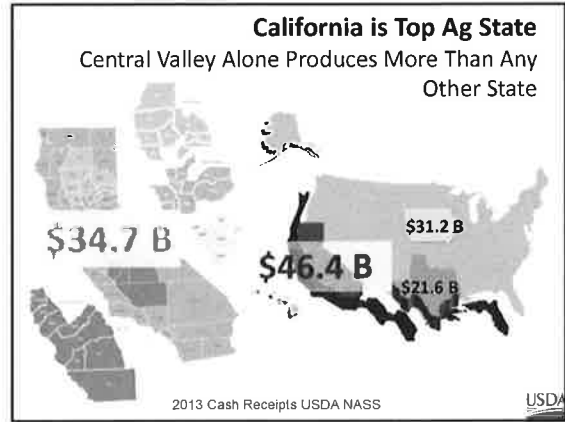
- ❖ California Community Colleges
- ❖ K12 Last Mile
- ❖ California Public Libraries
- ❖ 100G Backbone and Research Initiative
- ❖ New Commercial Partnerships



### Local Government Roundtable RURAL WIRELESS BROADBAND INFRASTRUCTURE STRATEGY OPPORTUNITIES

Robert Tse  
 USDA CA Rural Development  
 Mission Inn Hotel  
 Riverside, CA  
 April 2, 2015

United States Department of Agriculture



United States Department of Agriculture

### Disruptive Events

**DROUGHT**

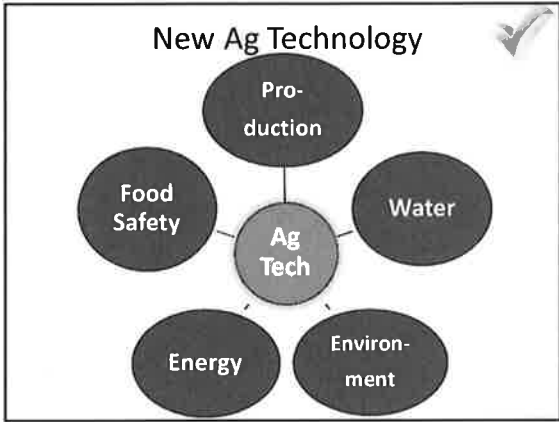
**Invasive Species**

**Shrinking Farm Labor Pool**

United States Department of Agriculture

### Disruptive Events

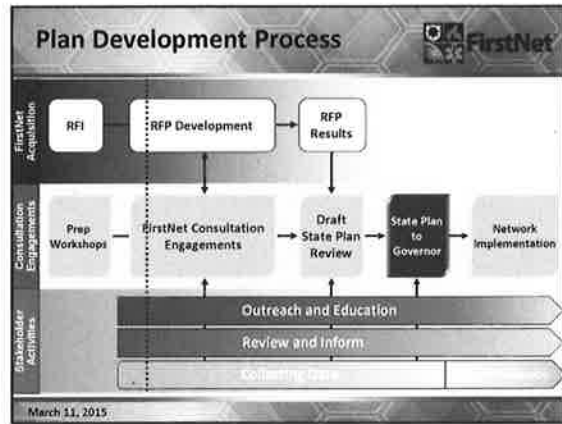
### Disruptive Technology



### Your Future 21<sup>st</sup> Century Agriculture Technology

### Positive Disruptive Events

## Digital 395



### Starting Coverage Objectives Data

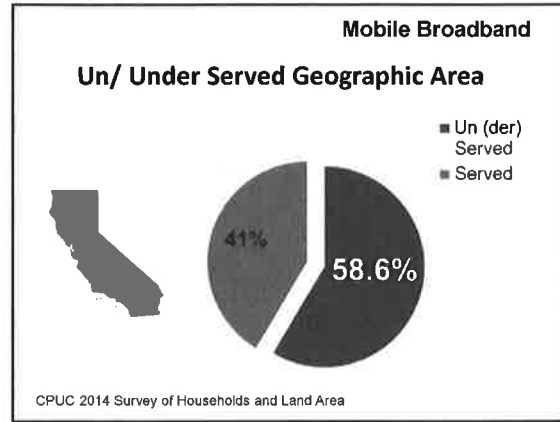
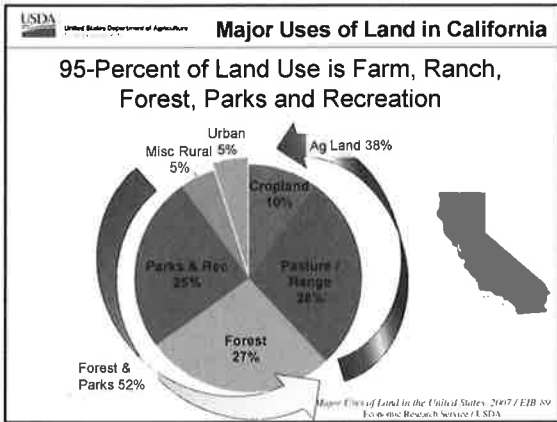
- Public Safety User Population (Source: HSP, OTC provided)
  - Public Safety User Density based on jurisdiction (OEC data to start)
  - Common response areas (EAD areas) - as it's made available with data collection
- Public Safety High Risk / Areas of Interest (Source: HSP)
  - Key facilities - PS agencies, corrections, airports, EOCs, hospitals, PSAs, schools, etc.
  - Critical infrastructure - manufacturing, energy, dams, etc.
  - Large Public Venues - stadiums, theme parks, malls
  - Other major event locations - if provided with initial consultation submission
  - Areas for feedback - tours/recreational destinations (parks, hiking, waterways, etc.)
- US Population (Source: 2012 US Census)
  - Population density
- Developed Areas / Buildings (Source: 2006 National Land Cover Database)
  - Dense / Medium / Light / Open / None
- Roadways (Source: Federal Highway Administration)
  - National Highway System
  - Average Daily Traffic Counts to identify significant secondary roadways
- Tribal Land
- Rural Metrics
- Federal Land

These will be incorporated with additional considerations (i.e. FirstNet Rural milestones) or via separate consultation (i.e. Federal)

March 11, 2015

### Public Safety

- Geographic
  - Urban / Town Centers
  - Forests
  - Farmland
  - Tribal Lands
  - Water Storage and Delivery
- Parks & Rec
  - Search and Rescue
  - Fire Fighting
- Farm and Ranch Land
  - Invasive Species
  - Contagious disease
- Disaster
  - Fire
  - Earthquake
  - Flood
  - Contagious Disease (Ebola)
- Physical
  - Police & Fire
  - Water & Sewer & Electric
  - Government Buildings
  - Schools
  - Telecommunications
  - Health Care facilities
  - Post Offices
  - Libraries
  - Disaster Evacuation and Staging Areas (Fairs)
  - Leaves
  - Transportation Centers & Systems (rail, air, roads)



**Platform for Rural Prosperity**

<b>RURAL WIRELESS BROADBAND</b>		
<b>NEW AGRICULTURE TECHNOLOGY</b>		
PRODUCTION	WATER	ENERGY
ENVIRONMENT	FOOD SAFETY	
<b>RURAL TELE-HEALTH / TELE-MEDICINE</b>		
Distance Learning	Public Libraries	
<b>TRANSPORTATION &amp; LOGISTICS</b>		
<b>PUBLIC SAFETY - FirstNet</b>		
<b>DIRECT MARKET ACCESS TO GLOBAL MARKETS</b>		
<b>Rural Agro Tourism &amp; Recreation</b>		

**USDA** United States Department of Agriculture

**Apps for Ag**

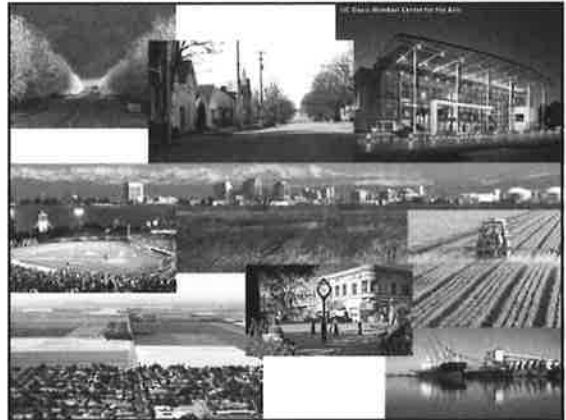
APRIL 17 - 19, 2015  
West Hills Coalinga Community College

**For More Information:**  
<http://www.apps-for-ag.com>

## Yolo's Broadband Strategy


CETF Regional Roundtable – April 3, 2015

Cecilia Aguiar-Curry, Mayor City of Winters  
Don Saylor, Yolo County Board of Supervisors




### Catalysts

- Realization of the Problem
- Missed opportunities (2012 CENIC build through Yolo, Woodland-Davis Water Project, ARRA grant, etc.)
- Needed unified effort
- Partners for grant funding
- Frustration re CPUC mapping
- Collaboration to bring state attention to local issues
- Economic Development imperative – both urban and high tech agriculture




### Creating Synergy

- Local leaders sounded the alarm
- Became "Yolo Leaders" topic (in May 2013)
- Decided YBSP was needed
- LAFCo would lead effort
- Regional Consortia
- CETF
- School 2 Home
- USDA
- CPUC



### Yolo Broadband Strategic Plan Process



- Hired consultant via RFP process
- Extensive surveys/speed test data
- Outreach
- Stakeholder Engagement
- Culminated in Yolo Broadband Strategic Plan
- Action Plan for each city and the County

### Strategic Plan Goals

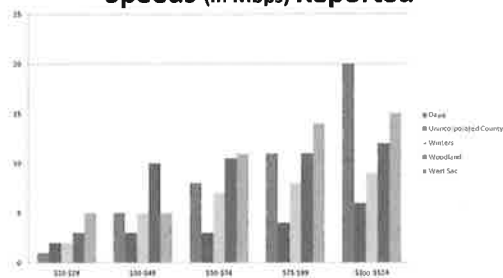
- Educate the community on broadband
- Positively affect broadband infrastructure and services
- Identify key short, mid and long-term initiatives
- Unified technology policy
- Identify key strategic broadband investments
- Identify broadband gaps

### Strategic Plan Tasks

- Community Profiles (i.e. Davis, West Sacramento, Winters, Woodland, and unincorporated areas of Yolo County):
  - Inventory of Existing Broadband Assets
  - Needs Assessment – Identify Broadband Gaps
  - Identify Broadband Demand – goals for economic development, agriculture, social justice, etc.
- Validate/Correct CPUC Coverage Map
- Outline and Prioritize Community Strategies including "middle mile" and "last mile" access
- Action Plan and Resources – a "road map" for each community's next steps for planning, funding, grants



### Monthly Cost Versus Speeds (in Mbps) Reported



### Findings

- 1,000+ speed test survey results
- Residential - half of survey results indicate underserved where CPUC maps show served (includes cities)
- Businesses - larger businesses can pay to get service they need, but small to medium just make due
- Disparity in service – even in cities
- Agriculture industry reports broadband is #1 need

This is not just a rural issue!

### Positive Outcomes

- Broadband has become a council/BOS priority issue
- Staff awareness - cultural shift to plan for broadband as essential public infrastructure
- No more missed construction opportunities!
- Agencies will adopt broadband policies into their General Plans to create framework for:
  - Project conditions
  - Road standards
  - Impact fees
- Some cities have already begun building segments of a network
- Advocacy and funding (School2Home in Winters)
- State/investor attention to Yolo issues

### What's Next?

- Joining Next Century Cities
- Marketing Yolo to providers
  - Winters
  - Knights Landing
- Building capacity in local agencies
  - Feasibility/market analysis
  - Community networks?
  - Public financing?
  - Grants?



## Questions?

Cecilia Aguiar-Curry [cecilia@cityofwinters.org](mailto:cecilia@cityofwinters.org)  
Don Saylor [don.saylor@yolocounty.org](mailto:don.saylor@yolocounty.org)  
Christine Crawford [christine.crawford@yolocounty.org](mailto:christine.crawford@yolocounty.org)

**Thank you!**



## Innovation

The industrial revolution ushered in the first Machine Age  
Steam started it all but took several decades to unfold

The second Machine age has computer hardware, software and networks at their core

"The Second Machine Age  
Erik Brynjolfsson  
Andrew McAfee"

## Lit San Leandro

<h3>What this is...</h3> <ul style="list-style-type: none"> <li>• A dark fiber loop</li> <li>• Wholesale service for large commercial users with a possible retail component</li> <li>• Significant capital investment in infrastructure</li> <li>• Private investment</li> <li>• A partnership</li> <li>• An opportunity to attract next generation high-tech businesses</li> </ul>	<h3>What this is not...</h3> <ul style="list-style-type: none"> <li>• High speed connectivity for all</li> <li>• A broadband solution for residents or small internet users</li> <li>• A revenue source for the City in short to mid-term</li> <li>• A public project</li> <li>• A significant risk to the City</li> <li>• A guarantee that businesses will relocate to the City</li> </ul>
--	---

## Public Private Partnership

Main goal was to connect businesses, not fiber to the home, to drive economic development

- Private Investment
- City Conduit
- Government Grants – EDA for Conduit Installation
- Involve Agencies External to the City
  - School Districts, ERATE
  - County Facilities
  - Health Care

## Target Areas

- Mapping
  - Existing Infrastructure
  - Broadband Maps showing broadband deficient areas
- Keep Initial Loop to Manageable Size 10-15 miles – it can grow in phase 2, 3, ...
- Work with Economic Development and Developers to identify areas

## Want Versus Need

"People do not need a gigabit"

- Conversation with competitor employee
- Conversation with a convention center

Wow, this is really fast

- Conversation with Application Developer, Next Door at Hyatt M2M App Challenge Event

Apple



## Customer Comments

- Customer 1:  
"It would take 8-9 hours to download approx 26GB's to the NFL, now it's about 20 minutes."
- Customer 2:  
"It all comes down to time, this saves time, time is money. Our productivity is greatly enhanced, Did not realize the construction required, once the connection was in, it worked great"

## Before/After

- Connecting buildings make them more attractive for business to locate and expand
- Multiple Downtown buildings went from 40% vacancy to 5% - enabling landlords to invest in improvements
- Health Care and Technology companies locating in San Leandro due to fiber

## On going work

- Expanding the Network into adjacent cities
- WiFi to enable citizens to "use" the fiber
- Partnerships with Education, Airports, Shipping Ports, Transportation



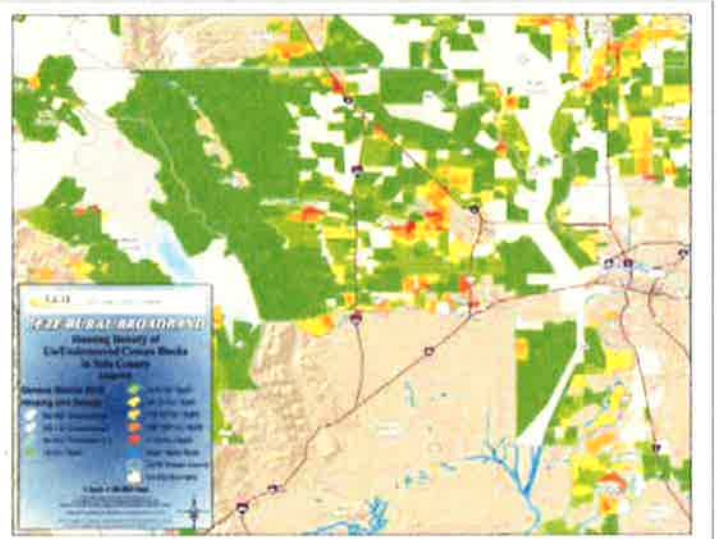
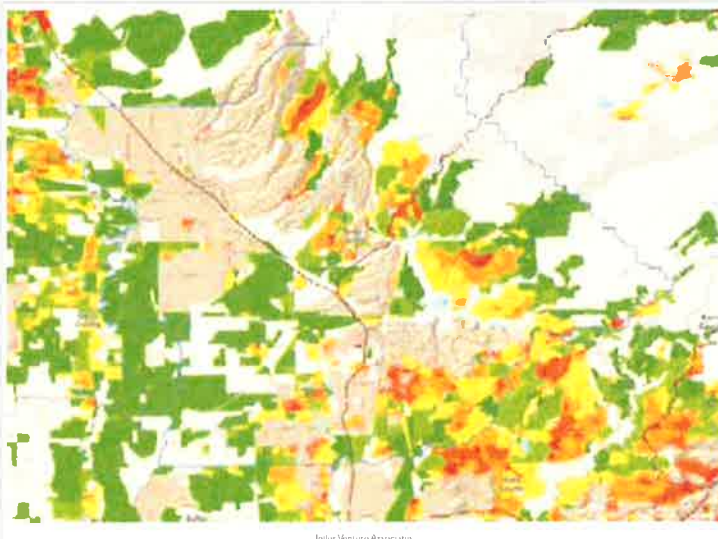
# Find a need and fill it

Riverside, California 2 April 2015



How do you find gaps & opportunities?

Relatively isolated anecdotes or a flood of data.

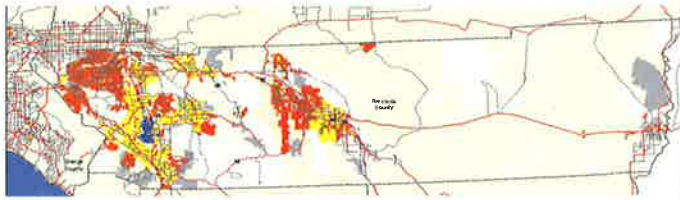


## Broadband report card

- A** Astound (or Sonic) and/or Comcast and/or AT&T offering their best levels of service
- B** Comcast Xfinity cable modem service and mid-level AT&T Uverse DSL
- C** AT&T DSL and Comcast cable modem service
- D** Only one provider, e.g. AT&T or Comcast or Winters Broadband, meets spec
- F** Service via outdated DSL equipment or nothing at all

# D 1.1

Riverside County



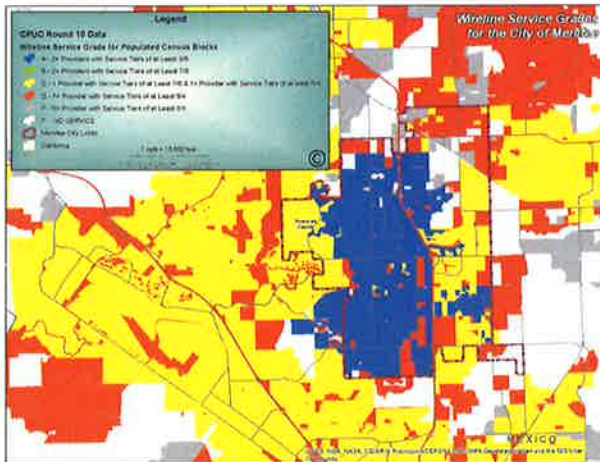
Riverside County Barely passing

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Menifee	C+	2.5
Hemet	C+	1.8
Temecula	C+	1.8
Wildomar	C-	1.7
Murrieta	C-	1.7
La Quinta	C-	1.7
Banning	D+	1.6
Lake Elsinore	D+	1.6
Canyon Lake	D+	1.6
San Jacinto	D+	1.5

Top ten Riverside County

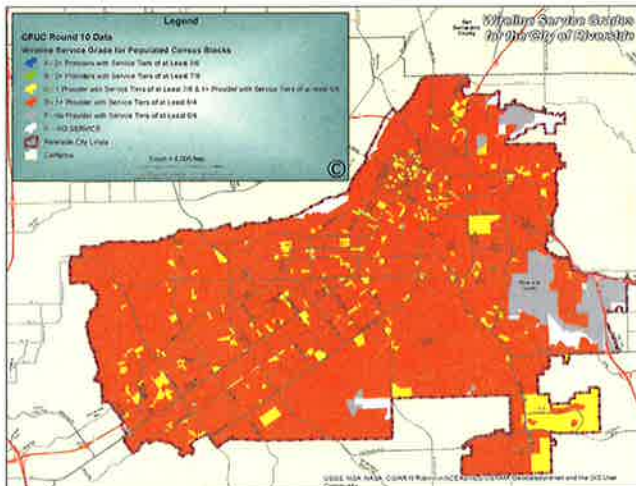
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Riverside	D	1.1
Calimesa	D	1.1
Norco	D	1.1
Corona	D	1.0
Palm Springs	D	1.0
Rancho Mirage	D	1.0
Desert Hot Springs	D-	0.9
Cathedral City	D-	0.9
Coachella	D-	0.9
Blythe	F	0.4

Bottom 10 Riverside County

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- City/County assets
  - Conduit
  - Real estate
- IT budgets
- Management of street cuts
  - Open trench/dig once
  - Shadow conduit
  - GIS logging
- Municipal enterprises
- Public/private partnerships

Policy options Riverside County

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## Questions?

Maps make the case



Tellus Venture Associates

## Primary broadband infrastructure analysis

- Only looked at carriers that actually own last mile, wireline infrastructure
- Consumer broadband infrastructure is a generally reliable indicator of all types of service availability and core infrastructure
  - For example, most AT&T and Comcast construction to date is based on expected revenue from consumers.
- Evaluation is based on grading according to advertised download and upload speeds, which provides a relative comparison even when ground truth differs
- Secondary providers are business oriented and do not file reliable service reports.
  - If you call, we'll tell you if we can serve you and how much it will cost.

Tellus Venture Associates

**CALIFORNIA PUBLIC UTILITIES COMMISSION**

**CALIFORNIA ADVANCED SERVICES FUND (CASF)**

Devia Singh  
CASF Consortia Project Manager

**What is CASF?**

- California Advanced Services Fund (CASF) promotes deployment of high-quality advanced communications services to all Californians.

**Funding is allocated to four CASF accounts**

- \$270 M- Broadband Infrastructure Grant Account
- \$10 M- Rural and Regional Urban Consortia Account
- \$15 M -Broadband Infrastructure Loan Account
- \$25 M-Broadband Public Housing Account

**Consortia Account**

- Rural and Urban Regional Broadband Consortia Account (Consortia Grant program) is intended **"to fund the cost of broadband deployment activities other than the capital cost of facilities, as specified by the Commission."**



**Promote ubiquitous broadband deployment and to advance broadband adoption in unserved and underserved areas by**

- Increasing sustainability of broadband infrastructure and projects;
- Promote broadband deployment (availability) for residences in California;
- Promote broadband access and adoption (knowledge of service options and ability to utilize services as well as subscription of services) for residences in California;
- Increase the rate of broadband adoption by facilitating the impact of consumer education, outreach, and training;
- Support those community-based parties, especially anchor institutions, who are working to increase deployment, access, and adoption.

### Benefits of Consortia Program

- Collaborating with Internet Service Providers (ISP's) to develop regional strategic plans for broadband infrastructure priority investments, aimed at increasing access to broadband;
- Promotion of increased access, utilization, outreach and adoption of broadband with non-users;
- Promotion of increased awareness and understanding among policymakers of the importance of broadband access for economic development and regional wellbeing;
- Verifying, troubleshooting and increasing the accuracy of the California Interactive Broadband Map, by way of conducting mobile and wired speed tests in their regions as well as providing feedback to update the Map;
- Creating regional initiatives to improve quality, speed, and coverage of wireless, wireline and fiber broadband infrastructure in the region.
- Implementing a regional approach to broadband issues and increasing the program's efficiency by reducing duplicative efforts. For example, one consortium encouraged a CASF applicant to combine multiple applications into one, resulting in reduction of overhead while serving more households.

### Future Proposed Legislation for CASF

- \$5 Million in future funding for Regional Consortia. AB1262(Wood)
  
- 25 (Mbps) down stream and 3 (Mbps) upstream – California to consider FCC recent adoption of the 25/3 benchmark in its 2015 Broad band Progress report. AB238 (Stone)