

Mapping Local Broadband Provision in the US

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Overview

- Introduction & Motivation
- Background
- Methodology of BITS
- What makes our map different from other resources?
- BITS Map App Demonstration
- Limitations
- Discussion



Introduction & Motivation

- People in the United States lack access to highspeed internet (broadband)
- Many dimensions of accessibility in local markets.
- FCC measures are used to determine broadband policy.
- However, official mapping resources often do not display change over time.
- We have created a mapping tool to display these changes to help inform citizens, researchers, and policymakers of local trends.



Background: Broadband Accessibility

- Broadband Access is multidimensional.
 - Availability: whether high-speed internet is available in an area (e.g. provision)
 - Adoption: whether residents use internet and the factors associated with it.



Background: Provision & Mapping

- As part of ARRA 2009, funding was directed towards (Kruger, 2010):
 - Improvement in the broadband data collection
 - Maintaining maps devoted to mapping availability & provision of broadband
- Federal Communications Commission (FCC) provides data and maps to the public.
 - FCC Form 477
 - ISP Reports
 - National Broadband Map



BITS Methodology

- Our Map App uses Form 477 data using the Broadband Integrated Time Series (BITS) methodology and dataset (Mack et al, 2021).
 - Harmonizes shifting census block & tract-level data into 2010 tracts
 - Identifies unique internet providers (holding companies) at the tract level
 - Provides counts (sums) of unique providers in tract
- Our map adds several features to underlying data
 - Change in counts over time
 - layers of other boundaries (districts, tribal areas, etc.)



Other Resources

	FCC National Broadband Map	FCC Fixed Broadband Deployment Map	Maps provided by state governments	BITS Map App Link
Underlying Data/Granularity	FCC ISP reports/Household	Form 477/Census Block	Multiple sources	Form 477/Census Tract
Measure?	Providers with associated speeds	Providers with associated speeds	Multiple measures: adoption, speeds, etc.	Number of unique providers in tract
Geographic Coverage?	National	National	State	National
Time Series Component?	No	No	No (to author's knowledge)	Yes, 2014-2020
Tribal/Rural/Urban designations?	No	Yes	Depends	Yes

Demonstration of BITS Map App

The Broadband Integrated Time Series (BITS) dataset is a Census tract-level panel dataset on broadband provision from 2008-2020. This Web application displays the BITS data from 2014-2020, which is derived from the Federal Communications Commission (FCC) Form 477 database and covers the contiguous United States. For technical details about the construction of this dataset, please refer to the paper published in *PlosOne* <https://doi.org/10.1371/journal.pone.0250732>.

Click [here](#) for detailed instructions on navigating and filtering data

Additional layers can be turned on by accessing the **Layers** widget in the Anchor Bar (*bottom-middle, also includes **Legend**, **Basemap**, and **Info/Help** widgets*)



Link:

***Note** Not all layers will display at full extent*

<https://enterprise.rgis.msu.edu/portal/apps/webappviewer/index.html?id=00d412ef4dc048108e8694a1a02575c5>

OK



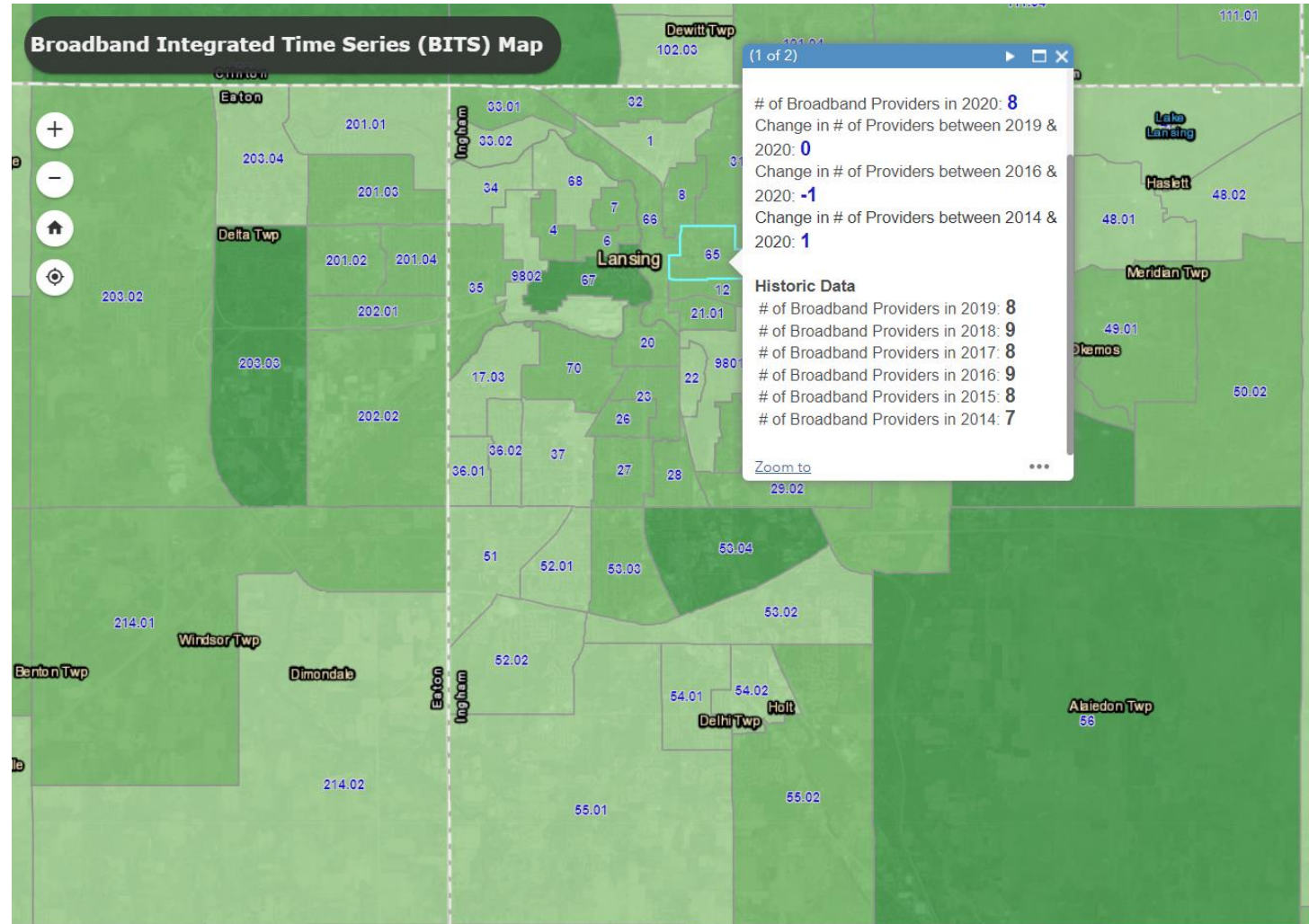
BIT Map App: For Citizens

Citizens can look at change over time to

- Assess changing availability in their own area

Citizens can use this tool in tandem with National Broadband Map to

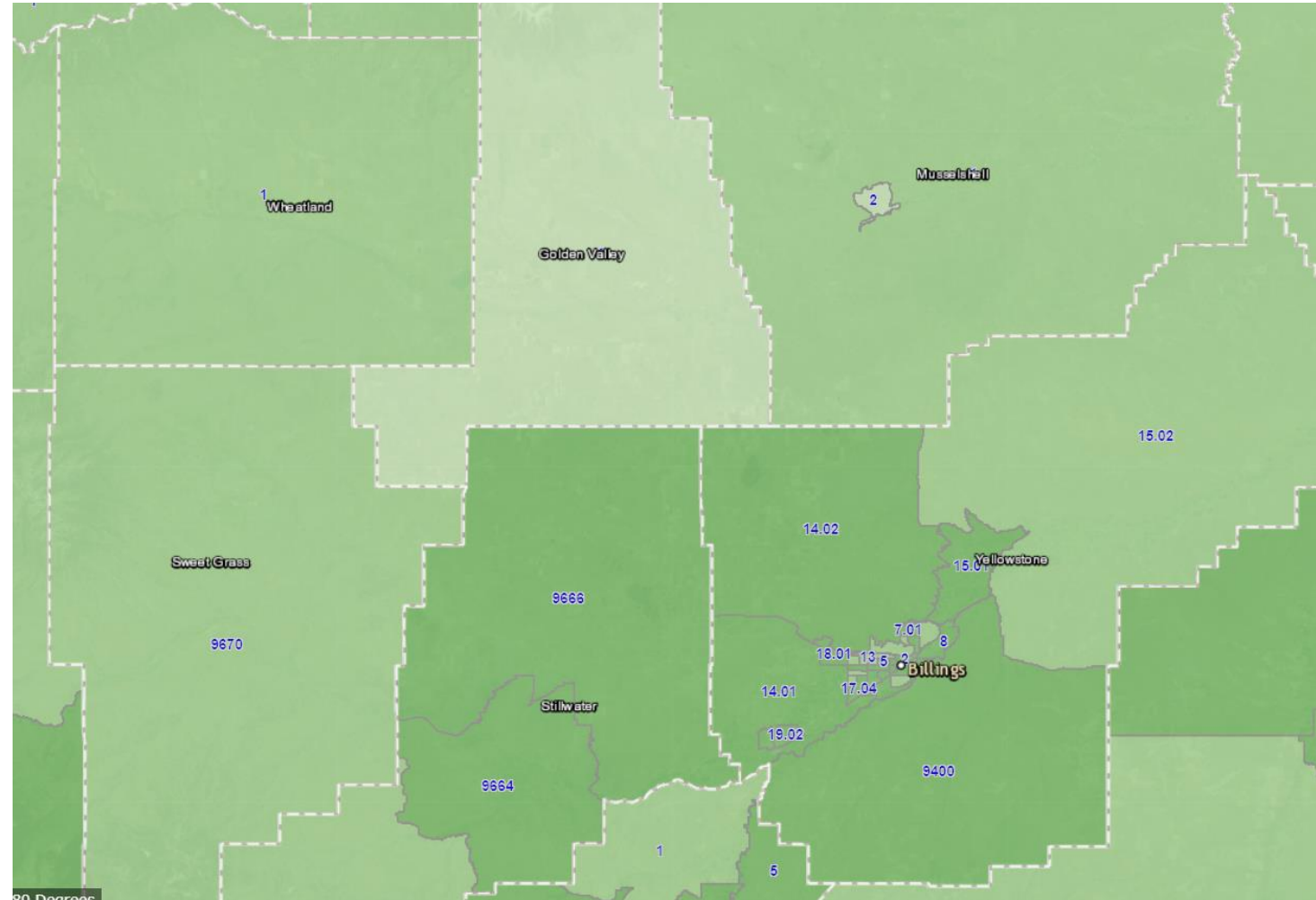
- Spot & report inconsistencies
- Make informed decisions on switching broadband providers



BITS Map App: For Researchers

Researchers can look at change over time to:

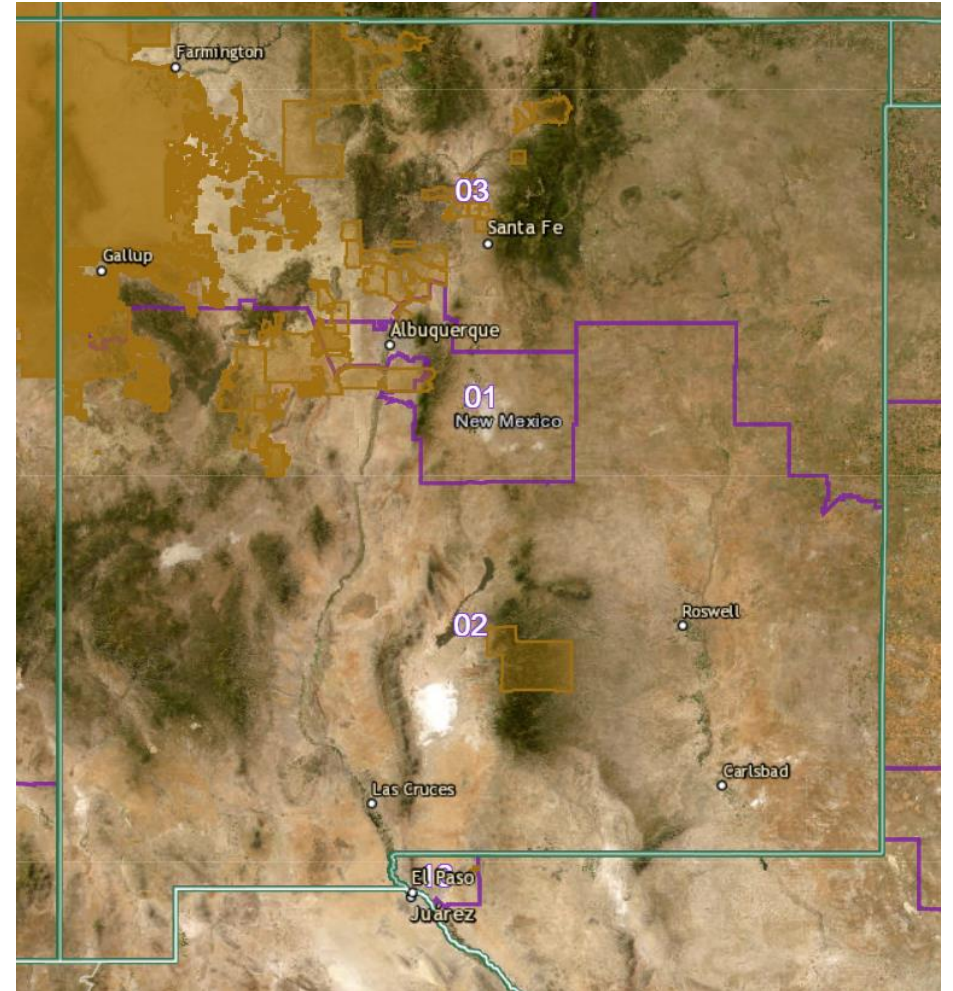
- Identify specific areas of interest for further study
- Identify geographic variation for
 - Discontinuity studies
- Identify temporal variation:
 - Stable
 - “Monopolization”
 - “Catching up”
 - “Leading the pack”



BITS Map App: For Local Government

Local policymakers can:

- Change filters to visualize areas of local governance
 - Congressional Districts
 - Tribal Areas
- Identify geographic variation for
 - Place-based policies
- Use temporal variation to
 - Identify “lagging” areas in their jurisdictions
 - Identify and research areas that may have better policy environments for broadband.



Limitations

- Provision levels as a measure of...
 - Availability? – to an extent
 - Competition? – No
 - Accessibility? – Not the whole story
- Measurement Error in FCC Form 477
- Potential incentive incompatibility between parties
 - [“Comcast gave false map data to FCC”](#)
 - [Bulk Challenge from Michigan High-Speed Internet Office](#)
 - Right to withhold from public distribution



Discussion

[BITS Map App Link](#)
Questions?

Ways to improve?

Features you would like to see?



Thank you for listening!

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[BITS Map App Link](#)



References

Kruger, L. G. (n.d.). *Broadband Infrastructure Programs in the American Recovery and Reinvestment Act*. 26.

Mack, E. A., Helderop, E., Ma, K., Grubestic, T. H., Mann, J., Loveridge, S., & Maciejewski, R. (2021). A broadband integrated time series (BITS) for longitudinal analyses of the digital divide. *PLOS ONE*, 16(5), e0250732. <https://doi.org/10.1371/journal.pone.0250732>

