Validation of Oklahoma's Broadband Map: A Multi-Pronged Approach

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Outline

- Program overview
- Data validation done by Sanborn
- Data validation undertaken by Oklahoma University
- Challenges with data validation
- How can you help?

The National Broadband Map

- Provide grants to the states (stimulus funded)
- Create 50 state broadband maps
- Put the 50 states together for the national map

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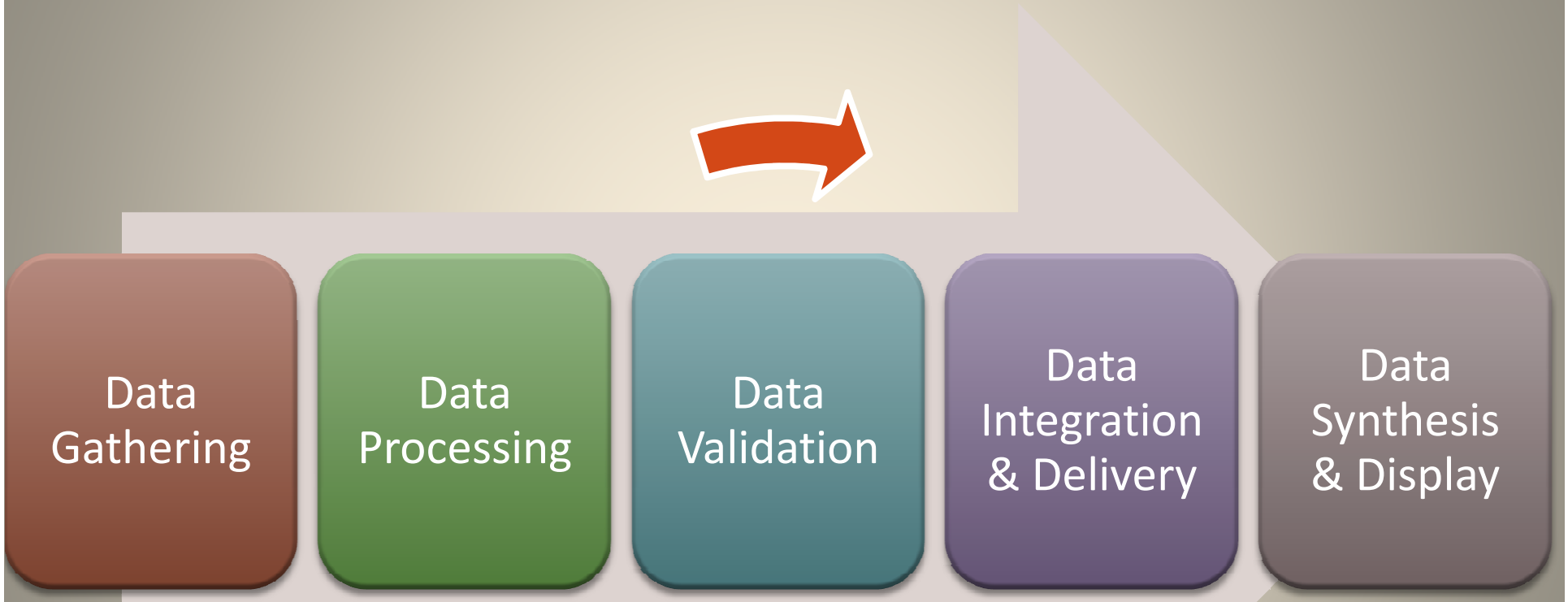
NTIA'S State Broadband Data Development Program: Process Overview



GIS: an integrative framework

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What Are We Gathering?

- Information about:
  - Where is broadband available?
  - What technology is used? cable/dsl/wireless
  - What speeds?
  - Where is the broadband infrastructure to deliver services
- Information from:
  - Providers of broadband
    - √ Public
    - √ Public
    - √ Public/Private
  - × No information from resellers

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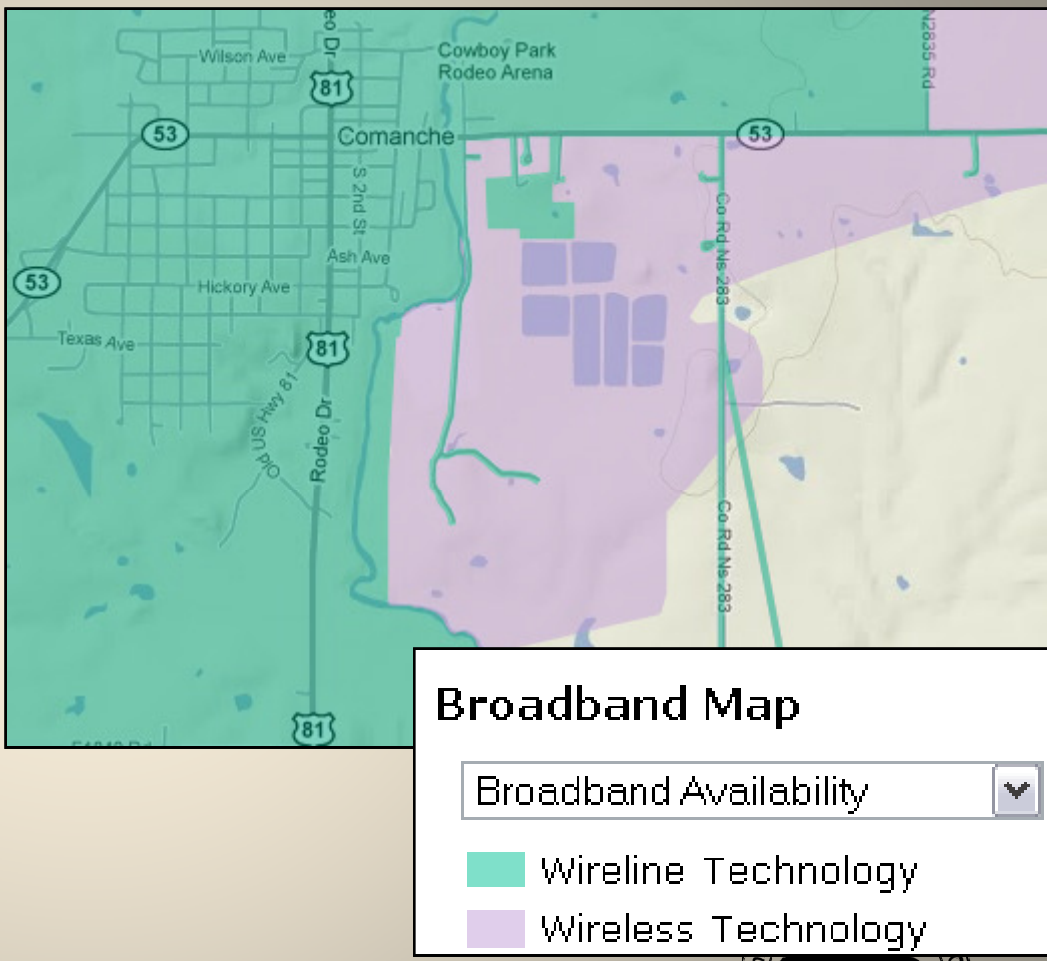
How Is Data Processed?

- To protect provider customer data, all information is **aggregated to census blocks or street segments**
- If a census block is >2 sq. miles (indicating rural areas) information is aggregated to street segments



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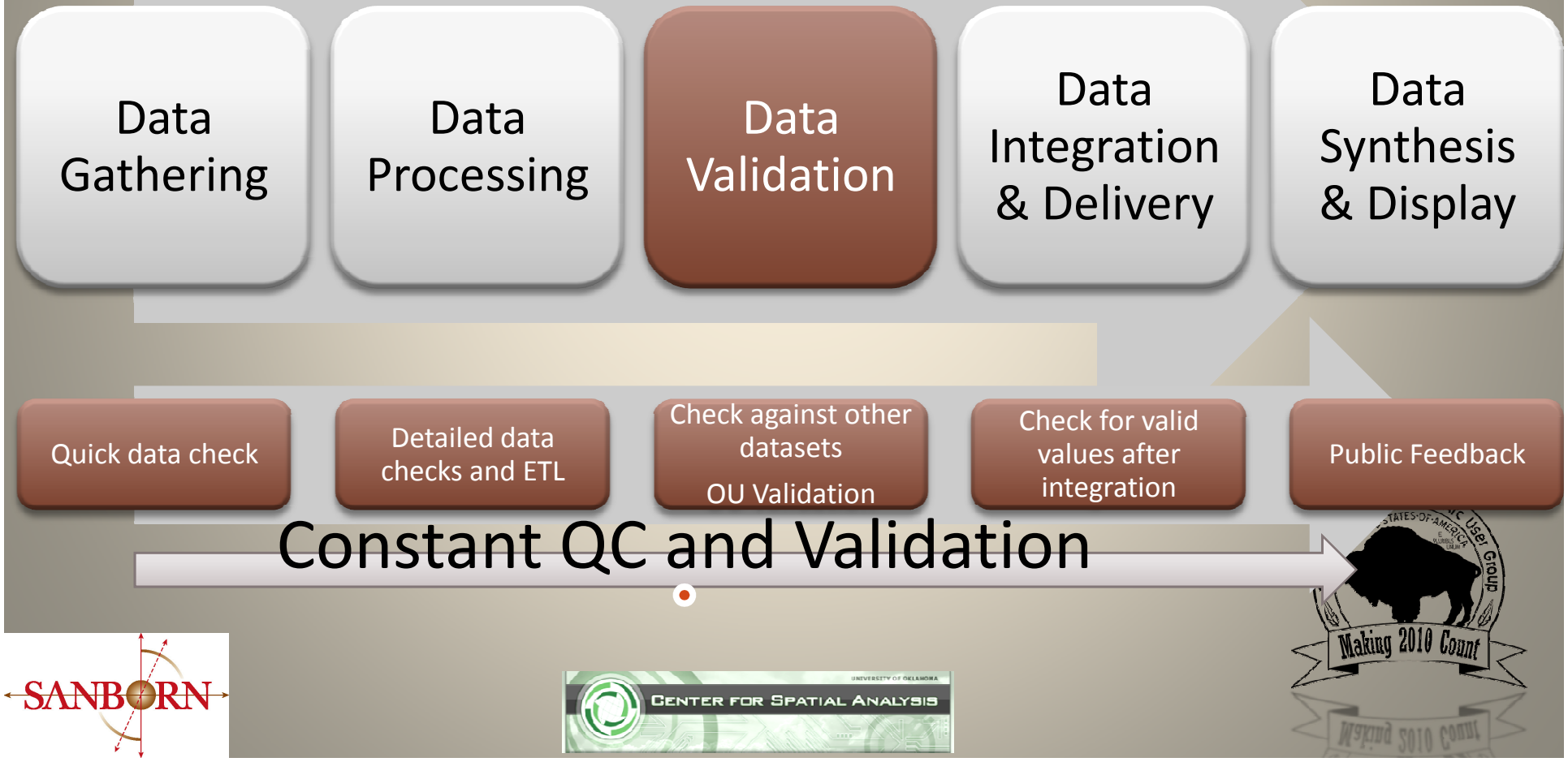
Data Validation: A Multi-Pronged & Iterative Process



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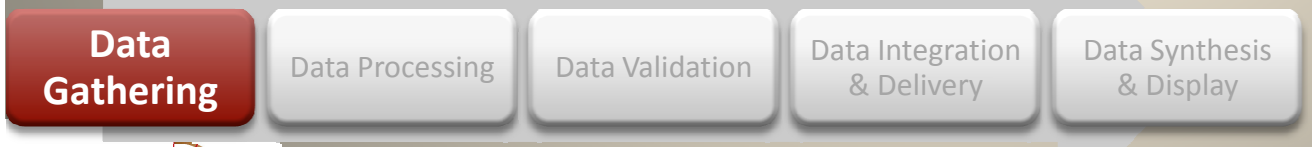
Data Validation: During Data Gathering

- Check the data that comes in to make sure that it has:
  - All the pieces of information
    - Service availability for blocks < 2 sq. miles and blocks > 2 sq. miles
    - Information about provider, technology of transmission, and speed
    - Middle mile infrastructure
    - Weighted average speeds for residential customers



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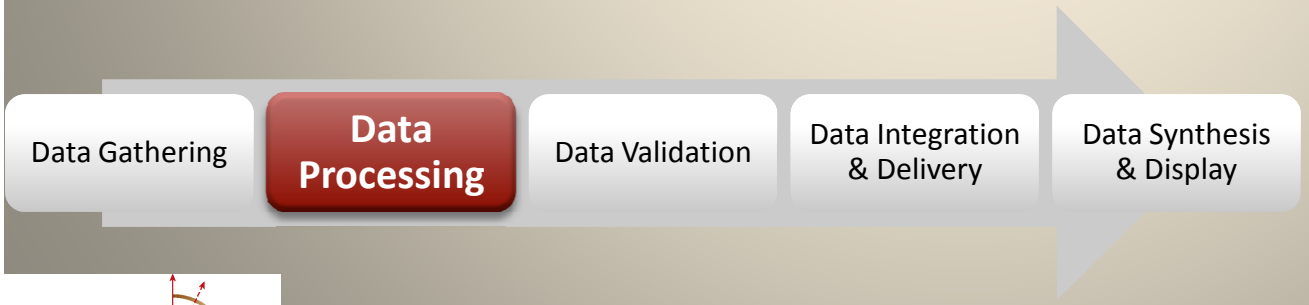
Data Validation: During Data Processing

- More detailed checks to see:
  - Missing values in records
  - Invalid values in records
  - Spatial outliers



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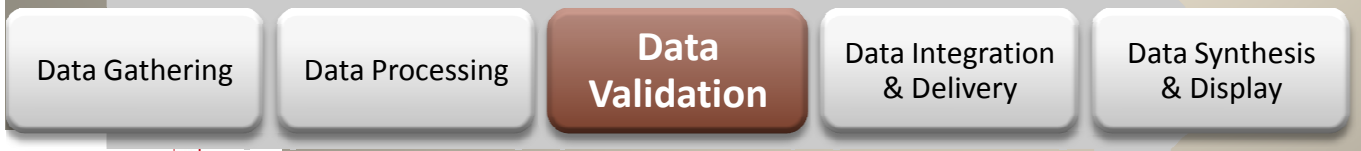
Data Validation: A Multi-Pronged View

- Provider validation
- Speed test data
- Telephone Exchange boundaries for DSL
- Cable boundaries for cable
- Public validation
- Independent validation by Oklahoma University



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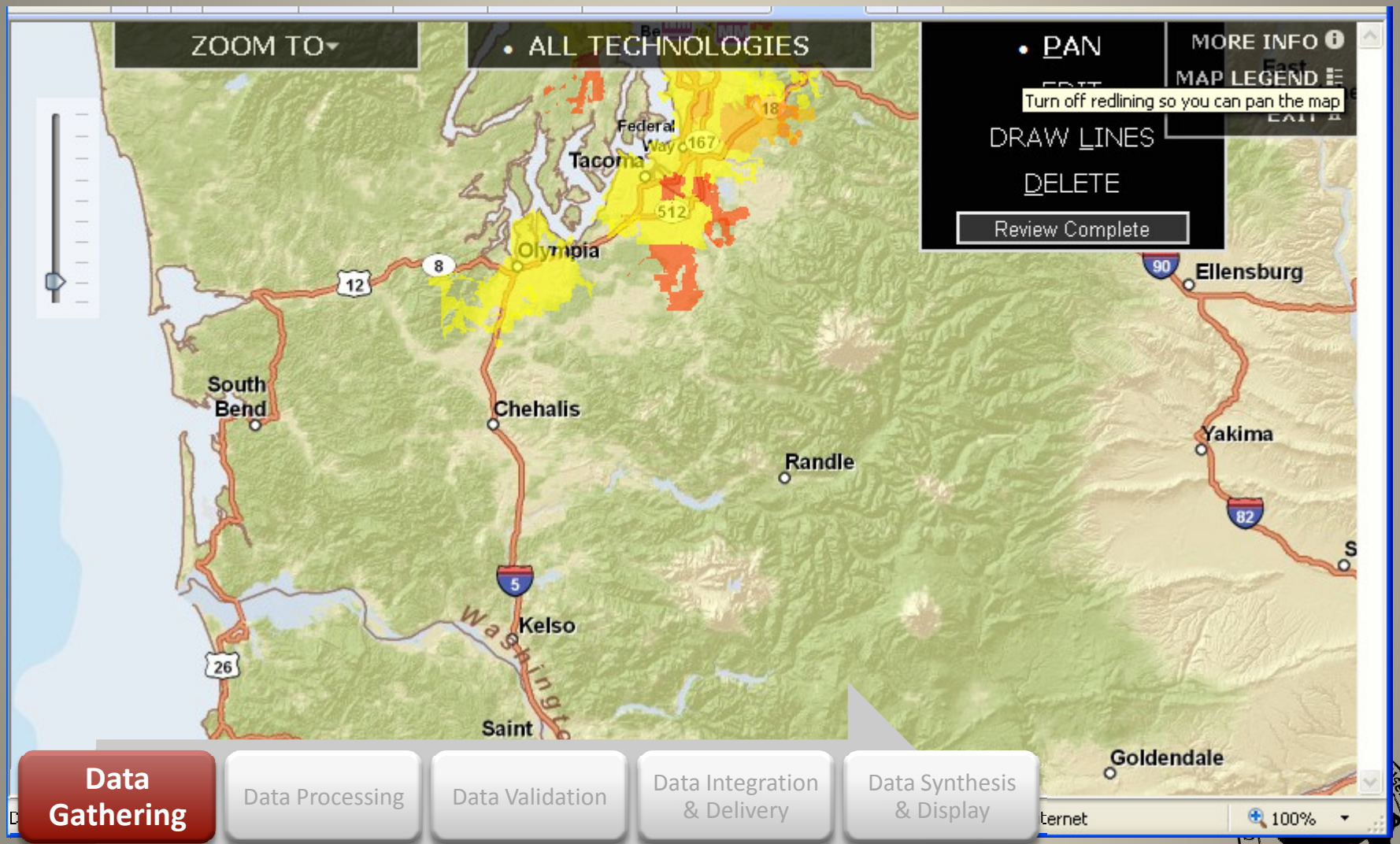
Provider Validation: Secure Provider Portal



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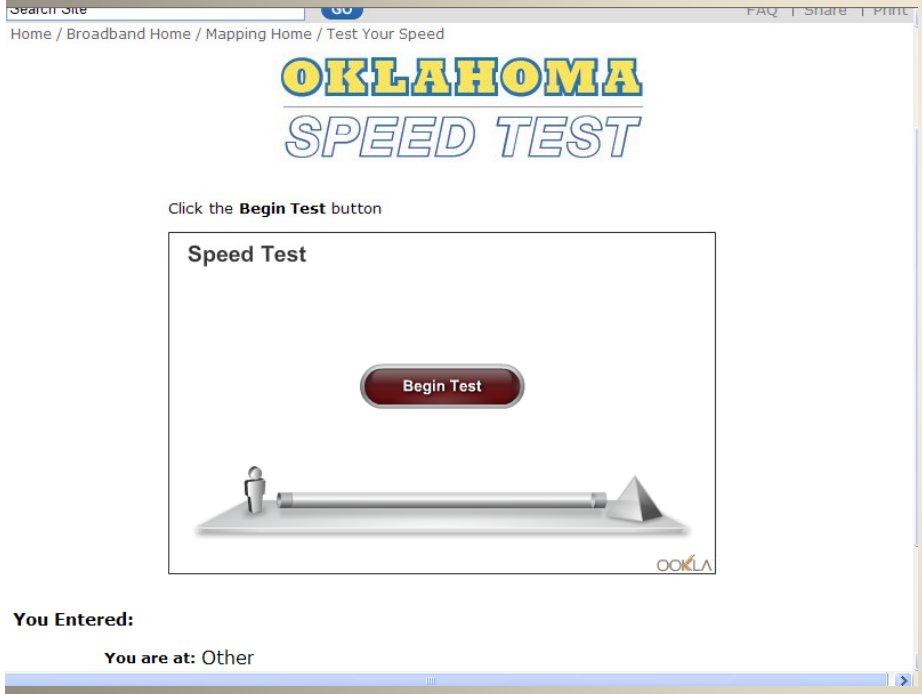
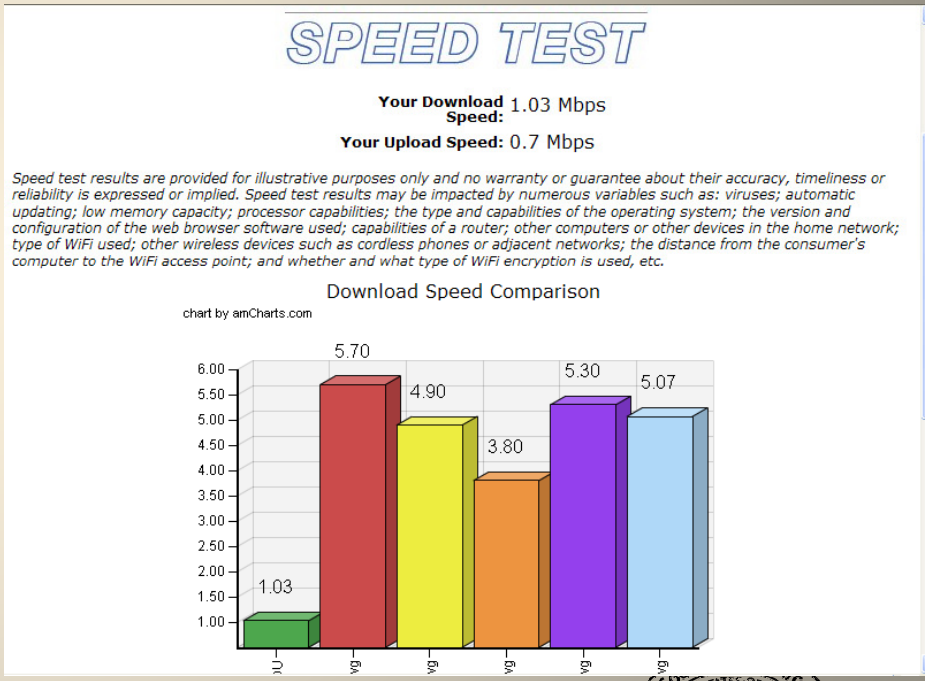
Speed Tests





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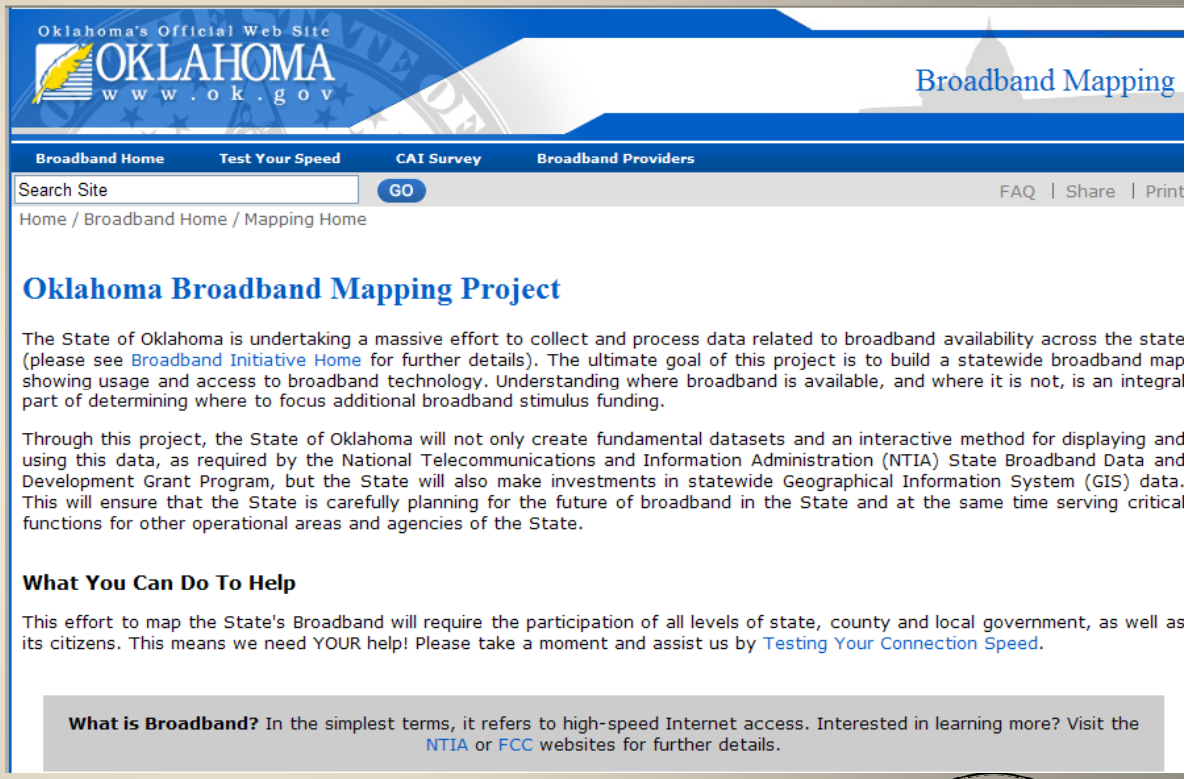
Checking against other datasets

- Telephone Exchange Boundaries for DSL
- Media Prints
- Community Anchor Institutions

Public Validation

- Through
  - Surveys – mail survey, Community Anchor survey
  - Speed tests
  - Feedback on the map



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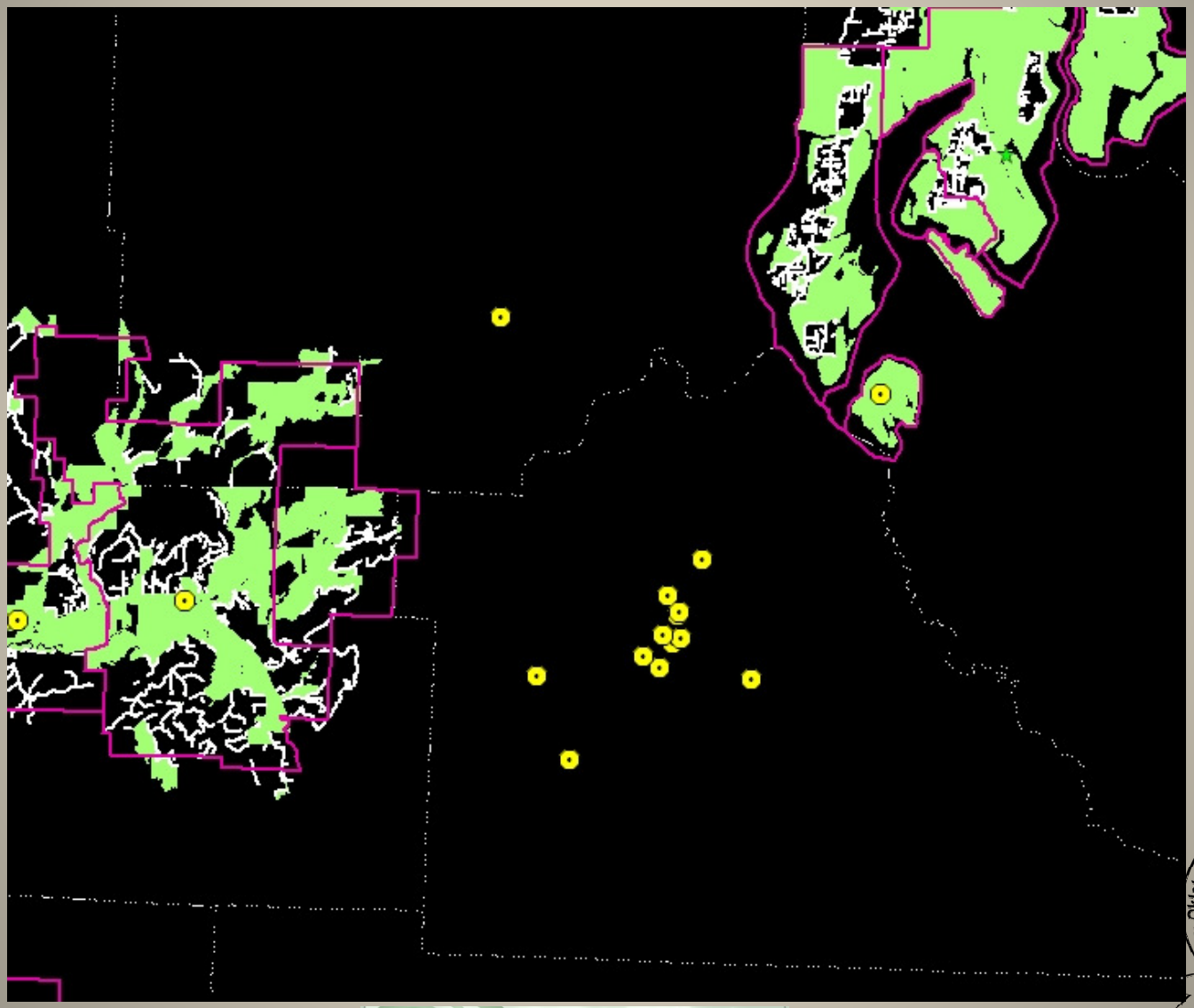
No simple/complete truth!



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INDEPENDENT VALIDATION BY OKLAHOMA UNIVERSITY

Independent Validation by OUCSA

- Validation independent of Sanborn data processing and compilation
- Broadband coverage map provided by Sanborn
- Bottom-up approach to determining broadband availability across the state with an emphasis on reaching **unserved** populations through surveys
- Validate the broadband coverage map:
  - False positive: blocks mapped as served but not
  - False negative: blocks mapped as unserved but are
- Priority: focused on false positive
- Estimate the percentage of population and household in false positive

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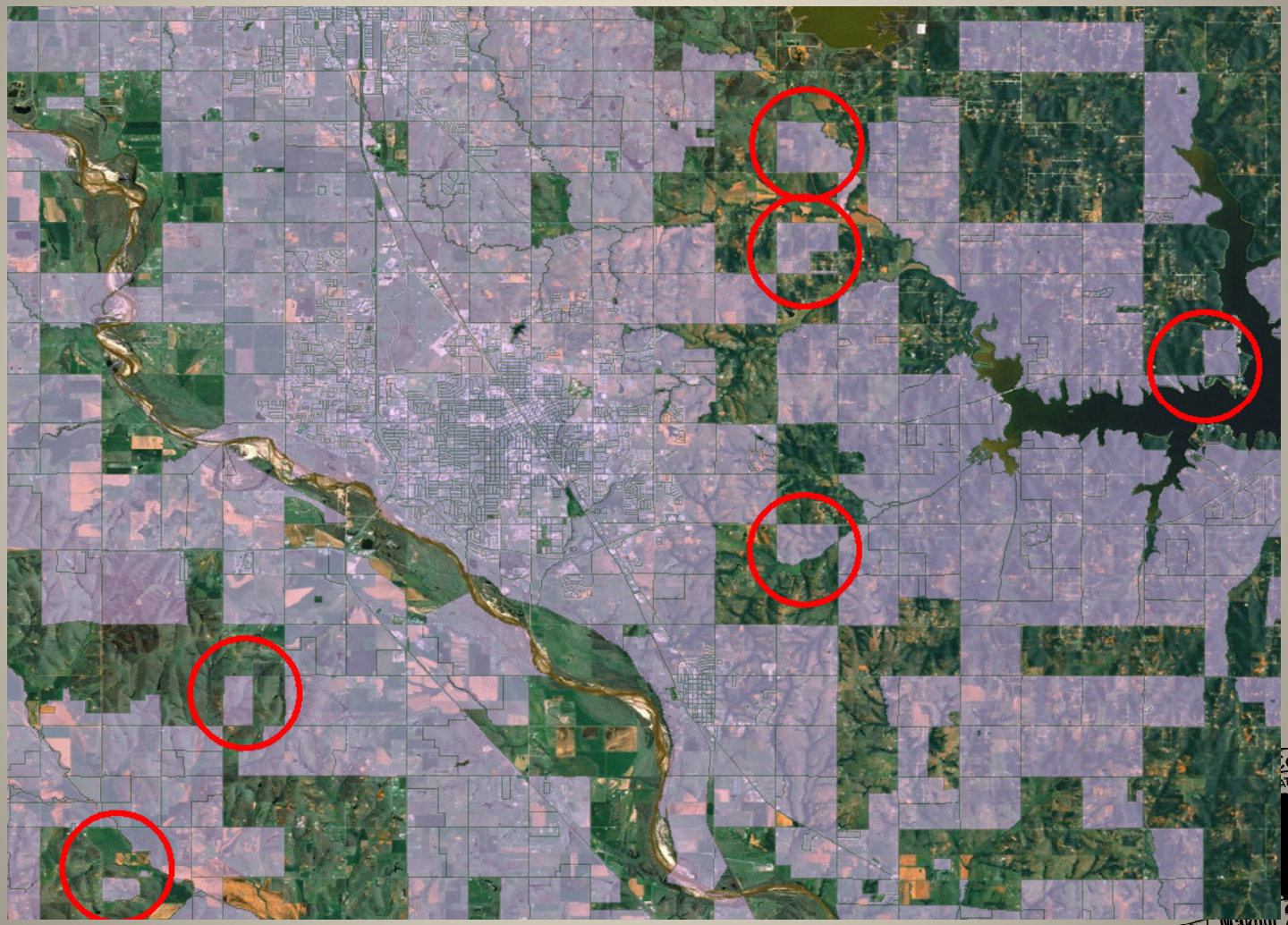
Examples of blocks in question east Norman; wirelines only



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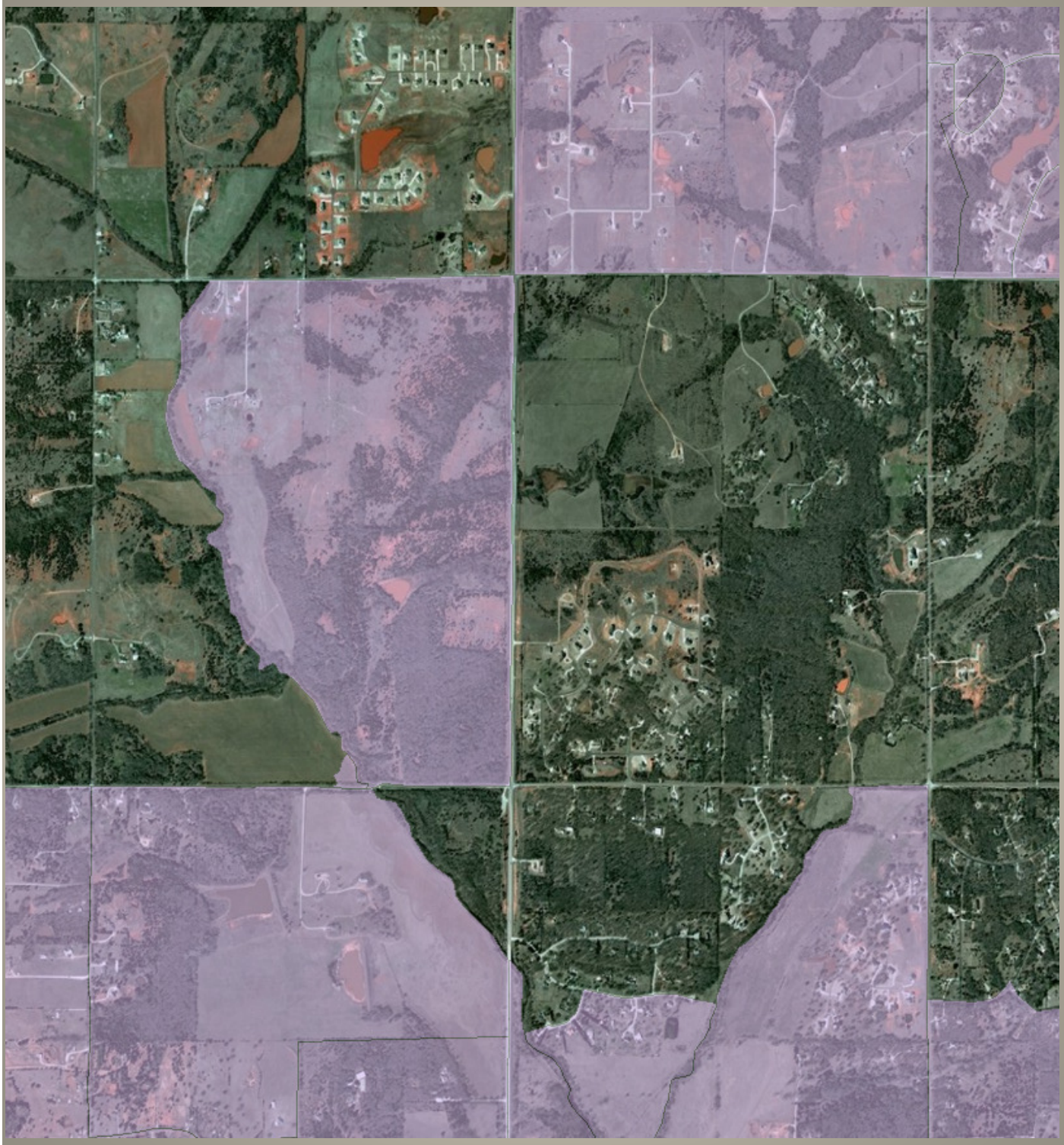

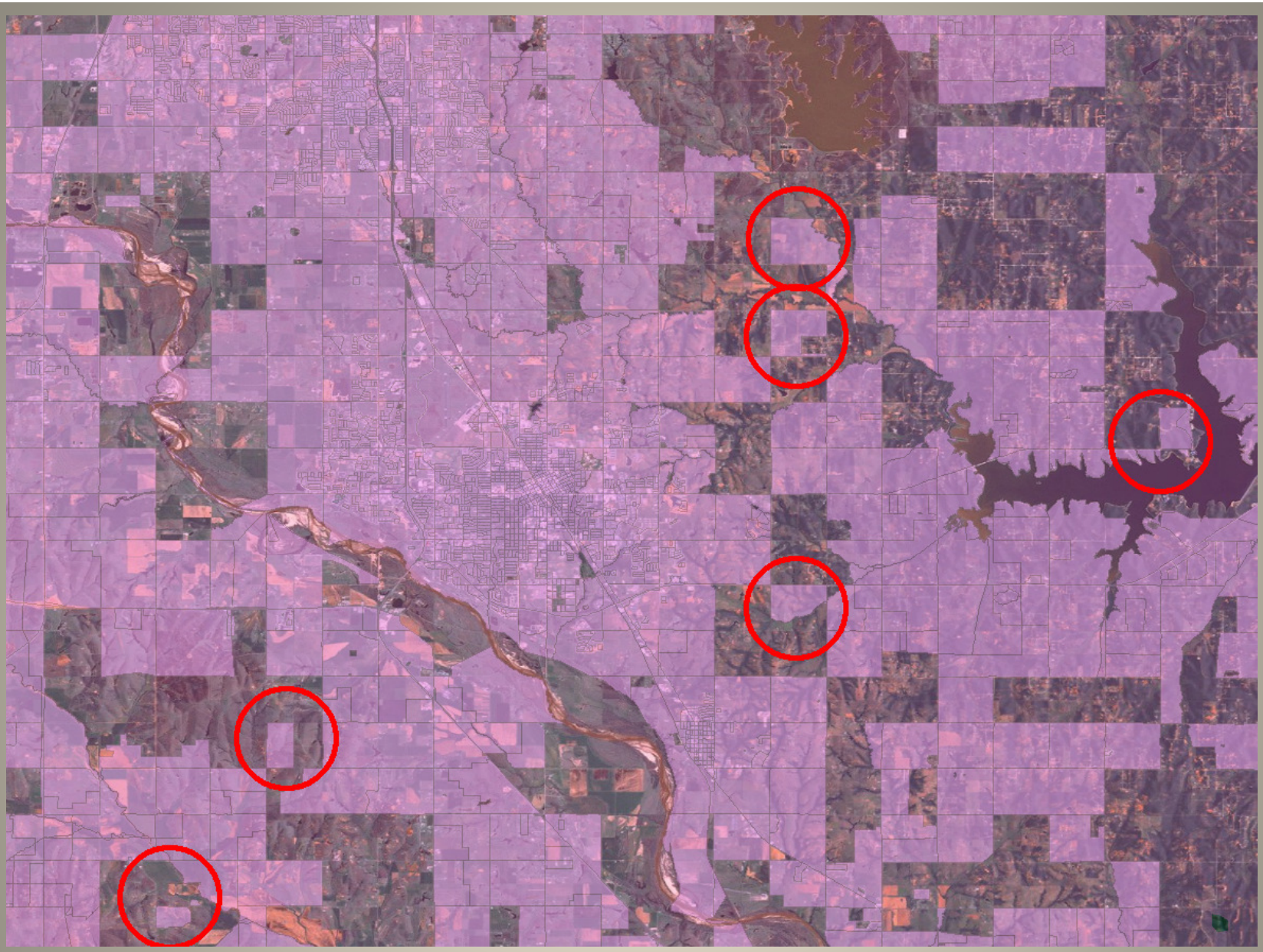

With wireless coverage, the entire area is shown fully covered.

Examples of false negative

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OU CSA Validation Process

- Norman – Pilot Validation
- Survey
  - Mail out
  - Email
  - Snowball Sampling

CSA Validation Process

- Norman Pilot Validation
  - Collaborate with Norman Police Department
  - Door-to-Door Verification of outlying areas
  - Develop process for identifying suspect outliers
- Purpose: to identify spatial characteristics of blocks in question >> targeted survey strategy for the state

CSA Validation Process

- Survey
  - On-line at..

https://selectsurvey.net/ouit/TakeSurvey.aspx?SurveyID=m42M7o8

  - Adobe clickable form at…

http://ags.ou.edu/~myuan/broadbandsurvey.pdf

CSA Validation Process

- Survey - Methodology
  - Email
    - Employees and Service Providers
      - OSDH, ODH, ODMHSAS, OSU – Extension Centers, Choctaw Nation
      - Council of Governments
      - Inter-tribal Emergency Managers
    - GeoTech networks
    - OK GIS listserv

CSA Validation Process

- Survey - Methodology
  - Mail-out
    - Random selection by county of voters in Oklahoma
- Geocode addresses and accessibility information
- Overlay the survey addresses with the broadband coverage map
- Identify and map blocks of false positive or false negative
- Follow-up with geotechs, county officers, or other contacts to double check if available
- Finalize a map with problematic blocks
- Questions?

Data Validation Challenges

- No good validation for wireless providers
  - Drive tests are expensive
  - Will have more in Years 3-5 grant
- Conflicting information from various sources
- Swiss cheese valid or not valid?
- Speed test accuracy
  - Critical mass of data needed
  - Local environments affect speeds
- Budget for validation not sufficient to survey a statistically significant sample

How Can You Help?

- Help us collect speed test and community anchor institutions data
- Validate the data that is on the interactive map
- Work with local officials to provide more local knowledge
- Spread the word – get your friends, neighbors, colleagues and their friends, neighbors and colleagues to create a viral campaign to crowd source information

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Oklahoma Geographic Central Arc User Group

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Thank you!

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