



**Office of the Governor
Economic Development & Tourism**

Governor's Broadband Development Council Meeting

January 28, 2021

AGENDA
Governor's Broadband Development Council

January 28, 2021
10:00 AM

VIDEOCONFERENCE MEETING

Governor's Broadband Development Council (" Council ") members will be meeting via videoconference. Members of the public who would like to attend the meeting may join by videoconference using the following information:

Free Web Link for Videoconference:

https://teams.microsoft.com/l/meetup-join/19%3ameeting_Y2Q1MmNmYWYtYThiMy00NWNiLTg1YjUtYWE2OGU4OTg3MjA1%40thread.v2/0?context=%7b%22Tid%22%3a%2254cb5da6-c734-4242-bbc2-5c947e85fb2c%22%2c%22Oid%22%3a%22bc6eb630-bc65-4377-b472-df8f2396b720%22%7d

Members of the public attending the meeting via the videoconference information provided will be able to hear audio of the meeting and can provide comments during the Public Comment portion of the meeting. The Council will also record the meeting, which will be made available to members of the public.

All agenda items are subject to possible discussion, questions, consideration, and action by the Council. Agenda item numbers are assigned for ease of reference only and do not necessarily reflect the order of their consideration by the Council. Presentations may be made by the identified staff or Council member or others as needed.

ITEM

I. Call to Order

II. Chair welcome, remarks and roll call

III. Discussion and Possible Action on Approval of Minutes from the Council meeting on October 19, 2020 (Tab 1).

IV. Comments by Oklahoma State University staff providing information relating to the Council's areas of research, identification, study, and analysis under Tex. Gov't Code § 490H.006, including information relating to distribution of broadband in unserved areas of Texas, and Council review, discussion, consideration and/or possible action regarding same (Tab 2)

V. Comments by Grow Associates, LLC staff providing information relating to Council's areas of research, identification, study, and analysis under Tex. Gov't Code § 490H.006, including information relating to distribution of broadband in unserved areas of Texas, which includes an update on Operation Connectivity, and Council review, discussion, consideration and/or possible action regarding same (Tab 3)

VI. Comments by Connected Nation staff providing information relating to Council's areas of research, identification, study, and analysis under Tex. Gov't Code § 490H.006, including information relating to distribution of broadband in unserved areas of Texas, and Council review, discussion, consideration and/or possible action regarding same (Tab 4)

VII. Review, Discussion, Consideration and/or Possible Action on information provided by Chairman Sproull relating to Council's areas of research, identification, study, and analysis under Tex. Gov't Code § 490H.006, including information relating to distribution of broadband in unserved areas of Texas, which includes information relating to broadband legislation

VIII. Review, Discussion, Consideration and/or Possible Action on Council Next Steps for Following Meeting(s) - Chairman Sproull

IX. Comments without Deliberation:

Public comment may be received on any matter under the Council's jurisdiction without regard to whether the item was posted on the agenda.

X. Adjournment

Link to January 28, 2021 Council meeting documents:

<https://gov.texas.gov/business/page/governors-broadband-development-council>

Persons with disabilities who plan to attend this meeting, who may need auxiliary aids or services, or who need assistance in having English translated into Spanish, should contact Philip Rocha at 512-936-0246 at least 2 days before the meeting so that appropriate arrangements can be made.

Personas con discapacidades que asistirán a esta reunión y requieren servicios o instrumentos especiales, o necesitaran traducción al español, por favor de comunicarse con Philip Rocha al 512-936-0246 por lo menos 2 días antes de la reunión para hacer los arreglos necesarios.

Tab

1

GOVERNOR'S BROADBAND DEVELOPMENT COUNCIL

Minutes of October 19th, 2020 Meeting

Videoconference Meeting

1:30 PM

VIDEOCONFERENCE MEETING

COUNCIL MEMBERS IN ATTENDANCE:

William "Bill" Sproull (Chair), Juli Blanda, Frank Moreno, Lindsey Lee, Marshall Harrison, Marty Lucke, Kirk Petty, Thomas Kim, M.D., Greg Pittman, Jennifer K. Harris, Kenny Scudder, Mike Easley, Edward Smith, Ph.D., Saurin Patel, M.D.

STAFF IN ATTENDANCE:

Lindsey Aston, Philip Rocha, Fauye Bennett, Michael Treyger, Larry McManus, Ryland Ramos, Cristina Madrid, Stephen Davis

The Governor's Broadband Development Council ("Council") proceeded on posted agenda items in the order as follows:

Agenda Item I. CALL TO ORDER

Bill Sproull, Chairman of the Council, called the meeting to order at 1:30 PM. A quorum was present online.

Agenda Item II. CHAIR WELCOME, REMARKS, AND ROLL CALL

Chairman Sproull welcomed the Council for their fifth meeting and briefly outlined the agenda for the meeting.

Agenda Item III. DISCUSSION AND POSSIBLE ACTION ON APPROVAL OF MINUTES FROM THE COUNCIL MEETING ON SEPTEMBER 24, 2020

The Council approved the minutes from the September 24th, 2020 meeting.

Agenda Item IV. COMMENTS BY TEXAS DEPARTMENT OF TRANSPORTATION STAFF PROVIDING INFORMATION RELATING TO COUNCIL'S AREAS OF RESEARCH, IDENTIFICATION, STUDY, AND ANALYSIS UNDER TEX. GOV'T CODE § 490H.006, INCLUDING INFORMATION RELATING TO DISTRIBUTION OF BROADBAND IN UNSERVED AREAS OF TEXAS, AND COUNCIL REVIEW, DISCUSSION, CONSIDERATION AND/OR POSSIBLE ACTION REGARDING SAME

Remarks from Kyle Madsen of the Texas Department of Transportation ("TXDOT") regarding how TXDOT interacts with statewide broadband efforts.

Agenda Item V. COMMENTS BY THE PEW CHARITABLE TRUSTS STAFF PROVIDING INFORMATION RELATING TO COUNCIL'S AREAS OF RESEARCH, IDENTIFICATION, STUDY, AND ANALYSIS UNDER TEX. GOV'T CODE § 490H.006, INCLUDING INFORMATION RELATING TO DISTRIBUTION OF BROADBAND IN UNSERVED AREAS OF TEXAS, AND COUNCIL REVIEW, DISCUSSION, CONSIDERATION AND/OR POSSIBLE ACTION REGARDING SAME.

Remarks from Katherine DeWit of The Pew Charitable Trust relating to broadband initiatives and the Pew Charitable Trust's ability to serve as a resource to the Council.

Agenda Item VI. REVIEW, DISCUSSION, CONSIDERATION AND/OR POSSIBLE ACTION RELATING TO PERMISSION AND AUTHORIZATION TO EDIT, FINALIZE, AND SUBMIT THE 2020 ELECTRONIC REPORT DUE TO THE GOVERNOR, THE LIEUTENANT GOVERNOR, AND THE MEMBERS OF THE LEGISLATURE FROM THE COUNCIL UNDER SECTION 490H.007 OF THE TEXAS GOVERNMENT CODE.

Discussion among the Council members related to submission of the 2020 electronic report to the Legislature. Motion relating to permitting and authorizing editing, finalizing, and submitting the 2020 electronic report due to the governor, the lieutenant governor, and the members of the legislature from the Council under Section 490H.007 of the Texas Government Code. Seconded. Motion carried.

Agenda Item VII. REVIEW, DISCUSSION, CONSIDERATION AND/OR POSSIBLE ACTION ON COUNCIL NEXT STEPS FOR FOLLOWING MEETING(S) - CHAIRMAN SPROULL

No date set for a following meeting at the time. Chairman Sproull discussed later scheduling of the next meeting.

Agenda Item VIII. COMMENTS WITHOUT DELIBERATION:

Public comment may be received on any matter under the Council's jurisdiction without regard to whether the item was posted on the agenda.

Agenda Item VIII. COMMENTS WITHOUT DELIBERATION:

Public comment may be received on any matter under the Council's jurisdiction without regard to whether the item was posted on the agenda.

No public comment.

Agenda Item IX. ADJOURNMENT

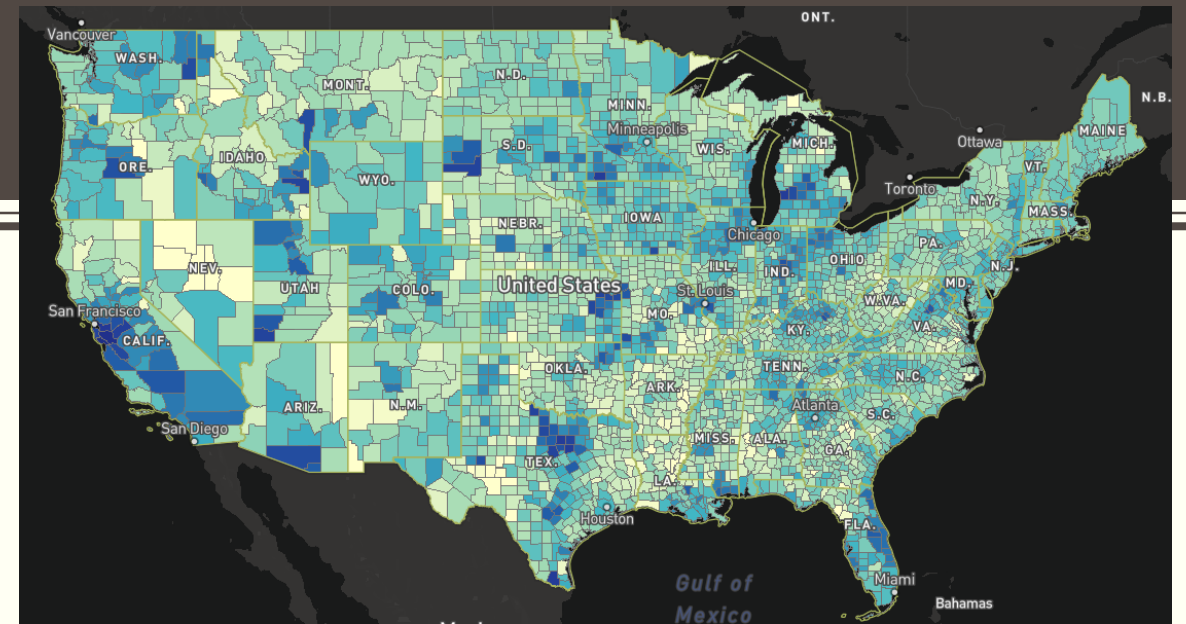
Chairman Sproull called the meeting to a close at approximately 3:45 pm.

Bill Sproull, Chair

Date

Tab

2



STATE BROADBAND POLICY: WHAT IMPACTS AVAILABILITY?

Brian Whitacre



DEPARTMENT OF
AGRICULTURAL ECONOMICS

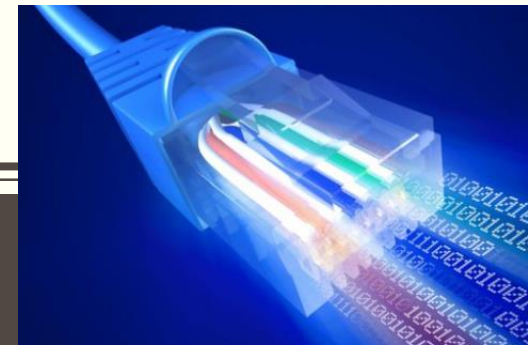
Roberto Gallardo



Center for Regional Development



State Broadband Policy Explorer



State Broadband Leaders Network



Presentation to the Texas Governor's Broadband Development Council

Jan 28, 2021

Background



- Provision of broadband Internet is an increasingly important topic
 - Highlighted by COVID-19 pandemic
- Rural areas have continued to lag behind in terms of broadband availability
- Broadband is important for a host of rural (and urban) economic outcomes (Kim and Orazem, 2017; Kandilov et al. 2017; Whitacre et al. 2014)
- States have taken different approaches to broadband policy
 - Some have state broadband offices with full-time employees
 - Others have state-level funding mechanisms
 - Some restrict cooperatives / municipalities from providing broadband
- Little to no empirical evidence regarding which policies work

California Broadband Council

[The California Broadband Council](#)
was established in 2010 by legislation

The NYS Broadband Program Office

In 2015 Governor Andrew M. Cuomo established the \$500 million New NY Broadband Program

UTAH

Legislation in 2013 added new obstacles to municipal broadband



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Center for Regional Development

Previous Research on Broadband Policy

**Broadband Penetration:
An Empirical Analysis of State and Federal Policies**
Scott Wallsten* June 2005

- Limited number of studies have examined U.S. broadband policy efforts
 - One early study concluded most state-level policies (tax incentives, universal service funds, municipal restrictions) were ineffective at promoting broadband penetration (Wallsten, 2005)
 - Another early study argued that policies focused on increasing demand were most effective (Falch, 2007)
 - Siefer (2015) lays out elements of “good” state broadband policy but stops short of empirically documenting their impacts.
 - Lack of research likely due to no clear source of information on state-level policies

Existing literature does not speak to effectiveness of state-level broadband policy in U.S.

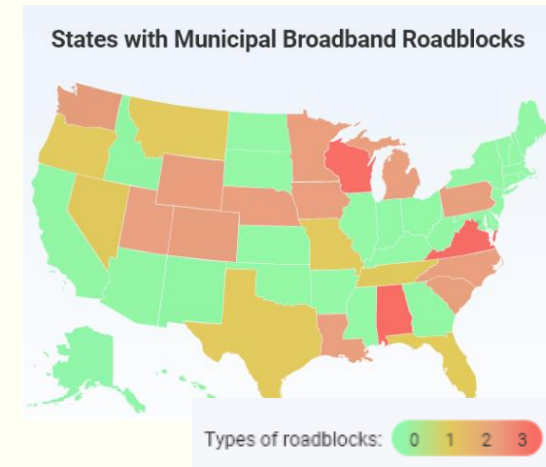
SEPTEMBER 2015
**STATE-LEVEL
BROADBAND POLICY**
A COMPENDIUM OF RESOURCES AND APPROACHES

ANGELA SIEFER
ADJUNCT FELLOW



Research Questions

- Do state-level broadband policies impact overall availability?
 - What about rural availability?
- Which broadband policies are most effective – and what is the magnitude of their impact?
 - Existence of state-level broadband office with full-time employees
 - Existence of state-level funding mechanism
 - Existence of state-level restrictions on cooperative / municipal broadband provision



Source: Broadbandnow.com



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Center for Regional Development

Data & Methods

Panel Dataset from
2012 – 2018
(3,140 counties)

- Dependent Variable: County % of Population with Access to 25/3
 - Aggregated from Census Block-level data
 - National Broadband Map (2010 – 2013)
 - Federal Communications Commission (2014 – 2018)
 - Other availability metrics of interest:
 - County % of Population with access to fiber
 - County % of Population with at least 2 providers offering 25/3 speeds
 - Also compiled “rural-only” metrics using Census Blocks classified as rural in 2010
 - Primary Independent Variables of Interest: State Broadband Policies
 - Other county-level Control Variables
 - Income
 - Education
 - Poverty Rates
 - Population Density
 - % Houses built after 2010
 - Topography
- Sources:
- US Census American Community Survey
 - US Census SAIPE
 - BLS - LAUS
 - USDA ERS Natural Amenities Scale



State Broadband

Initial Summary

- Compiled by Pew Char
- Initially available July 2
- Reviewed all state-level and governing directive dating to 1991
- First comprehensive co

Ground-truthing

- Statutes may establish unclear if it provides fun
- Several organizations k in dataset)
- Personalized emails se Leaders Network (SBLN assessment
- 31 of 50 states respon



DEPA
AGI

| fips | Geography | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-------|-----------------|------|------|------|------|------|------|------|------|------|
| 1 | Alabama | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | Alaska | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Arizona | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Arkansas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | California | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | Colorado | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 9 | Connecticut | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Delaware | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | District of Col | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | Florida | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 13 | Georgia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | Hawaii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | Idaho | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | Illinois | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 18 | Indiana | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Iowa | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 20 | Kansas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Kentucky | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | Louisiana | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Maine | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | Maryland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | Massachusetts | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 26 | Michigan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | Minnesota | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 28 | Mississippi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | Missouri | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | Montana | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | Nebraska | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 32 | Nevada | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 33 | New Hampshire | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34 | New Jersey | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 35 | New Mexico | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 36 | New York | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 37 | North Carolina | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 38 | North Dakota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 39 | Ohio | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40 | Oklahoma | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41 | Oregon | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 42 | Pennsylvania | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 44 | Rhode Island | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45 | South Carolina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46 | South Dakota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 47 | Tennessee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 48 | Texas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49 | Utah | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | Vermont | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 51 | Virginia | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 53 | Washington | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 54 | West Virginia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 55 | Wisconsin | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 56 | Wyoming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | | 4 | 3 | 4 | 4 | 8 | 13 | 15 | 16 | 18 |

Highlighted rows = response from SBLN state contact

Broadband Policy Explorer

ing high-speed internet access

ing 851 of 851

Clear all

r results

EGORIES

broadband programs

competition and regulation

definitions

funding and financing

infrastructure access

ther



band Leaders Network (SBLN)

gional Development

Data & Methods

Table 1. Descriptive Statistics for Broadband Outcomes, Policy Variables, and Demographics, 2012 & 2018.

| Outcome Measures | 2012 | | | | 2018 | | | |
|----------------------------|-------|-------|-----|------|-------|-------|-----|-----|
| | Mean | S.D. | Min | Max | Mean | S.D. | Min | Max |
| 25/3_all (%) | 31.93 | 37.93 | 0 | 100 | 79.08 | 23.32 | 0 | 100 |
| 25/3_rural (%) | 24.43 | 31.46 | 0 | 100 | 71.46 | 26.10 | 0 | 100 |
| Fiber_all (%) | 7.50 | 18.20 | 0 | 100 | 24.66 | 28.84 | 0 | 100 |
| Fiber_rural (%) | 6.48 | 15.83 | 0 | 100 | 21.58 | 27.33 | 0 | 100 |
| 2+comp_all (%) | 4.48 | 14.46 | 0 | 99.8 | 35.49 | 31.97 | 0 | 100 |
| 2+comp_rural (%) | 2.37 | 2.83 | 0 | 100 | 27.23 | 26.88 | 0 | 100 |
| Broadband Policies | | | | | | | | |
| State Funds (% with) | 9.86 | 29.82 | 0 | 100 | 32.96 | 47.01 | 0 | 100 |
| State Office (% with) | 6.01 | 23.77 | 0 | 100 | 42.82 | 49.49 | 0 | 100 |
| Muni Restrictions (% with) | 56.66 | 49.56 | 0 | 100 | 51.60 | 49.98 | 0 | 100 |

The Elephant in the Room...

Experts are furious over the FCC's rosy picture of broadband access

The data the agency uses has been criticized as flawed

BAD BROADBAND DATA —

FCC data fails to count 21 million people without broadband, study finds

Congress Tells FCC to Fix Broadband Maps Now

AT&T gave FCC false broadband-coverage data in parts of 20 states

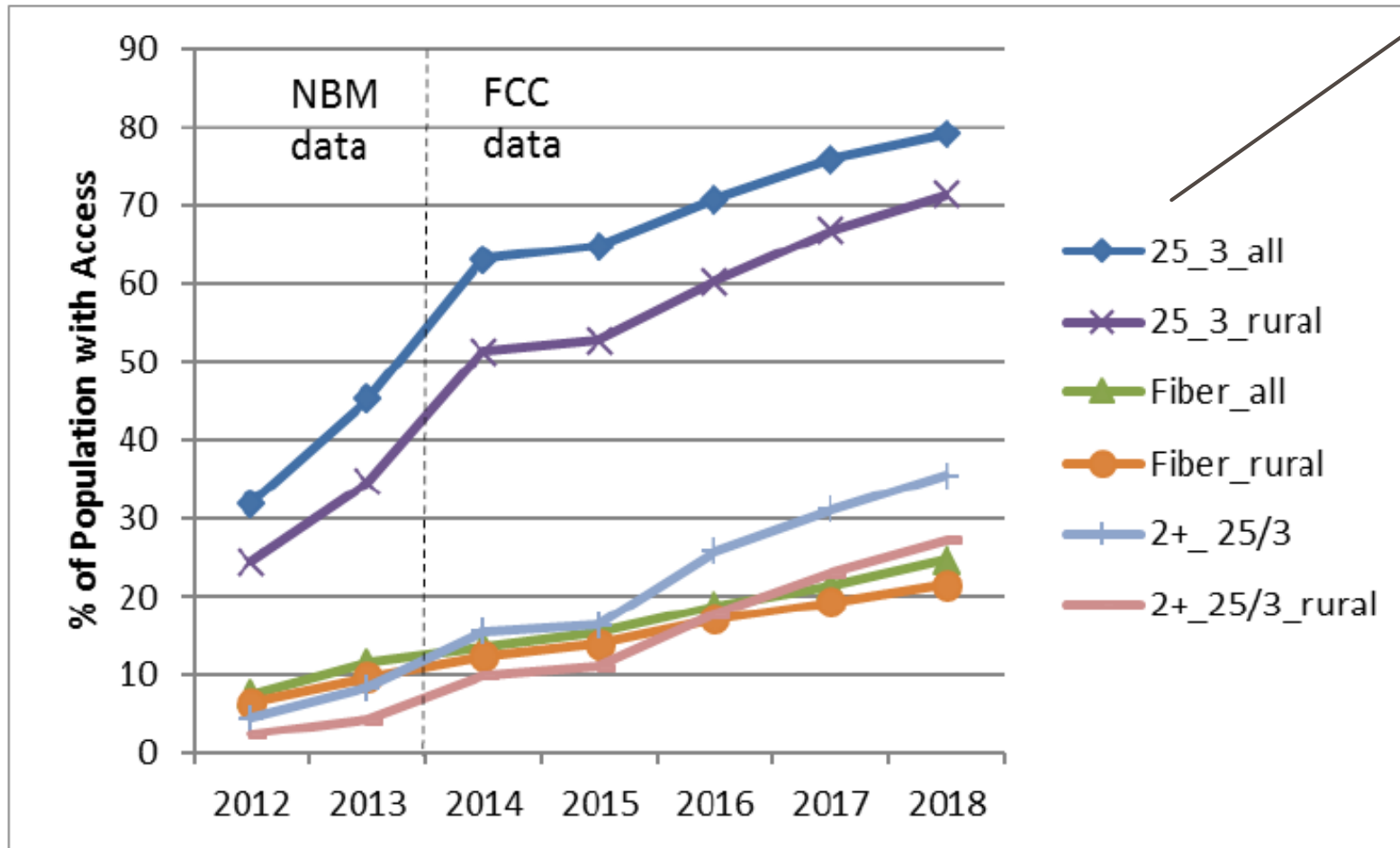
AT&T corrects mistake, admitting it offers no broadband in 3,600 census blocks.

- Major problems with FCC broadband data
- Coverage of any part of census block = service in entire block
- Max advertised speeds, not actual
- No cost data
- Incorrect submissions by providers

But, it remains the best / most complete data we have available

Broadband Availability, 2012-2018

Figure 1. Broadband Availability Averages for U.S. Counties, 2012-2108.



County averages

FCC Population-Based Availability Estimates

| | 2017 | 2018 |
|-------|-------|-------|
| All | 93.5% | 94.4% |
| Rural | 73.7% | 77.7% |

State Broadband Policies, 2012 & 2018

Figure 2. State Broadband Offices, 2012 (left) and 2018 (right)

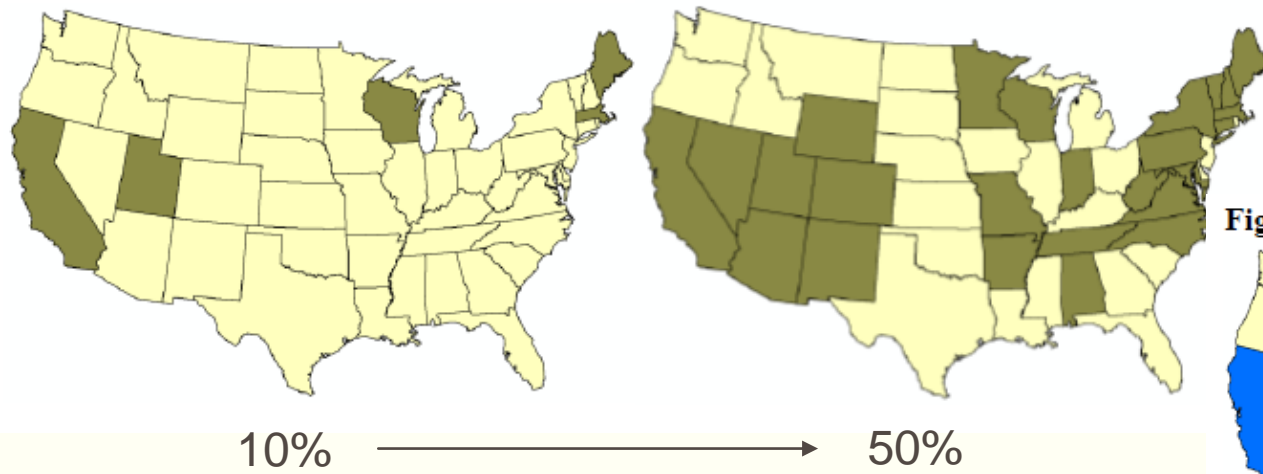


Figure 4. State Broadband Funding, 2012 (left) and 2018 (right)

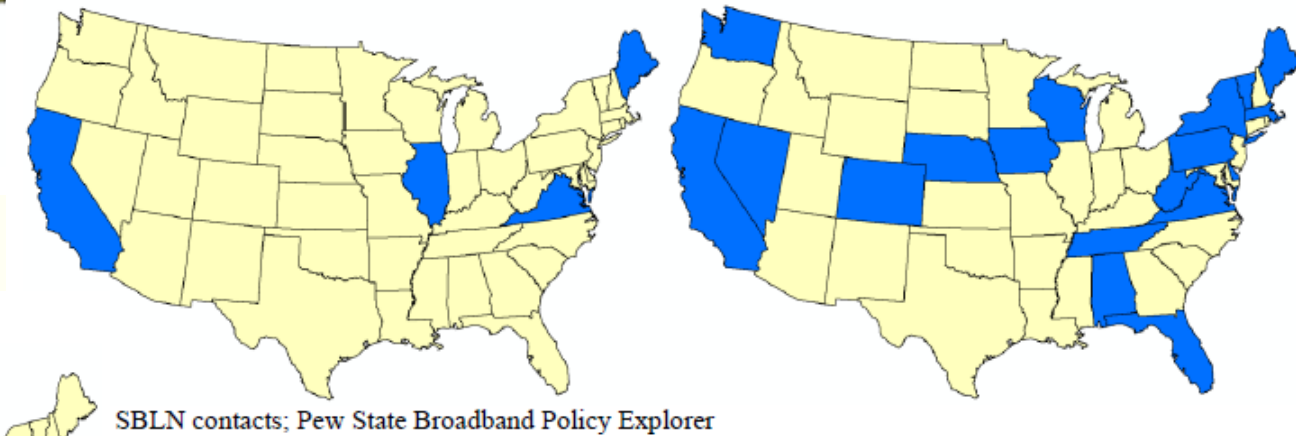
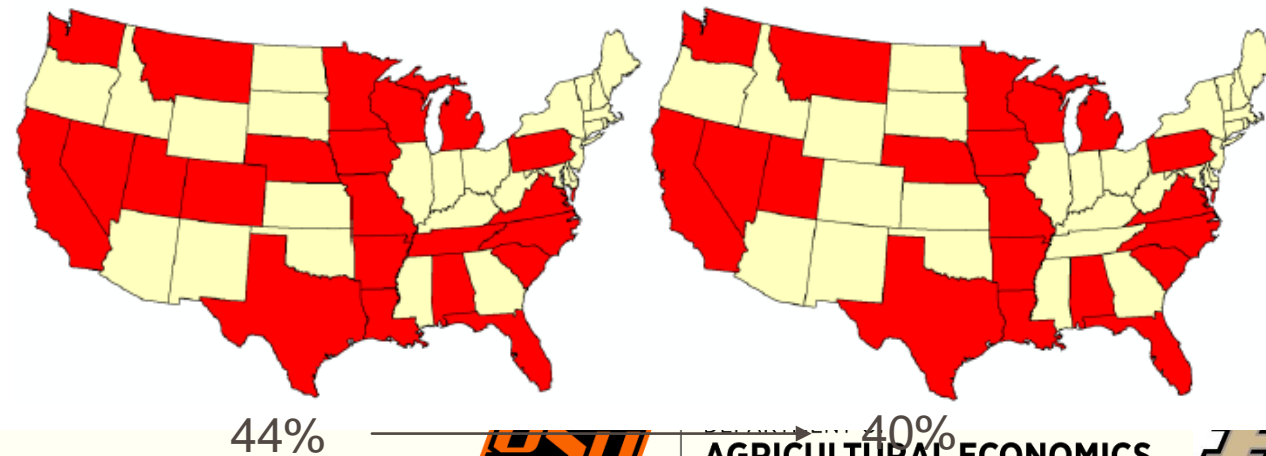


Figure 3. Municipal Broadband Restrictions, 2012 (left) and 2018 (right)



Data & Methods (cont'd)

Table 1. Descriptive Statistics for Broadband Outcomes, Policy Variables, and Demographics, 2012 & 2018.

| Demographics | 2012 | | | | 2018 | | | |
|---|--------|---------|--------|-----------|---------|---------|--------|------------|
| | Mean | S.D. | Min | Max | Mean | S.D. | Min | Max |
| <i>All County</i> | | | | | | | | |
| Population | 98,447 | 313,839 | 66 | 9,840,024 | 102,769 | 329,907 | 75 | 10,152,600 |
| Median HH Income | 45,644 | 11,900 | 19,624 | 122,844 | 51,583 | 13,703 | 20,188 | 136,268 |
| Population Density | 259.35 | 1725.37 | 0.03 | 69,423 | 269.75 | 1783.49 | 0.037 | 70,977 |
| % with Bach or more | 19.50 | 8.75 | 3.72 | 72.81 | 21.57 | 9.43 | 0 | 78.58 |
| % in Poverty | 16.30 | 6.43 | 0 | 47.70 | 15.60 | 6.48 | 2.30 | 55.10 |
| % Housing after 2010 | 0.31 | 0.44 | 0 | 5.60 | 3.59 | 2.64 | 0 | 36.00 |
| Rural % of population | 56.75 | 33.74 | 0 | 100.00 | 56.71 | 33.80 | 0 | 100.00 |
| Topography | 8.93 | 6.61 | 1 | 21.00 | 8.93 | 6.61 | 1 | 21.00 |
| <i>Rural Portion of County Only</i> | | | | | | | | |
| Population | 17,358 | 15,512 | 0 | 123,887 | 17,579 | 15,993 | 0 | 128,275 |
| Median HH Income | 25,468 | 14,858 | 0 | 91,571 | 28,919 | 17,003 | 0 | 102,156 |
| % with Bach or more | 17.35 | 8.64 | 0 | 73.65 | 19.45 | 9.24 | 0 | 73.64 |
| % in Poverty | 13.92 | 7.42 | 0 | 86.00 | 13.25 | 7.17 | 0 | 76.40 |
| % Housing after 2010 | 0.30 | 0.49 | 0 | 4.80 | 3.72 | 3.11 | 0 | 38.80 |
| <i>Instrumental Variables (State level)</i> | | | | | | | | |
| Conservative Adv. | 20.56 | 7.93 | -20.33 | 36.57 | 16.72 | 9.45 | -30.34 | 38.24 |
| % Repub. Legislators | 58.99 | 12.21 | 0 | 84.28 | 62.53 | 12.82 | 0 | 87.20 |
| # Obs | 3,143 | | | | 3,143 | | | |



Empirical Specification (Insert Glossy Eyes Here)

Dynamic Panel Regression

Dependent Variable:

% of Population with 25/3
access in county i at time t

Control Variables:

- Poverty Rates
- Education
- Population Density
- Rural % of Population
- Topography

$$(1) \quad Availability_{it} = \rho Availability_{it-1} + \beta X_{it-1} + \gamma BBPolicy_{it-1} + \delta_t + v_i + \varepsilon_{it}$$

Lagged Dependent Variable

Variables of Interest

Year Fixed Effects

County Fixed Effects

A Commonly-used Approach:
Difference (or System) Generalized
Method of Moments (GMM)

Results

Table 2. System GMM Estimates for Broadband Availability

| | 25_3_All (1) | | | Fiber_All (2) | | | 2_Competitors (3) | | |
|-----------------------------|-----------------|--------|-----|------------------|--------|-----|----------------------|--------|-----|
| Lag (availability) | 0.433 | 0.013 | *** | 0.755 | 0.023 | *** | 0.574 | 0.027 | *** |
| % Bachelor's Degree or More | 0.141 | 0.031 | *** | 0.204 | 0.023 | *** | 0.139 | 0.028 | *** |
| % Poverty | -0.351 | 0.065 | *** | -0.128 | 0.042 | *** | -0.068 | 0.039 | * |
| % Housing after 2010 | -0.320 | 0.106 | *** | 0.496 | 0.092 | *** | 0.358 | 0.124 | *** |
| ln(Median Household Income) | -0.008 | 0.020 | | -0.016 | 0.013 | | 0.062 | 0.013 | *** |
| ln(Population Density) | 0.032 | 0.002 | *** | 0.000 | 0.001 | | 0.020 | 0.002 | *** |
| Rural % of Population | -0.112 | 0.009 | *** | 0.015 | 0.005 | ** | -0.093 | 0.008 | *** |
| Topography | 0.000 | 0.001 | | -0.001 | 0.000 | | 0.000 | 0.000 | |
| Year F.E. | Yes | | | Yes | | | Yes | | |
| Policy Variables | | | | | | | | | |
| State funds | 0.012 | 0.006 | * | 0.020 | 0.005 | *** | 0.001 | 0.005 | |
| State office | -0.003 | 0.006 | | 0.009 | 0.006 | | 0.016 | 0.006 | ** |
| Municipal restrictions | -0.031 | 0.009 | *** | -0.022 | 0.008 | *** | -0.018 | 0.008 | ** |
| Constant | 0.542 | 0.220 | ** | 0.231 | 0.145 | | 0.170 | 0.140 | |
| Wald Chi Squared | 14,568 | | *** | 5,705 | | *** | 18,455 | | *** |
| # Instruments | | 54 | | | 55 | | | 61 | |
| # Groups | | 3,140 | | | 3,140 | | | 3,140 | |
| Hansen J-test | | 0.261 | | | 0.332 | | | 0.258 | |
| AR(1) | | 0.000 | *** | | 0.000 | *** | | 0.000 | *** |
| AR(2) | | 0.336 | | | 0.231 | | | 0.150 | |
| # Obs | | 18,833 | | | 18,833 | | | 18,833 | |

Intuitive results for controls

Some evidence of state office effectiveness

Municipal restrictions lower availability 2-3%

State funds increase availability 1-2%

Pass specification tests

*, **, and *** represent statistical significance at the p<.10, .05, and .01 levels, respectively

Hansen J-test represents p-values for the null hypothesis of valid instruments (overidentification)

AR(1) and AR(2) represent p-values for null hypotheses of no 1st and 2nd-order autocorrelation

Results - Rural

Table 3. System GMM estimates for Rural Broadband Availability

| | 25/3_All_Rural (1) | | | Fiber_All_Rural (2) | | | 2+_Competitors_Rural (3) | | |
|--------------------------------------|-----------------------|--------|-----|------------------------|--------|-----|-----------------------------|--------|-----|
| Lag (availability) - Rural | 0.448 | 0.015 | *** | 0.818 | 0.025 | *** | 0.803 | 0.019 | *** |
| % Bachelor's Degree or More – Rural | 0.264 | 0.029 | *** | 0.095 | 0.022 | *** | 0.104 | 0.018 | *** |
| % Poverty – Rural | -0.401 | 0.046 | *** | -0.091 | 0.028 | *** | -0.112 | 0.192 | *** |
| % Housing after 2010 - Rural | -0.152 | 0.096 | | 0.382 | 0.065 | *** | 0.059 | 0.075 | |
| ln (Median Household Income – Rural) | -0.035 | 0.004 | *** | -0.009 | 0.330 | *** | -0.016 | 0.002 | *** |
| ln (Rural Population) | 0.045 | 0.003 | *** | -0.010 | 0.168 | *** | 0.015 | 0.001 | *** |
| Rural % of Population | 0.019 | 0.014 | | 0.050 | 0.009 | *** | -0.008 | 0.006 | |
| Topography | -0.001 | 0.001 | | -0.000 | 0.000 | | 0.000 | 0.001 | |
| Year F.E. | Yes | | *** | Yes | | | Yes | | |
| Policy Variables | | | | | | | | | |
| State funds | 0.018 | 0.007 | *** | 0.021 | 0.005 | *** | 0.014 | 0.004 | *** |
| State office | -0.007 | 0.008 | | 0.015 | 0.006 | ** | 0.003 | 0.005 | |
| Municipal restrictions | -0.037 | 0.011 | *** | -0.016 | 0.006 | ** | 0.003 | 0.006 | |
| Constant | 0.175 | 0.042 | *** | 0.208 | 0.032 | *** | 0.037 | 0.024 | |
| Wald Chi Squared | | 15,432 | *** | | 7,215 | *** | | 17,635 | *** |
| # Instruments | | 54 | | | 53 | | | 52 | |
| # Groups | | 3,028 | | | 3,028 | | | 3,028 | |
| Hansen J-test | | 0.251 | | | 0.304 | | | 0.275 | |
| AR(1) | | 0.000 | *** | | 0.000 | *** | | 0.000 | *** |
| AR(2) | | 0.201 | | | 0.621 | | | 0.042 | ** |
| # Obs | | 18,159 | | | 18,159 | | | 18,159 | |

Intuitive
results for
controls

Municipal
restrictions lower
availability 2-4%

State funds increase
availability 1-2%



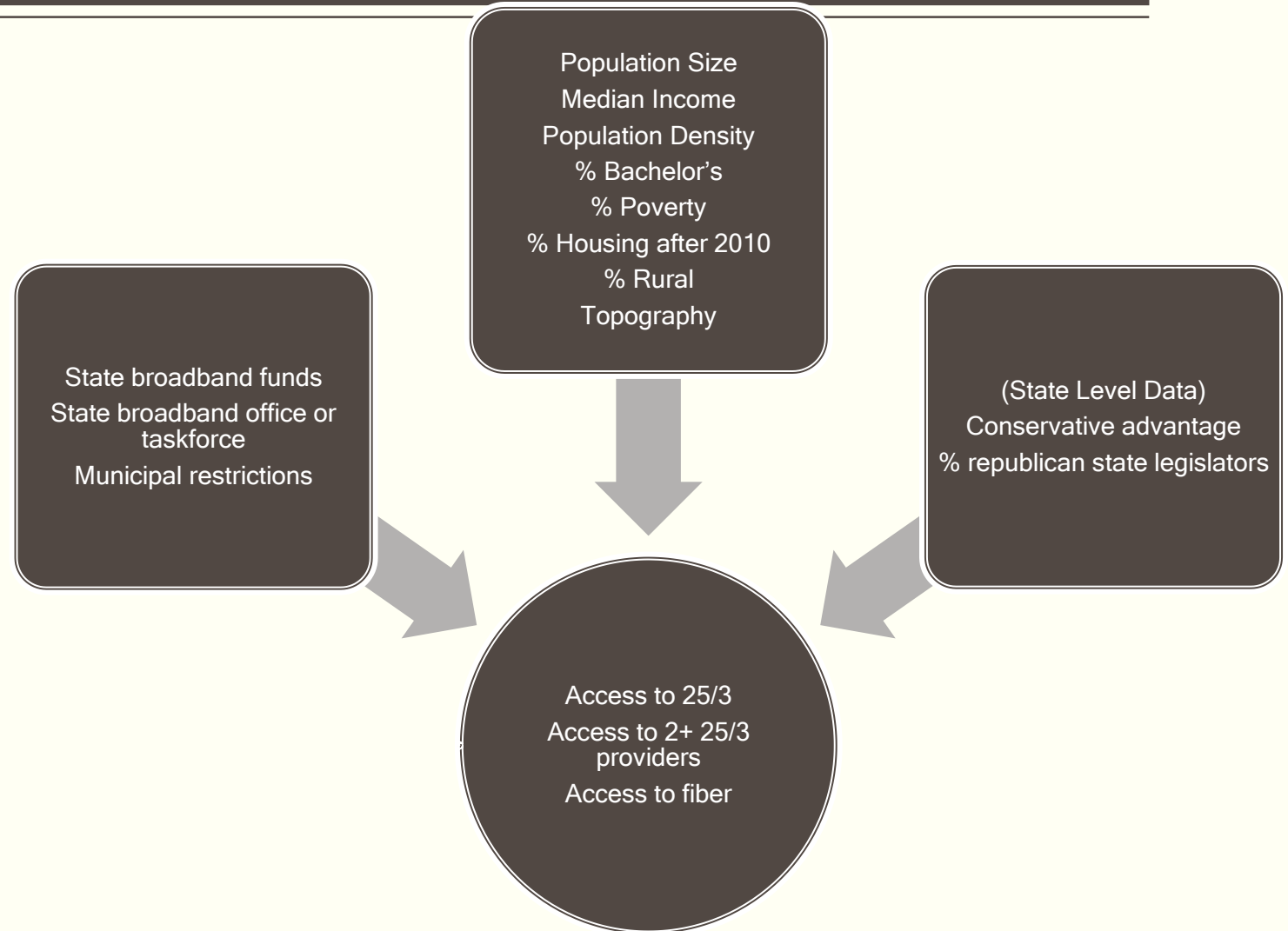
*, **, and *** represent statistical significance at the p<.10, .05, and .01 levels, respectively

Hansen J-test represents p-values for the null hypothesis of valid instruments (overidentification)

AR(1) and AR(2) represent p-values for null hypotheses of no 1st and 2nd-order autocorrelation

Study Summary in 2 slides:

- 2012-2018
- County-level data
- 18,833 observations
- Dynamic panel regression
- FCC Form 477
- ACS 5-year
- Pew Charitable Trusts



Study Summary in 2 slides (cont'd):

| Do these state broadband policies matter? | State broadband office | State broadband funding | Municipal network restrictions |
|---|------------------------|-------------------------|--------------------------------|
| Overall | | | |
| 25/3 availability | | Yes (higher) | Yes (lower) |
| Fiber availability | | Yes (higher) | Yes (lower) |
| Two or more 25/3 providers | Yes (higher) | | Yes (lower) |
| Rural | | | |
| 25/3 availability | | Yes (higher) | Yes (lower) |
| Fiber availability | Yes (higher) | Yes (higher) | Yes (lower) |
| Two or more 25/3 providers | | Yes (higher) | |



Conclusions

- Strong argument that state broadband policies are having an impact
 - Existence of restrictions on municipal / cooperative broadband hinders overall availability
 - Broadband funding programs / offices have positive impact
- Magnitude of impacts:
 - Typical county in 2018: 71.5% rural broadband availability
 - Including state-level funding program: (+1.8%) → 73.3%
 - Removing municipal restrictions: (+3.7%) → 75.2%
 - Additive in nature: Do both → 77.0%



Conclusions (and recent progress)

■ State Broadband Offices

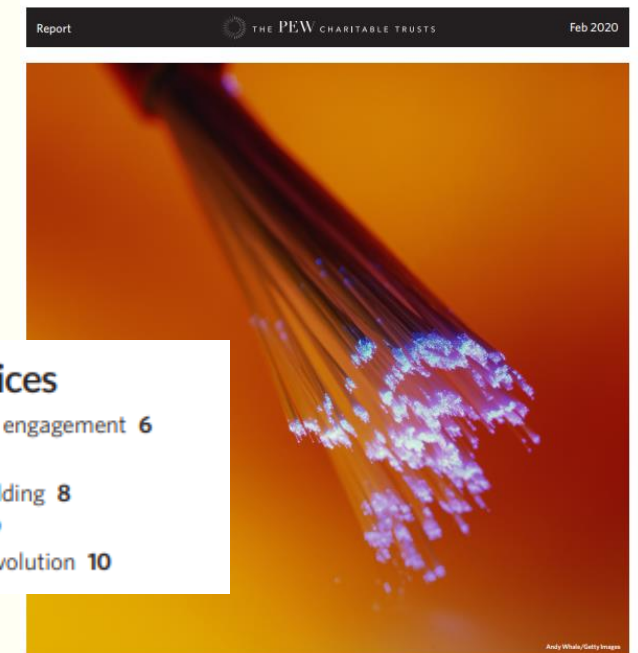
- Positive impact shown for only 2 outcomes: % of residents with 2+ providers; rural-only fiber
- But, many states only began investing in these relatively recently
 - 8 in 2014
 - 25 by 2018
- Benefits of these offices may take time to accrue
 - Stakeholder outreach
 - Planning / capacity building
- Interplay between state offices / other policies?

■ Recent Momentum

- Pew's update for 2019 legislative session:
 - 4 additional states set up broadband task forces
 - 7 states set up their own broadband funding structures
 - 5 states reduced restrictions for cooperative broadband provision

5 Promising practices

- Stakeholder outreach and engagement 6
- Policy framework 7
- Planning and capacity building 8
- Funding and operations 9
- Program evaluation and evolution 10



How States Are Expanding Broadband Access



That's all, folks!

- Thanks to the development council for having us!
- Questions?
- Comments?



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DEPARTMENT OF
AGRICULTURAL ECONOMICS



Center for Regional Development

Tab

3

Operation Connectivity is a joint effort between Governor Greg Abbott, the Texas Legislature, and the Texas Education Agency (TEA) to **connect** Texas's 5.5 million public school students with a device and reliable internet **connection**.





Operation Connectivity | Timeline

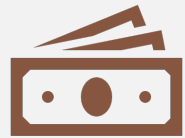
| Operation Connectivity Launch | | PHASE 1: TRIAGE | | | | PHASE 2: MAPPING & ADOPTION FOR ECO DIS STUDENTS & EXISTING INFRASTRUCTURE | | | | PHASE 3: DEVELOPMENT & ADOPTION OF NEW INFRASTRUCTURE | |
|----------------------------------|---------------------------------|---------------------------|----------------------------|--------------------|-------------------|--|---------------------------------------|--|---|---|--|
| Launch of Operation Connectivity | Initial Taskforce Work & Report | Triage Device Procurement | Device Shipping & Delivery | LMRP | PPRP | Mapping of Access & Adoption of HSB Service for Eco Dis Students by LEA | Determine # of FLIP Eligible Students | Negotiate Consistent Pricing & T&Cs for LEAs | Fixed Line Installation Program (FLIP) Launch | Explore New Broadband Tech | Work with Legislature to Secure Funding for New Infrastructure and Adoption Programs |
| May '20 | June '20 – July '20 | July '20 – August '20 | Sept '20 – Jan '21 | Sept '20 – Dec '20 | Nov '20 – Feb '21 | January '21 | Jan '21 – Feb '21 | Feb '21 – Mar '21 | April '21 – July '21 | Sept '20 – July '21 | TBD |
| ✓ | ✓ | ✓ | ✓ | ✓ | ➡ | ➡ | ➡ | ➡ | ➡ | ➡ | 🕒 |

| | |
|---|-----------------|
| ✓ | Completed |
| ➡ | In Process |
| 🕒 | Not Yet Started |

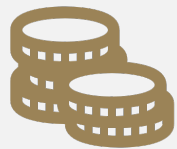
Operation Connectivity Phase 1



Triage Bulk Purchase of E-learning
Devices and Hot Spots



Local Match Reimbursement
Program (LMRP)

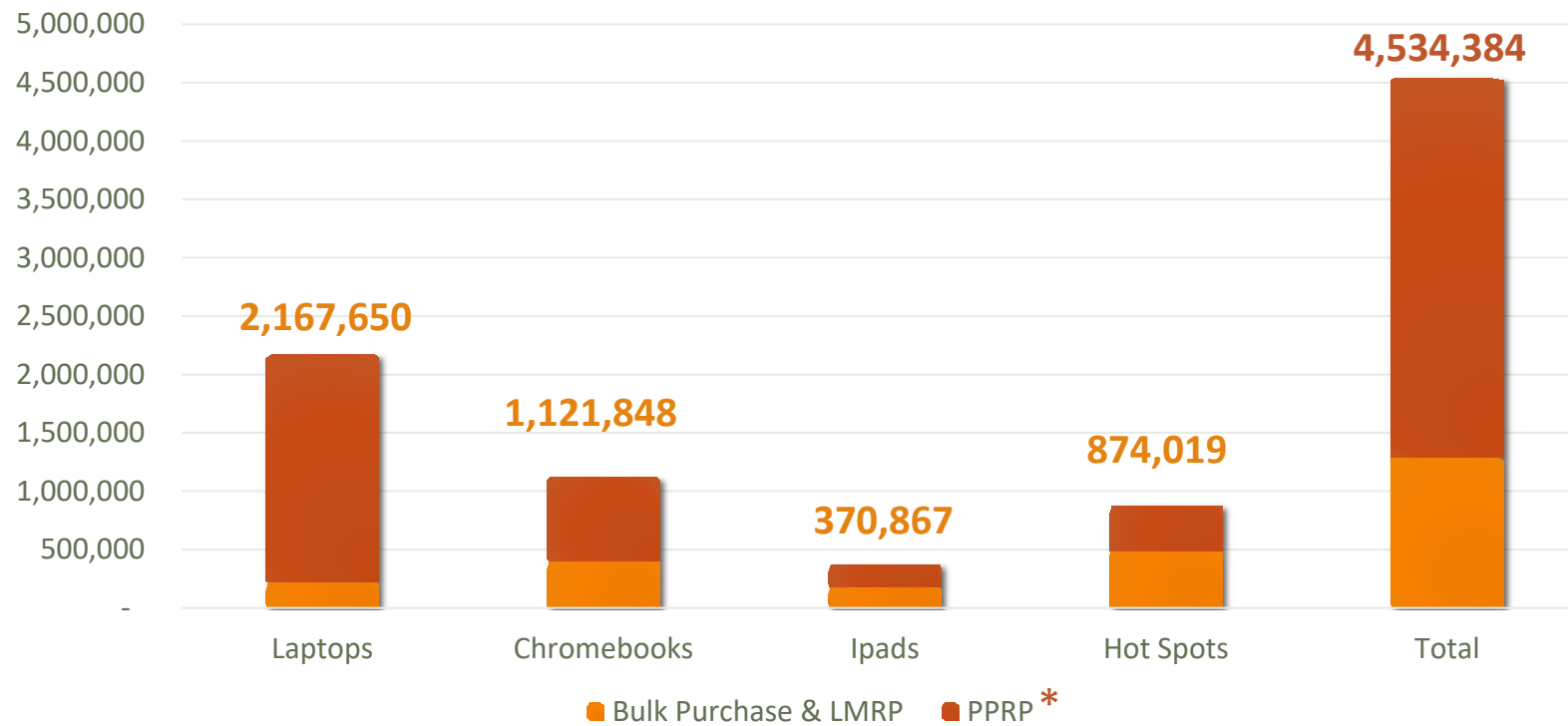


Prior Purchase Reimbursement
Program (PPRP)



Summary Impact of Operation Connectivity To Date

of Devices Acquired Since 05/21/2020

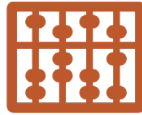


* PPRP #s will not be final until 02/28/21.

Operation Connectivity Phase 2



Mapping of Economically Disadvantaged Students by Census Block Group in Collaboration with Connected Nation



Determination of # of Economically Disadvantaged Students by LEA whom we believe have access to High-Speed Broadband but have not adopted it, and the # of Students by LEA who do not have access to High-Speed Broadband at all



Work with ISPs across the State to develop consistent service pricing and T&Cs for LEAs to purchase high-speed broadband service for economically disadvantaged students



Leveraging this consistent pricing and T&Cs, assist LEAs to implement bulk purchases of high-speed broadband service for their districts

Operation Connectivity Phase 3



Explore New Broadband Technologies
Applicable to LEAs



Work with Legislature to Secure Funding for
New Infrastructure and Adoption Programs



Questions

Tab

4

Rural Digital Opportunity Fund In Texas

January 28, 2021

Lindsay Conrad

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- Established in 2019 to provide up to \$20.4 billion for rural connectivity
- Doled out in 2 Phases:
 - Phase I: Up to \$16 billion for census blocks that wholly lack voice and broadband with speeds of at least 25 Mbps
 - Phase II: Up to \$4.4 billion for blocks that are partially served, as well as locations not funded in Phase I



- In December 2020, FCC announced 180 winning bids in the Phase I Auction across 49 states
- 5.2 Million Homes to be served
- 99.7% of the locations receiving speeds of at least 100/20 Mbps coverage
- Over 85% of locations will be served at gigabit speeds
- Only \$9.2 billion allocated, far short of the allotted \$16 billion



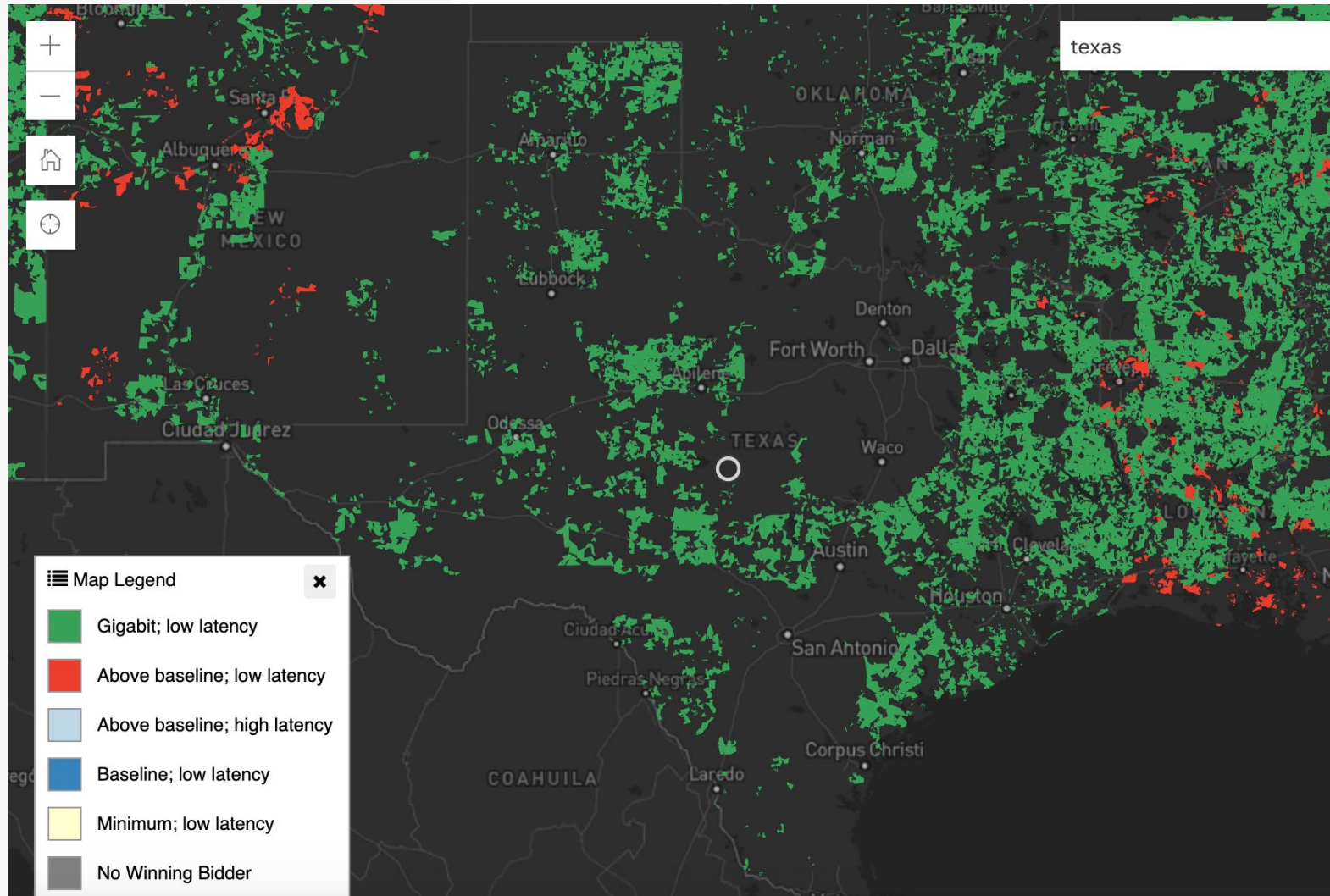
- 22 Texas providers won \$362,662,934.10 to offer service to 310,962 locations
- In terms of money allocated, Texas ranks #9 following CA, MS, AR, MN, IL, WI, PA, and MI
- In terms of locations to be served, Texas ranks #2 behind CA

Texas Winning Bidders – Top 10



| Bidder | Support | Locations |
|---------------------------------------|----------------|------------------|
| CCO Holdings, LLC | \$186,793,360 | 133,993 |
| Resound Networks, LLC | \$94,443,072 | 82,945 |
| LTD Broadband LLC | \$42,668,489 | 26,260 |
| AMG Technology Investment Group LLC | \$24,510,589 | 38,003 |
| Rural Electric Cooperative Consortium | \$4,222,893 | 9,071 |
| Windstream Services LLC | \$4,052,298 | 2,331 |
| NexTier Consortium | \$3,276,899 | 14,498 |
| Bandera Electric Cooperative, Inc. | \$1,689,602 | 534 |
| Frontier Communications Corporation | \$673,062 | 613 |
| Consolidated Communications, Inc. | \$140,964 | 199 |

Texas Locations



[Link to Map](#)



- 10-year term, monthly installments
- Winning bidders must meet periodic buildout requirements:
 - Year 3: 40%
 - Year 4: 60%
 - Year 5: 80%
 - Year 6: 100%

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