



# Broadband In Rural Economic Development

Tessa Conroy  
Assistant Professor



Department of Extension  
Department of Agricultural and Applied Economics

# Broadband is..

- a high-speed connection between homes (or institutions or organizations) and the world wide web.
- faster than a dial-up or narrow band telephone connection and it is always on making it preferable to other technologies.
- defined by the FCC as at least 25 Mbps of download speed and at least 3 Mbps of upload speed.
  - The definition, though, has evolved over time to increasingly higher thresholds, reflecting the increasing demand for faster connections.

## Types of Broadband Connections

Faster	Fiber	A wired technology, generally viewed as the most preferred option for broadband. It uses fiber-optic cable to transmit large amounts of information. The infrastructure is relatively expensive to build.
	Cable	Cable uses the same coaxial cables, another wired technology, that deliver picture and sound to television sets to support broadband.
	DSL	Also a wired technology, DSL uses traditional copper telephone lines already connected to homes and businesses. Speed may vary with distance from the home to the nearest equipped telephone facility.
Slower	Wireless	Wireless connections use a radio link to connect between residences or businesses and the provider's facility. Available to fixed locations as well as across broader regions via a cell phone, for example.
	Satellite	A type of wireless broadband using the satellite technology used in for telephone and television service. It is viewed as useful for getting service to remote or low-density areas.

Source: (1) Federal Communication Commission. "Types of Broadband Connections." July, 23, 2014. Available at: <https://www.fcc.gov/general/types-broadband-connections>. (2) "Broadband Reference Guide: A Digital Resource for Stakeholders." Broadband & E-Commerce Education Center. University of Wisconsin Extension Madison. January, 2014. <https://cced.ces.uwex.edu/files/2018/07/007.010.2014-Broadband-Reference-Guide.pdf>

## How Much Speed Do You Need?

**0-5 Mbps**

General browsing, email, social media, online radio.

**5-40 Mbps**

Videoconferencing, telecommuting, online gaming, streaming video, multiple device usage within a household

**40-100 Mbps**

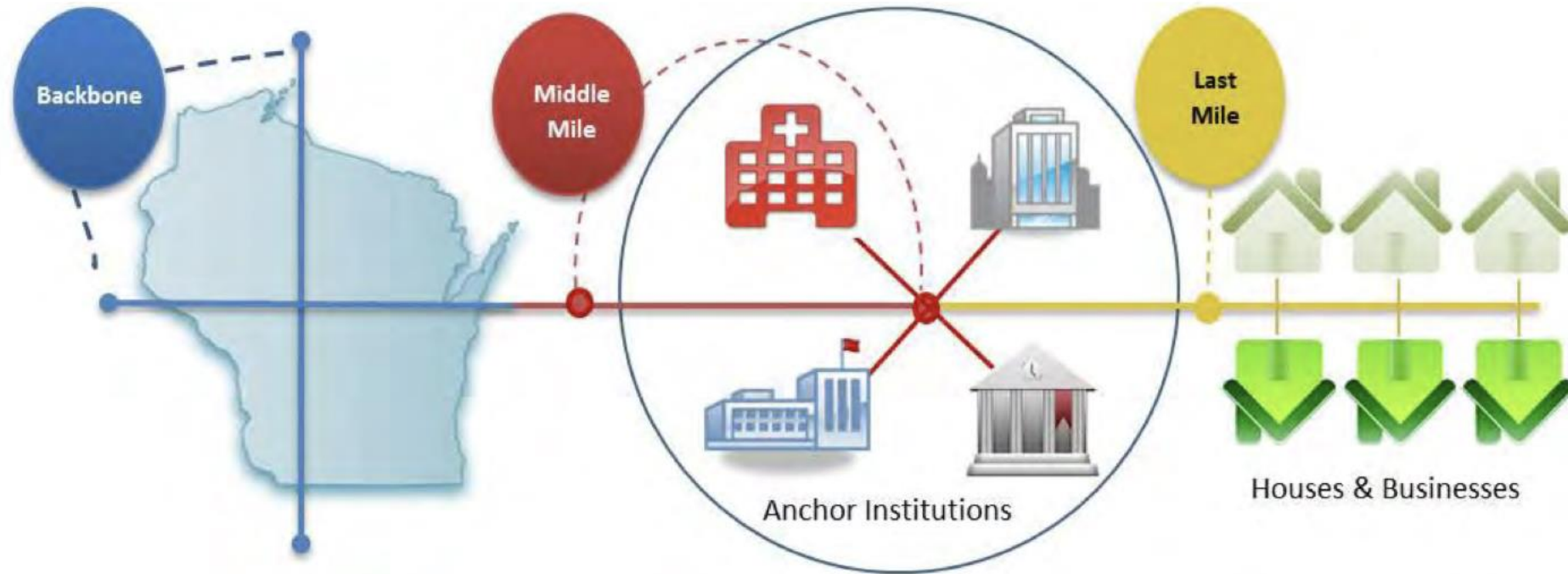
Streaming ultra high-definition (Netflix 4K), multiple device usage within a household/business

**100-500+ Mbps**

Online education delivery (e.g. testing services and video streaming), database access, record storage and sharing characteristic of anchor institutions.

Sources: (1) Federal Communication Commission. "Household Broadband Guide." February, 5, 2020. Available at: <https://www.fcc.gov/consumers/guides/household-broadband-guide>. (2) Federal Communication Commission. "Broadband Speed Guide." February, 5, 2020. Available at: <https://www.fcc.gov/consumers/guides/broadband-speed-guide?fontsize=largeFont>. (3) Kruger, Lennard. "Defining Broadband: Minimum Threshold Speeds and Broadband Policy." Congressional Research Service. December 4, 2017. Available at: <https://fas.org/sgp/crs/misc/R45039.pdf>.

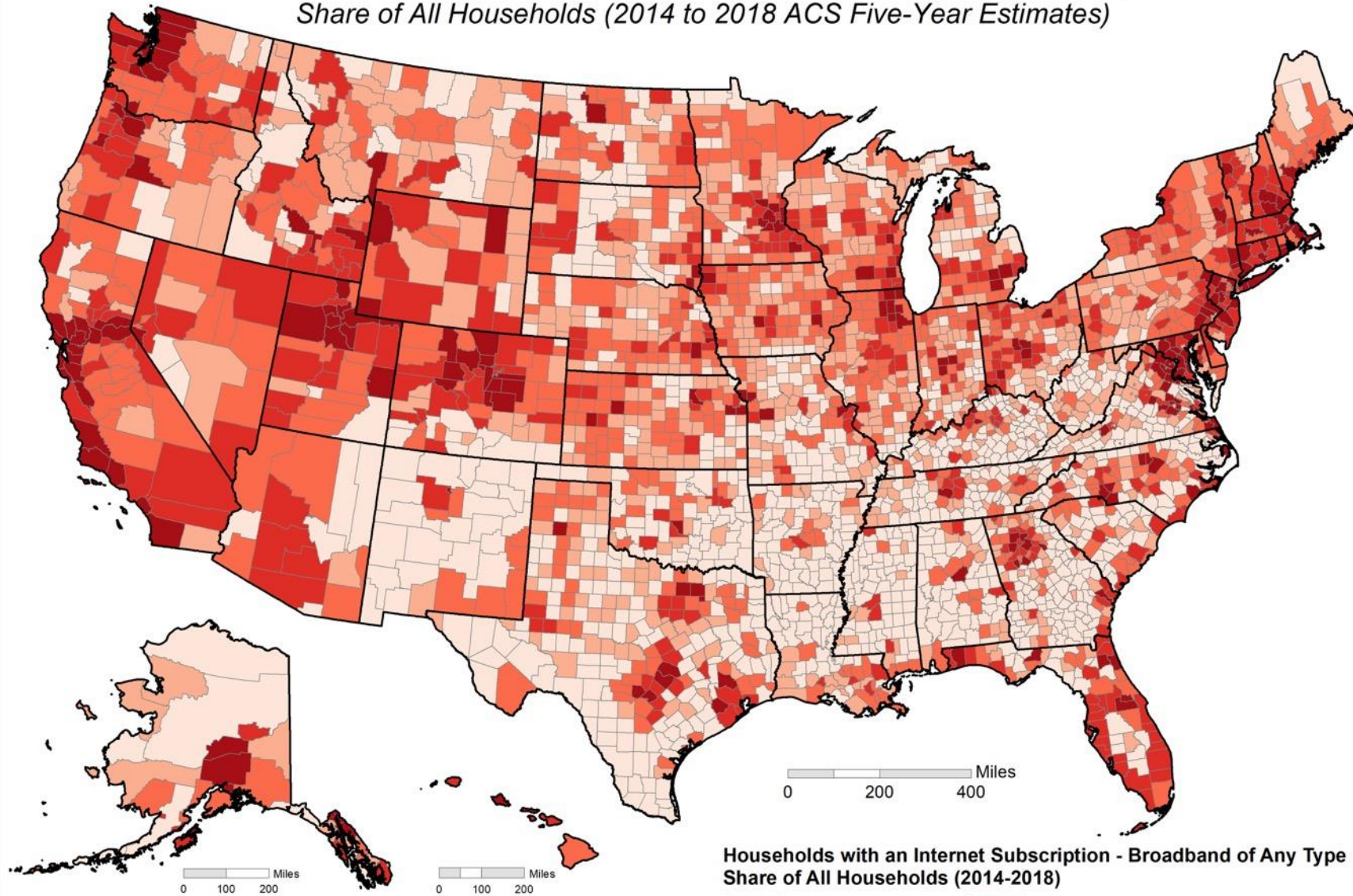
# Infrastructure





# Broadband Coverage

## Households with an Internet Subscription - Broadband of Any Type Share of All Households (2014 to 2018 ACS Five-Year Estimates)



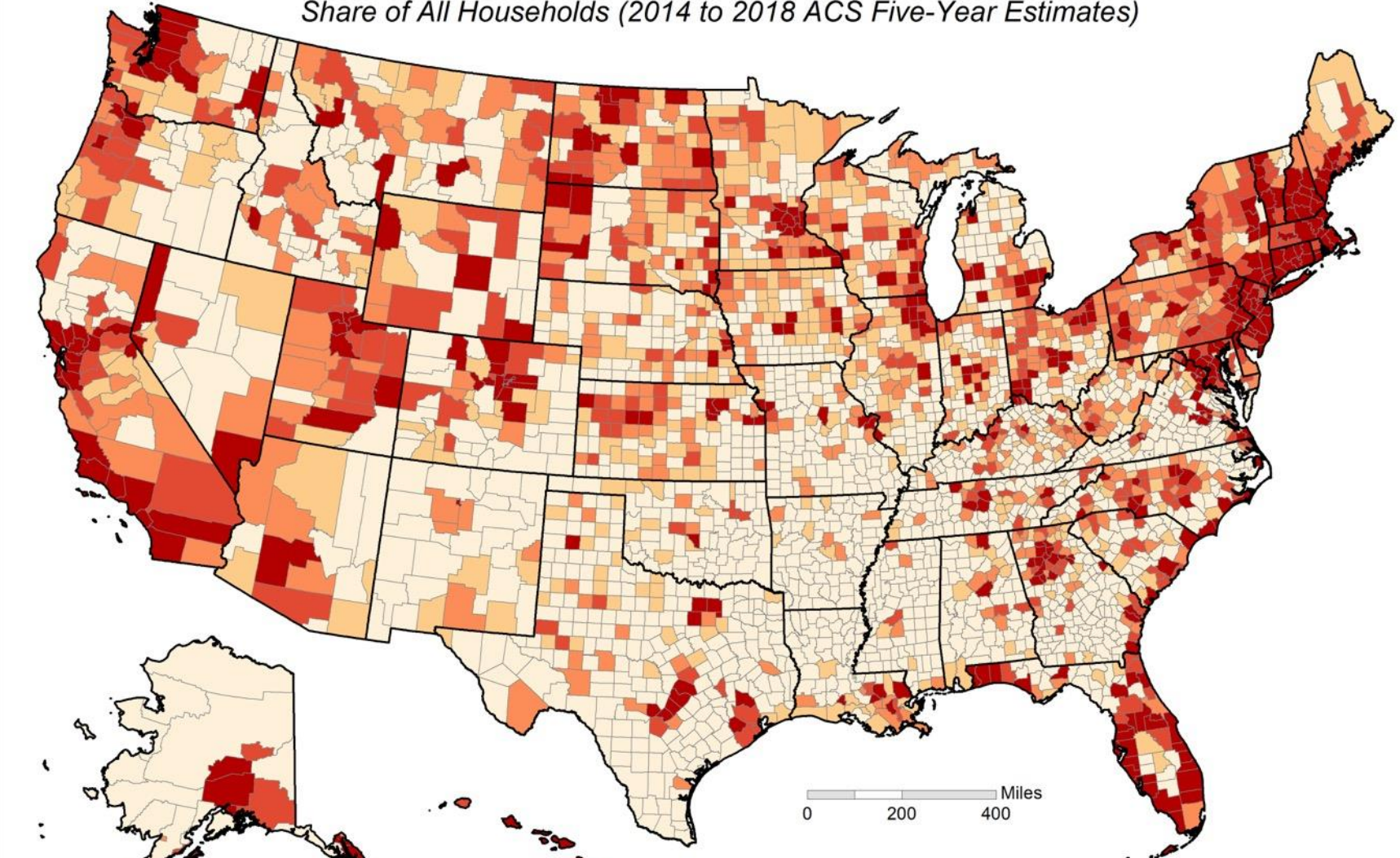
Data Source: U.S. Census Bureau 2014-2018 American Community Survey. Numbers are subject to a margin of error. "Broadband of any type" refers to those who said "Yes" to at least one of the following types of Internet subscriptions: Broadband such as cable, fiber optic, or DSL; a cellular data plan; satellite; or a fixed wireless subscription. \* National Average = 80.4%; Wisconsin Average = 80.4%

### Households with an Internet Subscription - Broadband of Any Type Share of All Households (2014-2018)



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# Households with a Broadband Internet Subscription - Cable, Fiber Optic or DSL Share of All Households (2014 to 2018 ACS Five-Year Estimates)



0 200 400 Miles

0 100 200 Miles

0 100 200 Miles

## Households with a Broadband Internet Subscription - Cable, Fiber Optic or DSL: Share of All Households (2014-2018)

- 55.0% or Less
- 55.1% to 60.0%
- 60.1% to 65.0%
- 65.1% to 70.0%\*
- 70.1% to 88.0%

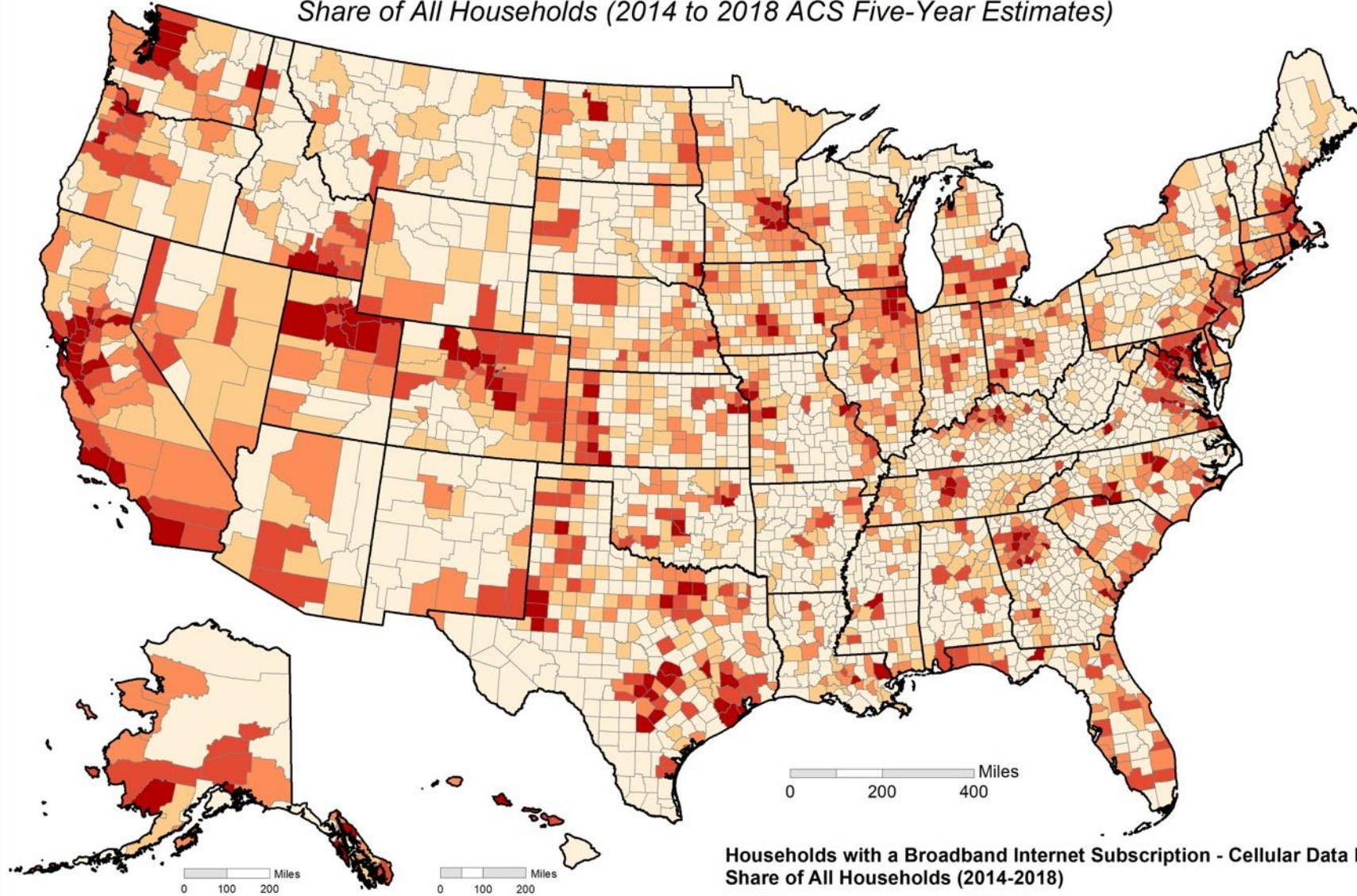
Data Source: U.S. Census Bureau 2014-2018 American Community Survey. Numbers are subject to a margin of error. An Internet "subscription" refers to a type of service that someone pays for to access the Internet. Individuals with a cable, fiber optic or DSL plan may also have Internet access of some other type.  
\* National Average = 67.9%; Wisconsin Average = 66.7%



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## Households with a Broadband Internet Subscription - Cellular Data Plan Share of All Households (2014 to 2018 ACS Five-Year Estimates)



Data Source: U.S. Census Bureau 2014-2018 American Community Survey. Numbers are subject to a margin of error. An Internet "subscription" refers to a type of service that someone pays for to access the Internet. Individuals with a cellular data plan may also have Internet access of some other type.  
\* National Average = 57.8%; Wisconsin Average = 56.9%

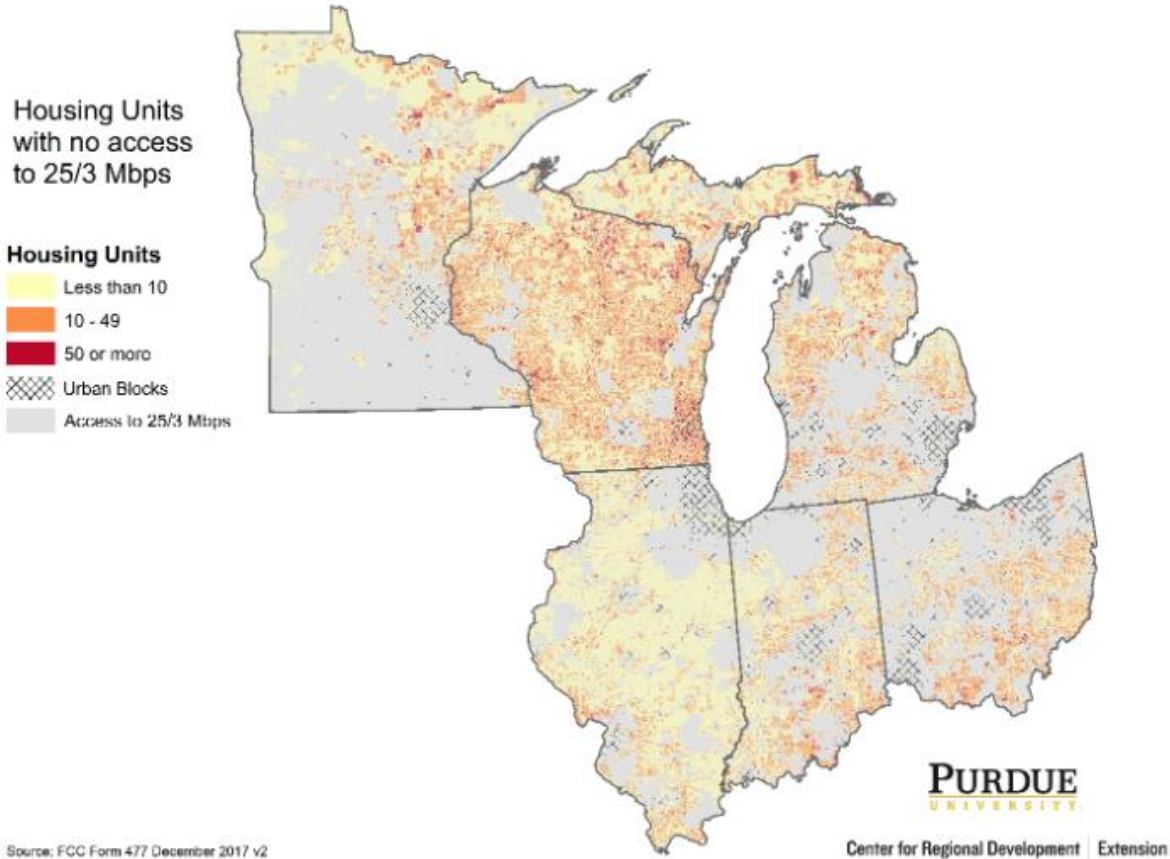
### Households with a Broadband Internet Subscription - Cellular Data Plan Share of All Households (2014-2018)



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# Broadband Access in the Upper Midwest

Figure 4. 25/3 Broadband Footprint in the upper Midwest, 2017

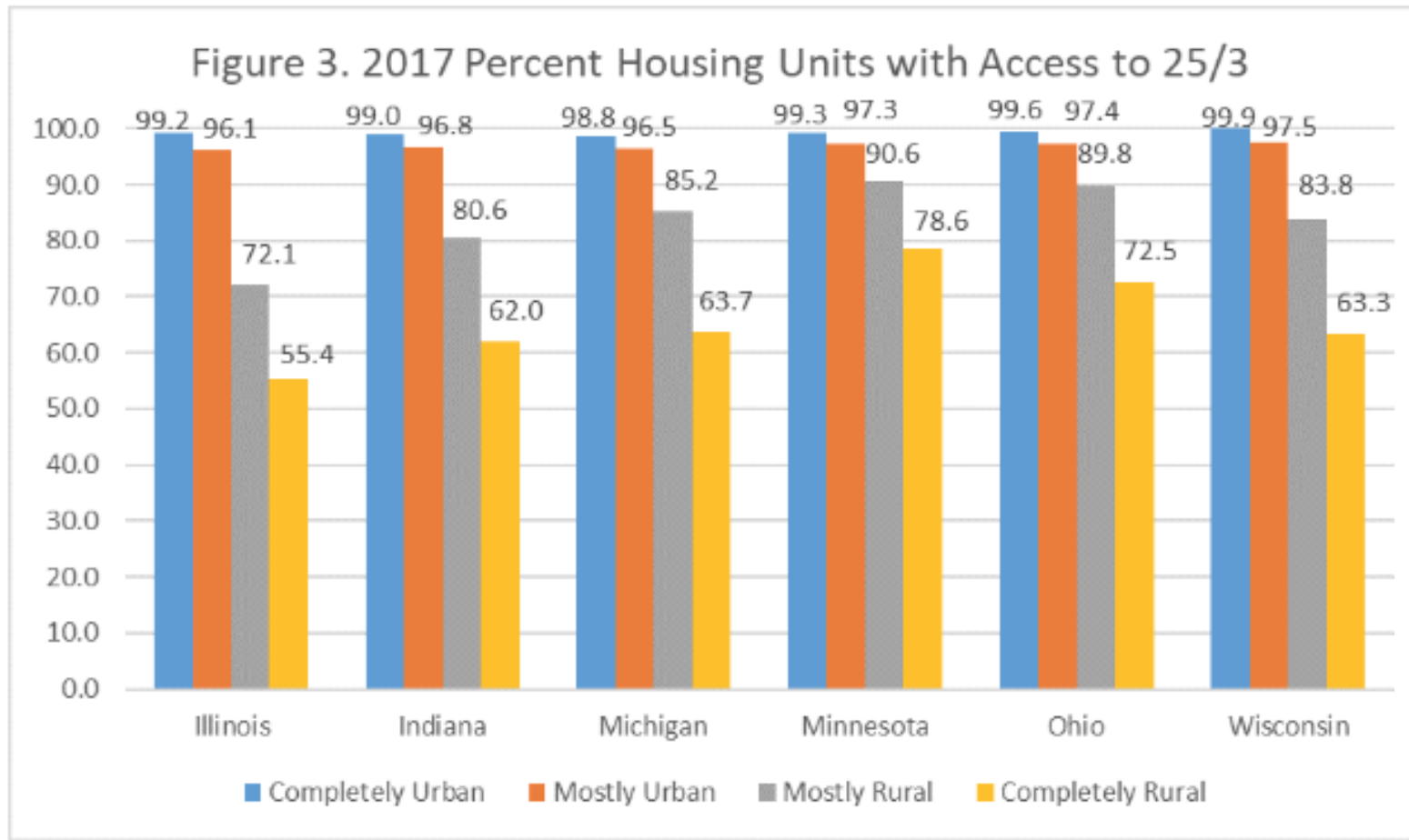


Source: FCC Form 477 December 2017 v2

Source: FCC Form 477 December 2017-v2

Source: Robert Gallardo, Purdue University, Center for Regional Economic Development, "An X-Ray of Broadband Access in the Upper Midwest," June, 24, 2019. Blog

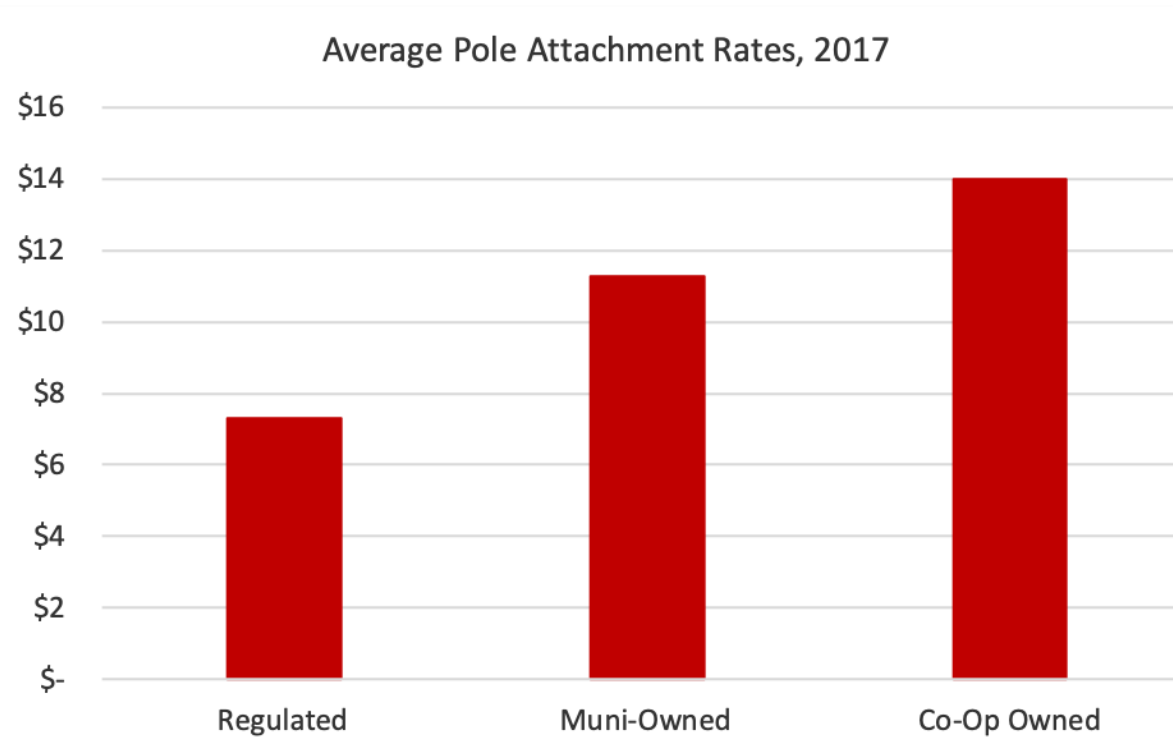
# Broadband by Rurality





How did we get here?

# Low-Density/High-Cost



# Mapping and Data

- FCC overstates coverage.
  - ISPs self-report at census block level
  - Can claim coverage if even one household has service
- Makes it difficult to apply for grants/loans
  - Require demonstrated need.
  - FCC is the most common data source and it is likely to show that coverage is better than it actually is.
- Discourage competition?
- President signed the Broadband Deployment Accuracy and Technological Availability (DATA) Act on March 23, 2020.

# Mapping and Data

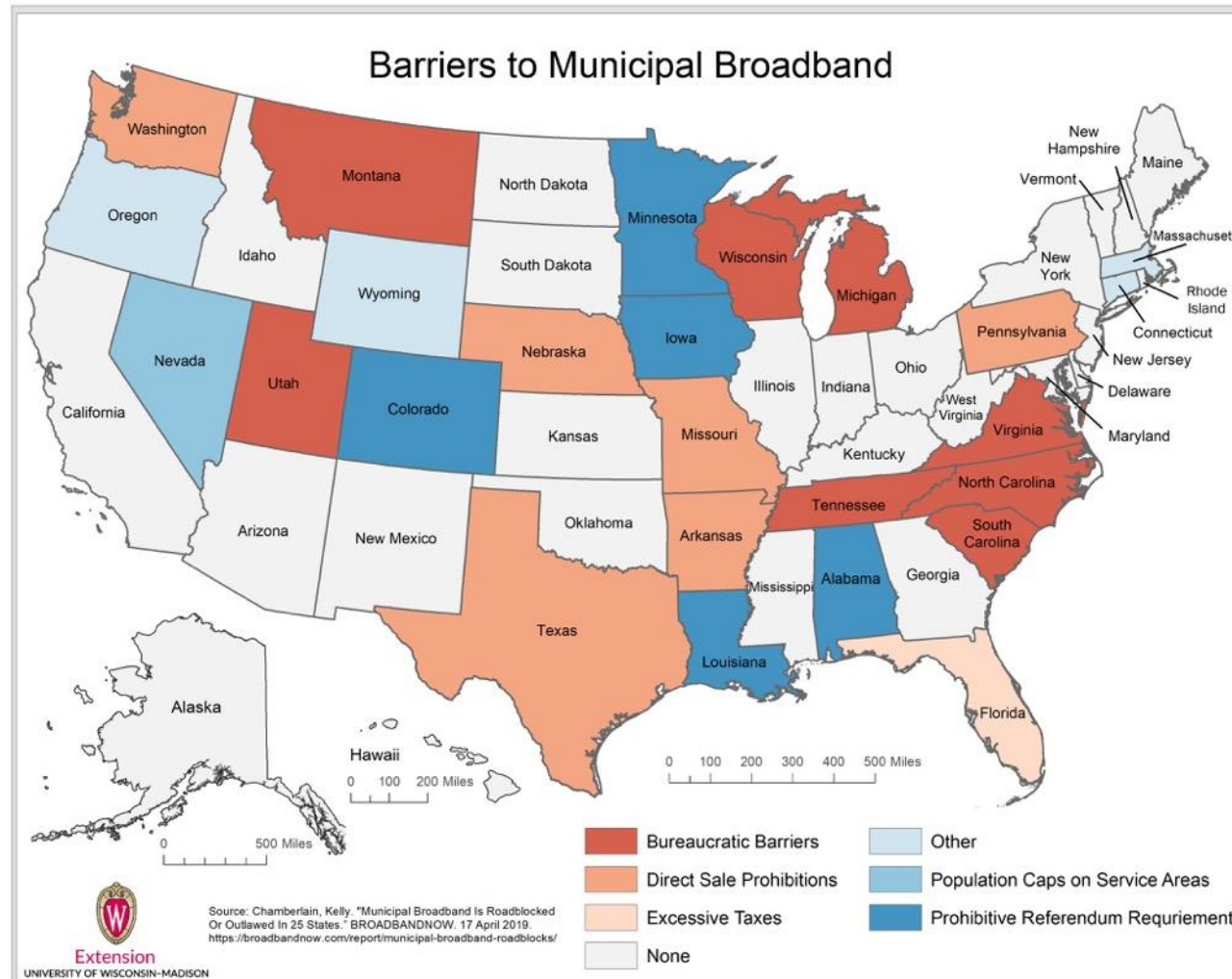


# Broadband Opportunities

- 25 states have laws that restrict or outright prohibit towns and cities from building their own networks.
  - Wisconsin, Minnesota, Illinois among restrictive states.
  - Result of telecom lobbying.
- Laws make it practically difficult (impossible?) for municipal provision.
  - Can build/invest in infrastructure but can't operate.
  - Need a partner! Co-ops?



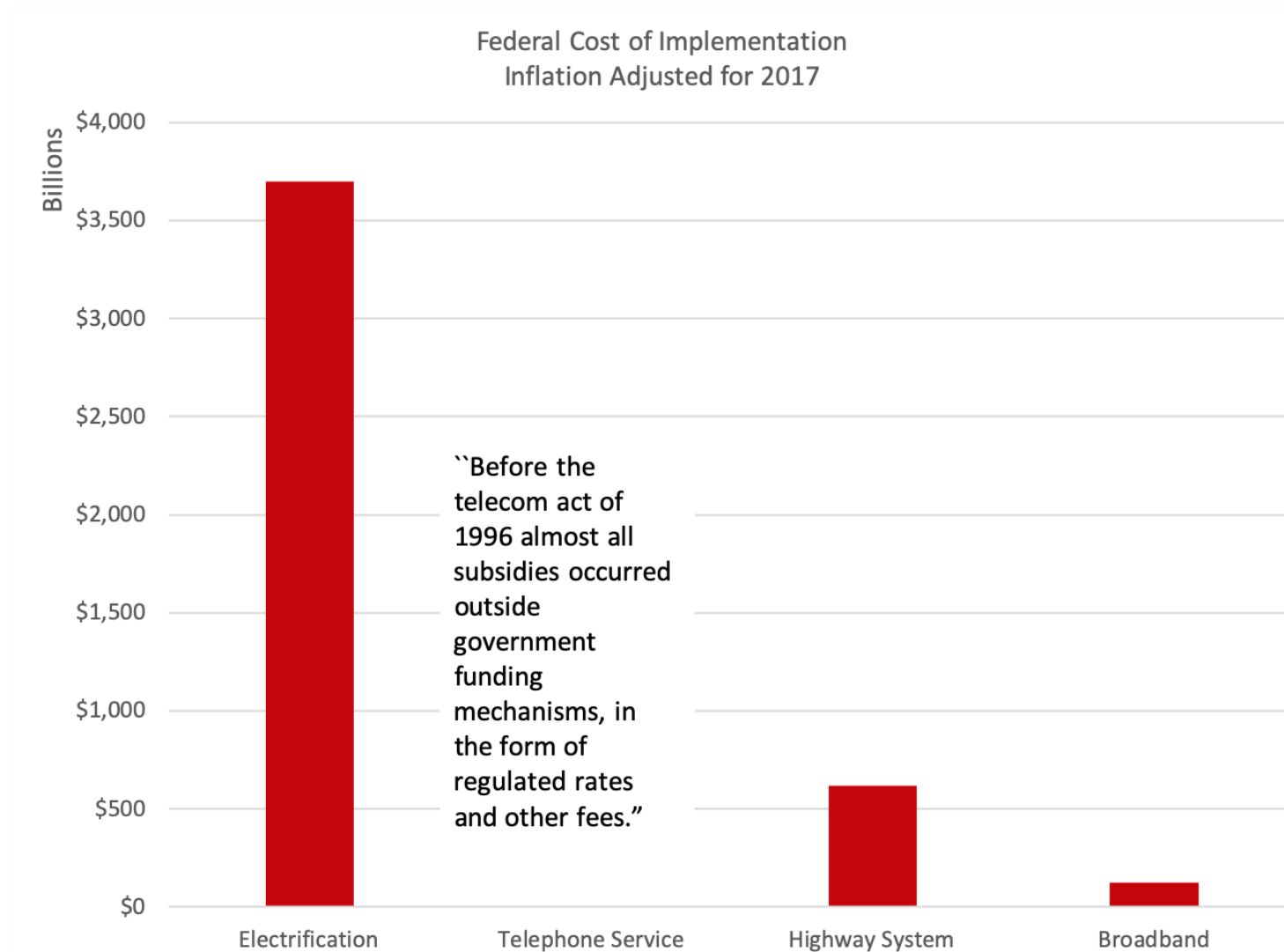
# Legal Barriers



# Spending

- 2019 Farm Bill
  - \$350 million in broadband-related funding over five years
  - 3 programs: Community Connect/Middle Mile Infrastructure/Innovative Broadband Advancement
- ReConnect
  - 2018: \$600M in grants/loans
  - 2019: \$550 M for second round
- CARES allocates \$100 M for grants

# Spending





# Economic Impacts

# Entrepreneurship

- Places with better access have better entrepreneurial outcomes.
  - Particularly of small and women-led establishments.
- Important as rehabilitate local economies in a post-COVID Wisconsin.
- CARES allocates \$100 M for grants



Tessa Conroy

W: [tessaconroy.com](http://tessaconroy.com)

E: [tessa.conroy@wisc.edu](mailto:tessa.conroy@wisc.edu)