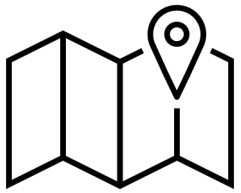
Kentucky's Mapping Resources



The Role of GIS in State Agency Operations

Property Valuation Administrator's Office Task Force Hearing

October 20th, 2020

Agency Overview

- COT-GIS operates under KRS 42.650 based upon the Legislative Findings noted in KRS 42.630.
- Maintain the central statewide GIS clearinghouse *(KyGeoNet)*
- Coordinate multiagency GIS projects *(KyFromAbove)*
- Create and update GIS Standards
- Provide centralized GIS Services
- Offer technical assistance and guidance to the Ky GIS Community
- Promote collaboration and data sharing

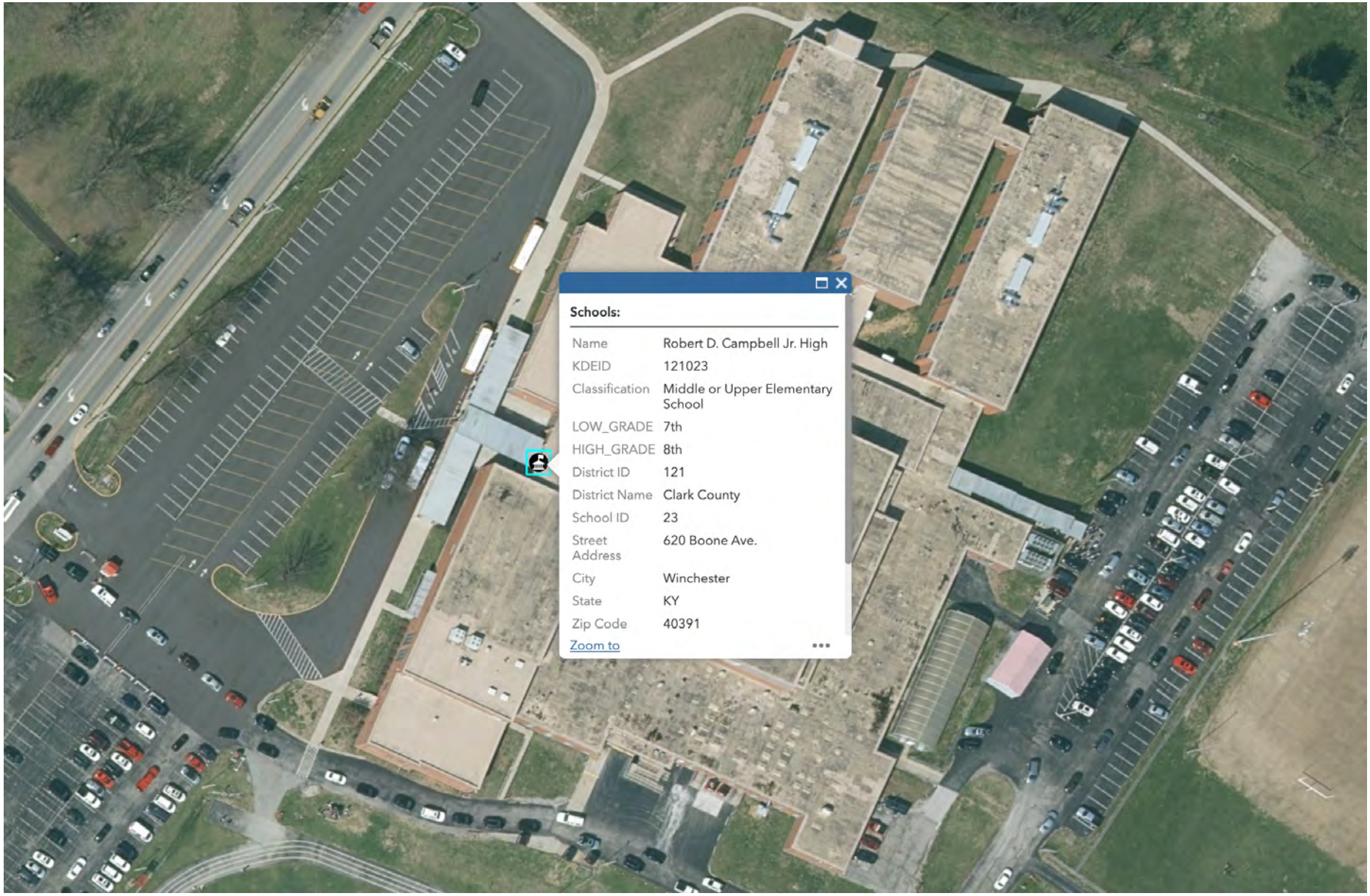
Did you know?

- Kentucky is commonly known as the best mapped state in the nation
- Maintain a nationally recognized, publicly available, Enterprise GIS that is accessible as interactive maps, downloadable data and baseline information
- Kentucky entered 2020 with over 40 years of experience in GIS, beginning with Governor Julian Carroll's "Lands Unsuitable for Mining Project"
- The KyGeoNet and its supporting server infrastructure receives a monthly average of 15 million server requests from upwards of 30,000 unique visitors accessing interactive maps, retrieving data or doing data research
- Kentucky, via its highly successful KyFromAbove Program, is one of a small number of states that has achieved statewide LiDAR (elevation data) coverage
- Kentucky's statewide Water & Wastewater Infrastructure, Mining, Transportation, Recreation, and Geologic GIS implementations and data stores are unmatched in the nation
- Consultants, investors, economic development specialists, environmental protection entities, local governments, and a host of other people utilize Kentucky's services as they look to invest, locate, or visit the Commonwealth
- The Kentucky GIS Community has a rich history of collaboration and data sharing

What is GIS Data?

- GIS or **Geospatial data** is data about objects, events, or phenomena that have a **location** on the surface of the earth.
- The **location** may be **static** (e.g., the location of a road, an earthquake event, children living in poverty), or **dynamic** (e.g., a moving vehicle or pedestrian, the spread of an infectious disease).
- Geospatial data **combines location information** (usually coordinates on the earth), **attribute information** (the characteristics of the object, event, or phenomena concerned), and often also **temporal information** (the time or life span at which the location and attributes exist.
- The Commonwealth has successfully consolidated its geospatial data in an enterprise **Geographic Information System**, or GIS, located in the computing center.

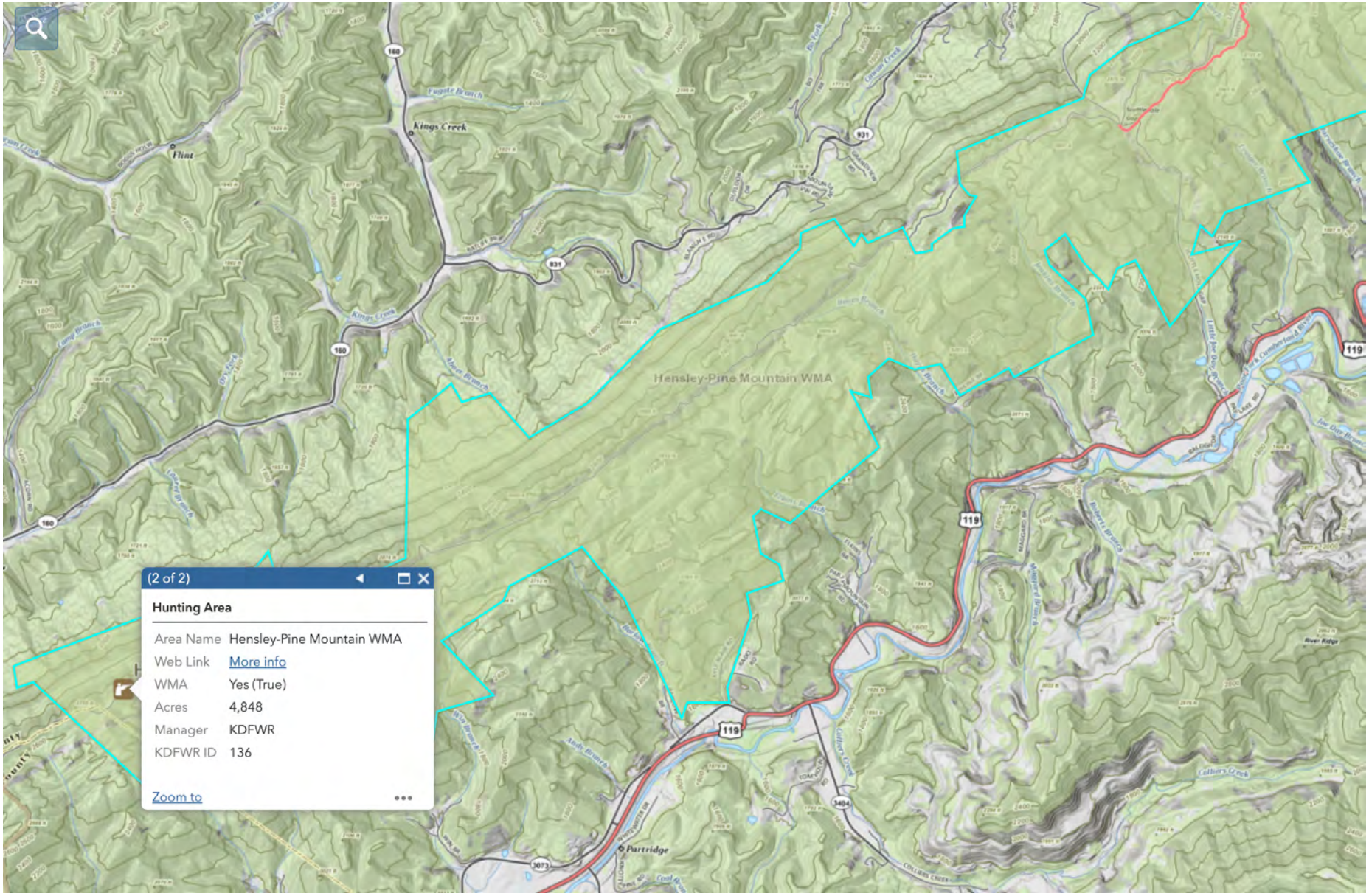
Point Data


Schools:
Name Robert D. Campbell Jr. High
KDEID 121023
Classification Middle or Upper Elementary School
LOW_GRADE 7th
HIGH_GRADE 8th
District ID 121
District Name Clark County
School ID 23
Street Address 620 Boone Ave.
City Winchester
State KY
Zip Code 40391
Zoom to

Linear Data


Water Line: KY0110097
Public Water System ID
KY0110097
System Name
DANVILLE CITY WATER WORKS
Purpose
TRANSMISSION
Size
24.00
Transmission Use
RAW
Year Constructed
1960
Material
DUCTILE IRON
Zoom to
DANVILLE WTP
18
12
16

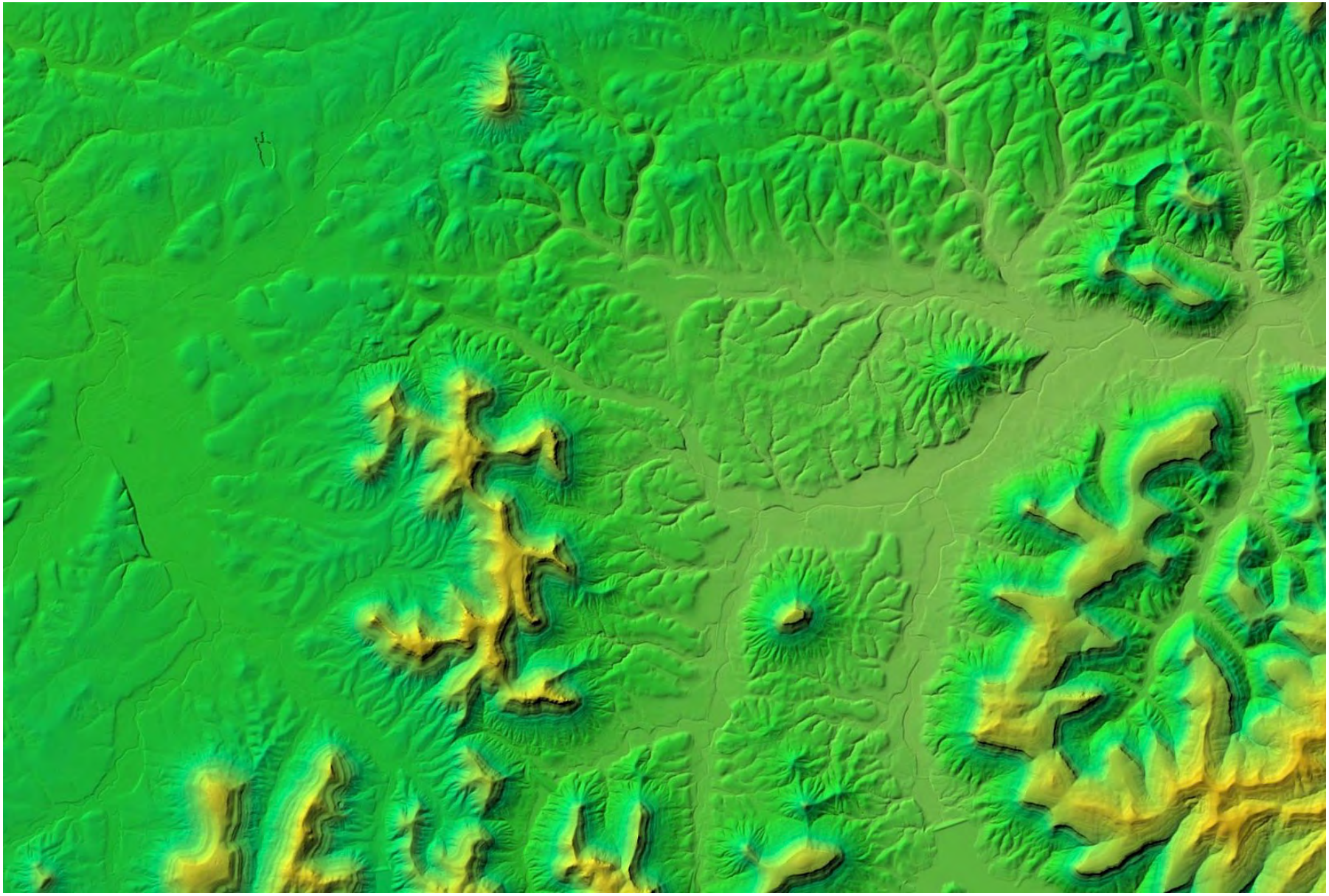
Area or Polygon Data



Raster Data – Aerial Photography

Raster Data – Topographic Maps

Raster Data – Digital Elevation Model



Agency Uses

Highway Planning & Design

Water & Wastewater Infrastructure Mapping

School Safety

Critical Infrastructure Mapping

Emergency Response

Economic Development

Environmental Response & Analysis

NextGen 9-1-1

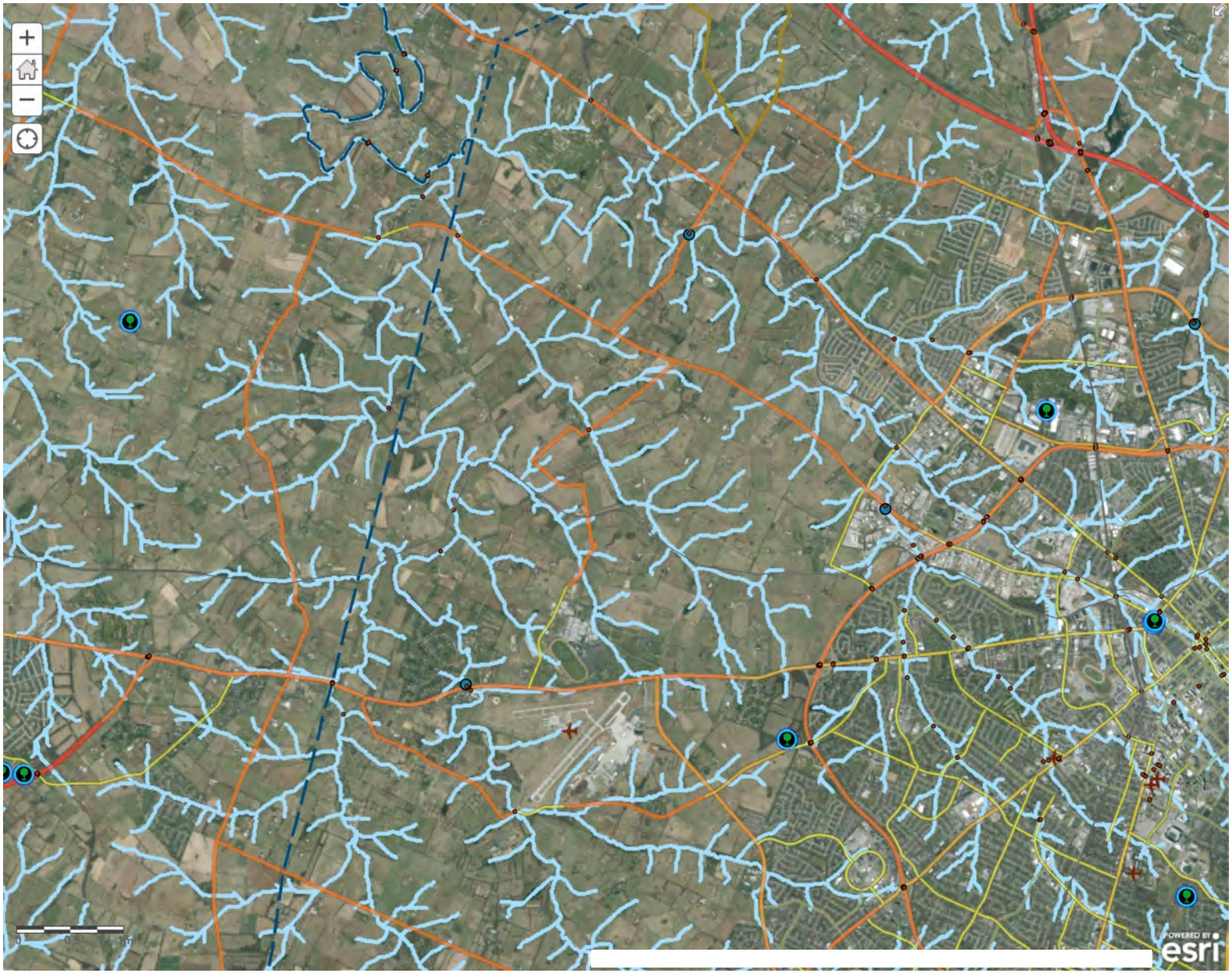
Disease Outbreaks

Property Mapping

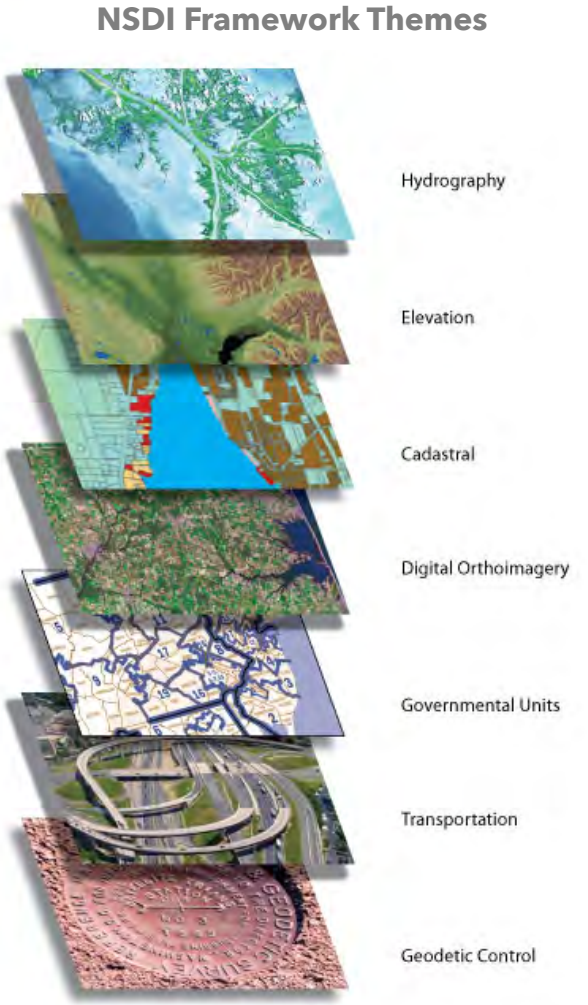
Facility Inventories

Recreation & Tourism Mapping

Putting it all in Context



Available GIS Data Layers



The Commonwealth has **over 400 layers** of GIS data in its repository.

Most repository layers are **publicly available**

All data layers are **documented and categorized** in accordance with FGDC standards

Kentucky was recognized as having contributed the **most "framework" layers** to the USGS

Still needed: **911 Address Points & Parcel Data**

Kentucky's **lowest scores** on the NSGIC Geospatial Maturity Assessment (2019) were for lack of address points and parcel data – *(Ky did get an "A-" overall score!)*

Why Kentucky GIS is a Leader

Recognize “Data” as an asset

Promote collaboration

Reduce duplicative spending

Require reasonable documentation (metadata)

Identify and promote authoritative data sources

Rely heavily on existing business processes

Provide direct and easy access

Establish open communications

We openly share data

Importance of 911 Address Points

Today vs Tomorrow

E9-1-1

MSAG = routing

GIS = Display

NG9-1-1

GIS

used for validation, routing AND display

Importance of 911 Address Points

Importance of 911 Address Points

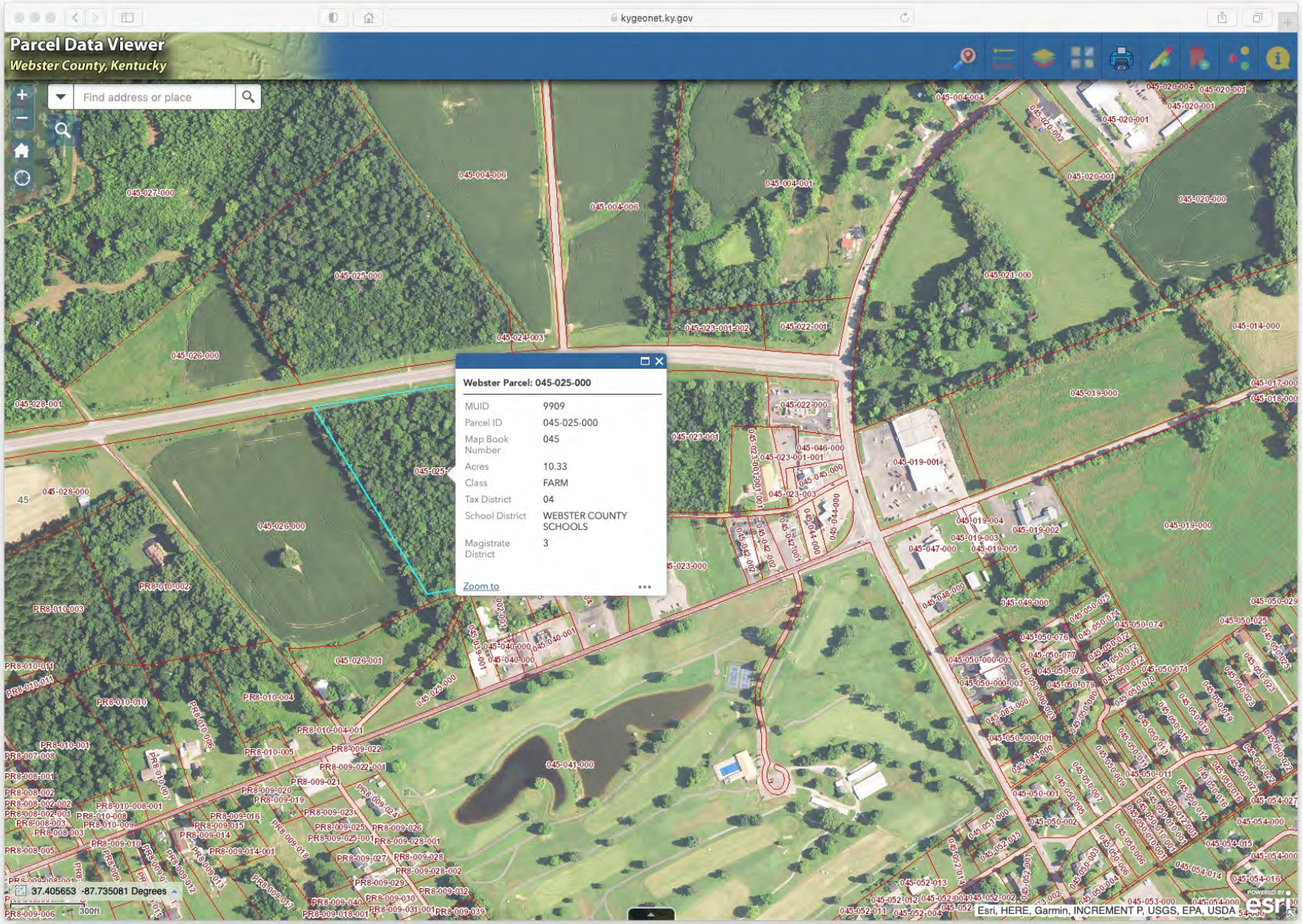
Enhance the response times of first responders and improve situational awareness – *Save Lives*

Provide exact situs address needed for PVA parcel mapping and assessment operations

Promote the visualization of address data contained in thousands of local and state agency databases

Improve decision making during infrastructure planning stages

What is PVA Parcel Data?



What is PVA Parcel Data?

- A **graphic representation** of a property boundary used in the assessment process
- It is **not a legal property boundary**
- It is represented as a **polygon feature** in a GIS
- Includes a **corresponding database** of relevant information
- Exists as 120 separately maintained **county-based datasets**

How is Parcel Data Created?

- **Methods** of parcel data creation and updates **vary**
- Most PVAs utilize **aerial photography** when creating parcel lines
- Some PVAs use **coordinate geometry** (COGO) software to input calls from deeds
- Some PVAs **scale and sketch the lines** on overlays that are later sent to DOR for input
- The **best practice** is to utilize both COGO tools & high accuracy orthoimagery (aerial photography)
- Utilization of best practices will **improve data over time**

Parcel Data Integration & Sharing

"Managing this data resource as a single statewide data layer will introduce a variety of efficiencies, ensure adherence to standards, promote data sharing within state government and save valuable resources at both the local and state levels of government within the Commonwealth."

Efficiencies

All agencies would have read-only access to the data for internal usage

Standards

A common data storage and input standard would improve data quality and integrity

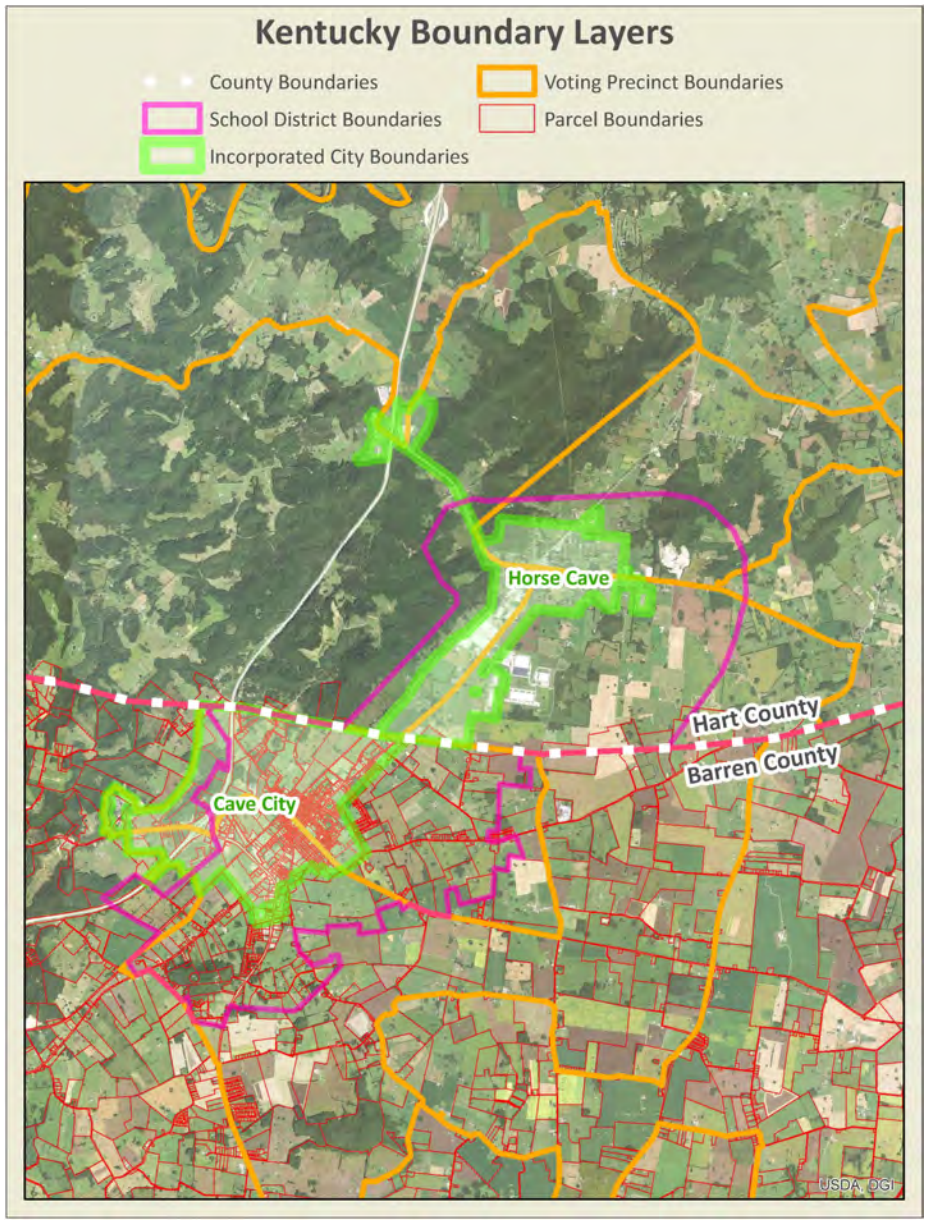
Data Sharing

Clearly demonstrates that data sharing and collaboration across agency lines enhances governmental operations

Save Resources

Personnel, travel, processing, and data cost savings will be realized

Importance of PVA Parcel Data



Parcels are the lowest common denominator of all boundary layers

- Voting Precincts
- School Districts
- Magisterial Districts
- US Census Boundaries
- Incorporated City Boundaries
- County Boundaries
- Legislative Boundaries
- State Boundary as per KRS 1

Importance of PVA Parcel Data

Three primary needs identified by agencies are:

Land Management
(acquisition or sale)

Decision Support
(what is the best location for infrastructure, an industrial facility or an activity)

Situational Awareness
(emergency response, intelligence, first responder, post event mitigation efforts)

Which agencies needs parcel data?

Kentucky Transportation Cabinet

Division of Real Properties

Kentucky Department for Fish & Wildlife Resources

Kentucky Cabinet for Economic Development

Energy & Environment Cabinet

Kentucky Infrastructure Authority

Kentucky State Parks

Kentucky Emergency Management

Kentucky National Guard

Kentucky Department of Education

Kentucky State Police

Kentucky Office of Homeland Security

Kentucky Department of Agriculture

Kentucky 911 Services Board

Agency Uses

Highway Planning & Design

Water & Wastewater Infrastructure Mapping

School Safety

Critical Infrastructure Mapping

Emergency Response

Economic Development

Environmental Response & Analysis

NextGen 9-1-1

Disease Outbreaks

Property Mapping

Facility Inventories

Recreation & Tourism Mapping

Public Benefits

How do our citizens benefit?

Reduced Operational Costs

Gaining free and open access to parcel data will directly and very significantly reduce costs within affected agencies and will indirectly benefit taxpayers.

Improved Decision Support

Currently, many agencies make decisions without access to parcel data, especially, when time is of the essence. Improved decision-making within our state and local governmental entities benefits everyone in the Commonwealth.

Enhanced Situational Awareness

It is very, very rare that first responders, emergency management, or the environmental response team has access to parcel data. As a result, responses take much longer than they should, and in many instances, the time savings may equate to property or even lives being saved. The Commonwealth should bring all of its resources to bear when protecting the health and well-being of its citizens.

PVA Benefits

How do the PVA's benefit?

Identification of orphaned, publicly-held, parcels that can placed back on the tax rolls

Improved parcel data geometry for publicly-held properties

Notifications from the Department of Housing & Building Codes would alert PVAs of properties being developed which in turn may result in higher assessed values

Agencies are more likely to share their programmatic GIS data layers with PVAs that share their data with government entities

Why is Aerial Photography so Important?

The Essential Base Layer
Provides Context

Intuitive
"Places" are recognizable

Crucial for Data Updates
Utilized by the entire GIS Community

Aerial Photography: Leaf-On

Leaf-On

Acquired when leaves are on the trees (May-November)
Less desirable

Aerial Photography: Leaf-Off

Leaf-Off

Acquired when no leaves are on the trees (February-April)
Most desirable

Aerial Photography: Resolution

Resolution

A function of the distance between the sensor and the ground, as well as, the quality of the sensor

Aerial Photography: Accuracy

Accuracy

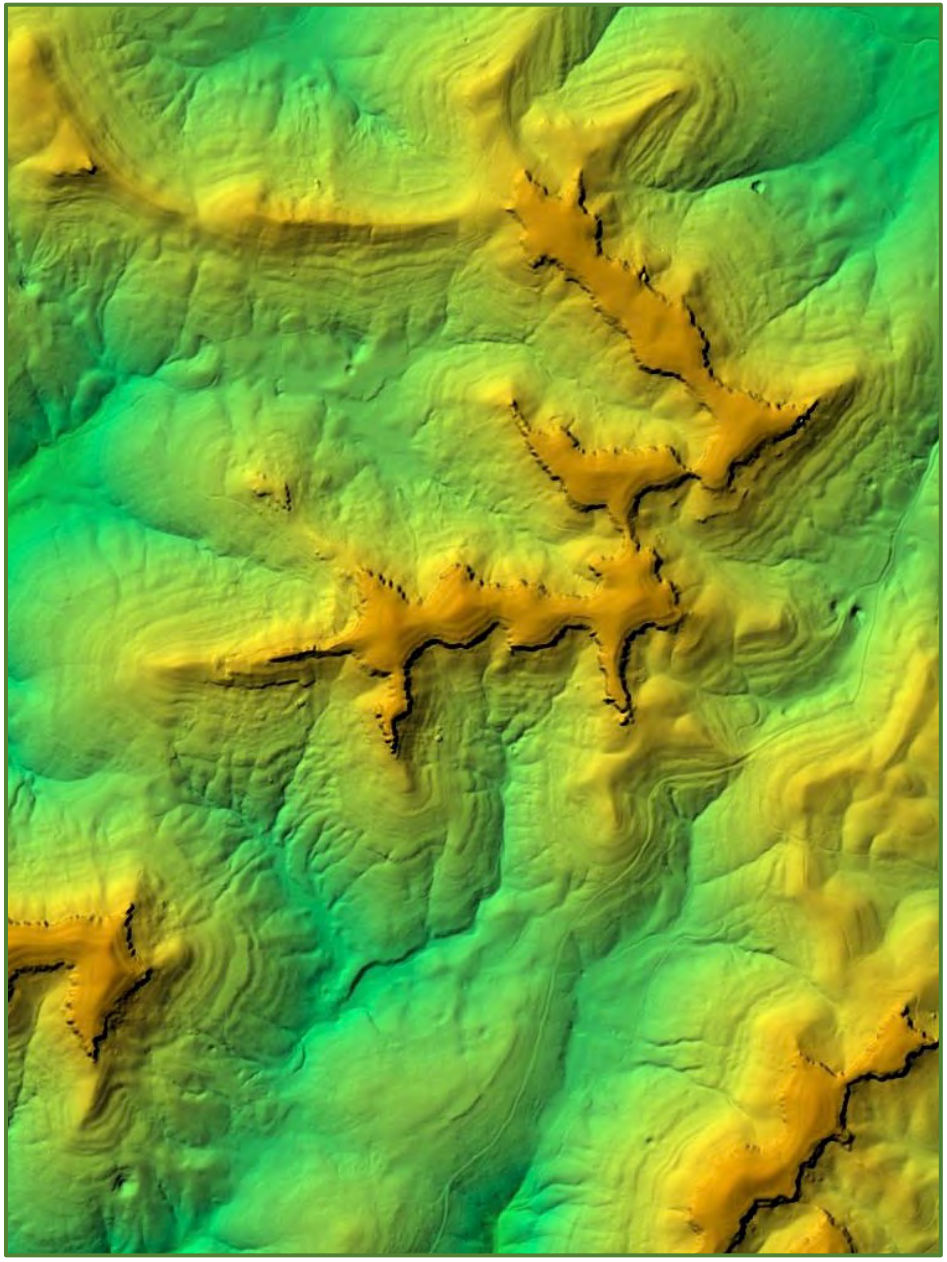
A function of the quality of the elevation model, ground control, GPS, and appropriate processing techniques - orthorectification

Aerial Photography: Oblique

Oblique

Provides a "side view" from four different angles – useful for assessment purposes

KyFromAbove



KyFromAbove

Successful, collaborative effort to acquire statewide aerial photography and elevation data (LiDAR)

Kentucky is a Leader

One of very few states to have achieved statewide LiDAR coverage

Pooling Resources

Over 20 local, state, and federal partners have contributed over $13-million since 2012

Engineering Quality

Specifications ensure collected data meets the needs of ALL partners – USGS/FEMA/NRCS

Tiered-Pricing

The more you buy, the cheaper it is per-square-mile - Economies of Scale

Accessible

Freely available and easy to access

PVA's & Aerial Photography

PVA Aerial Photography

Needed for effective operations

Need Ortho and Oblique

Ortho imagery is used for mapping, Oblique imagery is used for assessment

Licensed not Purchased

Some PVA's license rather than purchase their imagery

Resolution & Accuracy Confusion

Lots of confusion regarding resolution, accuracy, and measurements – not engineering quality

Sharing Status

Occasionally shared at the local level, rarely shared with state government

The Have Nots

Many counties don't have access to leaf-off aerial photography – just can't afford it

Opportunity for Savings?

Duplicative Acquisitions
Some Ky Counties have been flown twice in the same year

One Purchase – Used by Many
Buy it once. Let everyone use it.

Ortho Imagery for Everyone
ALL GIS users need ortho imagery. Period.

Oblique Imagery
Oblique imagery will be available to PVAs and other GIS users

Openly Shared
All data will be openly shared at all levels of government

Planned Refresh Intervals
Full, statewide refresh every three years

Questions?

Kent Anness

COT-GIS

kent.anness@ky.gov

https://kygeonet.ky.gov/