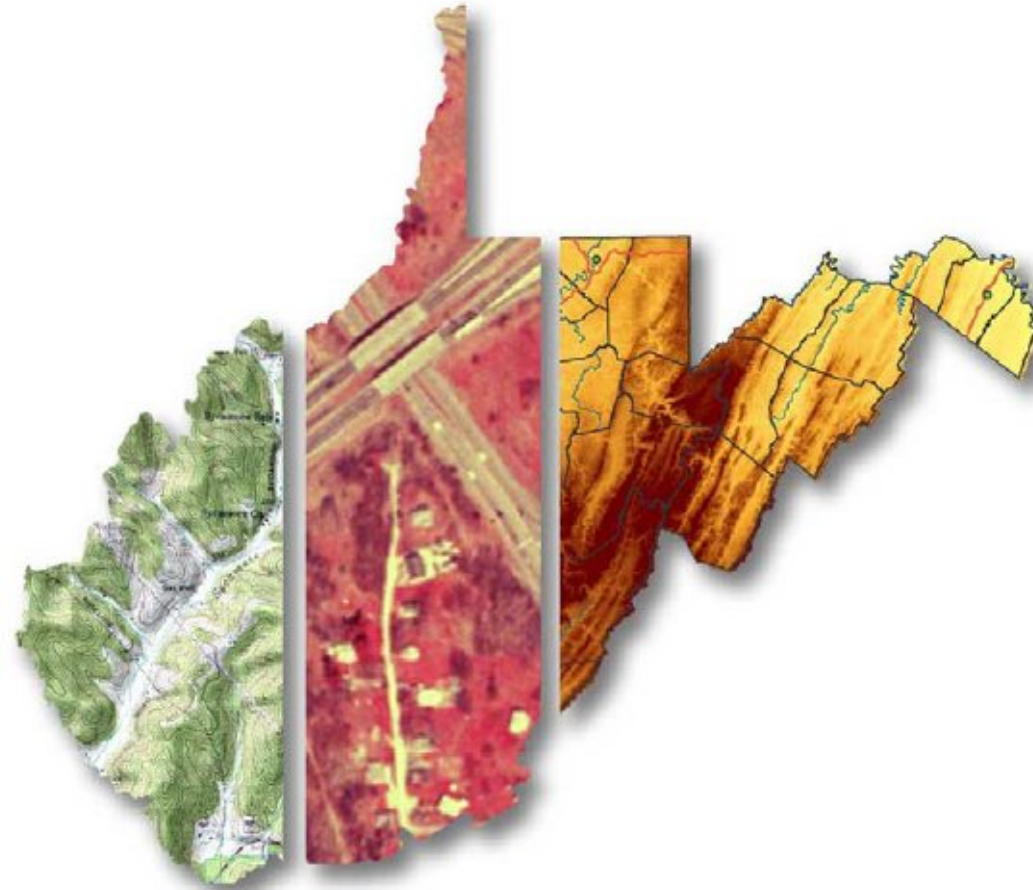


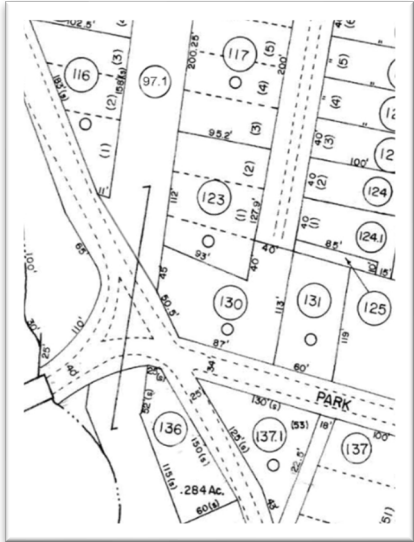
GIS Data Development



- Member, Property Valuation Training & Procedures Commission
- Manager, WV GIS Technical Center, WVU (kdonalds@wvu.edu)

Key Reference Layers: GIS Data Development

Parcels



Parcel geometry not misaligned or shifted

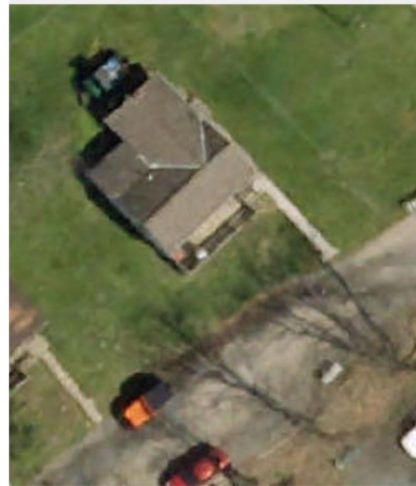
Assessment attributes of improvements or structures tagged to correct parcel

Addresses



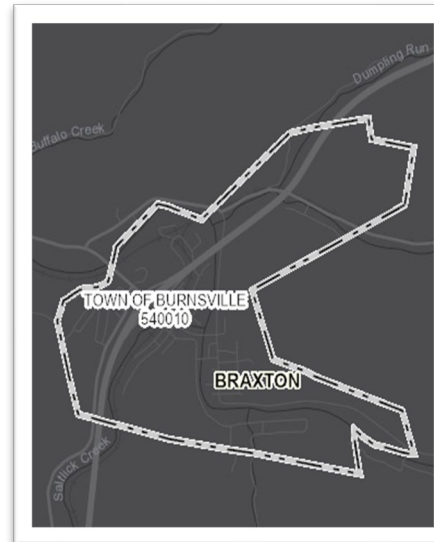
E-911 addresses current and accurate

Aerial Imagery



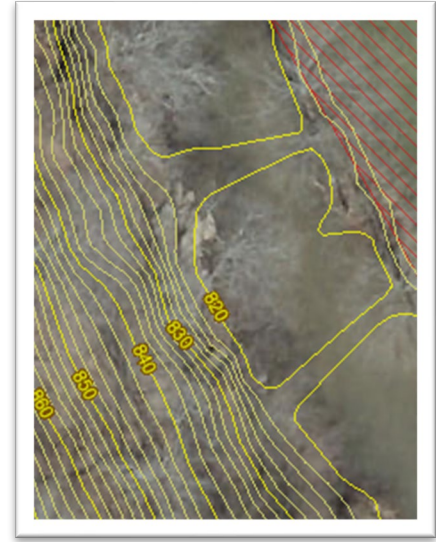
County Leaf-off imagery < than 5 years

Boundaries



Current and Accurate Cadastral, Legal, & Election Boundaries

Elevation



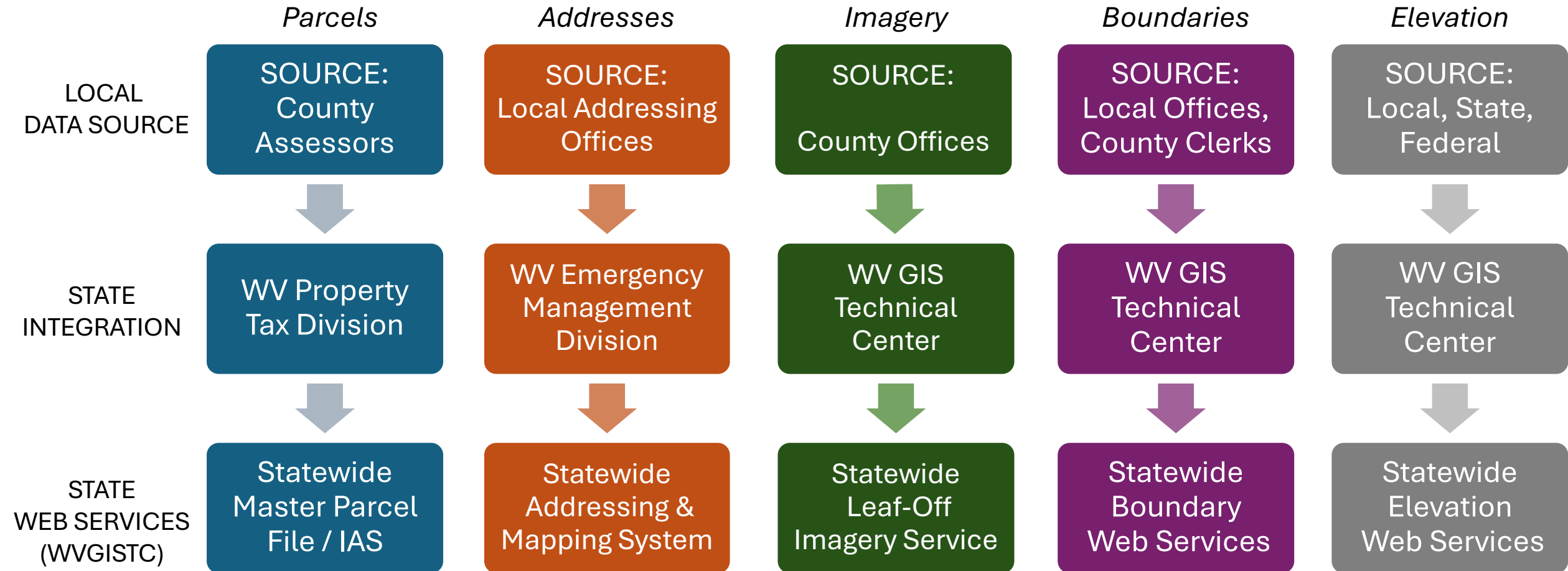
Statewide 1-meter DEM and 1-ft. contours.

Local and State Spatial Data Infrastructures

Data Development & Integration

- **Local-Level → Data Development**
- **State-Level → Integration**

State-Level Integration



*State-level integration allows for statewide mapping products and services.
At the state level, WVGISTC creates and hosts these framework spatial data layers.*

Map Reference Layers

Aerial Imagery

Accessibility to quality, up-to-date aerial photography

Statewide Imagery Contract (2019-25)



Unit Costs: All counties using the state contract typically acquire imagery at 4- or 3-inch pixel resolution.

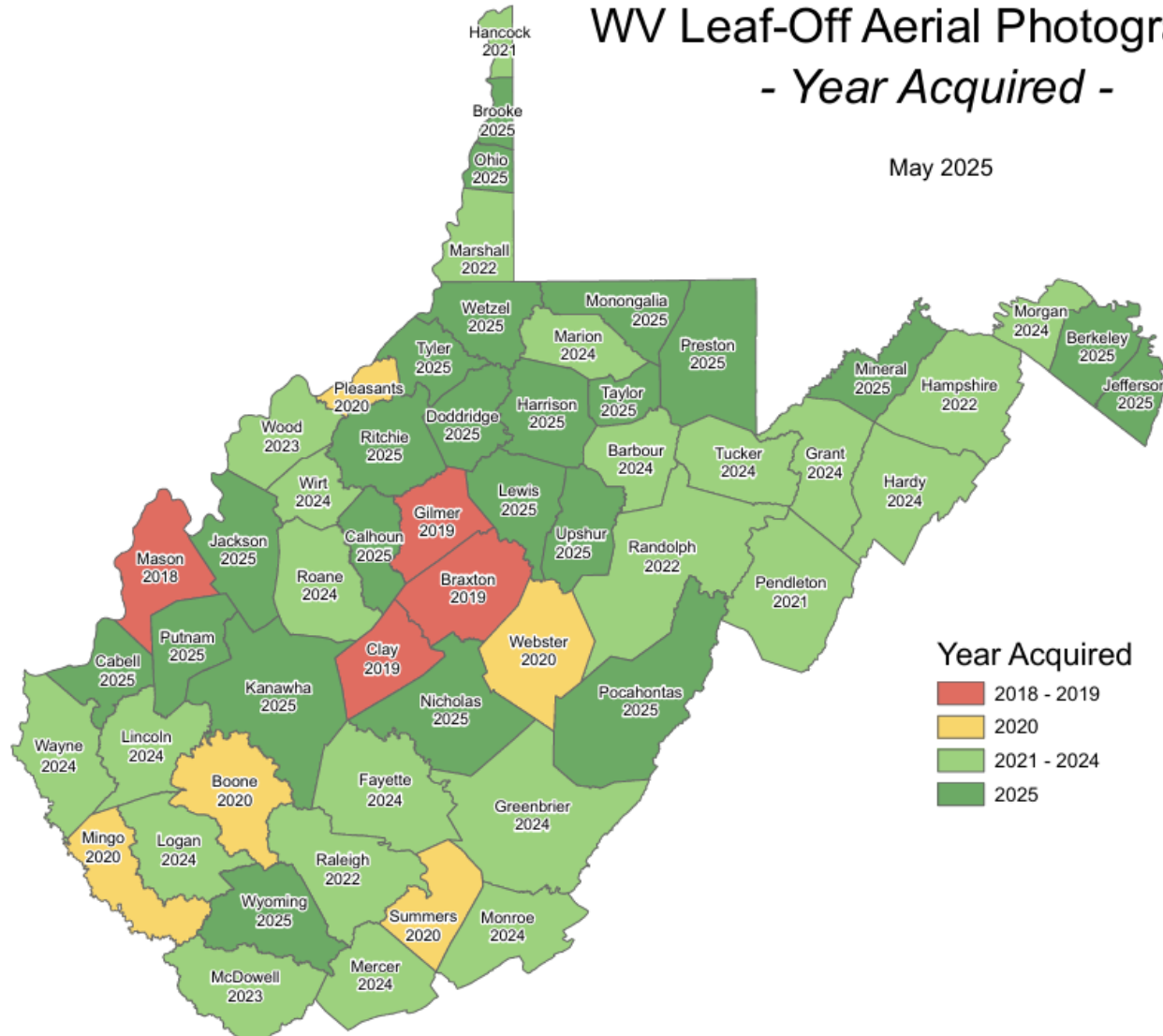
Pixel Resolution (Detail Level)	3-inch	4-inch	6-inch	12-inch
Cost per square mile ^{1,2}	\$106	\$77	\$62	\$42
Map Scale	1" = 50'	1" = 67'	1" = 100'	1" = 200'
Horizontal Accuracy (ASPRS 1)	0.5 feet	0.66 feet	1.0 feet	2.0 feet

¹ 2.5% annual inflation rate increase

² The county border buffer is 1000 feet

- **Vendor:** Thrasher Group.
- **Flying Season:** February to Mid-April (during leaf-out and no snow conditions).
- **Non-Exclusive Contract:** County offices still had the option to contract with other companies for the same services.
- **Public Domain:** State-contracted “top-down” aerial imagery resides in the public domain.
- **Oblique Imagery:** Not part of contract; oblique imagery usually requires proprietary software.

County Aerial Imagery: Year Acquired



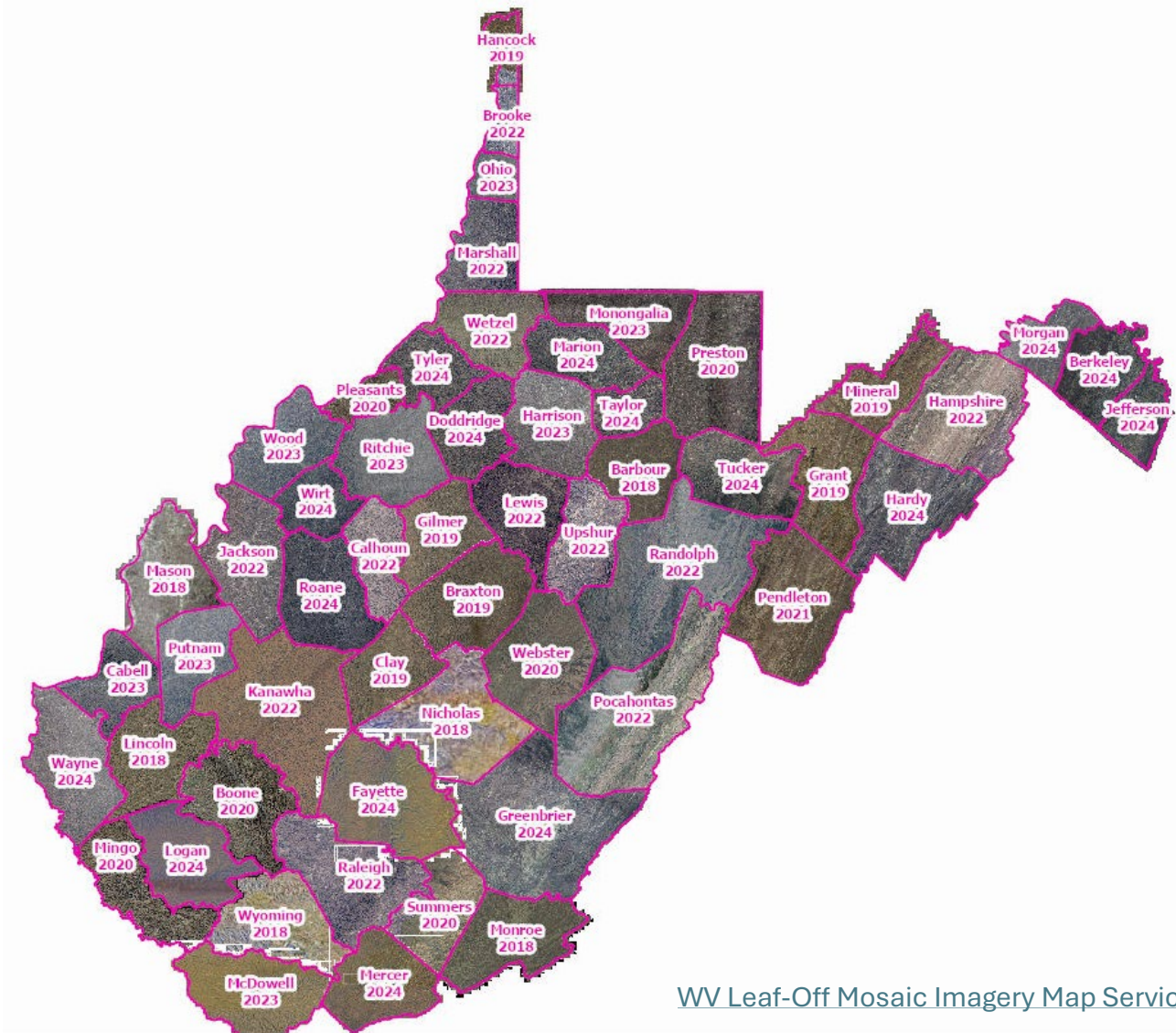
Trend: More counties are routinely purchasing aerial imagery

Some counties fly annually or every two years

*Ideally, leaf-off imagery should not be older than **5 years***

Make sure “top-down” imagery is licensed to county for sharing purposes

Statewide Mosaic

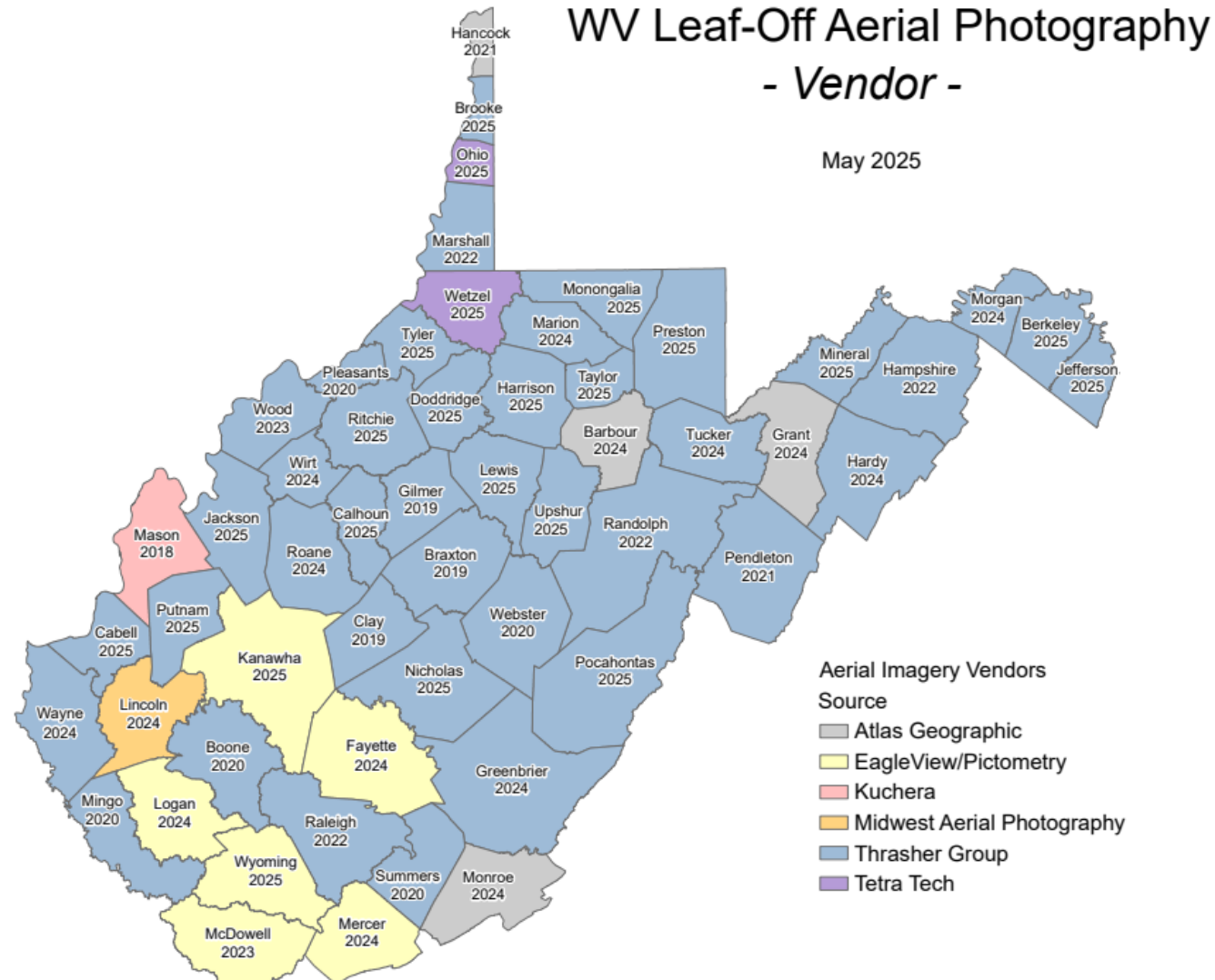


[WV Leaf-Off Mosaic Imagery Map Service](#)

West Virginia does not have a statewide orthophoto program

WV GIS Technical Center creates a **statewide mosaic** of county imagery from different county acquisition dates, formats (e.g., GeoTIFF, MrSID), and resolutions

County Aerial Imagery: Vendor



6 companies have acquired imagery for counties

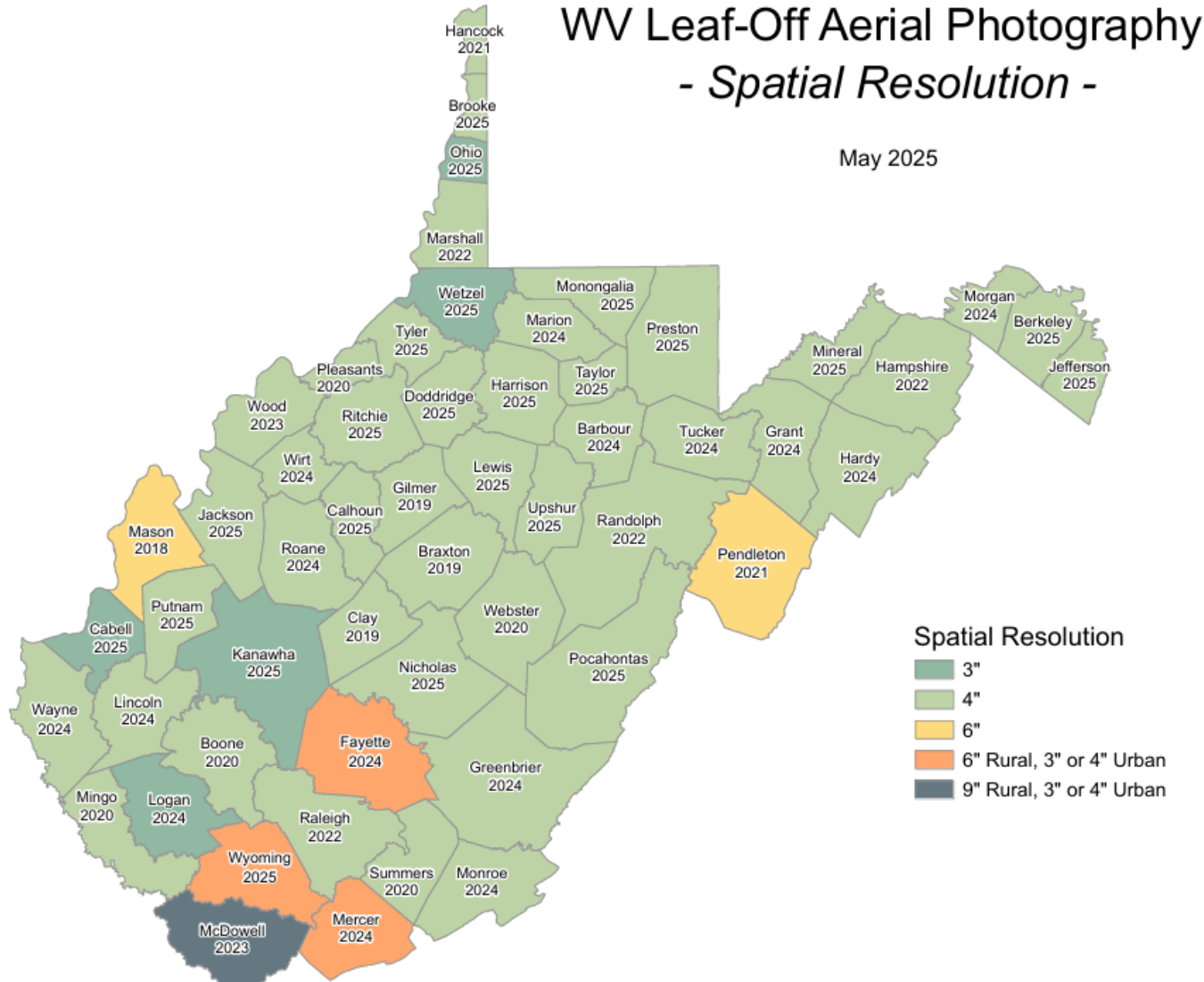
Majority of counties have been acquired via the **state contract**

Select counties for 2019-22 received funding support through HMGP grant

[PDF Map](#)

WVGISTC 2025-05-15

County Aerial Imagery: Resolution

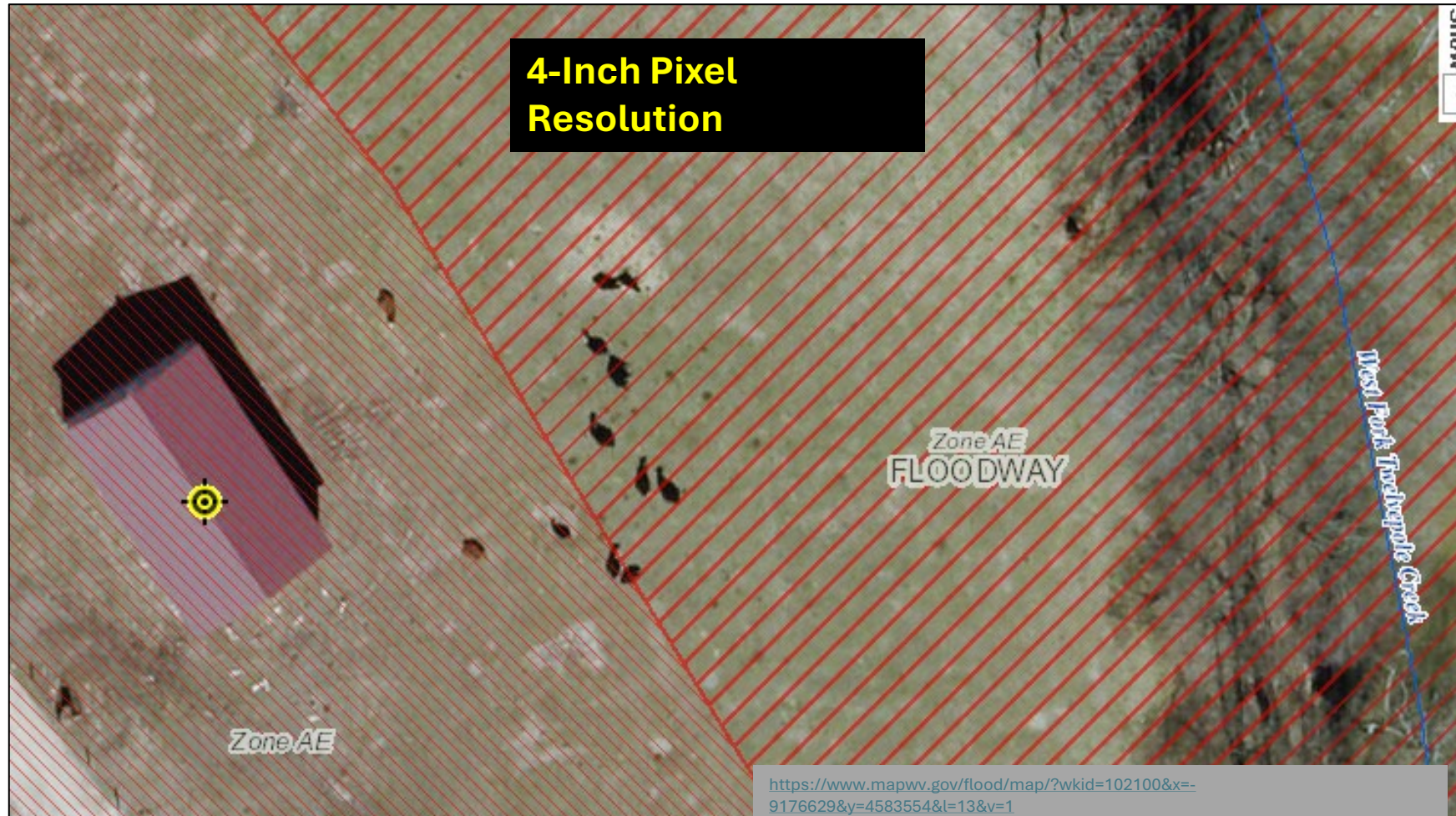


Aerial Imagery of most counties (98%) is captured at a *countywide* spatial cell resolution of **6 inches** or higher

Trend: Past decade spatial resolution has increased from 12" to 6", with more counties flying 3"

A target spatial resolution of 6" is recommended for counties that can afford this level of detail

Resolution (Cows in Wayne Co.)



Choose **WV Best Leaves Off** Base Map



Bing Hybrid



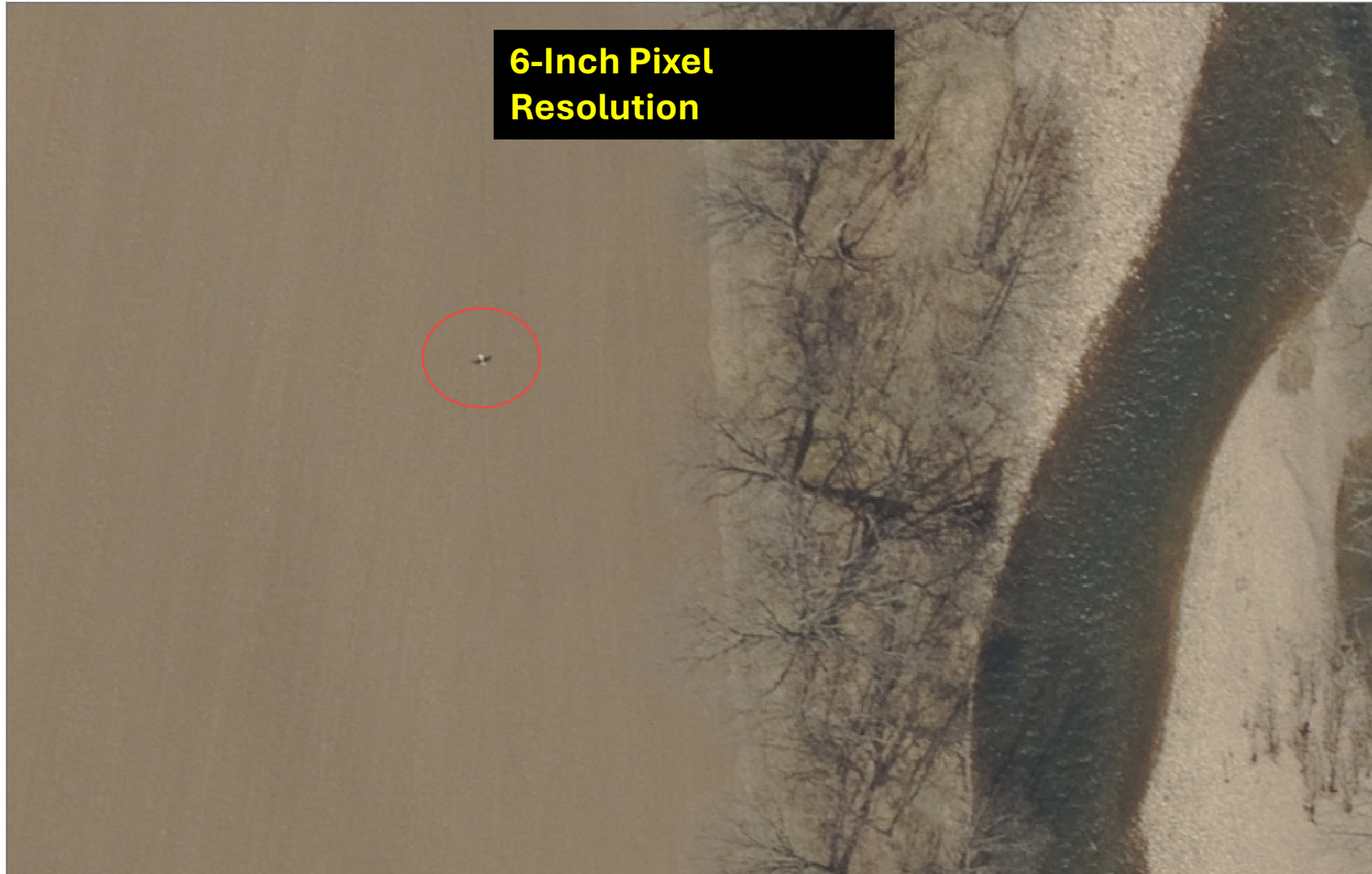
WV Best Leaves Off



Bing Imagery

Cows in the Floodway
West Fork Twelvepole Creek,
Wayne County

Resolution (Eagle in Pendleton Co.)

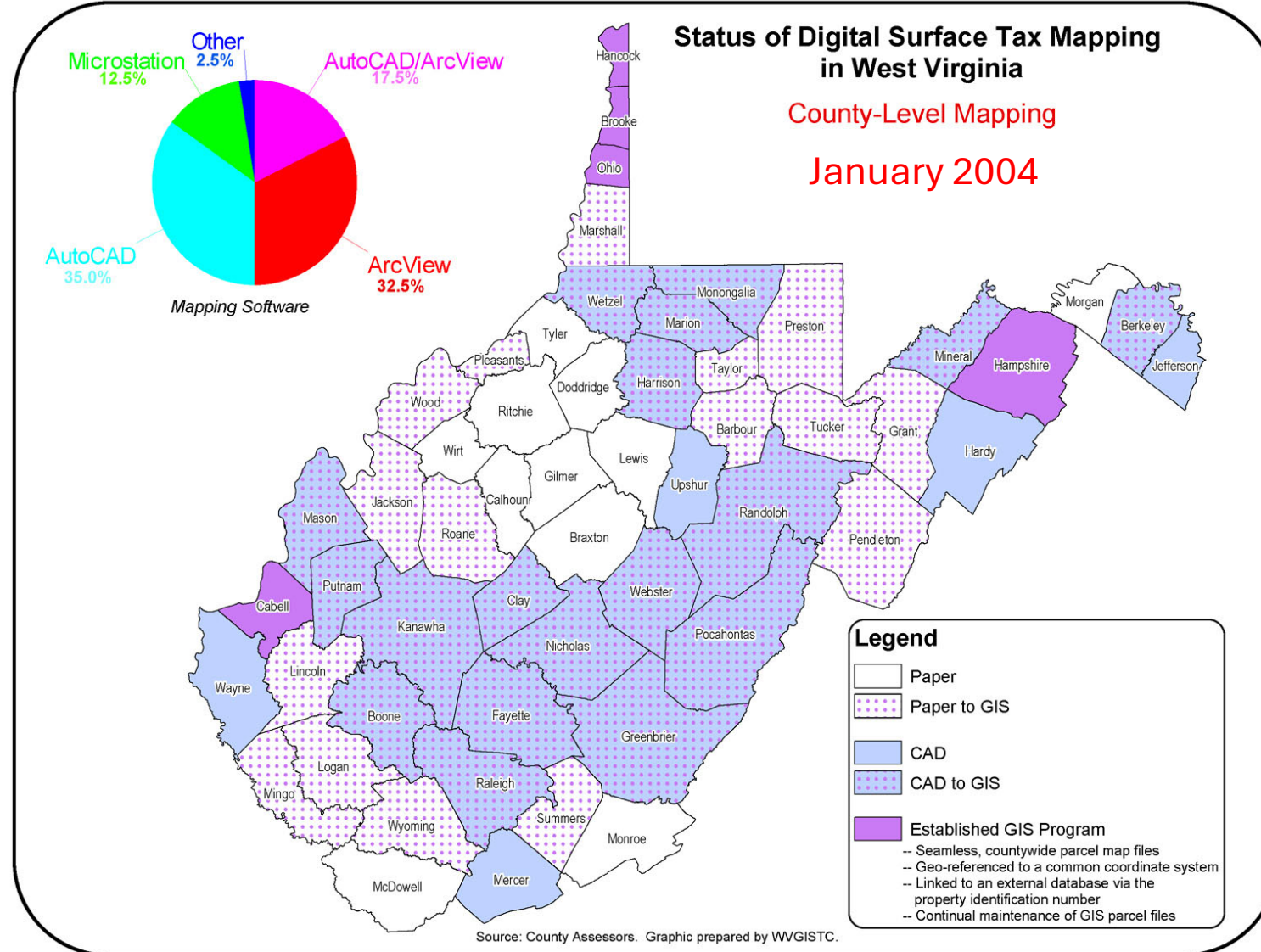


Bald Eagle in Pendleton County

Map Reference Layers

Parcels / Assessment Records

Digital Parcel Mapping in 2004



In 2004 only **five counties** had GIS parcels.

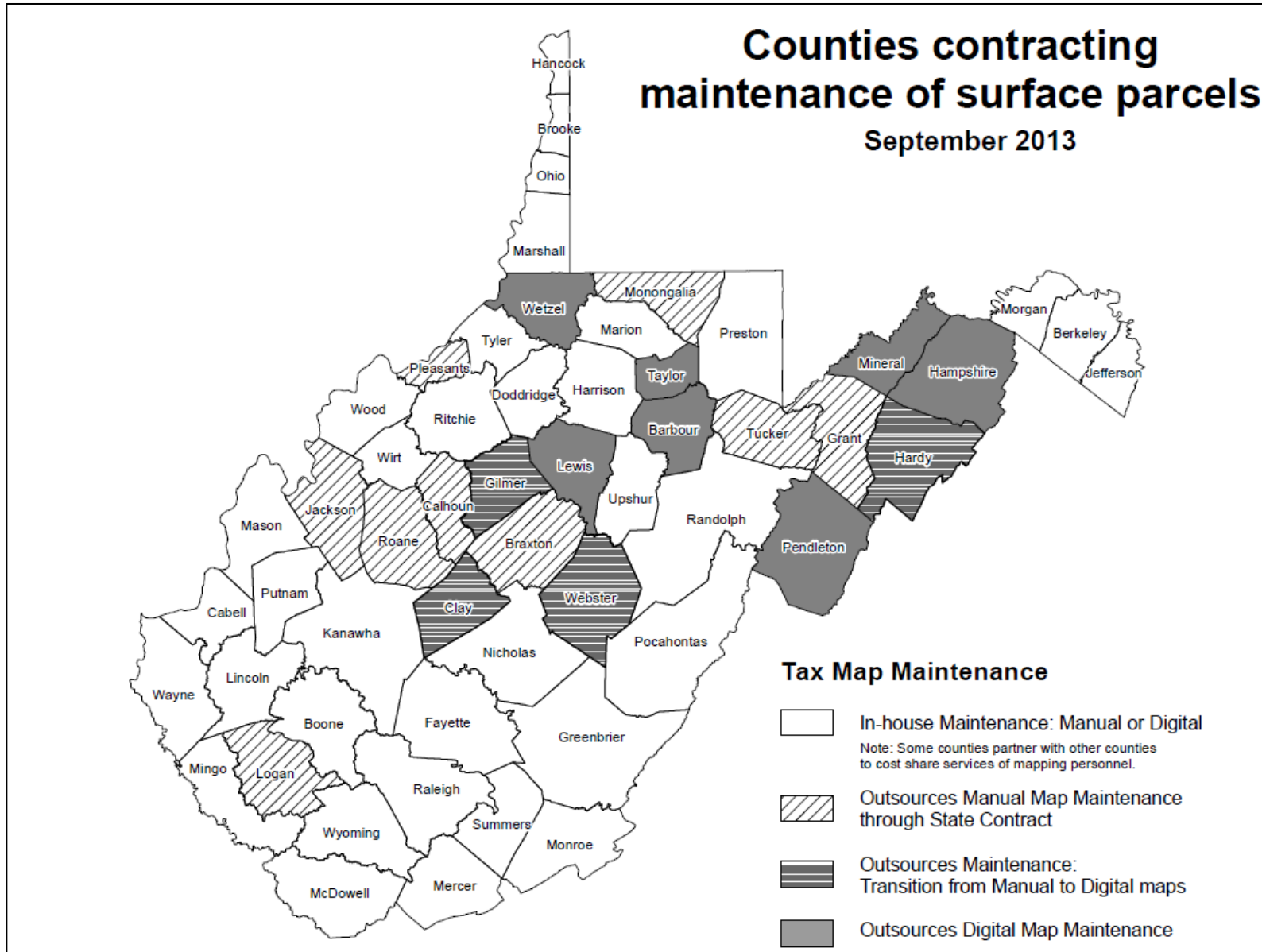
Early digital parcels systems were **CAD** and not **GIS**.

GIS ADVANTAGE

Geographic Information Systems (GIS) link to IAS

By 2021 all 55 counties had converted their tax maps from paper to digital

Tax Map Maintenance in 2013







In 2013, **20 counties** outsourced their tax map maintenance

In 2025, **37 counties** outsource their tax map maintenance

Digital Parcel Mapping in 2014

GIS Tax Parcel Program

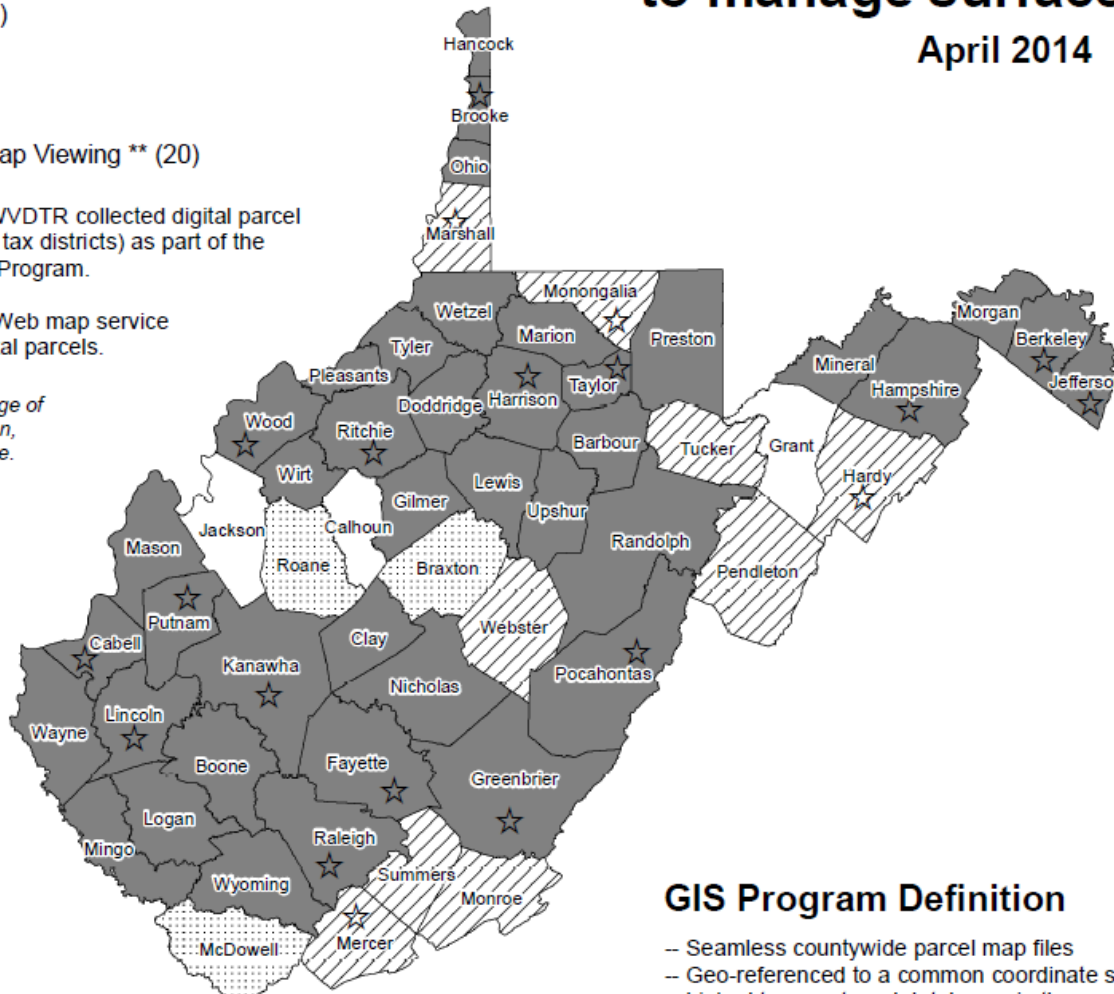
-  Yes (39)
-  In Progress (9)
-  No* (3)
-  No (3)

☆ Parcel Web Map Viewing ** (20)

* Between 1998-2006, WVDTR collected digital parcel polygons (primarily rural tax districts) as part of the Mineral Lands Mapping Program.

** Publically accessible Web map service for "viewing only" of digital parcels.

***Counties in planning stage of implementing GIS: Logan, Monongalia, and Monroe.



Counties using GIS to manage surface parcels

April 2014




GIS Program Definition

- Seamless countywide parcel map files
- Geo-referenced to a common coordinate system
- Linked to an external database via the property identification number
- Continual maintenance of parcel files
- Digital surface tax maps published according to state guidelines

In 2014, **39 counties** had GIS parcels

By 2021, all **55 counties** had converted their tax maps from paper to digital

In **2015**... Future Mapping 15-YR Predictions

- All 55 counties will have adopted GIS mapping
 - Successful State Digital Maintenance Program
 - Digital Conversion Funding Support from State  Funding from FEMA Grant (2019-2021)
- The Property Tax Division will have integrated all 55 counties into a seamless GIS database linked to the IAS and viewable to authorized users Open Public Access
- Map maintenance and publishing standards for manually drafting paper tax maps will be dropped Revised Tax Map Procedural Rule 189-3 standard needs to be published

Digital Parcel Mapping in 2025

GIS Program Definition

- Seamless countywide parcel map files
- Geo-referenced to a common coordinate system
- Linked to an external database via the property identification number
- Continual maintenance of parcel files
- Digital surface tax maps published according to state guidelines

* Other Parcel Data Sources besides County Assessors:

Between 1998 and 2006, the State Tax Department collected digital parcel polygons for rural tax districts as part of the Mineral Lands Mapping Program. In 2021, a FEMA grant managed by the WV Emergency Management Division and WV GIS Technical Center provided funding for a parcel mapping contract with the GIS professional services company Atlas Geographic Data Inc. to convert the remaining seven counties from paper to digital tax maps; consequently, all 55 counties now maintain and publish tax maps in an electronic format.

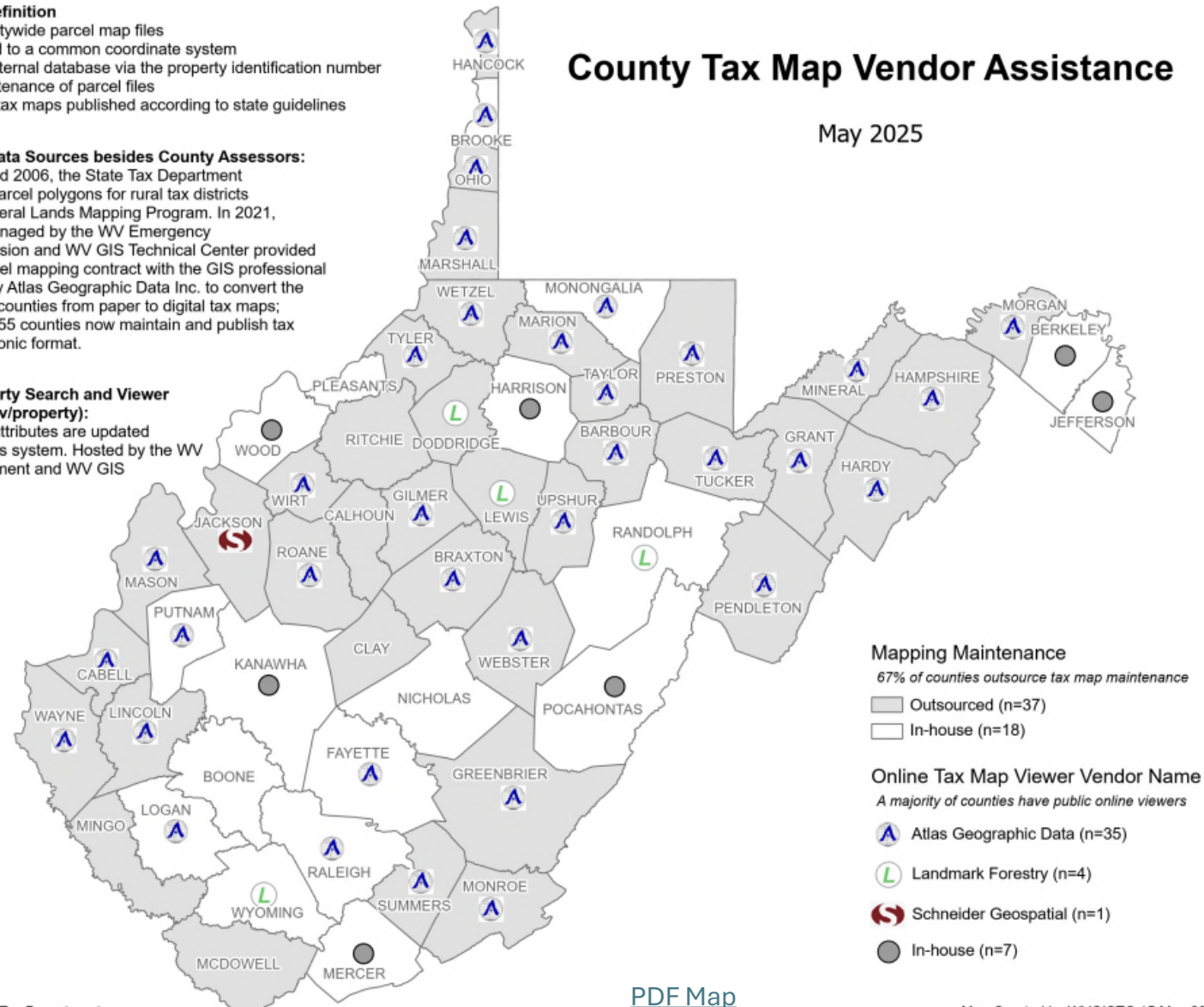
Statewide Property Search and Viewer

(www.mapwv.gov/property):

Tax parcels and attributes are updated annually on state's system. Hosted by the WV State Tax Department and WV GIS Technical Center

County Tax Map Vendor Assistance

May 2025



Data Source: State Tax Department

Map Created by WVGISTC 15 May 2025

COUNTY TAX MAP VIEWER

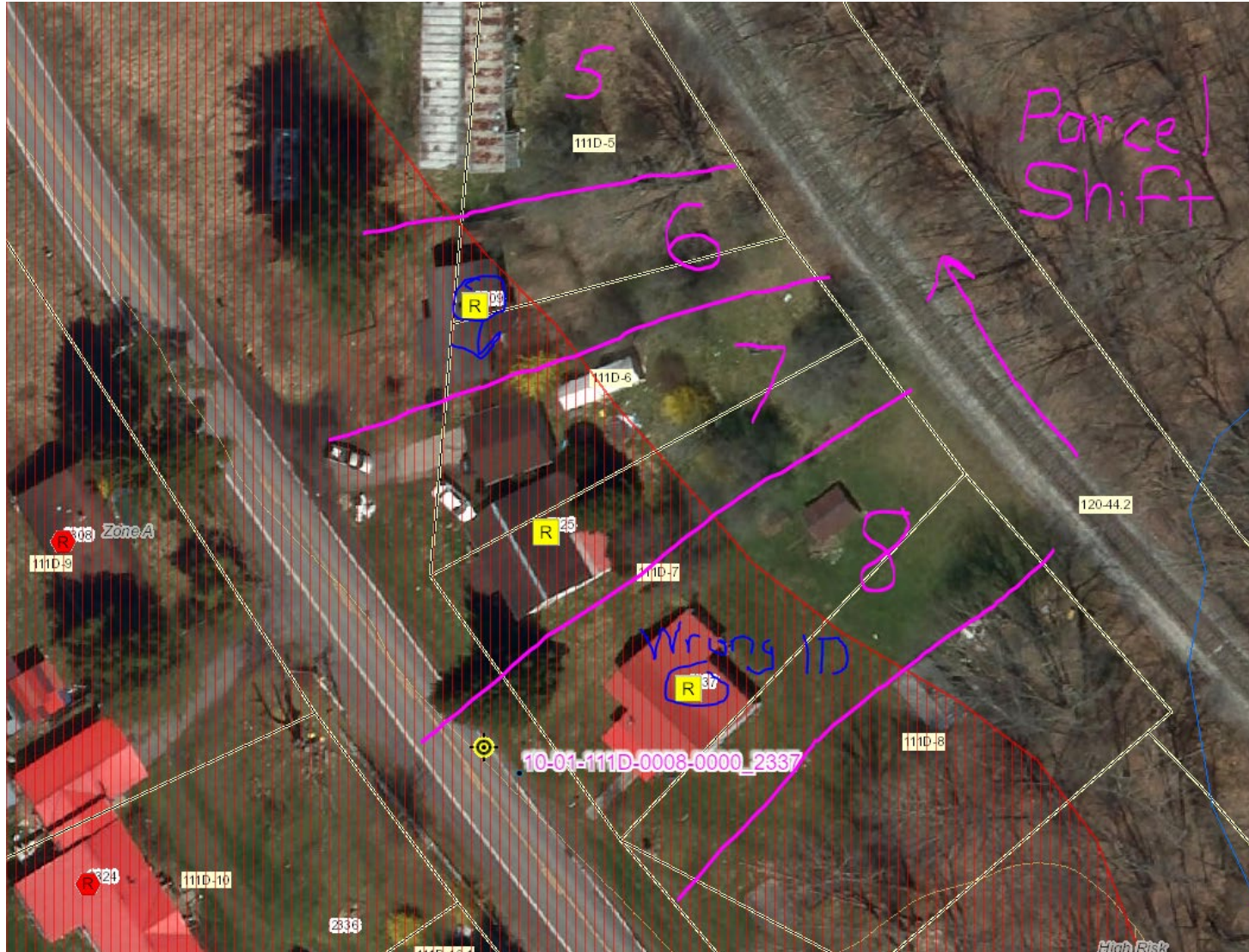
- 85% of counties have public online viewers

MAP MAINTENANCE

- All counties use GIS
- 67% of counties outsource map maintenance

Trend: More counties are outsourcing their tax maintenance

Tax Map Issue 1: Parcel Misalignment



Parcel Shift

- Tax **parcel geometry shifted** or misaligned
- Tax maps do not represent legal boundaries but should be **remapped** when parcels are shifted and do not align with the correct structure on accurately geo-referenced aerial photography



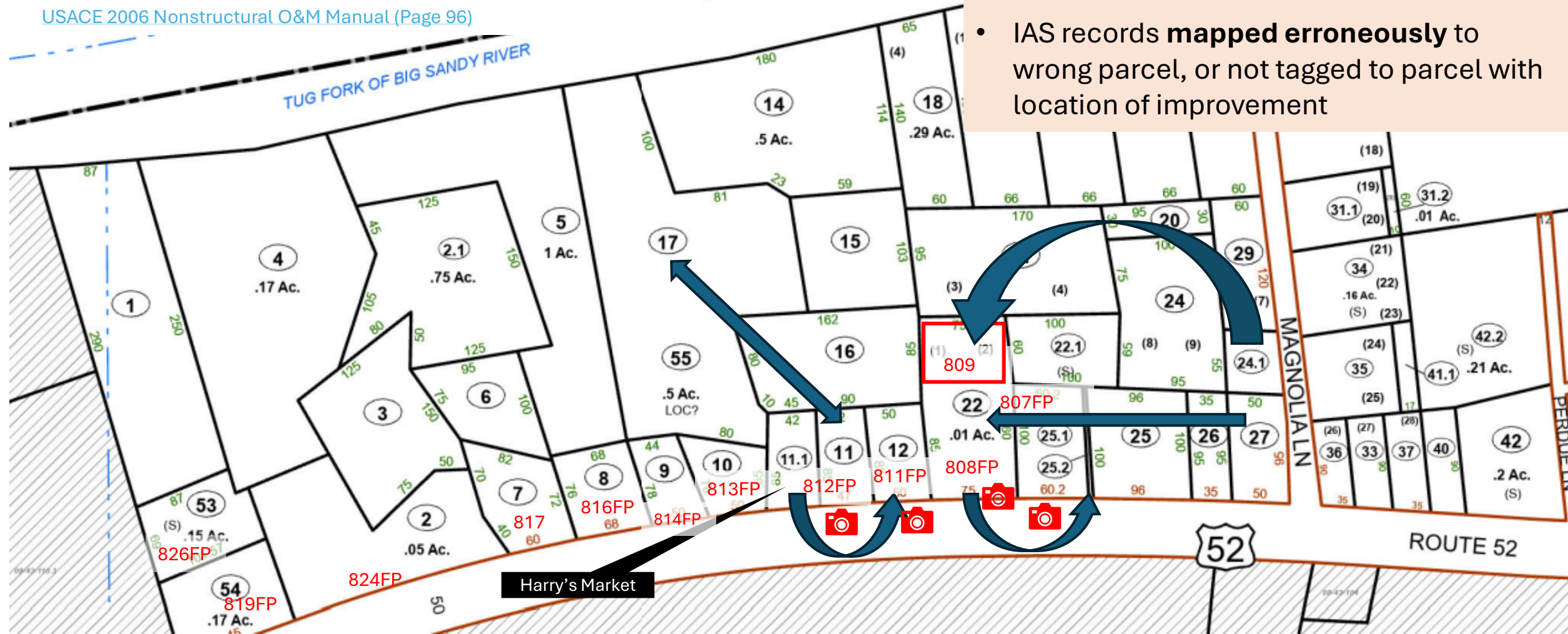
Tax Map Issue 2: IAS-Parcel Mismatches

- **USACE Tract 812FP:** Switch IAS Records of Parcels 43A-17 and 43A-11
- **USACE Tract 811FP:** Copy IAS Record IAS 43A-11.1 to IAS Record 43A-12
- **USACE Tract 808FP:** Replace IAS Record 43A-22 with IAS Record 43A-27
- **USACE Tract 809:** Copy IAS Record/Geometry of 43A-24.1 to north end of 43A-22
- Replace IAS Record 43A-25.2 with IAS Record 43A-22

[USACE 2006 Nonstructural O&M Manual \(Page 96\)](#)

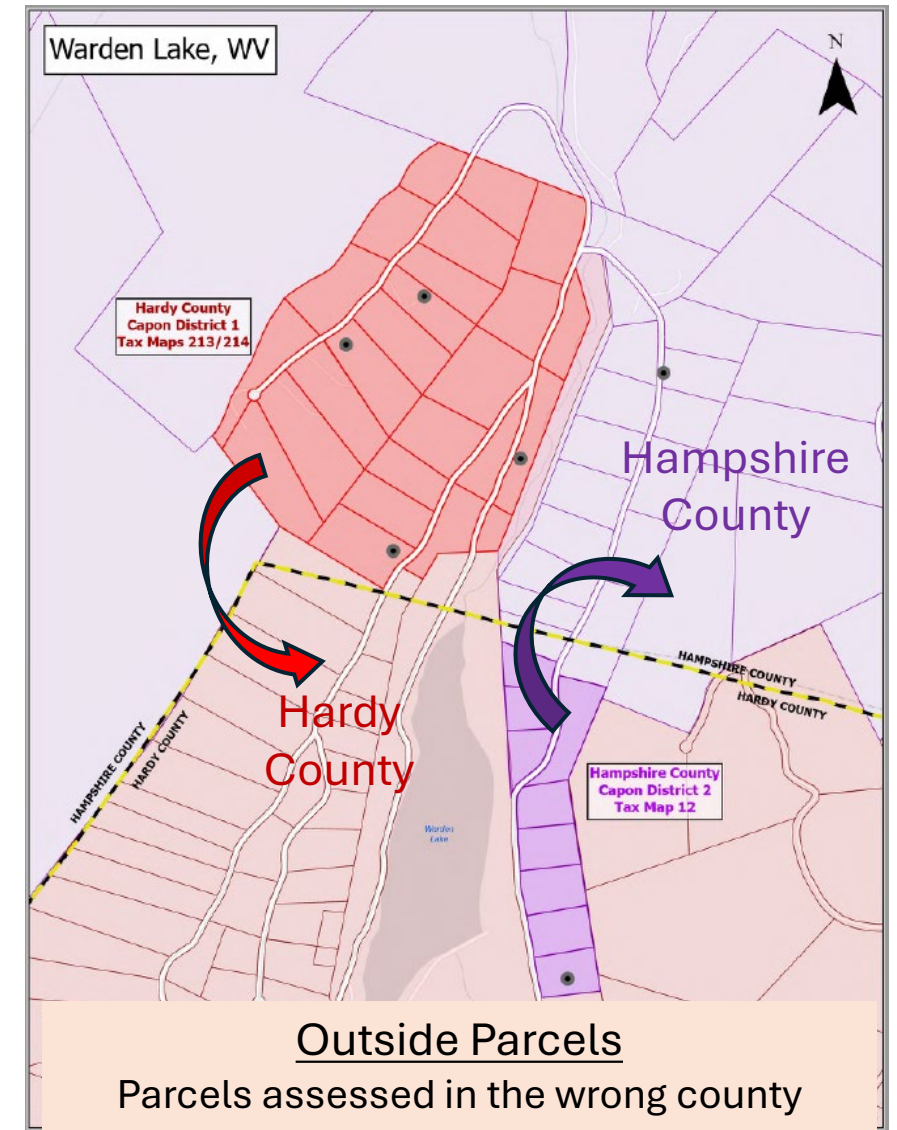
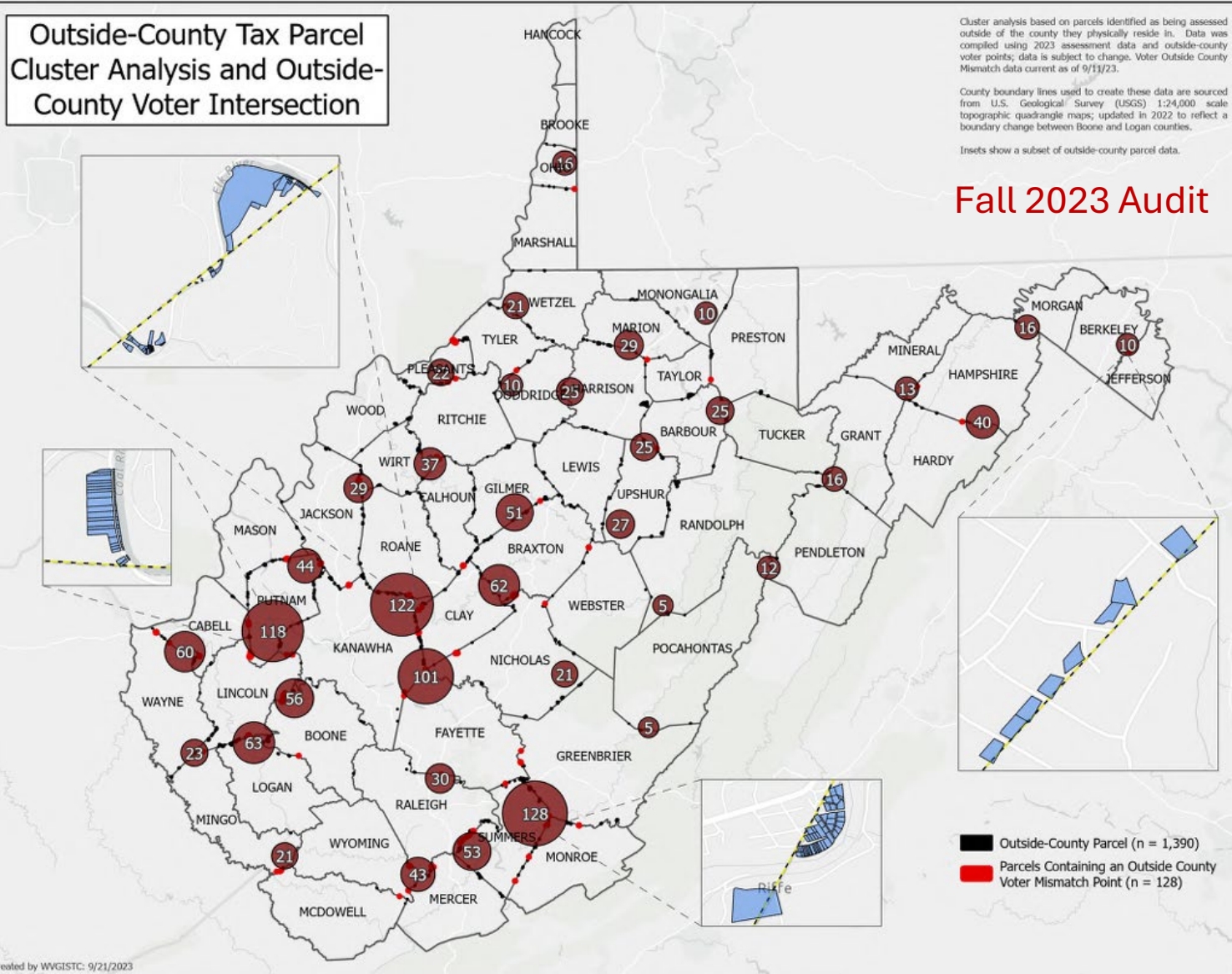
IAS-Parcel Mismatches

- **Missing** IAS records or parcel geometry
- IAS records **mapped erroneously** to wrong parcel, or not tagged to parcel with location of improvement




Tax Map Issue 3: Outside Parcels

Outside-County Tax Parcel Cluster Analysis and Outside-County Voter Intersection



Tax Map Issue 4: E-911 Addresses

West Virginia Property Viewer



Parcel ID: 22-06-0006-0019-0000

Owner(s): GODDARD T O & I (SURV)
Address: RT 10 UP ON HL
Class Type: Residential
Legal Description: W S GUYAN RT 10 3 AC ASSD SUR

Community: E-911 Address: 4131 MCCLELLAN HWY, Branchland, WV, 25506

External Links: [Click here for parcel assessment report](#)

Flood Info: Parcel appears to be in a LOW RISK flood hazard zone. Learn more at [WV Flood Tool](#)

Map Style: WV Hillshade, WV Best Leaves Off, Bing Aerial, Bing Road, Bing Hybrid

Scale: 1: 2,257
38.182486, -82.176356
(38.184084, -82.180347)

WV Hillshade | FEMA, Census, WVDEP, WVGISTC | WV

Parcel Physical Address

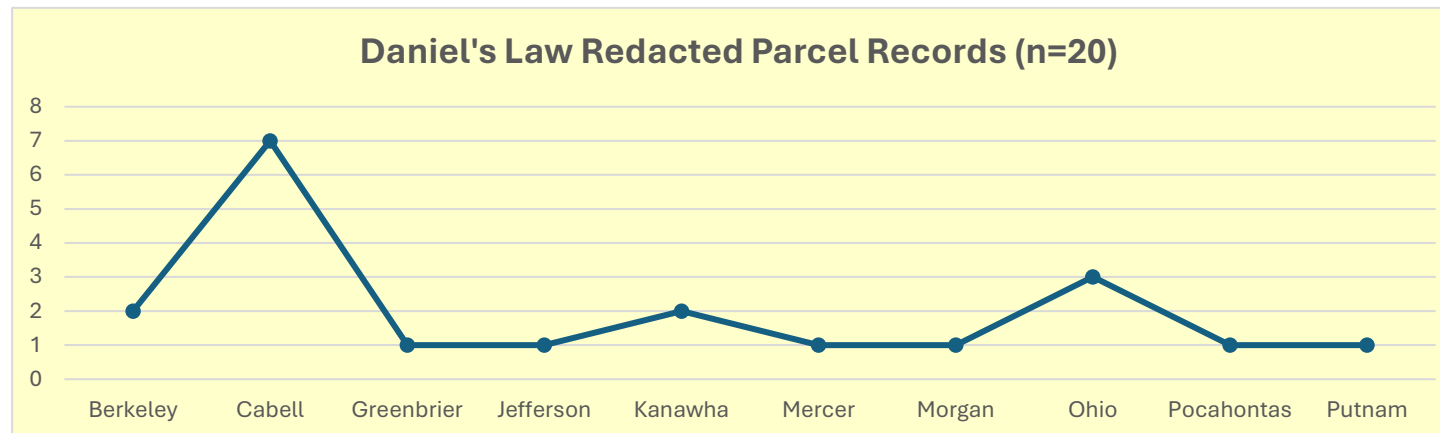
- IAS physical address of parcel should be **E-911 address**

Daniel's Privacy Law

§ 5A-8-24. Protection of personal information relating to judicial officers, prosecutors, and law-enforcement officers.
Effective: July 9, 2021

When we receive Daniel's Law requests, we perform the following actions on the following **statewide geodatabases**:

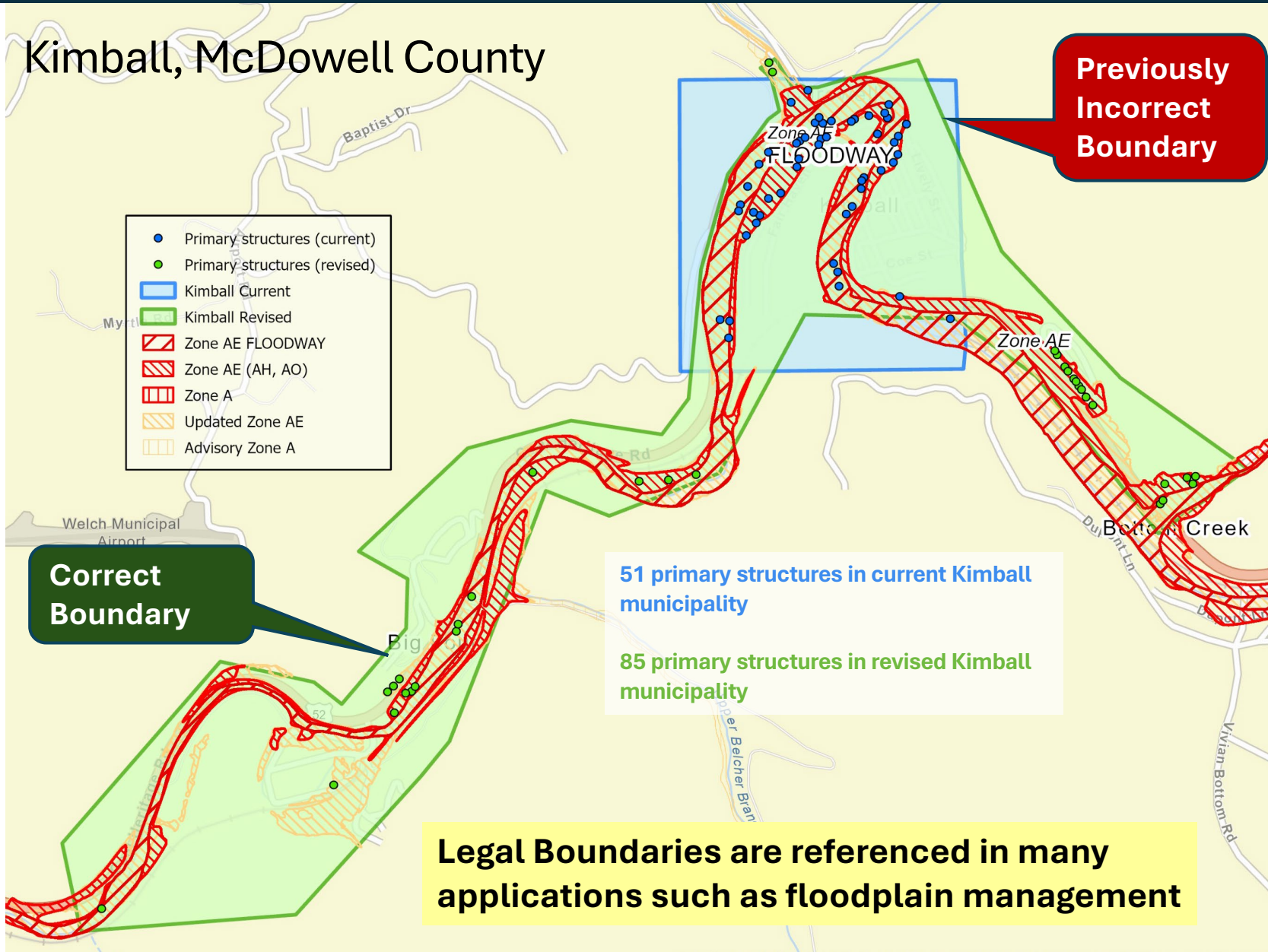
- **E-911 Address**: Coordinate with WV Emergency Management Division. Flag the address in the E-911 database as a "sensitive record" and do not display the address label on applications.
- **Parcel Record**: Coordinate with WV State Tax Department. Remove the owner's name, address, and legal description from the tax assessment database while preserving the parcel geometry. Update the data records on the Data Clearinghouse so sensitive parcel records cannot be downloaded. **County assessors are responsible for redacting "covered people" from their publicly accessible databases and map viewers.**
- **State Voter Registration System (SVRS)**: Coordinate with the Secretary of State's Office which is responsible to set a sensitive flag for voting records in the SVRS



Map Reference Layers

Boundaries

Legal Boundaries (Municipal)



Legal Boundaries

Official **municipal boundary** changes need to be submitted to the State and U.S. Census BAS Program

- **Tax Boundaries:** Corporation Tax District Boundaries & Tax Sales
- **Election Boundaries:** Municipal Precincts & Census Redistricting

Map Reference Layers

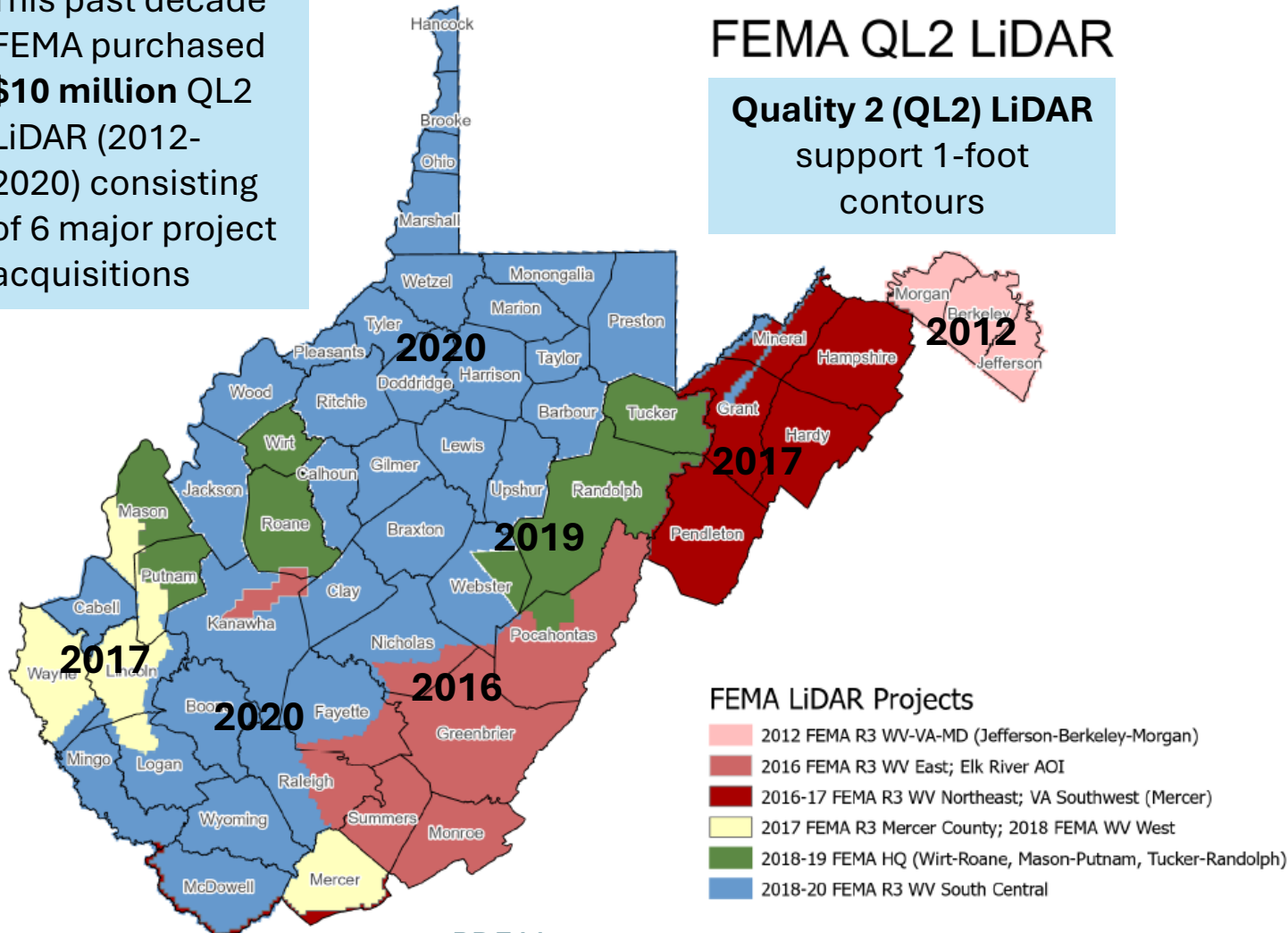
Elevation (Topographic)

Elevation Data

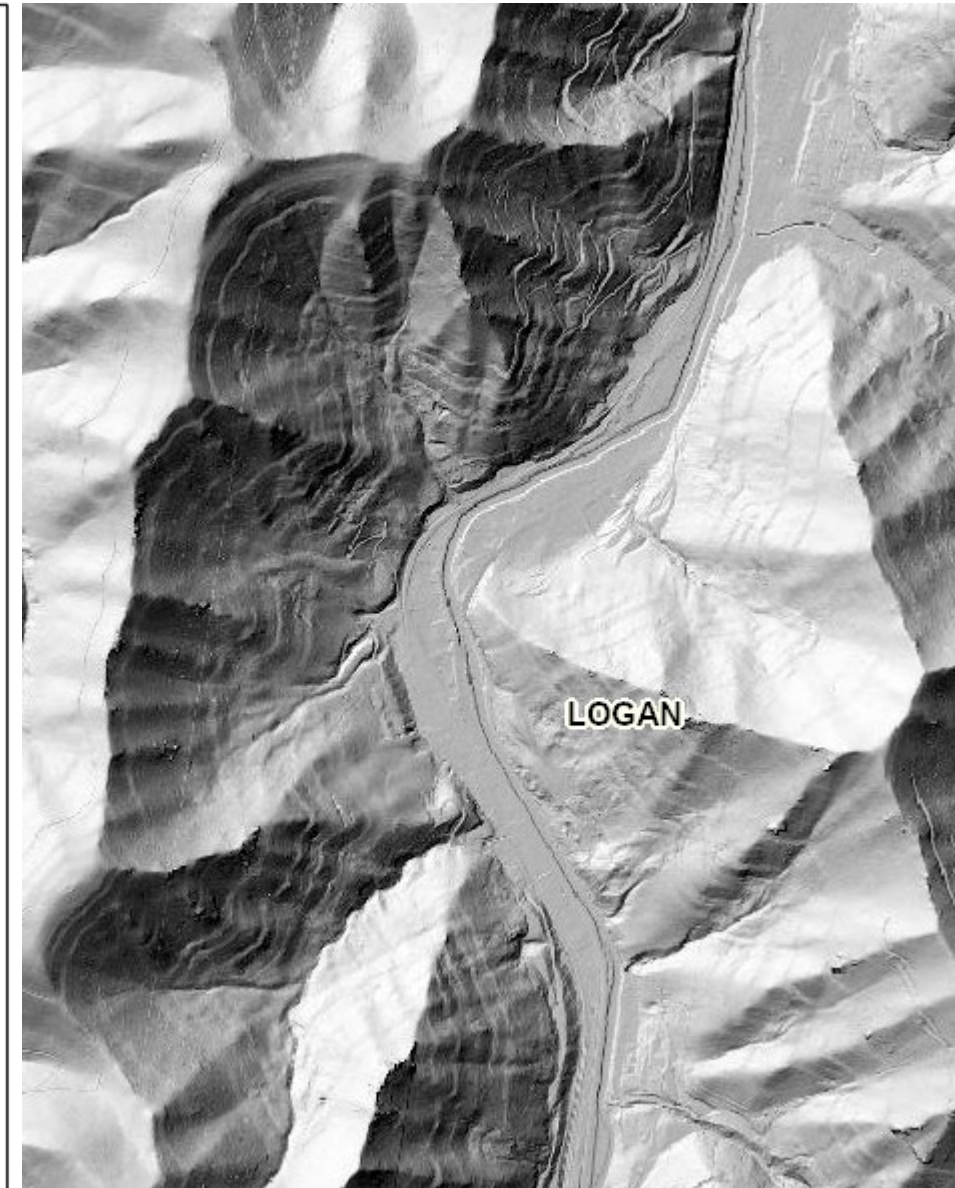
This past decade FEMA purchased **\$10 million** QL2 LiDAR (2012-2020) consisting of 6 major project acquisitions

FEMA QL2 LiDAR

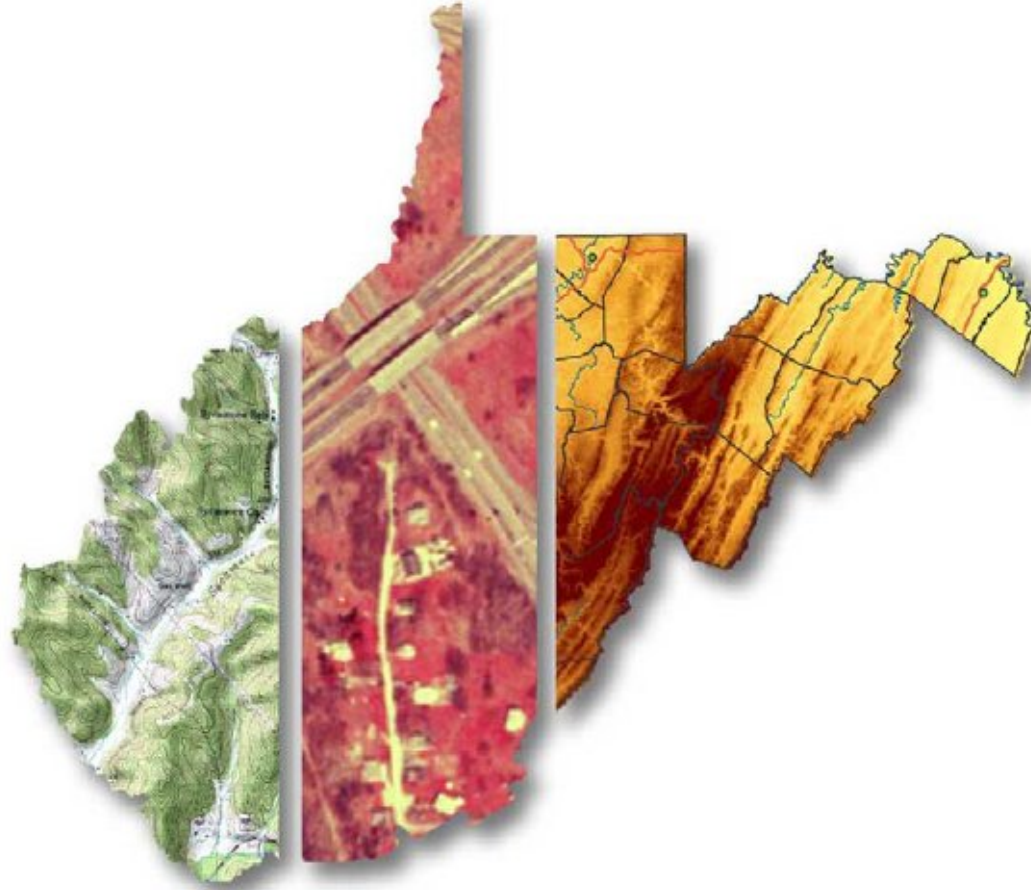
Quality 2 (QL2) LiDAR
support 1-foot
contours



[PDF Map](#)



Contact:



Kurt Donaldson, GISP, CFM

- Member, Property Valuation Training & Procedures Commission
- Manager, WV GIS Technical Center, WVU (kdonalds@wvu.edu)