



CalSPEED Home



California's Residential Broadband Measurement

Communications Division

February 06, 2019





Agenda

- Introduction Taylor Cheim, CPUC
- Context Owen Rochte, CPUC
- Technical Overview Ken Biba, Novarum
- Role of the CASF Consortia Tyler Boyle, CSU Chico
- Questions & Answers





Background and Importance of the Study

Decision 16-12-025: ANALYZING THE CALIFORNIA TELECOMMS MARKET

D16-12-025 - Directs Staff to:

- Continue data gathering, monitoring, and reporting on the market.





The decision notes certain “methodological issues”

- Notes the limits of carrier reported data
- Notes the limits of using advertised vs. actual broadband speeds
- Acknowledges the robust CPUC mobile testing program





CaISPEED Mobile

- The Commission has collected over 5 years worth of data with CaISPEED Mobile, which measures actual wireless broadband data in the field.
- The Commission created and pioneered this open source, non-proprietary, network performance measurement tool and methodology with the assistance of a grant from the National Telecommunications and Information Administration.
- CaISPEED has been cited and relied on by the FCC's 17th, 18th, and 19th [Wireless Competition Reports](#).
- The CaISPEED data, collected in a structured sampling program at roughly 2000 locations across the state, [allows us to conclude](#) (among other things) that advertised wireless speeds regularly exceed the speeds actually measured in the field.





Decision 16-12-025 concludes:

- This Commission does not have sufficient data to draw conclusions about ***non-mobile*** broadband quality and speeds
- It is a significant limitation of our analysis, and for our ability to monitor this rapidly changing market, that we do not have a comparable data set for residential broadband.





Ordering Paragraph 4.

IT IS ORDERED that:

4. “The Communications Division staff shall budget and seek state funding for a third party survey of consumer broadband speed experience measured by the CalSPEED fixed location test. Staff shall report to the Commission its findings and recommendations.”





Promised vs. Actual Speed

Advertised

1. Urban
2. Rural
3. Cable
4. DSL

Measured

1. Urban
2. Rural
3. Cable
4. DSL



KEN BIBA

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NOVARUM, INC.

FEBRUARY 2019

CALSPEED HOME- CALIFORNIA'S RESIDENTIAL BROADBAND MEASUREMENT

BROADBAND – A KEY CALIFORNIA ASSET

- ▶ We all depend on it every day
- ▶ Yet - astonishingly poor information
- ▶ Carriers perceived as less than transparent
- ▶ Known, but unquantified deficits
 - ▶ Rural broadband
 - ▶ Pace of technology - 5G, Internet of Things, WiFi, Fiber
 - ▶ Old devices
 - ▶ Old gateways
- ▶ So ... let's measure
 - ▶ Broadband quality as user experience it
 - ▶ How it compares to the promise

CALSPEED – CALIFORNIA BROADBAND MEASUREMENT

▶ California Broadband Measurement

- ▶ Bootstrapped by NTIA grant in 2011
- ▶ Now funded by California Assembly
- ▶ Managed by California Public Utility Commission
 - ▶ Novarum (design, analysis)
 - ▶ CalState U @ Monterey Bay (tools, mapping)
 - ▶ CalState U @ Chico (mapping, operations)

▶ Measures the User Experience

- ▶ Urban, rural, tribal, no service, underserved

▶ Open Source: Tools + Data

▶ Mobile Broadband First

- ▶ Now residential wired+WiFi

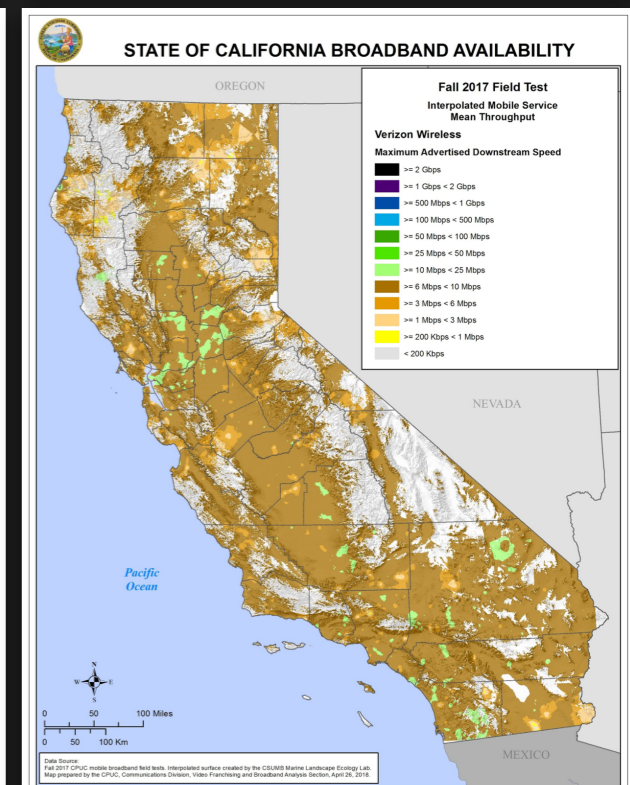
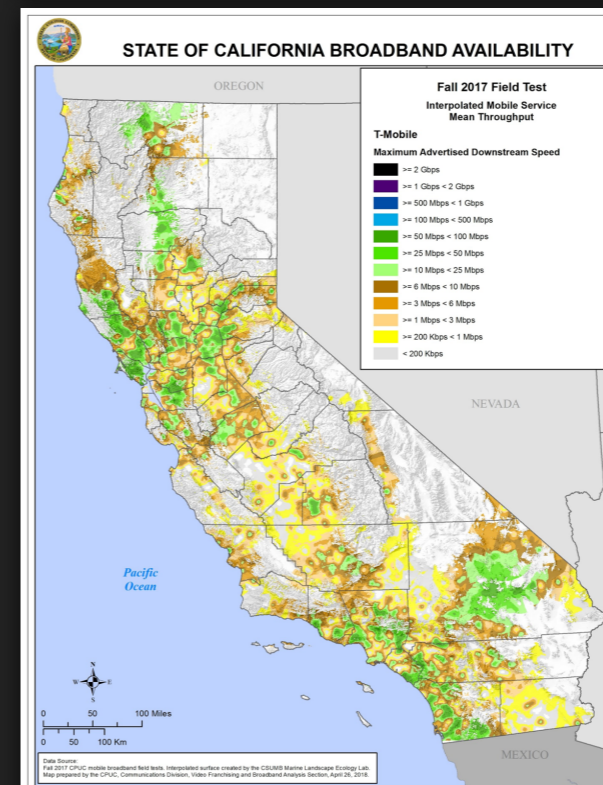
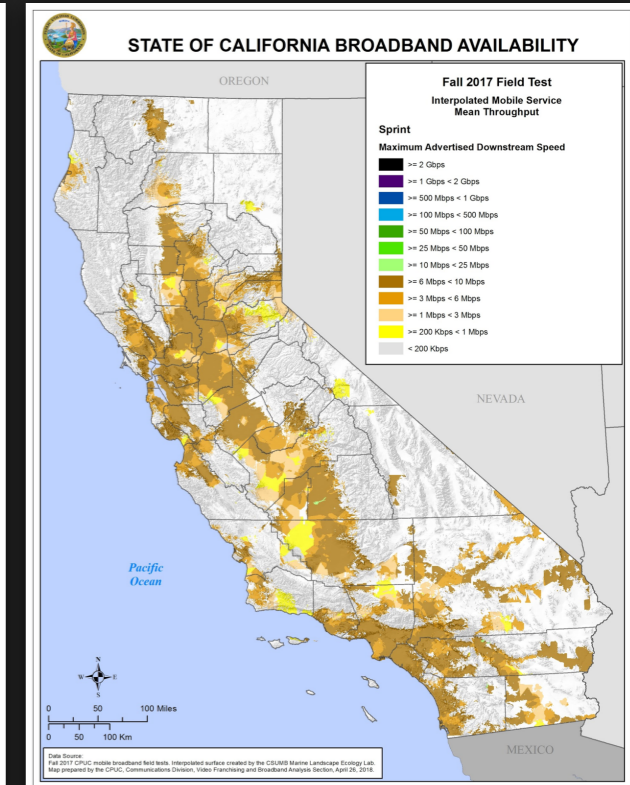
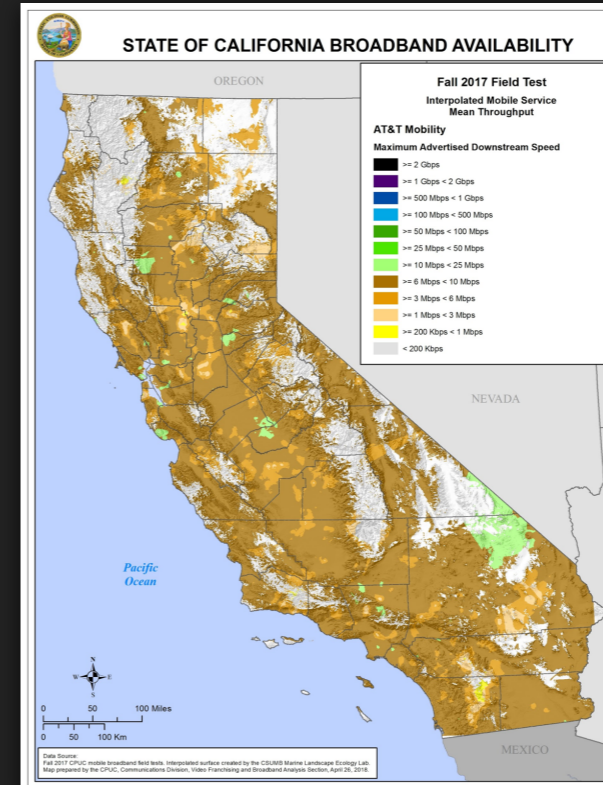
▶ End-to-end User Experience

- ▶ Content all across the Internet

▶ Maps/information for decision makers

- ▶ Consumers
- ▶ Government
- ▶ Advanced geostatistical interpolation techniques to translate raw measurements into geographic information

▶ Inform California Advanced Services Fund (CASF)



KEY THEMES – CALSPEED MOBILE

- ▶ Overall quality improving ... but ...
- ▶ Wide variation in broadband quality and coverage
 - ▶ Not all carriers are equal
 - ▶ Not all user devices are equal
 - ▶ Location matters: users and content
 - ▶ Rural/tribal users are 3/5ths of an urban user
- ▶ Challenges for mission critical applications (public safety)
- ▶ Challenge of 5G

CALSPEED MOBILE

▶ Final Report on California Mobile Broadband

- ▶ <https://www.dropbox.com/s/m7n6fafswq2ant2/CalSPEED%20Mobile%20-%20Final%20Report.pdf?dl=0>

▶ Urban/Rural Mobile Broadband Divide

- ▶ Rural users has about 3/5ths of the Internet quality of an urban user
- ▶ <https://www.dropbox.com/s/mf9zt2qtssezqxf/CalSPEED%20Mobile%20-%20Rural%3AUrban%20Mobile%20Broadband%20Divide.pdf?dl=0>

▶ Residential WiFi in California

- ▶ Residential WiFi (and broadband) for just about every household
- ▶ High percentage of residential WiFi is VERY old
- ▶ <https://www.dropbox.com/s/exzckbqll6q3unc/WiFi%20in%20California.pdf?dl=0>

CALSPEED HOME – RESIDENTIAL BROADBAND

- ▶ Extend CalSPEED Mobile
 - ▶ Residential Wired and WiFi
- ▶ Same measurement methodology and tools
- ▶ Residential Measurement Instrument
 - ▶ Stand-alone Linux microprocessor (1 Gb/s capable)
 - ▶ CalSPEED measurement software
 - ▶ Two Internet measurement interfaces (alternately)
 - ▶ Gigabit Ethernet
 - ▶ WiFi 5 - 2x2 MIMO 802.11ac Dual Band
- ▶ Each household self install
 - ▶ Ethernet and WiFi (user gives access to local WiFi)
- ▶ Multi-week measurement period
 - ▶ User returns Instrument for reuse
 - ▶ Pre-paid shipment
- ▶ At least 500 homes, more is better



CALSPEED HOME - SOME EARLY DATA

- ▶ Beta test results in Fresno
 - ▶ Small sample size - < 30 households - DSL, Cable, Fiber, Satellite, Fixed Wireless
 - ▶ <https://www.dropbox.com/s/pi1k7n5yhuqovno/CalSPEED%20Home%20-%20Wired%20and%20WiFi%20Measurements%20-%20January%202019.pdf?dl=0>
- ▶ Technology Matters
- ▶ A (Bigger) Internet Penalty
- ▶ WiFi Penalty
- ▶ Legacy Routers (likely?) Unreliable

MARKETING AND DEVICE DEPLOYMENT STRATEGY

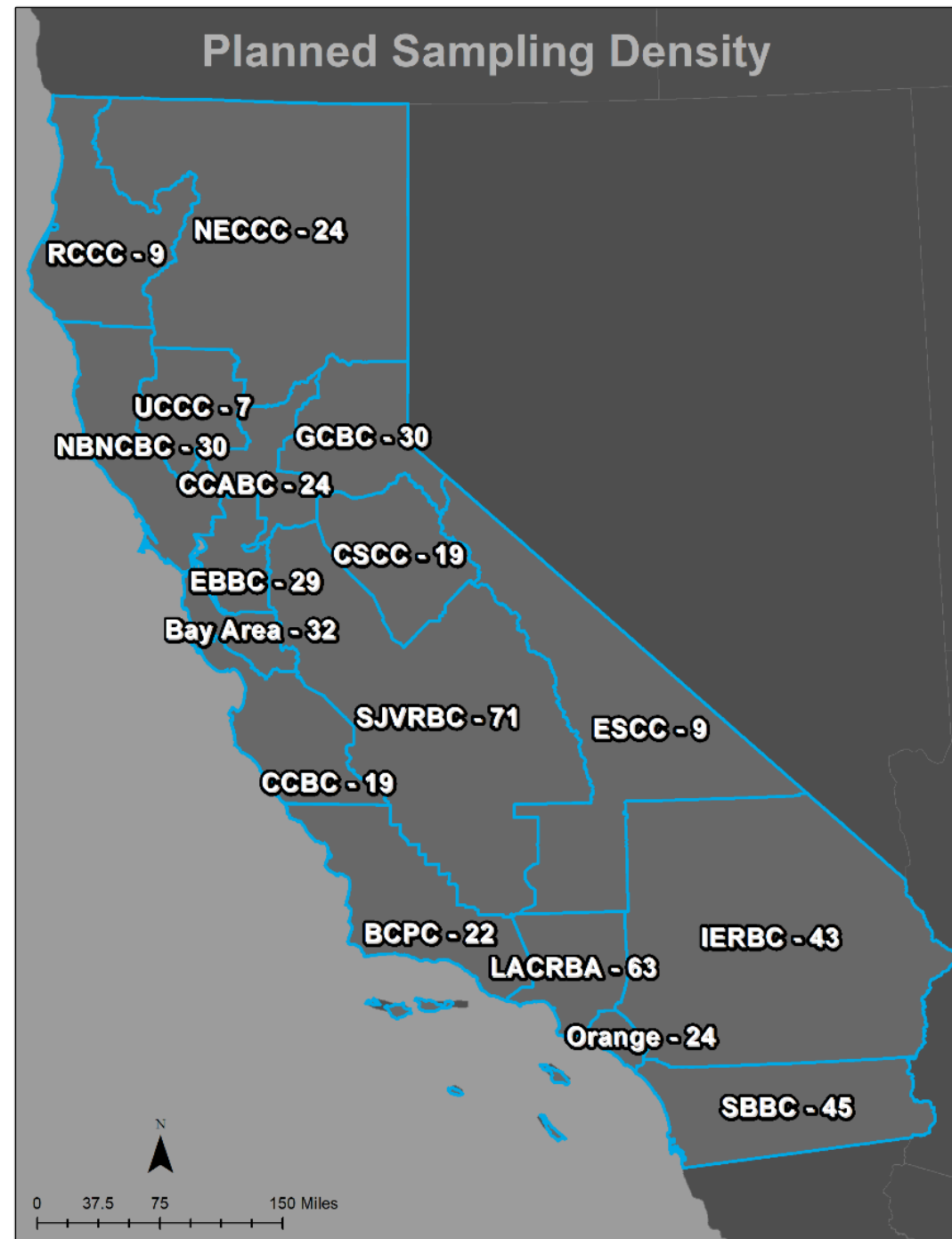
- Study aims to deploy CalSPEED Devices in 500 California homes.
- Need to collect as many volunteers as possible to meet sampling design criteria.
 - Want to find a representative sample of California broadband connections.
Not just homes with bad connections.
- CSU, Chico is beginning a Statewide outreach marketing campaign.

Outreach includes...

- a. Consortia engagement
- b. CPUC news outlets
- c. Facebook marketing
- d. Additional targeted regional outreach and paid advertising as necessary.

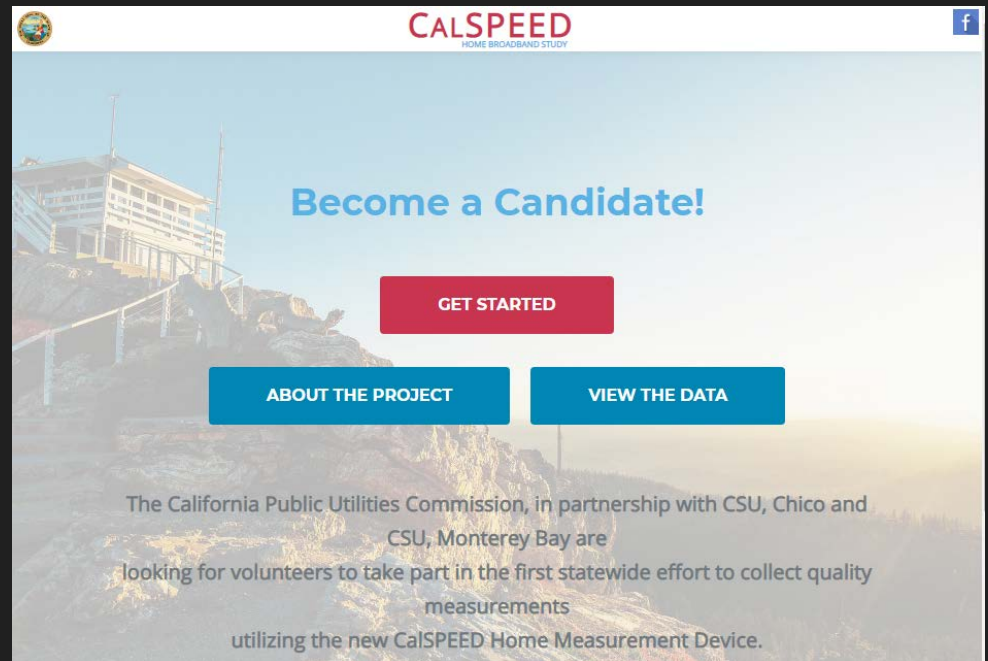
WHO WE NEED

- 500 Volunteers Selected Statewide.
- Split between Urban/Rural and Cable/DSL Subscribers.
- Volunteers which help meet the requirements of the sampling design will be selected.
- Selected volunteers will be contacted prior to device shipment to verify details.
- Need to know their subscribed plan speed or be willing to look it up to qualify.



WHAT WE ARE ASKING OF VOLUNTEERS

- GO TO www.calspeed.net
- Click “Get Started” and “Start Survey”
- Volunteers can find out more about the project at our website.
- Contact our support team at support@calspeed.net with any questions.



CALSPEED
HOME BROADBAND STUDY

Become a Candidate!

GET STARTED

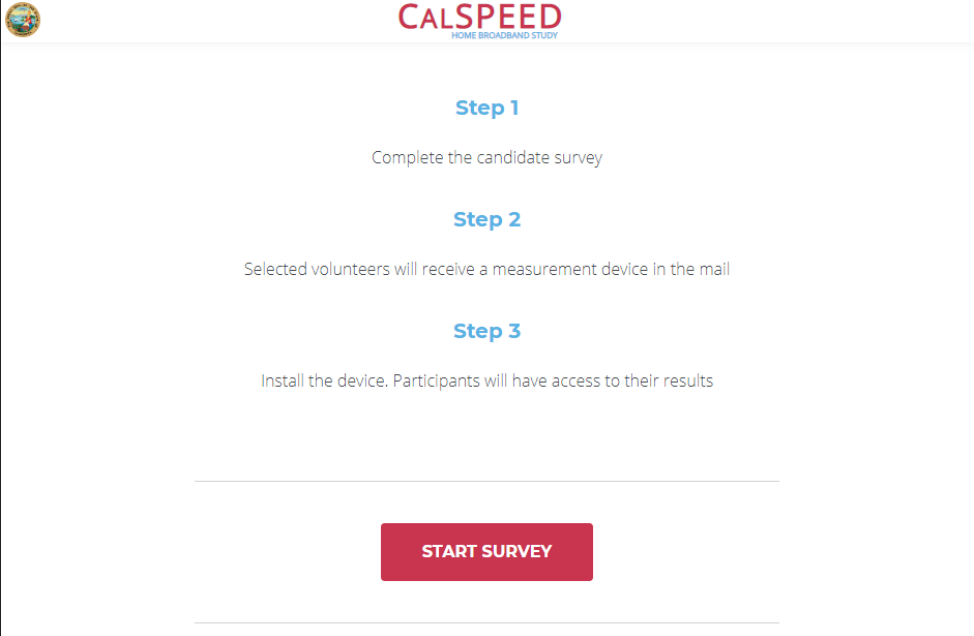
ABOUT THE PROJECT **VIEW THE DATA**

The California Public Utilities Commission, in partnership with CSU, Chico and CSU, Monterey Bay are looking for volunteers to take part in the first statewide effort to collect quality measurements utilizing the new CalSPEED Home Measurement Device.

CANDIDATE SURVEY

SURVEY QUESTIONS

- Home Address?
- Shipping Address (if different)?
- Name?
- Email and Phone #?
- ISP Name and Connection Type?
- Service Plan Subscribed?
- Do you have open Ethernet port?
- How did you hear about us?
- Agree to terms of [user agreement](#).



The screenshot shows the CALSPEED HOME BROADBAND STUDY candidate survey page. The page is white with a red header containing the CALSPEED logo and the text "HOME BROADBAND STUDY". The survey steps are listed in blue text: Step 1: Complete the candidate survey; Step 2: Selected volunteers will receive a measurement device in the mail; Step 3: Install the device. Participants will have access to their results. A red button labeled "START SURVEY" is centered at the bottom of the page.

CALSPEED
HOME BROADBAND STUDY

Step 1
Complete the candidate survey

Step 2
Selected volunteers will receive a measurement device in the mail

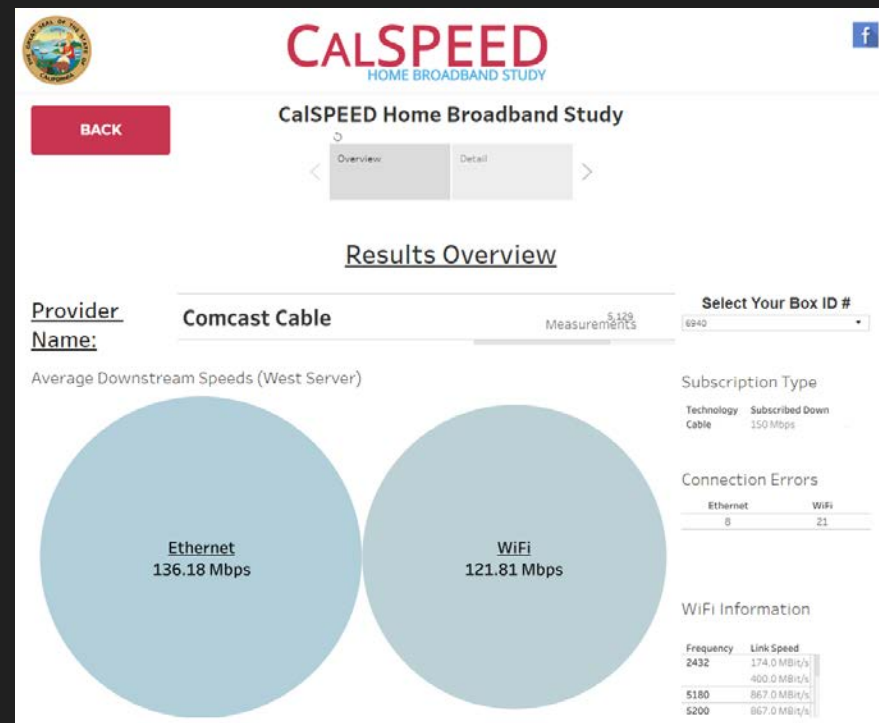
Step 3
Install the device. Participants will have access to their results

START SURVEY

WHAT VOLUNTEERS CAN EXPECT

IF Selected...

- Boxes delivered via USPS.
- Package contains:
 - The CalSPEED Testing Device
 - Installation Instructions
 - Return label
- Volunteer should keep original packaging material for returning the device.
- Leave device online for 2 weeks.
- CalSPEED Support will notify user to return device when needed.
- Volunteers will have access their results during the course of the study.



HOW THE CONSORTIA CAN HELP!

- Spread the word!
 - Goal is to drive traffic the signup survey at www.calspeed.net
 - Consortia not responsible for fielding questions about the study.
- Facebook
 - @calspeedhbs
 - <https://www.facebook.com/calspeedhbs>
- Newsletters
- Press Releases
- Post on websites
- Other social media
- Any other outlets you feel are appropriate for your region.





Benefits of CalSPEED Home

- Gain better knowledge of the quality of your internet connection
- Represent actual broadband speeds in your region
- View results on a Tableau Dashboard
- Results can be fed into California Interactive Broadband Map





Questions & Answers





Thank You!

We appreciate your participation in *Ca/SPEED Home*.

