

# Broadband in Rural America

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AUSTIN MOSER, HOUSING ASSISTANCE COUNCIL

# Overview

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2018 marks the first year of ACS 5-year estimates for broadband subscription data

1. Provide descriptive statistics for rural areas and broadband
2. Describe disparities in broadband access using the Housing Assistance Council's definitions for rural, suburban, and urban census tracts
3. Propose solutions to help expand broadband in rural America

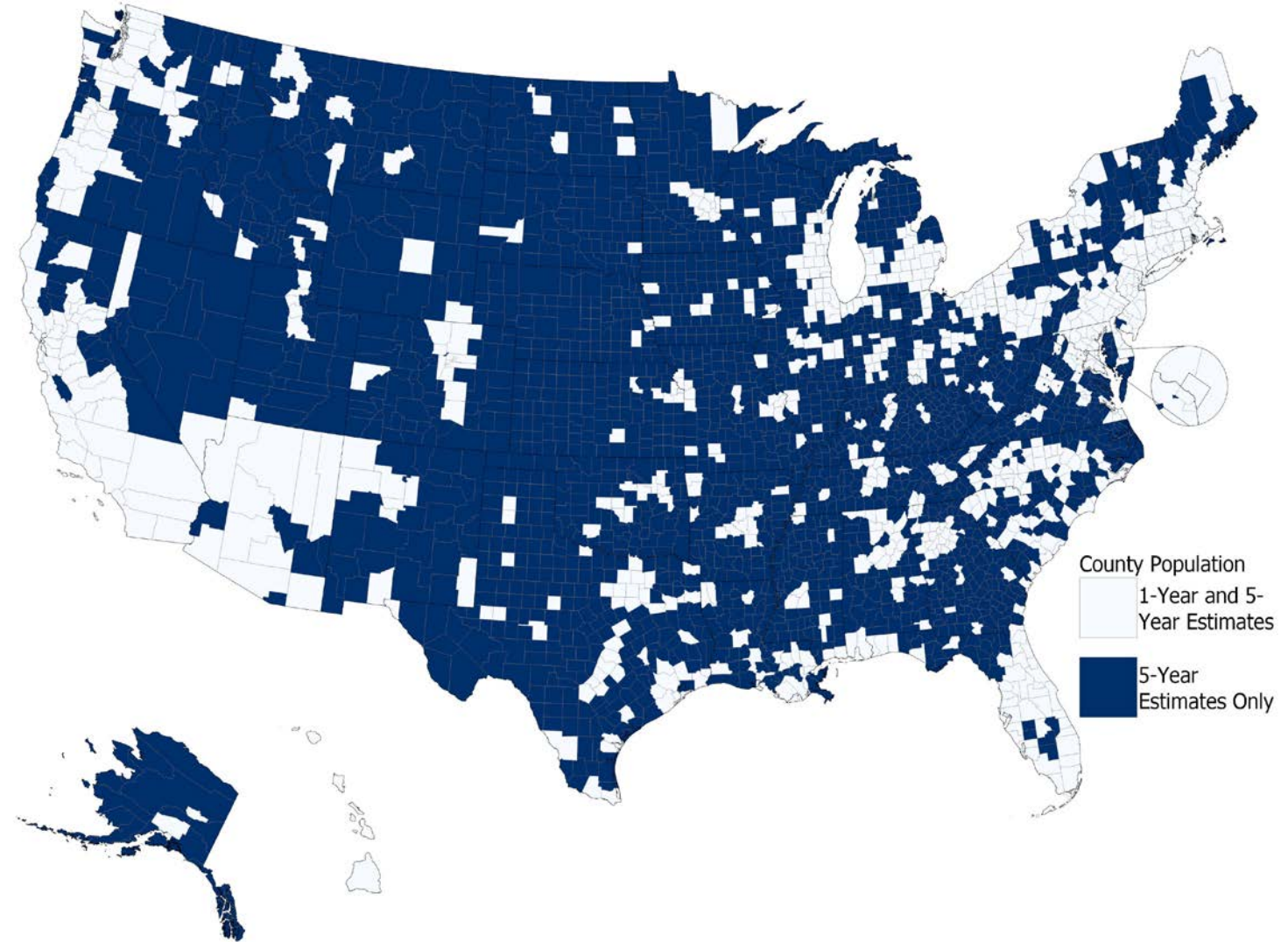
# Value of 5-year data for Rural America

5-year estimates must be used for areas with populations under 65,000

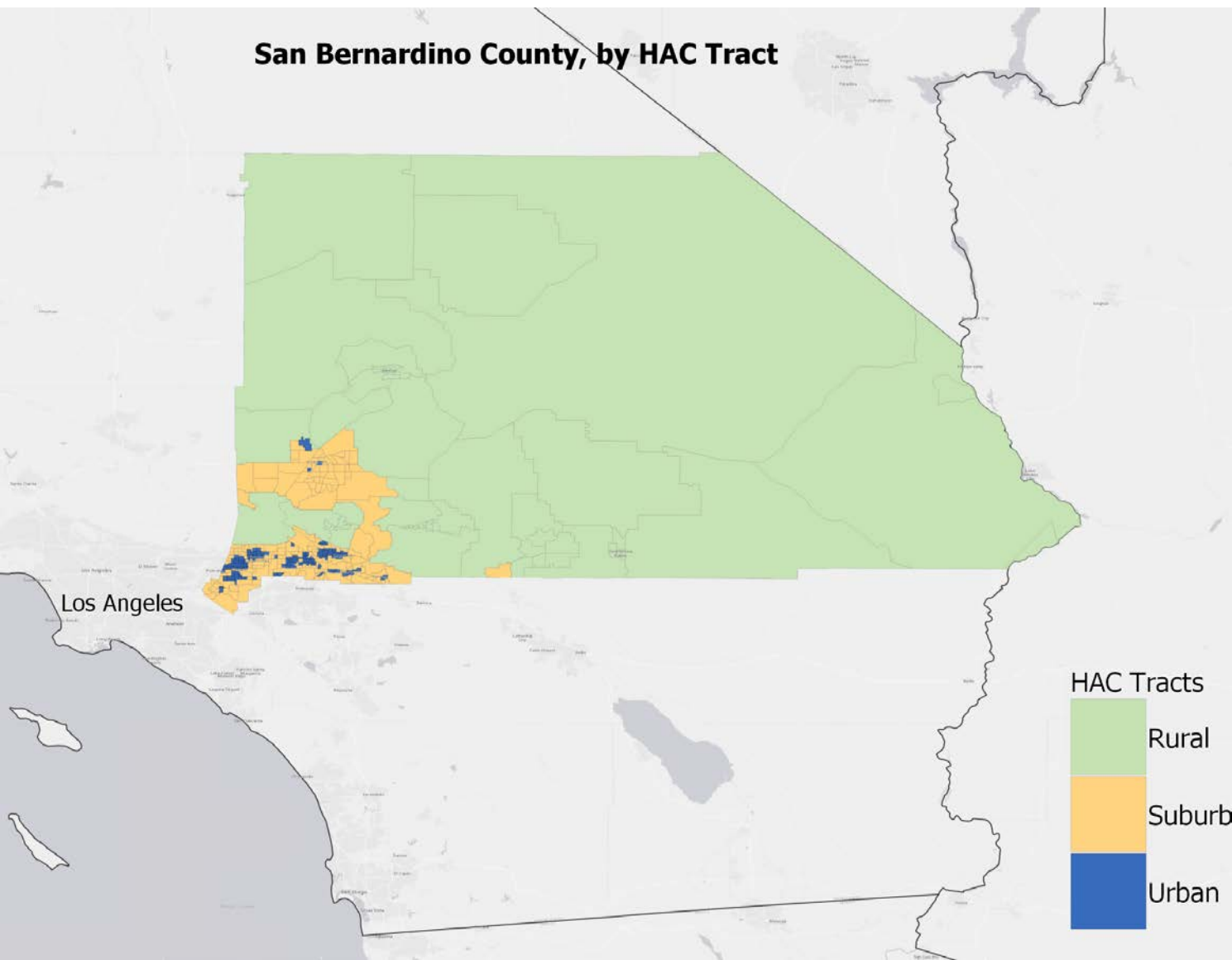
75% of U.S. counties have populations under 65,000

80% of these counties are rural

Counties Populations with over and under 65,000 populations



# HAC Tracts mapped



San Bernardino tract info	Total Population	Percentage of population	Total Tracts
Rural	187,369	9.1%	49
Suburban	1,100,338	53.3%	173
Urban	776,850	37.6%	147
Total	2,064,557	100.0%	369

# The Question/Measure

The ACS defines broadband internet as internet service through satellite, cable, fiber optic, cable, or cellular data plan

78.7% of Household count (s2801) have internet, 78.1% with broadband

82.1% of the population (s2802) has having some form of broadband

**9 At this house, apartment, or mobile home – do you or any member of this household have access to the Internet?**

☐ Yes, by paying a cell phone company or Internet service provider

☐ Yes, without paying a cell phone company or Internet service provider → *SKIP to question 11*

☐ No access to the Internet at this house, apartment, or mobile home → *SKIP to question 11*

**10 Do you or any member of this household have access to the Internet using a –**

	Yes	No
a. cellular data plan for a smartphone or other mobile device?	<input type="checkbox"/>	<input type="checkbox"/>
b. broadband (high speed) Internet service such as cable, fiber optic, or DSL service installed in this household?	<input type="checkbox"/>	<input type="checkbox"/>
c. satellite Internet service installed in this household?	<input type="checkbox"/>	<input type="checkbox"/>
d. dial-up Internet service installed in this household?	<input type="checkbox"/>	<input type="checkbox"/>
e. some other service? <i>Specify service</i> ↗	<input type="checkbox"/>	<input type="checkbox"/>

# Population vs Household ACS measures

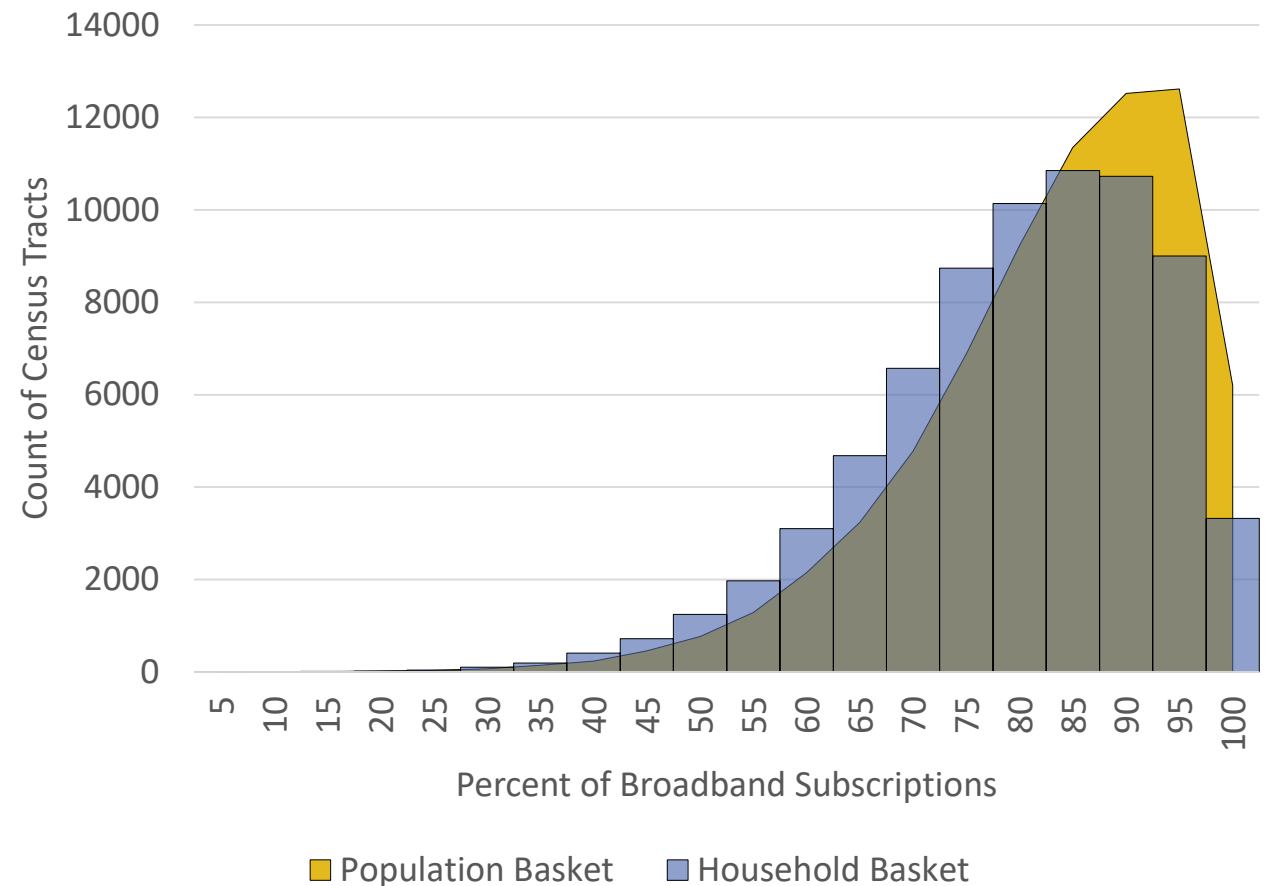
Household only contains type of computer, type of subscription, and HH income

Population data contains demographics (age, race, education attainment, employment status, type of computer)

HH always slightly lower subscription rates

Rural and urban have less population per house

Population vs Household measures compared, by Broadband Subscription rate, by Census Tract



# ACS measure compared to other data

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## Pros

Accurate

Consistent

No third-party information

Self reported

## Cons

No speed measurement

- Limit on understanding of variability of capability

Self reported

- Definitions of 'Broadband' may be wide

# What is the Digital Divide?

## Household Broadband Adoption



92.8 million, or 78.1% of  
American Households



81.8% Suburban



77.8% Urban



69.5% Rural

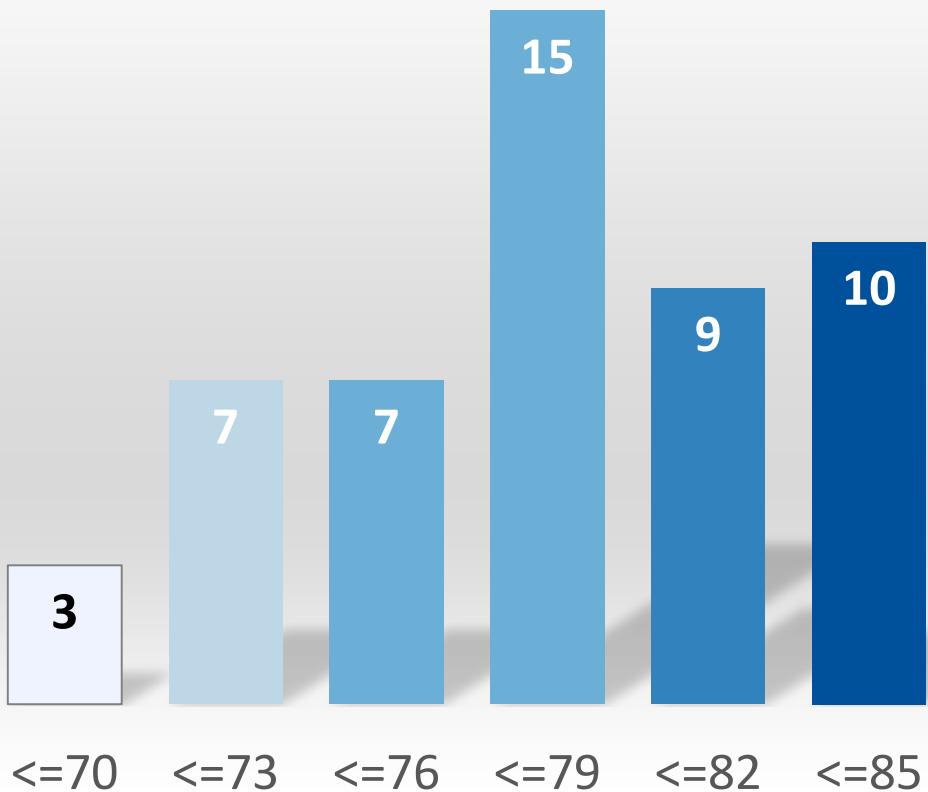
# 12.3%

gap between rural  
and suburban  
broadband

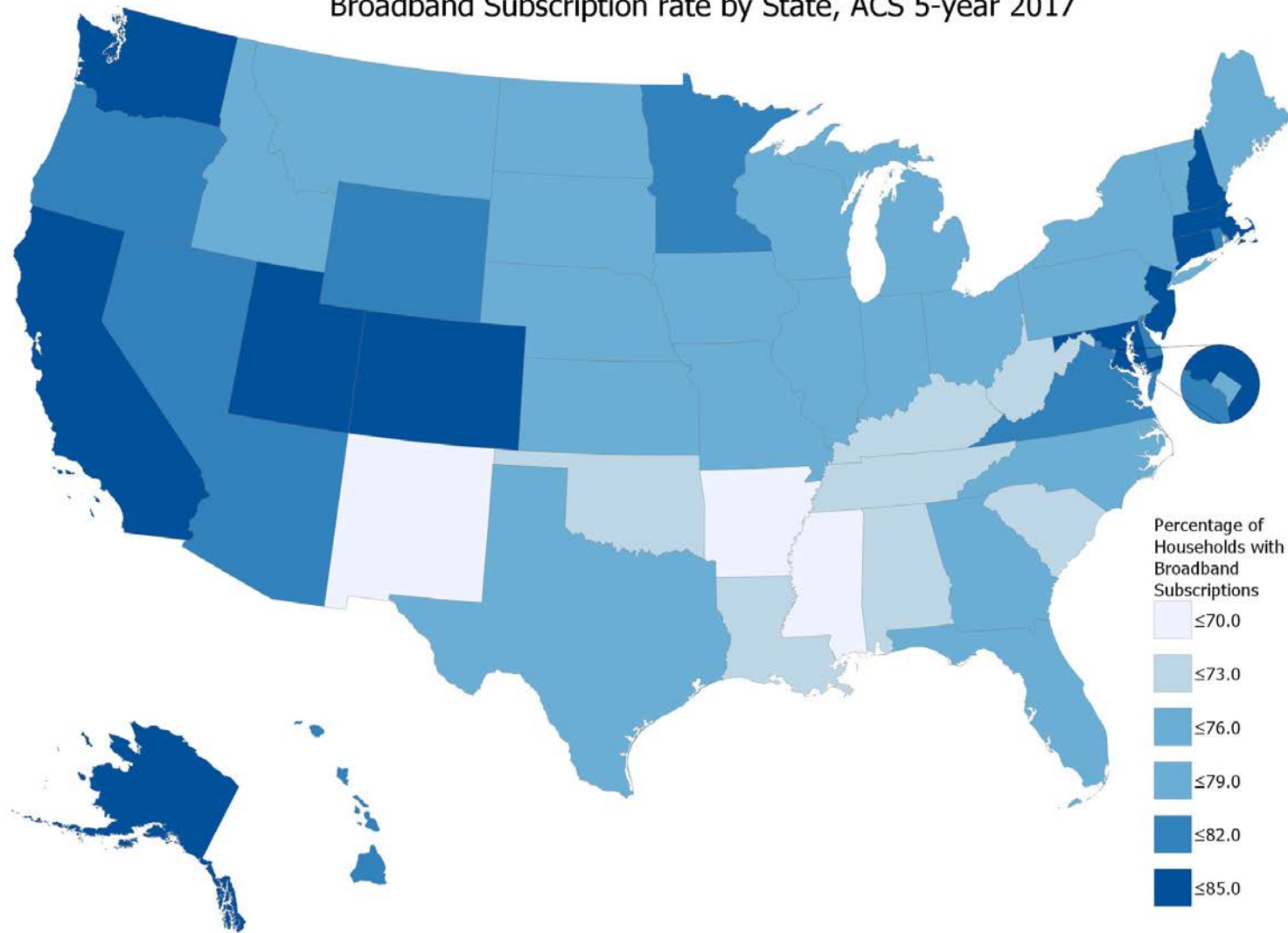


# Broadband Subscriptions, By State

Number of States by  
Broadband Subscription Rates



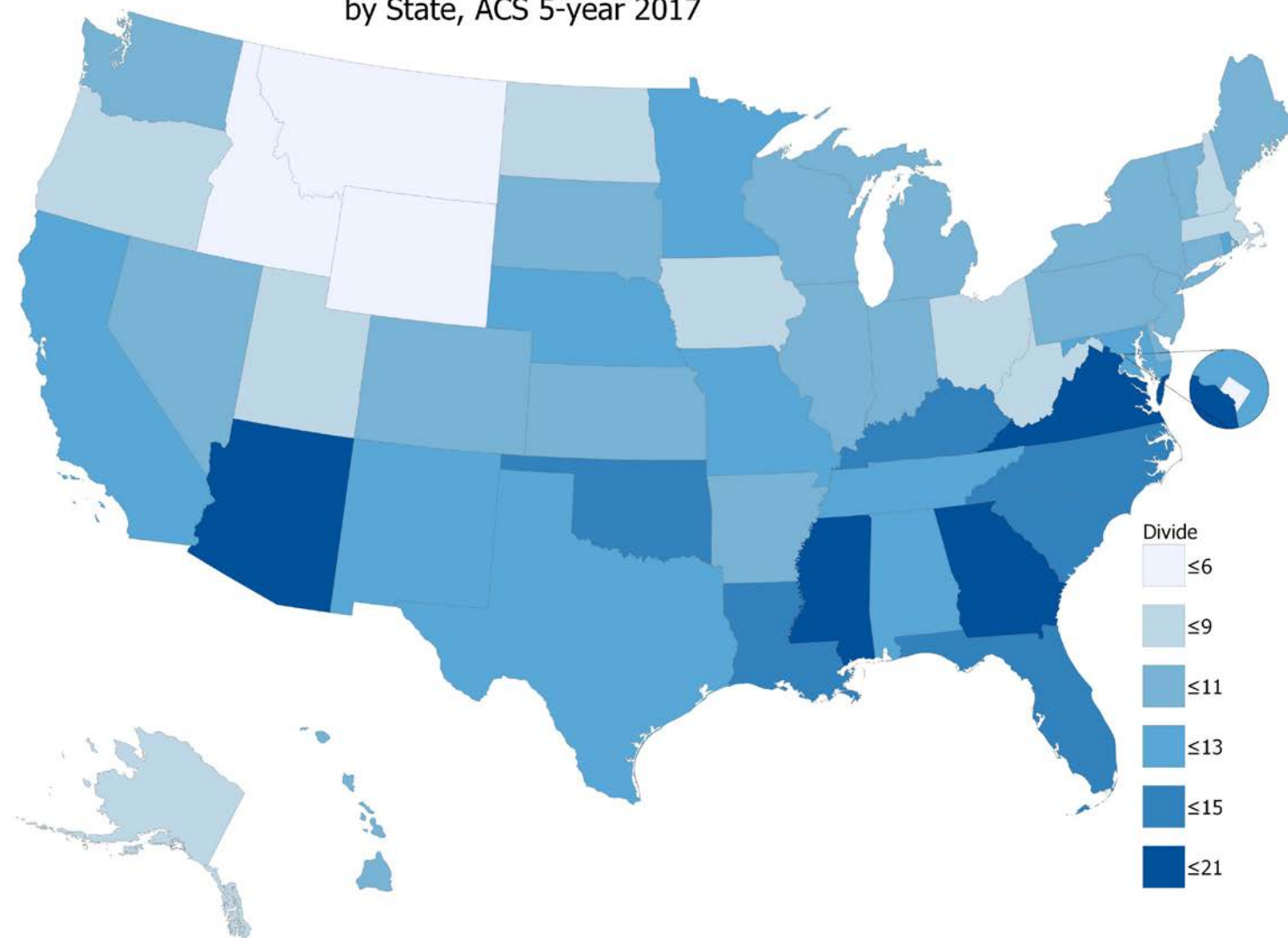
Broadband Subscription rate by State, ACS 5-year 2017



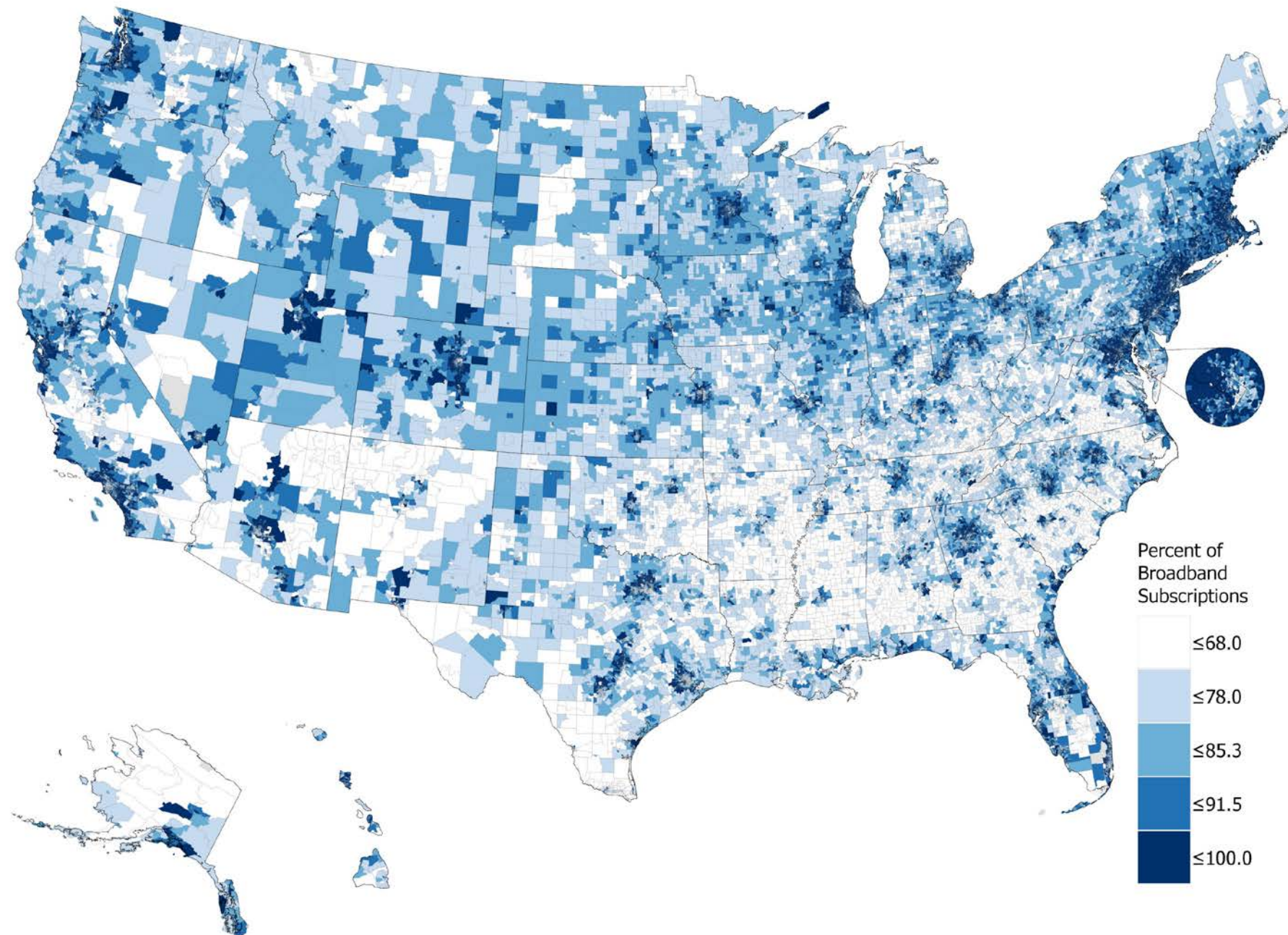
# Digital Divide, By State

State	Suburb	Rural	Divide
Virginia	83%	63%	<b>20%</b>
Arizona	85%	67%	<b>18%</b>
Georgia	81%	64%	<b>17%</b>
...			
Montana	81%	75%	<b>6%</b>
Idaho	80%	75%	<b>5%</b>
Wyoming	80%	79%	<b>2%</b>

Rural-Suburban Digital divide by Broadband Subscription rate  
by State, ACS 5-year 2017

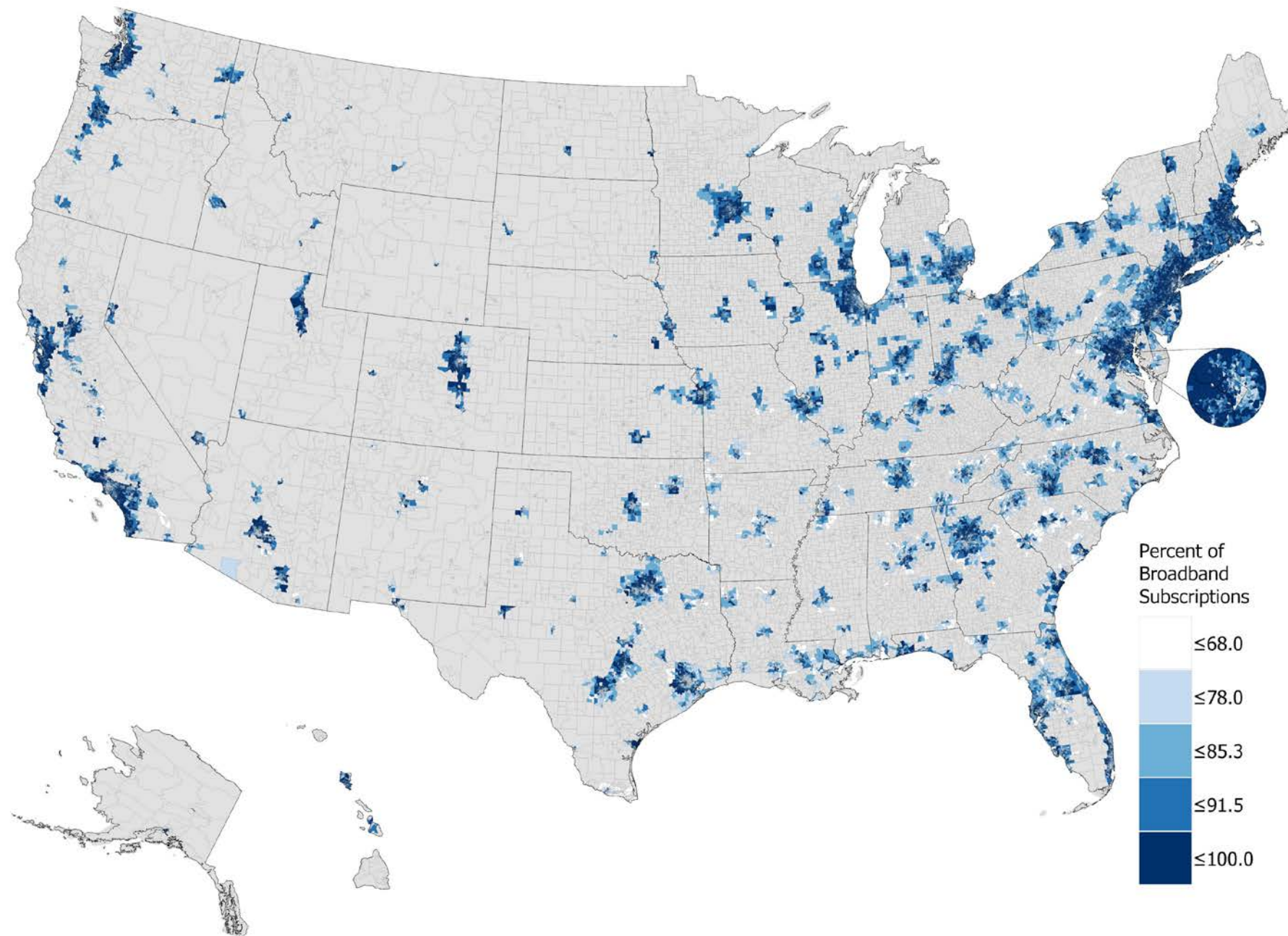


Percent of Broadband Subscriptions, All Census Tracts

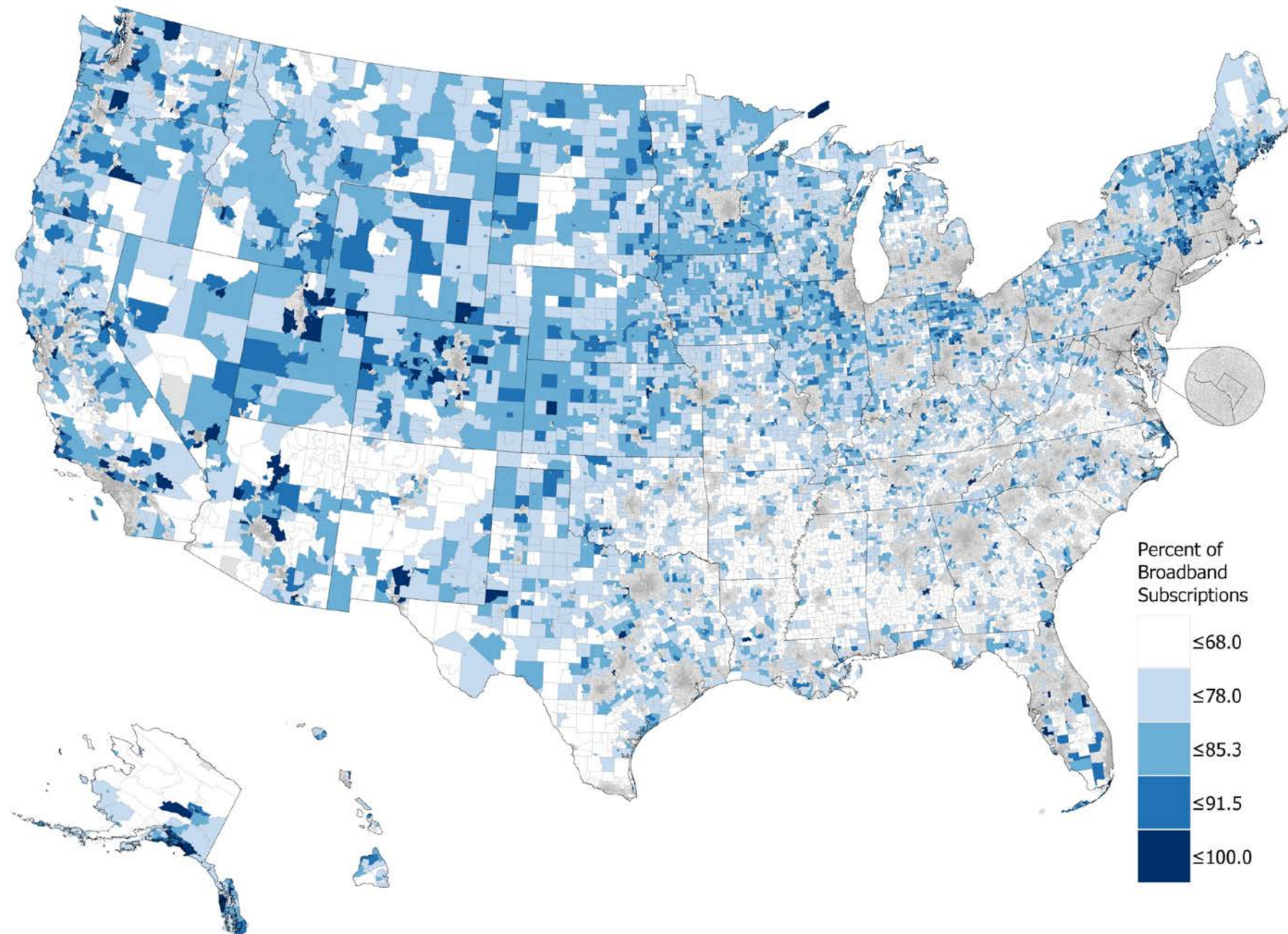




Percent of Broadband Subscriptions, Suburban/Urban Census Tracts



Percent of Broadband Subscriptions, Rural Census Tracts



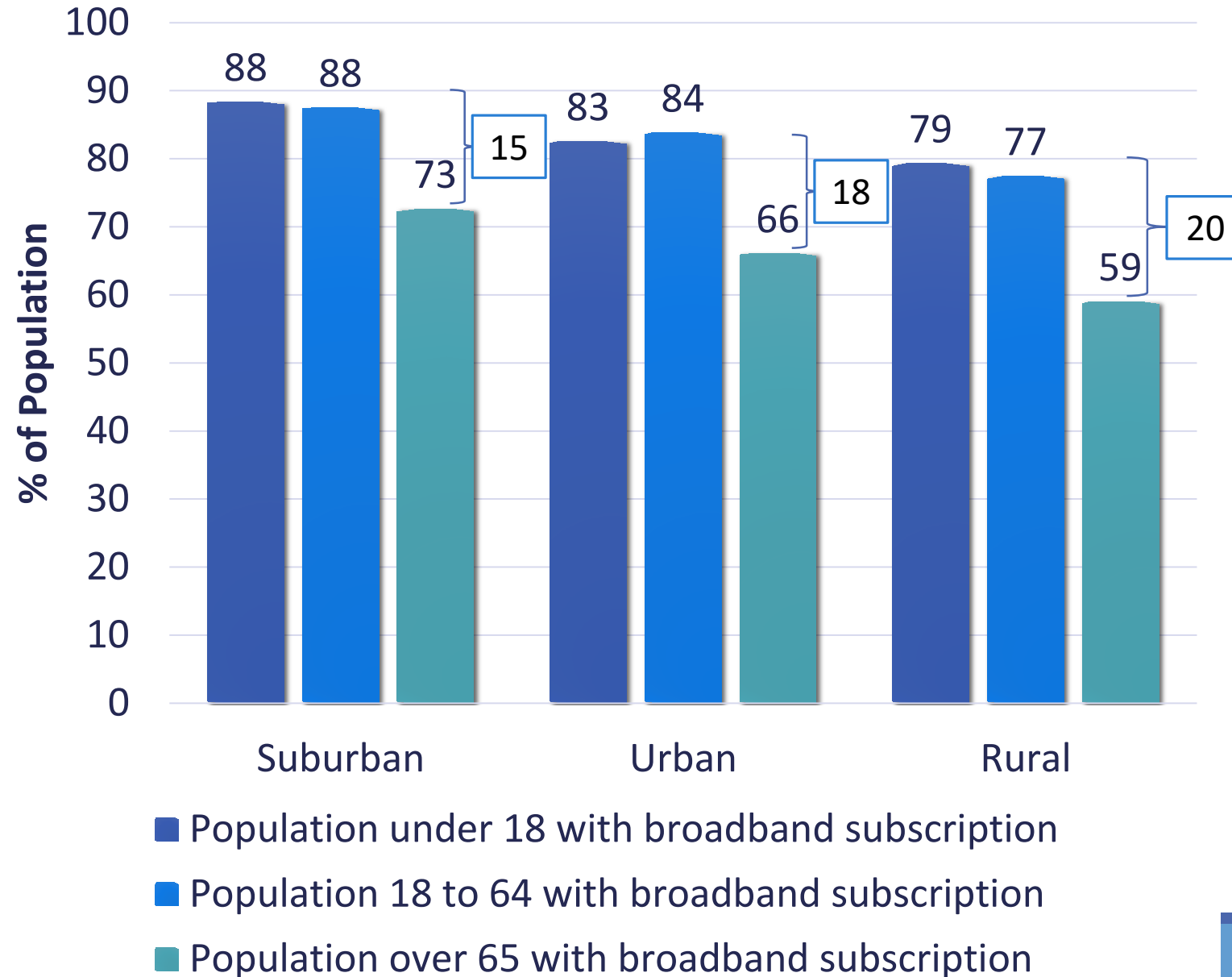


# By Age

Rural Mississippi has the lowest broadband rates by every age group

Suburbs in the Northeast (NH, NJ, MA, CT, RI) have the highest rates for populations under 65

## Broadband subscriptions by geography and age group

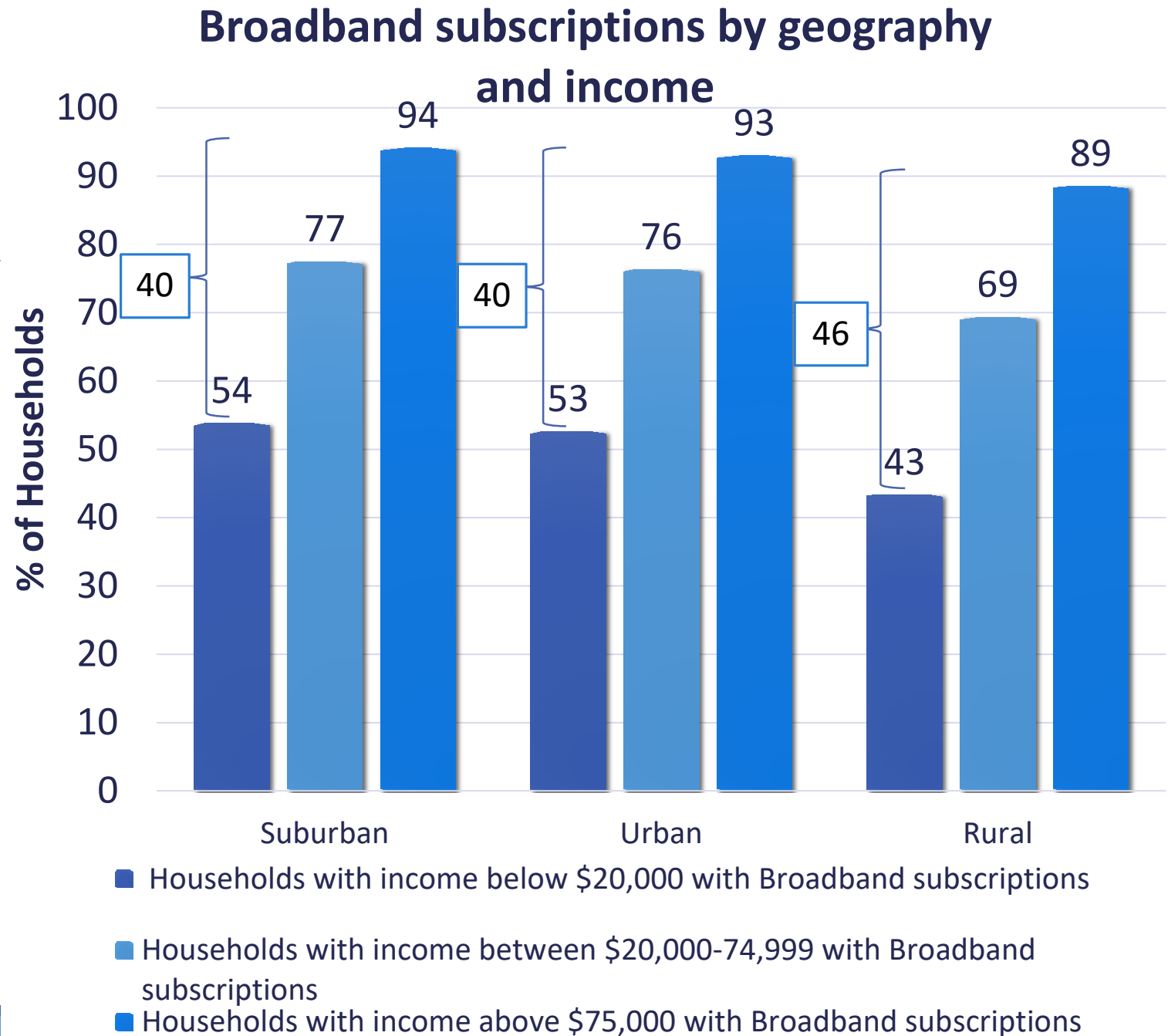


# By Income

Rural SC, VA, MS, LA have the lowest rates for HH under 20,000 (Broadband rates below 36%)

Suburban areas have the highest rates across all incomes

Rural Tracts have the lowest rates across all incomes



# Regression Models (ACS 5-Year 2017), weighted by total households

	DEMOGRAPHICS	GEOGRAPHY	LABOR FORCE	TRACT INCOME	TRACT INCOME AND GEOGRAPHY	ALL
CONSTANT	0.71	0.82	0.07	-1.63	-1.52	-1.26
Log tract median income				<b>0.22</b>	<b>0.21</b>	<b>0.17</b>
Rural		-0.12			-0.05	-0.05
Urban		-0.04			0.01	0.00
Share of population over 16 in the labor force			0.61			0.21
Share of population with a H.S. degree or higher			0.52			0.15
Share of population over 65	-0.25					-0.16
Share of population white	0.15					0.04
DEGREES OF FREEDOM	118,825,920	118,825,920	118,825,920	118,752,883	118,752,883	118,752,883
R SQUARED	0.08	0.13	0.43	<b>0.63</b>	<b>0.65</b>	<b>0.69</b>
ADJUSTED R SQUARED	0.08	0.13	0.43	<b>0.63</b>	<b>0.65</b>	<b>0.69</b>

\*all variables significant at 0.00



# IPUMS Regression Models (Years 2015-2017), weighted by household size

	HOUSEHOLD LOGIT MODEL	HOUSEHOLD INCOME MODEL	PUMA MEDIAN INCOME MODEL
(CONSTANT)	-7.54	-.79	-2.34
LOG HOUSEHOLD INCOME	.77	.14	
LOG MEDIAN PUMA INCOME			.27
RURAL	-.05	-.01	.00
METRO	.41	.07	.03
DEGREES OF FREEDOM	887,103,537	887,103,537	887,103,537
R SQUARED	.09	<b>0.10</b>	<b>0.70</b>
ADJUSTED R SQUARED	.09	<b>0.10</b>	<b>0.70</b>

- Internet Service Providers (ISPs) determine where broadband goes
  - Based on profitability, high median area income
- Generally, rural areas do not have high enough concentrations of high-income residents to be considered 'profitable'

\*all variables significant at 0.00

\*\*Mixed geography left out as a comparison group

# Implications

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Market looks like postal service at the turn of 20<sup>th</sup> century, or the expansion of electricity in the 1930's

- Similar policies: Free Rural Delivery, Rural Electrification Act
- Viewing broadband as a public good

Increasing internet accessibility could drastically improve economic trends in rural America

- Rural small businesses adoption of broadband can increase gross sales by an estimated value \$84.5 billion a per year, over the next three years
  - See *“Unlocking the Digital Potential of Rural America”*, by C\_Tech and Amazon

# Moving Forward

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## Current federal programs:

- **USDA:** Rural Broadband Access Loan and Loan Guarantee Program, the Community Connect Grant Program, and the ReConnect Program
- **FCC:** Universal Service fund

## Municipal broadband, broadband co-ops

- 26 states currently have laws fighting these concepts
- *“Community-Owned Fiber Networks: Value Leaders in America”*, by Harvard

## Technological improvements

- Microsoft: TV Whitespace
- Amazon/SpaceX: Satellite broadband

# Summary

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Internet accessibility in Rural areas drastically lag their suburban and urban counterparts

Area income determines broadband accessibility

- Outside intervention is required to increase accessibility

Increasing broadband accessibility could drastically improve economic trends and quality of life in rural America

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